

Cranes - Barge and Float Operations - Offshore

Seaward Marine Corp. has developed the following policy to protect its employees from hazards associated with offshore barge and float operations. This chapter provides information on the requirements and safe practices to be followed when working on barges and floats, and on or over water. This work may include, but is not limited to:

- Cargo transportation
- Dredging/drilling
- Bridge building
- Working at heights
- Excavation work
- Diving operations

REFERENCES

- §29 CFR 1910.23 -- Ladders
- §29 CFR 1910.21-.32 -- Walking, Working Surfaces
- §29 CFR 1910.146 -- Confined Space Entry
- §29 CFR 1910 Subpart T -- Commercial Diving Operations
- §29 CFR 1910.147 -- Controlling of Hazardous Energy
- §29 CFR 1910.179 -- Frequent Crane Inspection
- §29 CFR 1926.104 (a)-(f) -- Safety belts, lifelines, and lanyards.
- §29 CFR 1926.106 -- Working Over or Near Water
- §29 CFR 1926.1412 -- Competent Person Daily Visual Inspection
- §29 CFR 1926.251 -- Rigging Equipment for Material Handling
- §29 CFR 1926.500-503 -- Fall Protection
- §29 CFR 1926.552 -- Material Hoists; Personnel Hoists and Elevators
- §29 CFR 1926.605 -- Marine Operations and Equipment
- §29 CFR 1926 Subpart CC 1401-1428 -- Cranes and Derricks in Construction
- §29 CFR 1926-Subpart E -- PPE (personal protective equipment)
- §29 CFR 1926.1427 -- Operator Qualification and Certification
- §29 CFR 1926.1437 -- Floating cranes/derricks and land cranes/derricks on barges
- §49 CFR 177 -- Hazardous Material-Highway Regulations
- §49 CFR 393 -- Parts and Accessories for Safe Operation
- §46 CFR U.S. Coast Guard Subchapter V -- Marine OSHA Part §197 -- Subpart B -- Commercial Diving Operations
- ANSI Z-358 -- Emergency Eye Wash and Shower
- ANSI/ASME B 30.2.0 Overhead and Gantry Cranes
- ASME B15-1 -- Mechanical Power Transmission Apparatus
- ASME B30.5-3.12(a) -- Mobile and Locomotive Cranes
- API RP 2D-Operation and Maintenance of Offshore Cranes
- Cranes-Rigging and Signaling HSE Chapter

EMPLOYER RESPONSIBILITIES

Seaward Marine Corp. will:

- Develop, implement and manage a Barge and Float Operations Program.
- Provide training in elements of Barge and Float Operations, such as overhead material handling; fall protection; confined space entry; rigging; controlling of hazardous energies; etc.,
- Be knowledgeable of current regulations, standards, equipment, and systems
- Advise and provide guidance to managers, employees, and other departments on all managed Barge and Float Operations Program matters
- Establish and assign all duties and responsibilities outlined in this policy to trained, competent and qualified individuals
- Provide or verify that the personnel have the necessary resources to accomplish their duties and responsibilities safely
- Measure and evaluate the effectiveness of the Barge and Float Operations Program by: conducting periodic program evaluations (Overhead Material Handling Program audits at a minimum annually) and making improvements
- Appropriate management will participate in the investigation of all incidents (including near misses) related to Barge and Float Operations. These will seek a root cause to prevent reoccurrence.
- Provide employees with all necessary PPE (personal protective equipment)
- Ensure all equipment and vessels are maintained in good condition
- Verify that only trained, certified personnel will operate lifts, cranes and/or derricks
- All manufacturer procedures applicable to the operational function of equipment will be complied with

EMPLOYEE RESPONSIBILITIES

All employees will:

- Report to a supervisor all unsafe conditions encountered during work
- Assist in job hazard analyses and follow safe job procedures.
- Inspect equipment prior to use and ensure all safety controls are in place prior to work
- Understand the purpose of necessary PPE (personal protective equipment) for a given job, ensure it is in safe, serviceable condition and use it according to safe work practices
- Follow all safety and health policies and offer suggestions to improve safety and health in the workplace where such opportunities exist
- Follow all procedures and training
- Not be expected to undertake a job until trained and is authorized to perform the job
- Not undertake a job that appears to be unsafe
- Follow all Safe Practices for Barge and Float Operations-Offshore Cranes

HAZARDS

- Struck by- loss of load (fall) due to: poor rigging practices; failed slings; failure of hook safety latch; failure of other “below the hook” rigging devices
- Unplanned releases of stored energy

- Untrained personnel
- Falls (into bodies of water)
- Unsafe Diving Operations
- Miscommunication between signal person and operator
- Lack of component inspection prior to use
- Lack of system inspection prior to use
- Component failure (such as brakes)
- Lift weight in excess of Rated Load Capacity
- Swing Lifts
- Shock Loading
- Unintended load contact with fixed structures
- People working below suspended loads

SAFE PRACTICES

All Seaward Marine Corp. employees will follow these Company safe practices.

Safety Nets

- Follow all manufacturers direction on Safety Net installation
- Safety nets are to be provided when workplaces are more than 25 feet above the ground or water surface, or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors, safety lines, or use of harnesses/ belts is impractical.
- Where safety net protection is required, operations must not be undertaken until the net is in place and has been tested.
- Nets will extend 8 feet beyond the edge of the work surface where employees are exposed and will be installed as close under the work surface as practical but in no case more than 25 feet below such work surface.
- Nets are required to be hung with sufficient clearance to prevent user's contact with the surfaces or structures below. Such clearances will be determined by impact load testing.
- It is intended that only one level of nets be required for bridge construction.
- The mesh size of nets must not exceed 6 inches by 6 inches. All new nets will meet accepted performance standards of 17,500 foot-pounds minimum impact resistance as determined and certified by the manufacturers, and are required to bear a label of proof test.
- Edge ropes must provide a minimum breaking strength of 5,000 pounds of dynamic load.
- Modifications or additions that affect the safe operation of the equipment may not be made without the manufacturer's written approval. The original safety factor of the equipment must not be reduced if modifications or changes are made to the equipment. Modifications or changes will be certified by a competent registered engineer.

Use of a Competent Person

Russell H Williams (designated by Seaward Marine Corp.) will have the authority over all crane and hoisting operations. The Competent Person will ensure that all safety measures and systems are in place; all safety procedures are adhered to, and make sure pre-shift, monthly and additional inspections of the crane, rigging gear and the operational site are conducted.

Russell H Williams must begin a visual inspection prior to each shift the equipment is used, which must be completed before or during that shift. The inspection must consist of observation of wire ropes (running and standing) that are likely to be in use during the shift for any apparent deficiencies.

All Brakes, Hooks, Slings, and Ropes will all be inspected to certification monthly with record keeping.

Russell H Williams will perform a daily, pre-shift, pre-use inspection of the crane as well as monthly or Periodic Inspections.

The documentation of monthly inspections must include the parts of the crane checked, the serial number (or other identifier) the results of the inspection and the name and signature of the inspector with the date of the inspection. This focus is on the brakes, crane hooks and ropes.

Use of a Qualified Rigger

A trained, qualified rigger is able to rig efficiently and safely based on all the variables of the lift.

A qualified rigger shall work with the crane operator, Russell H Williams and the Signal person on every lift and move. The Rigger will be part of lift planning including identification of load weight, the center of gravity, identify the best "below the hook" rigging equipment to use for each lift such as hitches, shackles, spreaders, strong backs, hooks and latches as well as slings and rope. A qualified rigger can also determine the safety of the lift based on load weight and center of gravity. The rigger understands load control and the effects and impact of equipment use of tag lines, sling configuration, rope/ sling angles and rated load capacities.

Riggers partner with and assist Russell H Williams on equipment inspections. Riggers also work with the Signalperson(s) on each move.

Use of a Signal Person

An operator will respond to signals only from the employee directing a lift (signaler). However, they must obey at all times an emergency stop signal from any employee. When two or more cranes are used to lift a load, the designated signal employee will give all signals. A communication system for both operators must be agreed upon and established prior to lift. A signal person is required when:

- The Seaward Marine Corp. will ensure that a qualified signal person will be provided in each of the following situations: the point of operation, meaning the load travel or the area near or at load placement, is not in full view of the operator; when the equipment is traveling, the view in the direction of travel is obstructed; due to site specific safety concerns, either the operator, the rigger or the signal person determines that it is necessary

Crane Inspections

OSHA requires an operational/visual crane inspection before each shift by a competent person. Required crane inspections may include initial, daily, pre-use, frequent (daily to monthly), periodic (monthly to quarterly), monthly, quarterly and annual. Supporting inspection logs will be kept to satisfy the inspection requirement.

Daily Crane Inspections

- All control mechanisms for maladjustment interfering with proper operation; for excessive wear of components and contamination by lubricants or other foreign matter
- All safety devices for functionality
- Air or hydraulic systems for deterioration or leakage
- Crane hooks for deformations or cracks
- Rope reeving for noncompliance with manufacturer's recommendations
- Electrical apparatuses for malfunctioning, signs of excessive deterioration, dirt, and moisture accumulation

Daily or Frequent Crane Inspection

- Control mechanisms for wear and malfunction each daily use
- Deterioration or leakage of air or hydraulic systems, each daily use
- Hydraulic system for oil level, each daily use
- Hydraulic hoses and fittings for leaks and deterioration
- All running ropes, each daily use
- Rope reeving in conformance with the original installation
- Electrical apparatus for malfunction, wear, dirt, and moisture accumulations
- Tires for specified pressure (if in use)
- If the hoisting equipment is set up onshore for lifting over water, ground conditions must be inspected. It is a requirement that ground conditions be stable, drained, and graded by a qualified grade checker prior to any crane being assembled. The same rule applies for supporting materials for the crane. When using supporting materials for the crane the manufacture's specifications must be followed to ensure the adequate support and degree of level are met.
- Lifting hooks for deformation or cracks. A hook having a crack, a throat opening of more than 15% of normal or more than 10 degree twist from the plane of an unbent hook will be replaced

Monthly or Periodic Inspections

A crane will be given the following monthly to yearly inspections:

- Structural members and boom for cracks, deformation, and corrosion
- Bolts and rivets for tightness
- Sheaves, drums, pins, bearings, shafts, gears, rollers, locking and clamping devices for wear, distortion, and cracks
- Power sources for performance
- Brake & clutch system parts, linings, pawls, & ratchets for excessive wear
- Load, boom angle, and other indicators for inaccuracies over their full range

- Travel, steering, braking, and locking devices for malfunction
- Tires for wear or damage
- Radiators and oil coolers for leakage, blockage of air passages, and improper performance
- Rust on piston rods and control valves
- Oil strainers and filters for blockage

Annual Inspection; Certification of Crane and Preventative Maintenance

This shall be performed by a qualified third party as a best practice, although some manufacturers require this. The Annual inspection must include functional testing to determine that the equipment as configured in the inspection is functioning properly. If any deficiency is identified, an immediate determination must be made by a qualified person as to whether the deficiency constitutes a safety hazard or, though not yet a safety hazard, needs to be monitored in the monthly inspections.

If a qualified person determines that a deficiency is a safety hazard, the equipment must be taken out of service until it has been corrected, except when temporary alternative measures are implemented. If a qualified person determines that, though not presently a safety hazard, the deficiency needs to be monitored, the employer must ensure that the deficiency is checked in the monthly inspections.

Hazardous conditions disclosed by the inspection requirements will be corrected before operation of the crane is resumed.

The preventative maintenance program is established by the crane owner, taking into consideration crane type, frequency of usage, history of maintenance, and manufacturer's recommendations. If unsafe conditions are disclosed by the inspection, the crane shall be taken out of service or its operation restricted to eliminate the unsafe condition.

Documentation of annual/comprehensive inspection(s).

The following information must be documented, maintained, and retained for a minimum of 12 months, by the employer that conducts the inspection: the items checked and the results of the inspection; the name and signature of the person who conducted the inspection and the date.

Crane inspection certification records which include the date of inspection, the signature of the person who performed the inspection, and the serial number or other identifier of the crane which was inspected, will be made monthly on critical items in use such as brakes, crane hooks, ropes, structural members, and welds. This record will be kept readily available with the equipment.

Inspection Records shall be maintained for 3 months. Periodic/Annual retain for 1 year. A Best Practice is to maintain all inspection records for a year, Annual Inspections for 3 years.

Occasional and Out of Service Inspections

Cranes that have been idle for a period of more than one month, but less than six months will be given a frequent/periodic inspection prior to being placed in service.

Cranes which have been out of service for more than six months will be given a Daily, Frequent, Periodic/Annual inspection before being used. Standby cranes will be inspected at least semi-annually, or more frequently if they are exposed to adverse environments.

Records will include the date of inspection, the signature of the person who performed the inspection, and an identifier for the equipment will be made and kept on file at Seaward Marine Corp. office. The same records will be kept on inspections of all rigging equipment (below the hook).

Proof Testing Certificates – Russell H Williams will ensure that before use, each new, repaired, or reconditioned alloy steel chain sling, including all welded components in the sling assembly, will be proof tested by the sling manufacturer or equivalent entity, in accordance with American Society of Testing and Materials Specification A391, (ANSI G61.1). Seaward Marine Corp. will retain a certificate of the proof test and will make it available for examination.

Proof Test Records should be kept for 7 years. All inspection records shall be retained for 3 months (as a best practice, retain for 1 year). Annual Inspections for 1 year (as a best practice, retain for 5 years).

Equipment Guarding

Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or other moving parts or equipment will be guarded if such parts are exposed to contact by employees, or otherwise create a hazard. Guarding will meet the requirements of the American National Standards Institute B 15.1, Safety Code for Mechanical Power Transmission Apparatus.

Cranes and Derricks Safety Requirements

Seaward Marine Corp. will comply with the manufacturer's specifications and limitations applicable to the operation of any and all cranes and derricks. Where manufacturer's specifications are not available, the limitations assigned to the equipment will be based on the determinations of a qualified engineer competent in this field and such determinations will be appropriately documented and recorded. Attachments used with cranes will not exceed the capacity, rating, or scope recommended by the manufacturer.

Operators have the authority to stop or refuse to handle loads if they feel that the operation has safety concerns. The operations must not proceed until Russell H Williams deems that the safety is assured.

- Rated load capacities, recommended operating speeds, special hazard warnings, or instruction will be conspicuously posted on all equipment. Instructions or warnings will be visible to the operator while he is at the control station/cab.
- Hand signals to crane and derrick operators will be those prescribed by the applicable ANSI standard for the type of crane in use. An illustration of the signals will be posted at the job site.
- Accessible areas within the swing radius of the rear of the rotating superstructure of the crane, either permanently or temporarily mounted, will be barricaded in such a manner as to prevent an employee from being struck or crushed.
- All exhaust pipes will be guarded or insulated in areas where contact by employees is possible in the performance of normal duties.
- Whenever internal combustion engine powered equipment exhausts in enclosed spaces, air monitoring will be performed and recorded to see that employees are not exposed to unsafe concentrations of toxic gases or oxygen deficient atmospheres.

- All windows in cabs will be of safety glass, or equivalent, that introduces no visible distortion that will interfere with the safe operation of the machine.
- Where necessary for rigging or service requirements, a ladder, or steps, will be provided to give access to a cab roof.
- Guardrails, handholds, and steps will be provided on cranes for easy access to the car and cab.
- Platforms and walkways will have anti-skid surfaces.
- Fuel tank filler pipe will be located in such a position, or protected in such manner, as to not allow spill or overflow to run onto the engine, exhaust, or electrical equipment of any machine being fueled.
- An accessible fire extinguisher of 5BC rating, or higher, will be available at all operator stations or cabs of equipment.
- All fuels will be transported, stored, and handled to meet the rules of Subpart F of this part. When fuel is transported by vehicles on public highways, Department of Transportation rules contained in 49 CFR Parts 177 and 393 concerning such vehicular transportation are considered applicable.

Hazard Identification and Risk Assessment

- Where the assessment identifies that the crane has the potential to hit and injure or pin/crush a worker against an object, the hazardous areas of the crane swing radius will be marked with warning lines or railings.
- Seaward Marine Corp. will ensure that Russell H Williams conducts hazard identification and a designated risk assessment before work begins. Boundaries of the work zone must be identified by marking with flags and range limiting devices. The work zone must be defined using a 360-degree radius around the crane or the max radius of the crane.

If the assessment identifies that the crane, load line, load or any part of the crane could get closer than 20 feet to an electrical power line, the following measures must be followed:

- Any overhead wire will be considered an energized line until a representative of the owner or utility has checked and indicated otherwise
- Before any crane operation is started closer than 20 feet to a power line the owner or utility representative will be notified

- Ground jumper cables will be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews will be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.
- Combustible and flammable materials will be removed from the immediate area prior to operations.
- No modifications or additions which affect the capacity or safe operation of the equipment will be made by Seaward Marine Corp. without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, will be changed accordingly. In no case will the original safety factor of the equipment be reduced.

PPE (PERSONAL PROTECTIVE EQUIPMENT)

General Requirements

Hard hat, safety boots, gloves, hearing protection, safety glasses, high visibility wear and Personal Floatation Devices when over or near water. Goggles and/or face shield when they are needed. Respirators are required in hazardous atmospheres.

Safety Belts, Lifelines, and Lanyards

- Lifelines, safety belts, harnesses and lanyards are required to be used only for employee safeguarding. Any lifeline, safety belt, or lanyard actually subjected to in-service loading, as distinguished from static load testing, must be immediately removed from service, replaced and destroyed.
- Lifelines will be secured above the point of operation to an anchorage or structural member capable of supporting a minimum load weight of 5,400 pounds (dynamic).
- Lifelines used on rock-scaling operations, or in areas where the lifeline may be subjected to cutting or abrasion, must be a minimum of 7/8-inch wire core manila rope. For all other lifeline applications, a minimum of 3/4-inch manila or equivalent, with a minimum breaking strength of 5,400 pounds dynamic will be used.
- Safety belt lanyard must be a minimum of 1/2-inch nylon, or equivalent, with a maximum length to provide for a fall of no greater than 6 feet. The rope must have a nominal breaking strength of 5,400 pounds dynamic.
- All safety belt and lanyard hardware will be drop forged or pressed steel, cadmium plated in accordance with type 1, Class B plating. Surface will be smooth and free of sharp edges.
- All safety belt and lanyard hardware, except rivets, must be capable of withstanding a tensile loading of 4,000 pounds dynamic without cracking, breaking, or creating a permanent deformation.

Life Saving Equipment and Water Rescue

- Employees working over or near water, where the danger of drowning exists, must be provided with U.S. Coast Guard-approved life jacket or buoyant work vests. Wear these appropriately-secure all ties, zip it, and/or snap it so that it stays with you should you fall in the water.

At each job site, prior to hoisting employees on the personnel platform, and after any repair or modification, the platform and rigging will be proof tested to 125 % of the platform's rated capacity by holding it in a suspended position for five minutes with the test load evenly distributed on the platform (this may be done concurrently with the test lift).

After proof testing, Russell H Williams will inspect the platform and rigging. Any deficiencies found will be corrected and another proof test will be conducted. Personnel hoisting will not be conducted until the proof testing requirements are satisfied.

SAFE PRACTICES

Employees will keep all parts of their body inside the platform during raising, lowering, and positioning. This provision does not apply to an occupant of the platform performing the duties of a signal person

Before employees exit or enter a hoisted personnel platform that is not landed, the platform will be secured to the structure where the work is to be performed, unless securing to the structure creates an unsafe situation

- Tag lines will be used unless their use creates an unsafe condition
- The crane or derrick operator will remain at the controls at all times when the crane engine is running and the platform is occupied
- Hoisting of employees will be immediately stopped upon indication of any dangerous weather conditions or other impending danger
- Employees being hoisted will remain in continuous sight of and in direct communication with the operator or signal person. In those situations where direct visual contact with the operator is not possible, and the use of a signal person would create a greater hazard for the person, direct communication alone such as by radio, may be used.
- Except over water, employees occupying the personnel platform will use a body belt/harness system with lanyard appropriately attached to the lower load block or overhaul ball, or to a structural member within the personnel platform capable of supporting a fall impact for employees using the anchorage. When working over water the requirements of 29 CFR 1926.106 will apply
- No lifts will be made on another of the crane's or derrick's load-lines while personnel are suspended on a platform

Traveling

Hoisting of employees while the crane is traveling is prohibited, except for portal, tower and locomotive cranes, or where Seaward Marine Corp. demonstrates that there is no less hazardous way to perform the work.

Under any circumstances where a crane would travel while hoisting personnel, Seaward Marine Corp. will implement the following procedures to safeguard employees:

- Crane travel will be restricted to a fixed track or runway
- Travel will be limited to the load radius of the boom used during the lift
- The boom must be parallel to the direction of travel

A complete test run will be performed to test the route of travel before employees are allowed to occupy the platform. This test run can be performed at the same time as the test lift which tests the route of the lift.

If travel is done with a rubber tired-carrier, the condition and air pressure of the tires will be checked. The chart capacity for lifts on rubber will be used for application of the 50 % reduction of rated capacity.

Outriggers may be partially retracted as necessary for travel.

Pre-lift Meeting

A meeting attended by the crane or derrick operator, riggers, signal person(s) (if necessary for the lift), employee(s) to be lifted, and the person responsible for the task to be performed will be held to review the appropriate requirements and the procedures to be followed.

This meeting will be held prior to the test lift at each new work location, and will be repeated for any employees newly assigned to the operation.

TRAINING


Crane Operators Medical Evaluations and Requirements for Training:

While the OSHA operator qualification regulation does not include physical requirements for operators, ASME B30-5 has. These ASME requirements have endorsed by several professional organizations and may be included in some state regulations. Always check with the governing authority to determine the requirements for your worksite.

ASME B30-5 identifies minimum physical requirements for crane operators and trainees. An employee selected to operate a crane must possess all of the following minimum physical qualifications and be examined for the qualifications at least once every 3 years:

- Have effective use of all four limbs
- Be of a height sufficient to operate the controls and to have an unobstructed view over the controls into the work area
- Have coordination between eyes, hands, and feet
- Be free of known convulsive disorders and episodes of unconsciousness
- Possession of a driver's license
- Be able to read and understand signs, labels, and instruction manuals
- They will be able to distinguish colors, regardless of position of colors, specifically between red, yellow, and green (if color differential is required for operation)
- Have depth perception.
- Hearing, with or without hearing aid, must be adequate for a specific operation
- Vision of at least 20/30 Snellen in one eye and 20/50 in the other eye with or without glasses
- No history of disabling medical condition which may be sufficient reason for disqualification
- Qualifications for crane operators will be maintained every three years and will include medical and vision evaluations.

Seaward Marine Corp. will verify that only certified employees are allowed to operate cranes. Certification is available through one of the following:

- An accredited crane operator testing organization 
- An audited program provided by the Seaward Marine Corp.
- Have U.S. military licensing by a government authority

Crane operator qualifications must be maintained and refreshed every three years and may include vision and medical condition evaluations.

The employer must ensure that each operator is trained, certified/ licensed, and evaluated in accordance with Code of Federal Regulations. An employee who has not been certified/licensed and evaluated to operate assigned equipment may only operate the equipment as an operator-in-training under supervision. The employer must provide each operator-in-training with sufficient training, through a combination of formal and practical instruction. For purposes of this section, an operator who is an employee of the U.S. military meets the requirements of this section if he/she has a current operator qualification issued by the U.S. military for operation of the equipment.

Not portable: Such a qualification that meets the requirements where the operator is employed (and operating the equipment for) the employer that issued the qualification only. Valid for the period of time stipulated by the issuing entity.

Seaward Marine Corp. The employer must provide each OIT (operator-in-training) with formal/practical instruction, to ensure that the operator in- training develops the skills, knowledge, ability to recognize and avert risk necessary. A determination is made through a written test including all of the following:

- The controls and operational/performance characteristics.
- Use of, and the ability to calculate (manually or with a calculator), load/capacity information on a variety of configurations of the equipment.
- Procedures for preventing and responding to power line contact.
- Technical knowledge applicable to the suitability of the supporting ground and surface to handle expected loads, site hazards, and site access.
- The individual is able to read and locate relevant information in the equipment manual and other materials containing information

An operator in training must be continuously monitored by an operator trainer who meets the following requirements:

- The operator's trainer is an employee or agent of the operator-in-training's employer and has the knowledge, training, and experience necessary.
- While monitoring the operator-in-training, the operator's trainer performs no tasks that detract from the trainer's ability to monitor the operator-in-training.
- Other than tower cranes: The operator's trainer and the operator-in-training must be in direct line of sight of each other and must communicate verbally or by hand signals. For tower cranes: Operator's trainer and operator-in-training must be in direct communication.