**Cranes/Derricks—Mobile Auxiliary Crane Plan and Procedures**

**29 CFR PART** [**1926.1437**](https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.1437)**—Floating Cranes/Derricks and Land**

**Cranes/Derricks on Barges**

***Scope/Application:*** *This standard applies when more than one crane/derrick will be supporting the load.*

***Standard Requirements for 29 CFR 1926, Subpart CC—Cranes & Derricks in Construction:***

* ***Programs/Plans:*** *Multiple Crane/Derrick Operation Plan; Mobile Auxiliary Crane Plan*
* ***Procedures/Practices:*** *Work procedures (Include in your Plan)*
* ***Training:*** *Initially*
* ***Inspections:*** *Initially, each shift, monthly, annually*
* ***Recordkeeping:*** *Plan, inspections, certifications*

***Example Program:*** *The following example plan may be modified to be site-specific to the organization. Please reference 29 CFR 1926.1437—Floating Cranes/Derricks and Land Cranes/Derricks on Barges and Subpart CC—Cranes & Derricks in Construction to ensure that all requirements are being met.*

**Mobile Auxiliary Crane Plan and Procedures**

**Plan Development Procedures**

* A marine engineer or registered professional engineer familiar with floating crane/derrick design will develop and sign a written plan for the use of the mobile auxiliary crane.
* The plan will be designed so that the applicable requirements are met despite the position, travel, operation, and lack of physical attachment (or corralling, use of rails or cable system) of the mobile auxiliary crane.
* The plan will specify the areas of the deck where the mobile auxiliary crane is permitted to be positioned, travel, and operate, and the parameters and limitations of such movements and operation.
* The deck will be marked to identify the permitted areas for positioning, travel, and operation.
* The plan will specify the dynamic and environmental conditions will be present for use of the plan.
* If the dynamic and environmental conditions are exceeded, the mobile auxiliary crane is attached physically or corralled in accordance with option 1, 2 or 4 below:
	1. *Physical attachment*. The crane/derrick is physically attached to the barge, pontoons, vessel or other means of flotation. Methods of physical attachment include crossed-cable systems attached to the crane/derrick and vessel/flotation device, bolting or welding the crane/derrick to the vessel/flotation device, strapping the crane/derrick to the vessel/flotation device with chains, or other methods of physical attachment.
	2. *Corralling*. The crane/derrick is prevented from shifting by installing barricade restraints (i.e., a corralling system). Employers must ensure that corralling systems do not allow the equipment to shift by any amount of shifting in any direction.
	3. *Rails*. The crane/derrick must be prevented from shifting by being mounted on a rail system. Employers must ensure that rail clamps and rail stops are used unless the system is designed to prevent movement during operation by other means
	4. *Centerline cable system*. The crane/derrick is prevented from shifting by being mounted to a wire rope system. We will ensure that the wire rope system meets the following requirements:
* The wire rope and attachments are of sufficient size and strength to support the side load of crane/derrick.
* The wire rope is attached physically to the vessel/flotation device.
* The wire rope is attached to the crane/derrick by appropriate attachment methods (such as shackles or sheaves) on the undercarriage, and that the method used will allow the crew to secure the crane/derrick from movement during operation and to move the crane/derrick longitudinally along the vessel/flotation device for repositioning.
* Means are installed to prevent the crane/derrick from passing the forward or aft end of the wire rope attachments.
* The crane/derrick is secured from movement during operation.
* The systems/means used to comply with option 1-4 are designed by a marine engineer, registered professional engineer familiar with floating crane/derrick design, or qualified person familiar with floating crane/derrick design.

**Inspection Procedures**

*Modified equipment—*Equipment that has had modifications or additions which affect the safe operation of the equipment (such as modifications or additions involving a safety device or operational aid, critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism) or capacity will be inspected by a qualified person after such modifications/additions have been completed, prior to initial use.

The inspection will meet all of the following requirements:

* Inspection will assure that the modifications or additions have been done with the approval of the manufacturer or registered professional engineer (RPE).
* Inspection will include functional testing of the equipment.
* Equipment will not be used until an inspection has been approved by the manufacturer or an RPE.

*Repaired/adjusted equipment—*Equipment that has had a repair or adjustment that relates to safe operation (such as: A repair or adjustment to a safety device or operator aid, or to a critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism), will be inspected by a qualified person after such a repair or adjustment has been completed, prior to initial use.

The inspection will meet all of the following requirements:

* The qualified person will determine if the repair/adjustment meets manufacturer equipment criteria (where applicable and available).
* Where manufacturer equipment criteria are unavailable or inapplicable, the qualified person will:
	+ Determine if an RPE is needed to develop criteria for the repair/adjustment. If an RPE is not needed, we will ensure that the criteria are developed by the qualified person. If an RPE is needed, we will ensure that they are developed by an RPE.
	+ Determine if the repair/adjustment can be developed by a qualified person or an RPE is required.
* Inspection will include functional testing of the repaired/adjusted parts and other components that may be affected by the repair/adjustment.
* Equipment will not be used until an inspection demonstrates that the repair/adjustment meets manufacturer requirements and approval.

*Post-assembly—*Upon completion of assembly, the equipment will be inspected by a qualified person to assure that it is configured in accordance with manufacturer equipment criteria.

Where manufacturer equipment criteria are unavailable, a qualified person will:

* Determine if an familiar with the type of equipment involved is needed to develop criteria for the equipment configuration. If an RPE is not needed, we will ensure that the criteria are developed by the qualified person. If an RPE is needed, we will ensure that they are developed by an RPE.
* Determine if the equipment meets the criteria of needing an RPE.
* Equipment will not be used until an inspection demonstrates that the equipment is configured in accordance with the applicable criteria.

*Each shift—*A competent person will begin a visual inspection prior to each shift the equipment will be used, which must be completed before or during that shift. It includes:

* The inspection will consist of observation for apparent deficiencies.
* Taking apart equipment components and booming down is not required as part of this inspection unless the results of the visual inspection or trial operation indicate that further investigation necessitating taking apart equipment components or booming down is needed.
* Determinations made in conducting the inspection will be reassessed in light of observations made during operation.

At a minimum, the inspection will include all of the following:

* Control mechanisms for maladjustments interfering with proper operation.
* Control and drive mechanisms for apparent excessive wear of components and contamination by lubricants, water or other foreign matter.
* Air, hydraulic, and other pressurized lines for deterioration or leakage, particularly those which flex in normal operation.
* Hydraulic system for proper fluid level.
* Hooks and latches for deformation, cracks, excessive wear, or damage such as from chemicals or heat.
* Wire rope reeving for compliance with the manufacturer's specifications.
* Wire rope.
* Electrical apparatus for malfunctioning, signs of apparent excessive deterioration, dirt or moisture accumulation.
* Tires (when in use) for proper inflation and condition.
* Ground conditions around the equipment for proper support, including ground settling under and around outriggers/stabilizers and supporting foundations, ground water accumulation, or similar conditions. The equipment for level position within the tolerances specified by the equipment manufacturer's recommendations, both before each shift and after each move and setup.
* Operator cab windows for significant cracks, breaks, or other deficiencies that would hamper the operator's view.
* Rails, rail stops, rail clamps and supporting surfaces when the equipment has rail traveling.
* Safety devices and operational aids for proper operation.

*Deficiencies—*If any deficiency or any additional inspection items required to be checked for specific types of equipment is identified, an immediate determination will be made by the competent person as to whether the deficiency constitutes a safety hazard. If the deficiency is determined to constitute a safety hazard, the equipment will be taken out of service until it has been corrected.

If any deficiency is identified for safety devices/operational aids, operations will not begin until they are in working order.

*Monthly—*Each month the equipment is in service, it will be inspected each shift. Equipment will not be used until an inspection demonstrates that no corrective action is required.

*Documentation of shift and monthly inspections—*The following information for the inspections conducted each shift and monthly will be documented and maintained for 3 months:

* The items checked and the results of the inspection.
* The name and signature of the person who conducted the inspection and the date.

*Annual/comprehensive—*At least every 12 months, the equipment will be inspected by a qualified person. If needed, disassembly may be required to complete the inspection.

The equipment will be inspected for all of the following:

* Equipment structure (including the boom and, if equipped, the jib):
* Structural members: Deformed, cracked, or significantly corroded.
* Bolts, rivets and other fasteners: loose, failed or significantly corroded.
* Welds for cracks.
* Sheaves and drums for cracks or significant wear.
* Parts such as pins, bearings, shafts, gears, rollers and locking devices for distortion, cracks or significant wear.
* Brake and clutch system parts, linings, pawls and ratchets for excessive wear.
* Safety devices and operational aids for proper operation (including significant inaccuracies).
* Gasoline, diesel, electric, or other power plants for safety-related problems (such as leaking exhaust and emergency shut-down feature) and conditions, and proper operation.
* Chains and chain drive sprockets for excessive wear of sprockets and excessive chain stretch.
* Travel steering, brakes, and locking devices, for proper operation.
* Tires for damage or excessive wear.

Hydraulic, pneumatic and other pressurized hoses, fittings and tubing, will be inspected as follows:

* Flexible hose or its junction with the fittings for indications of leaks.
* Threaded or clamped joints for leaks.
* Outer covering of the hose for blistering, abnormal deformation or other signs of failure/impending failure.
* Outer surface of a hose, rigid tube, or fitting for indications of excessive abrasion or scrubbing.
* Hydraulic and pneumatic pumps and motors, as follows:
* Performance indicators: Unusual noises or vibration, low operating speed, excessive heating of the fluid, low pressure.
* Loose bolts or fasteners.
* Shaft seals and joints between pump sections for leaks.

Hydraulic and pneumatic valves, will be inspected as follows:

* Spools: Sticking, improper return to neutral, and leaks.
* Leaks.
* Valve housing cracks.
* Relief valves: Failure to reach correct pressure (if there is a manufacturer procedure for checking pressure, it must be followed).

Hydraulic and pneumatic cylinders, will be inspected as follows:

* Drifting caused by fluid leaking across the piston.
* Rod seals and welded joints for leaks.
* Cylinder rods for scores, nicks, or dents.
* Case (barrel) for significant dents.
* Rod eyes and connecting joints: Loose or deformed.
* Outrigger or stabilizer pads/floats for excessive wear or cracks.
* Slider pads for excessive wear or cracks.
* Electrical components and wiring for cracked or split insulation and loose or corroded terminations.
* Warning labels and decals originally supplied with the equipment by the manufacturer or otherwise required: Missing or unreadable.
* Originally equipped operator seat (or equivalent): Missing.
* Operator seat: Unserviceable.
* Originally equipped steps, ladders, handrails, guards: Missing.
* Steps, ladders, handrails, guards: In unusable/unsafe condition.

This inspection will include functional testing to determine that the equipment as configured in the inspection is functioning properly.

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

*Documentation of annual/comprehensive inspection—*The following information will be documented, maintained, and retained for a minimum of 12 months:

* The items checked and the results of the inspection.
* The name and signature of the person who conducted the inspection and the date.

*Severe service—*Where the severity of use/conditions is such that there is a reasonable probability of damage or excessive wear (such as loading that may have exceeded rated capacity, shock loading that may have exceeded rated capacity, prolonged exposure to a corrosive atmosphere), we will stop using the equipment and a qualified person will:

* Inspect the equipment for structural damage to determine if the equipment can continue to be used safely.
* In light of the use/conditions determine whether any items/conditions need to be inspected; if so, the qualified person will inspect those items/conditions.
* If a deficiency is found, the qualified person will determine if it constitutes a safety hazard and take appropriate corrective action.

*Equipment not in regular use—*Equipment that has been idle for 3 months or more will be inspected by a qualified person before initial use.

*Manufacturer procedures—*Any part of a manufacturer's procedures regarding inspections that relate to safe operation (such as to a safety device or operational aid, critical part of a control system, power plant, braking system, load-sustaining structural components, load hook, or in-use operating mechanism) that is more comprehensive or has a more frequent schedule of inspection than the above requirements will be followed.

*Barge, pontoons, vessel or other means of flotation used to support a floating crane/derrick or land crane/derric*k

*Shift inspections—*The following will be inspected during each shift inspection:

* The means used to secure/attach the equipment to the vessel/flotation device is in proper condition, including wear, corrosion, loose or missing fasteners, defective welds, and (when applicable) insufficient tension.

*Monthly inspections—*The following will be inspected during each monthly inspection:

* The means used to secure/attach the equipment to the vessel/flotation device is in proper condition, including inspection for wear, corrosion, and, when applicable, insufficient tension.
* The vessel/flotation device is not taking on water.
* The deckload is properly secured.
* The vessel/flotation device is watertight based on the condition of the chain lockers, storage, fuel compartments, and hatches
* The firefighting and lifesaving equipment is in place and functional.
* The shift and monthly inspections are conducted by a competent person, and:
	+ If any deficiency is identified, an immediate determination is made by a qualified person whether the deficiency constitutes a hazard.
	+ If the deficiency is determined to constitute a hazard, the vessel/flotation device is removed from service until the deficiency has been corrected.

*Documentation of shift and monthly inspections—*The following information for the inspections conducted each shift and monthly will be documented and maintained for 3 months:

* The items checked and the results of the inspection.
* The name and signature of the person who conducted the inspection and the date.

*Annual: external vessel/flotation device inspection—*For each annual inspection:

* The external portion of the barge, pontoons, vessel or other means of flotation used will be inspected annually by a qualified person who has expertise with respect to vessels/flotation devices and that the inspection includes the following items:
	+ The items listed in shift and monthly Inspections above.
	+ Cleats, bitts, chocks, fenders, capstans, ladders, and stanchions, for significant corrosion, wear, deterioration, or deformation that could impair the function of these items.
	+ External evidence of leaks and structural damage; evidence of leaks and damage below the waterline may be determined through internal inspection of the vessel/flotation device.
	+ Four-corner draft readings.
	+ Firefighting equipment for serviceability.
	+ Rescue skiffs, lifelines, work vests, life preservers and ring buoys are inspected for proper condition.
* If any deficiency is identified, an immediate determination is made by the qualified person whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly inspections.
* If the qualified person determines that the deficiency constitutes a hazard, the vessel/flotation device is removed from service until it has been corrected.
* If the qualified person determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency will be checked in the monthly inspections.

*Documentation of annual/comprehensive inspection—*The following information will be documented, maintained, and retained for a minimum of 12 months:

* The items checked and the results of the inspection.
* The name and signature of the person who conducted the inspection and the date.

*Four-year: internal vessel/flotation device inspection*. For each four-year inspection:

* A marine engineer, marine architect, licensed surveyor, or other qualified person who has expertise with respect to vessels/flotation devices surveys the internal portion of the barge, pontoons, vessel, or other means of flotation will conduct the inspection.
* If the surveyor identifies a deficiency, an immediate determination is made by the surveyor as to whether the deficiency constitutes a hazard or, though not yet a hazard, needs to be monitored in the monthly or annual inspections, as appropriate.
* If the surveyor determines that the deficiency constitutes a hazard, the vessel/flotation device will be removed from service until it has been corrected.
* If the surveyor determines that, though not presently a hazard, the deficiency needs to be monitored, the deficiency is checked in the monthly or annual inspections, as appropriate.

*Documentation of four year inspection*. The following information will be documented, maintained, and retained for a minimum of 4 years:

* The items checked and the results of the inspection.
* The name and signature of the person who conducted the inspection and the date.

**Training**

*Initially.* All employees will be trained initially on the procedures in the plan.

*Competent persons and qualified persons*. Each competent person and qualified person will be trained on the requirements of Cranes and Derricks Standard applicable to their respective roles.

*Refresher training.* We will evaluate each employee’s training to confirm that the employee understands the information provided in the training.

Refresher training will be provided in relevant topics for each employee when, based on the conduct of the employee or an evaluation of the employee's knowledge, there is an indication that retraining is necessary.

**Free Outreach Resources:**

[*Safety and Health Programs and Plans*](https://www.labor.nc.gov/safety-and-health/publications/example-programs) *(i.e., Example Programs to be Made Site-Specific)*

[*A - Z Safety and Health Topics*](https://www.labor.nc.gov/safety-and-health/occupational-safety-and-health/occupational-safety-and-health-topic-pages) *(i.e., Learn More About Safety and Health Topics)*

[*Which Standards Apply?*](https://www.labor.nc.gov/which-osha-standards-apply) *(Identify the Standards Applicable to Your Worksite)*

[*Safety and Health Presentations*](https://www.labor.nc.gov/document-collection/osh-presentations) *(Downloadable Presentations to be Made Site-Specific)*

[*OSH Training Calendar*](https://www.labor.communications.its.state.nc.us/OSHPublic/ETTA/class_regist/calendar.cfm) *(i.e., Register for Webinars, In-Person Classroom Training, Virtual Events)*

[*Streaming Video Services*](https://www.labor.nc.gov/safety-and-health/library/how-borrow-dvds-and-videos#are-your-videos-online) *(On-Demand Training)*

[*Request Outreach Services*](https://www.labor.communications.its.state.nc.us/OSHPublic/ETTA/Outreach/Outreach_Request_Form.html) *(i.e., Request Training, Booths, Guest Speaker)*

[*AskOSH*](https://www.labor.nc.gov/safety-and-health/occupational-safety-and-health/ask-osh) *(Interpretations)*