## Cranes and Rigging - Offshore

1. **Purpose**

To provide standardized procedures for safe crane operations.

1. **Responsibility**

The Foreman shall ensure:

* Crane operators and riggers are qualified. Only qualified employees shall operate equipment and machinery.
* Acceptable documentation of contract crane operator(s) qualification is on file prior to conducting crane operations.
* The manufacturer's procedures and prohibitions are followed when assembling and disassembling equipment.
* Crane maintenance and operations are conducted in accordance with Crane Manufacturers Manual and this procedure.
* Crane inspections are done daily, monthly, annually, and every four years using guidelines in API Recommended Practice (RP) 2D, Operations and Maintenance of Offshore Cranes. All inspections shall be documented.
* Crane gear and rigging are certified, maintained, and inspected in accordance with API RP 2D.
* A crane log is maintained.
* All cranes have a current load test.
* Crane operations do not interfere with helicopter operations, or helicopter operations are restricted accordingly.
* Affected wells are shut-in when heavy lifts are made over or near producing wells.

Maintenance/Construction Engineering shall:

* Ensure offshore cranes are in conformance with the latest edition of API Specification 2C Offshore Cranes.
* The Environmental, Safety and Health Department shall:
* Provide training resources.
* Maintain training records.
* Coordinate crane operator medical evaluations.

The Human Resources Department shall:

* Maintain crane operator medical evaluation records.

1. **Crane Equipment**

Procedures applicable to the operation of the equipment shall be readily available in the cab at all times. All Cranes shall be equipped with the following:

* Control devices clearly identified by signs, shape, or position in accordance with API Spec. 2C.
* Boom angle indicator which is functional and visible from the operator control station.
* Proper load chart, recommended operating speeds, special hazard warnings shall be posted and visible from the operator control station.
* Functional crane load weight indicator, calibrated in accordance with the manufacturer’s recommendations.
* Operable anti-two blocking device.
* Cranes with cabs and proper electrical power sources should be equipped with a Personal Address System (PA), installed by the manufacturer.
* Instructions and operator’s manual shall be readily available.

1. **Crane Safety Equipment**

* A functional red, rotating light shall be located on the gantry when the crane location is such that the boom can interfere with helicopter operations.
* All crane boom tips shall be painted safety red or orange.
* A 10 lb. ABC dry chemical or equivalent fire extinguisher shall be within the area of the crane cab.
* Cranes without cabs shall have the fire extinguisher located within 25 feet of the crane/power pack.
* All equipment and material hoists operating on rails, tracks, or trolleys shall have positive stop or limiting devices to prevent overrunning.
* All crane operating levers shall be located in accordance with API Spec. 2C, Specifications for Offshore Cranes.

1. **Crane Operations**

* A pre-operation hazard assessment will be performed to identify the work zone and determine if any part of the equipment could reach closer than 20 feet to a power line.
* Cranes must not be used unless ground conditions are able to support the equipment and any supporting materials per the manufacturer’s specifications.
* When the equipment has the potential to strike and injure an employee or pinch/crush an employee against any other object the crane swing radius shall be clearly marked with warning lines, railings or similar barriers.
* Lifts shall not exceed the rated load capacity of the crane, slings, hooks, shackles, etc.
* Inspections:
  + Ensure daily crane inspection is performed and all crane systems and components are in satisfactory condition before attempting a lift.
  + Tag the crane "DO NOT OPERATE" when the crane is not functioning properly.
  + Do not operate crane with bypassed safety devices without prior approval of the Production Supervisor, except during the performance of maintenance.
* Preparation For Cargo Handling:
  + Crane Operators must not operate the crane if physically or mentally unfit or taking medication that could affect coordination or sight.
  + Qualified riggers and signalman must assist with each lift.
  + Crane Operators must plan each heavy or unusual lift with the rigger(s).
  + Crane Operators must ensure that their signal person knows the correct signals, is aware of any modifications to the standard hand signals, and is visible to the operator at all times.
  + Crane mechanical components must be warmed upped prior to lifting by checking the functional operation of all clutches, brakes, etc.
  + Sufficient light must be provided during night crane operations.
  + Stop or restrict crane operations during bad weather or poor visibility.
  + Ensure slipping and tripping hazards are removed from work area.
  + Ensure area is clear of personnel before raising/lowering/swinging or moving the boom or lifting/lowering a load.
  + Do not refuel the crane with the engine running.
  + Adhere to the Crane and Rigging Manuals.
* Cargo Handling:
  + Refuse to perform any crane operation if an unsafe condition would result.
  + Do not attempt lifts that exceed 70 percent of the crane capacity at any planned boom angle without prior approval of person in charge.
  + Know the weight of the load to be lifted prior to lifting. If to/from a vessel know the weight is within the dynamic capacity of the crane and gear.
  + Use weight indicators or scales to determine weights of unmarked loads before they are off loaded to a vessel.
  + Unmarked lifts having an estimated weight in excess of 1500 pounds must be approved by the Production Supervisor.
  + Ensure one (1) full drum layer of rope remains on hoist drum, at maximum payout, if the drum is not grooved. A grooved drum shall retain 4 wraps, as a minimum.
  + Do not use cranes for dragging a load unless rigged for a vertical pull and equipped with a weight indicator.
  + Avoid sudden stops and starts while hoisting or lowering a load or hoisting/lowering/rotating the boom.
  + Do not divert attention from the crane operation.
  + Do not permit anyone to ride on the load.
  + Shutdown crane during helicopter operations (boom in cradle or pointed away from heliport, operator away from control station, etc.).
  + Do not leave the controls while a load is suspended.
  + Ensure the crane is shut down before leaving the crane cab. Ensure parking brake has been engaged. Ensure crane cab is kept clean.

1. **Rigging Practices**

The rigger shall:

* Stay from under the boom/load when there is tension on the load line and when there is no tension on the load line except for the minimum time necessary to hook/unhook the load.
* Stop a load from being lifted when it is unsafe.
* Stay in sight of the crane operator or signal man.
* Ensure safety latches are closed, shackle pins are screwed all the way in, and hooks without latches are secured.
* Ensure all slings, shackles, spreader bars, etc. are in good condition and appropriate for the load being handled.
* Ensure sling angles are not less than 30 degrees from the horizontal.
* Wear leather or other hard surface gloves when handling wire rope.
* Use a tag line to control loads.

Rigging Practices/Equipment:

* The fast line shall only be used for light cargo and personnel.
* The hoist rope shall not be wrapped around the load.
* The load shall be secured and balanced before being lifted.
* Multiple part lines shall not be twisted while lifting/lowering.
* The hook shall be located over the lift center of gravity.
* Shackles shall be used with all padeyes.
* All slings shall be tagged with the manufacturer's name and maximum rated capacity.
* Wire rope and slings should be inspected prior to use, and periodically for wear and corrosion.
* Slings shall be protected from sharp edges with padding.
* Wire rope slings shall not be made in the field. Only certified manufactured wire rope slings shall be used.
* Slings with hooks shall have a safety latch or shall be secured when safety latches are missing.
* Wire rope or slings should be immediately discarded whenever they have been shock loaded.
* Slings shall be kept free of salt water and properly stored when not in use.
* When less than all legs of a multilegged sling are used, the other leg(s) must be secured before lifting.
* Wire rope clips shall be placed with the U-bolts on the short end of the rope.
* Properly sized nylon slings shall be used where necessary to avoid damage to equipment & protective coatings.
* Nylon slings and wire rope with knots or sharp kinks shall not be used.
* Fiber rope or "soft line" shall be used only for tag lines.
* Chain slings shall not be used unless approved by the Foreman.
* Rubber coated wire rope slings that cannot be visually inspected for deterioration of the rope and shall not be used.

1. **Personnel Handling**

* Only crane operators, qualified to handle personnel, shall make personnel lifts.
* There shall be a clear, flat landing area on the deck of the marine vessel and on the platform.
* Personnel shall wear a properly secured Coast Guard approved work vest (Type V) or Type I life preserver.
* The personnel basket shall be inspected by the crane operator as part of the daily inspection or at time of use.
* The load shall be powered up and down.
* All hooks shall have a positive locking safety latch that is approved by the manufacturer for lifting personnel.
* A signal person or other competent person shall assist in attaching the load and directing the crane operator when the point of operation is not in full view of the operator, the view is obstructed when the equipment is traveling, and/or the operator or person handling the load determines it is necessary due to site specific concerns.
* Only personnel, who will ride on the basket on the next trip, or a section, shall be in the vicinity of the personnel basket during transfer operation.
* The number of persons on the personnel basket shall not exceed the manufacturer's recommendations.
* Passengers shall stand on the outer rim of the basket; facing inward.
* Only light personal luggage shall be permitted inside the personnel net when personnel are being transferred.
* A personnel basket shall not be used for cargo.
* When transferring personnel from the vessel to the platform or vice versa, the crane shall raise the personnel basket only high enough to clear the boat prior to swinging the basket over the water; raise it straight up, swing the basket over the landing area as soon as it clears the hand rail and lower it to the deck.
* Personnel baskets shall have a functional net stabilizer and tag line.
* The hoist line design factor shall not be less than 10.

1. **Safety Precautions**

* Boom shall be lowered to the deck or boom rest before making any repairs; suitable alternate arrangements must be accomplished for locations restricted by platform size and equipment layout. Consult appropriate supervisor and crane specialist.
* All controls shall be in the off or neutral positions before making any repair or inspections.
* Prime mover shall be locked-out before making any repairs.
* The electrical power supply shall be disconnected and energy source isolation verified before performing any maintenance.
* The pressure on the hydraulic system shall be bled off before doing any maintenance or repairs.
* All guards or panels shall be replaced before resuming operations.
* All safety switches shall be tested after all maintenance or repairs.
* Appropriate safety wear (goggles, gloves, clothing, etc.) shall be worn when servicing batteries or other crane components.
* Do not remove radiator cap when the engine has been overheated.
* Fuse sizes shall not be changed.
* Electrical repairs shall not be made without approval from the Foreman.
* Electrical limit switches or warning devices shall never be bypassed unless approved by the Foreman.

1. **Inspections**

* All new cranes shall have an annual inspection performed by a qualified crane inspector before putting the crane in service.
* Crane operators must complete a documented daily crane inspection before beginning any crane activities.
* Monthly Inspections:
  + Must be performed on all cranes that are in service by a qualified crane inspector.
  + Must be performed on cranes that have been idle for one month or more, but less than six months.
  + Monthly inspections shall be documented.
* Annual Inspections:
  + Must be performed by a qualified inspector on all cranes that are in service. Exceptions to the annual inspection frequency must be justified, approved, and documented in the "Crane Record Book".
  + Must be performed by a qualified inspector on all cranes that have been idle for a period of six months or longer prior to putting the crane in service.
  + All inspections shall be documented.
* Recordkeeping
  + A copy of all crane inspection forms, records, and reports shall be maintained in the field for two years.
  + Written reports verifying repairs or alterations shall be filed in each crane log and a copy forwarded to the Production Superintendent.

1. **Maintenance and Repairs**

* Modifications or additions that may affect the capacity or safe operation of the equipment shall not be made without written approval from the manufacturer or from a registered professional engineer.
* Critical components (identified in API Spec. 2C) shall be corrected immediately when damaged.
* No welding shall be permitted on critical components without specific repair procedures and recommendations from the manufacturer. Only certified welders shall be permitted to weld on critical components.
* Replacement parts shall be obtained from the manufacturer, unless the part equals or exceeds original parts specifications.
* Repairs shall equal or exceed the original design specifications.
* All moving parts of a crane shall be lubricated in accordance with manufacturer's recommendations.
* All rope, chains, hoists, hooks, and blocks shall be lubricated in accordance with manufacturer's recommendations.
* Load testing must be performed on all new cranes.
* Load testing must be performed on any crane having critical components repaired or replaced and after annual inspections.
* Unsafe Conditions:
* The crane shall be taken out of service when unsafe conditions are found and an out of service sign posted at the controls and prime mover.
* Unsafe conditions shall be immediately reported to the Foreman.
* The unsafe condition(s) shall be inspected by a qualified crane inspector. If found to be unsafe the crane shall be taken out of service until corrected or restricted to eliminate the unsafe condition.
* The assembly/disassembly of equipment must be directed by a competent and qualified person.

1. **Crane Operator Qualifications**

* Cranes shall only be operated by:
  + Qualified Operators.
  + Trainee Crane Operator while under the direct supervision of a Qualified Crane Operator.
  + Maintenance personnel and inspectors when it is necessary in the performance of their duties.

1. **Qualifications for Crane Operator Position**

Operators shall meet the following physical requirements:

* Vision of at least 20/30 Snellen in one eye and 20/50 in the other with or without glasses, and have depth perception.
* Be able to distinguish red, green and yellow, regardless of position of colors, if color differentiation is required for crane operation.
* Have hearing, with or without a hearing aid, adequate for the specific operation.
* Have no history of a disabling medical condition which may be sufficient reason for disqualification.
* A crane operator will be suspended from crane operations when any of the above listed physical requirements are failed and remain on suspension until the physical problem has been corrected.
* Employees must notify the Designated Person in Charge of any physical condition that may affect safe crane operations.
* All Qualified Operators must successfully complete a crane training course conducted in accordance with API RP 2D.
* All Qualified Operators must receive refresher training every four years.
* All Qualified Operators are required to have a follow-up medical examination every four years.

1. **Crane Operator/Rigger Position Requirements**

Crane Operator and Riggers must successfully complete all training requirements.

* Trainee Crane Operators must comply with the following conditions and restrictions:
* Worked as a Crane Operator's rigger for six (6) months before assignment as a "Trainee".
* Under the supervision of a Crane Operator I or II during all crane training operations. All training activities must be logged in the crane log by the supervising operator.
* Review the crane manual for each type of crane to be operated.
* Demonstrate functional skills with the control levers before lifting a load.
* Qualified on each type of crane to be operated by a designated qualifier.
* Cannot load or unload personnel or equipment to or from motor vessels, trucks, etc.
* Remain as a trainee for a minimum period of six (6) months. Crane Operator II must comply with the following conditions and restrictions:
* Complete all training requirements. All crane operations must be recorded in the crane log.
* Can transfer items which do not exceed 70% of the crane capacity at any boom angle and are not over 10,000 pounds.
* Can transfer personnel during favorable light and weather conditions without supervision.
* Crane Operator I must comply with the following conditions and restrictions:
* Classified as a Crane Operator II for one (1) year. All crane operations must be recorded in the crane log.
* Can routinely transfer items which do not exceed 70% of the crane capacity at any boom angle and are not over 25,000 pounds.
* Can transfer loads over 25,000 pounds and/or which exceed 70% of the crane capacity at any boom angle with the approval of the designated person in charge.
* Can transfer personnel under all conditions when safe to do so.

1. **Reclassification of Operators**

* A trainee can be reclassified when all the training requirements have been completed.
* Crane Operators I and II Must be qualified by a designated crane qualifier on each crane type that will be operated.
* Operators I and II experiencing preventable crane accidents shall have operator status reviewed by the Production Foreman. After review, recommendations for corrective action shall be forwarded to the Area Production Superintendent for approval and to the Training Department for filing.
* Relocated operators who have not operated a crane type for one year or more shall be re-qualified by a designated crane qualifier before operating a crane.

1. **Requirements for Contractor Crane Operators**

Contractor Crane Operators must meet physical and operator training requirements detailed in API-RP-2D and other applicable State and Federal regulations. Acceptable documentation of contract crane operator(s) qualification must be on file.

Prior to operating a crane, contractor personnel shall undergo a performance examination and comprehensive familiarization with the equipment he/she will be operating by an appropriate representative.