JOSOP 402 – Lifting and Rigging Standard

Approved 06 October 2010
Version 1.3 Posted 02 April 2013

Table of Contents

List of Figures

List of Tables

1.0 Purpose, Objectives and Scope

1.1 Purpose

The purpose of this standard is to ensure that lifting and rigging work is performed in a safe and controlled manner.

1.2 Objectives

This standard establishes requirements for lifting and rigging.

NOTE: Each Upstream and Gas strategic business unit (JO) or location may have additional regulatory requirements.

1.3 Scope

This Lifting and Rigging Safe Work Practice (SWP) Standard covers work performed by JO employees and their delegates and contractors within JO operational control.

This standard applies to mechanical lifting activities where lifting methods and rigging shall meet these minimum requirements.

This standard does not address activities where forklift, mobile elevated work platform (MEWP), manlift or other similar equipment might be used for lifting activities.

2.0 Requirements

1. Hazards associated with Lifting and Rigging shall be identified and mitigated prior to beginning work.
2. Competent personnel must complete (i.e., develop lift plan as required) the steps needed to properly and safely prepare the job site and equipment for the start of work.
3. Lifting and rigging equipment must be engineered and certified for current use and in good working order as verified through pre-use inspections.

   Note: *The use of non-certified locally fabricated or modified lifting and rigging equipment is prohibited.*
4. Lifting and rigging equipment shall be used in accordance with the intended design purposes and specified limits of the manufacturer and recognized and accepted good industry practices and company standards.
5. Confirm weight of the object and establish the load's center of gravity prior to beginning the lift.
6. Establish clear pick-up and lay-down areas that are within the crane's load lifting radius.
7. Ensure the load path from the beginning of the lift to the lay-down area is clear of obstructions.
8. Rig loads appropriately and verify that loads are free of possible restraints (ice, sea fastenings, hold-down bolts, etc.), debris and obstructions.
9. Place load in designated lay-down area and remove rigging equipment after load is securely in place and free of support from the crane.
10. Ensure there is sufficient space for outrigger deployment and that ground conditions are suitable (including any potential underground hazards such as utilities and voids) for mobile crane lifting operations.

3.0 Terms and Definitions

The following terms and definitions apply to this JO – Safe Working Practices (SWP) – Lifting and Rigging Standard.

Table 1. **Terms and Definitions**

Term	Definition
Anti-Two Block (Dead Heading Limit Switch)	A protection device designed to stop a hoist block and/or load from being hoisted into contact with the boom tip. A properly working anti-two block will prevent putting sufficient stress on the wire rope that it is either cut or stressed to the point that the line separates and the load falls.
Blind Lift	This is any lift where the Qualified Crane Operator does not have direct line of sight with all or part of the object being moved.
Boom Hoisting Limiting Device	Includes boom hoist disengaging device, boom hoist shut-off, boom hoist disconnect, boom hoist hydraulic relief, boom hoist kick-outs, automatic boom stop device or derricking limiter. These devices disengage boom hoist power when the boom reaches a predetermined operating angle. It also sets brakes or closes valves to prevent the boom from lowering after power is disengages.
Boom Stop	Devices that restrict the boom from moving above a certain maximum angle and toppling over backward.
Cargo Carrying Units	Containers that are approved for lifting operations (e.g., closed container, chemical transit tank, aviation tank, tote tank, basket, garbage/rubbish container, drum rack, gas cylinder rack/carrier, long basket, tool carrier, logging unit, power pack, tool box and similar containers).
Center of Gravity	The point in an object around which its weight is evenly distributed.
Certified	The condition or state when lifting and rigging equipment has been inspected and has been found to be in compliance with the manufacturer's design and specifications, and found to be in satisfactory condition and operation, and function according to the requirements within this standard, and applicable industry standards and regulatory requirements.
Certification	As used in this document, the process that gives evidence to the lifting and rigging equipment having been designed, manufactured, inspected and found to be in compliance and in satisfactory condition, operation and function according to the requirements within this standard and applicable industry standards and regulatory requirements.
Complicated Lifts	Complicated lifts are difficult because of the nature of the load, e.g., awkward shape, offset or high centre of gravity, fragile, containing liquids, no lifting attachments/difficult to sling, etc. The actual lifting operation/handling of the lift may also be difficult, e.g., it may require rotation or being cross-hauled involving two or more sets of rigging and/or tandem lifting with cranes.
Complex Lifts	A lift with additional hazards, for example, extremely heavy loads,

Term	Definition
	confined spaces, restricted headroom, lifting over unprotected plant or equipment, lifting subsea, lifts involving divers, lifts involving floating cranes, etc. Included in this definition are lifting operations or conditions which would merit additional engineering input.
Cranes	Lifting devices that are capable of being dynamically loaded when lifting, loading or shifting loads by means of a projecting and/or swinging boom and movable lifting blocks.
Critical or Non-Routine Lifts	A lift that has been identified as: a complicated or complex lift; a heavy lift; a lift involving man riding work baskets; and/or a lift so named by management or the Crane Operator due to the uniqueness of the lift. A critical lift operation is a hazardous activity during which, failure / loss of control could result in the loss of life, loss of or damage to critical process equipment. A critical lift is a non-routine lift requiring detailed planning and additional or unusual safety precautions. Critical lifts include lifts which require the load to be lifted, swung, or placed out of the view of the operator; lifts of objects with awkward shapes; lifts in proximity to overhead power lines; lifts greater than 75% of the cranes capacity; lifts made with more than one crane; lifts involving non-routine or technically challenging rigging arrangement or any lift which the crane operator considers critical because of safety concerns beyond normal lifting hazards.
Heavy Lift	Any lift that is greater than 75 percent of the rated capacity (per load chart) of the crane or hoist used for a specific lifting activity.
Hoist	A hoist (including pneumatic-powered lifting equipment, lever hoists) is a chain or electric lifting device, usually attached to a trolley, which travels along a monorail or bridge crane. A hoist may also be a chain or electric lifting device that is affixed to a stationary point.
Inspection	An organized examination or formal evaluation exercise where the results are compared to specified requirements and standards for determining whether equipment is in line with these targets. An inspection consists of: • A recognized procedure • Defined frequency and testing • Documentation of tests and inspections • Deficiencies in need of correction are identified
Load block-lower:	The assembly of hook or shackle, swivel, sheaves, pins, and frame suspended by the hoisting ropes.
Load block-upper:	The assembly of shackle, swivel, sheaves, pins, and frame suspended from the boom point
Load Chart	A table that summarizes the crane static, dynamic, and personnel handling load capacities at various boom angles, radii, and reeving configurations. The load chart will include boom length, cable size, and weight of block, crane model, and serial number.
Locally Fabricated	Lifting and rigging equipment that has been fabricated, constructed,

Term	Definition
	or altered outside of the original manufacturer's design and certification processes.
Locally Modified	Lifting and rigging equipment that has been fabricated, constructed, or altered outside of the original manufacturer's design and certification processes.
Outriggers	The extendable (or fixed) metal arms attached to the crane mounting base which rest on supports on the outer end. Proper operations and use of outriggers as per the manufacturer, along with adequate support, will level and stabilize the crane.
Passenger Pickup Truck Mounted Crane	Typically a purpose built crane of rated capacity of 3200 pounds (1450 kgs) or less that is permanently mounted on a passenger pickup truck. Note: the lifting capacity of a pickup truck mounted crane is limited by the lowest capacity of any of the components; and the lifting configuration and load charts.
Qualified Crane Inspector	An individual with training and experienced person who has demonstrated proficiency in the skills and abilities necessary to operate, inspect, maintain, and repair cranes.
Qualified Crane Operator	An individual with training and experience who has successfully completed an appropriate rigging and qualified crane operator crane skills training course. The qualified crane operator shall hold a qualification card for the type and capacity of crane that they are operating.
Qualified Rigger	An individual with training and experienced that has successfully completed an appropriate rigging training course and a rigger skills training course.
Qualified Rigging and Lifting Inspector	An individual, with documented training and experience that has demonstrated proficiency in the skills and abilities necessary to inspect and certify lifting and rigging equipment.
Rigging	Rigging refers to two things: the process of safely moving loads with slings, hoists, jacks, and other types of lifting equipment and the equipment used to lift and move these loads.
Routine Lifts	Routine lifts are uncomplicated lifts that are performed on a regular basis using fixed, dedicated lifting equipment. Essentially, this type of lift consists of normal crane operations within the installation and to or from supply vessels.
Simple Lifts	Simple lifts involve the use of basic hoisting equipment for a lifting operation that does not require specialist rigging skills. This would involve direct lifting using certified lifting equipment suspended from dedicated lifting points such as padeyes or runway beams, e.g., an electrician using portable lifting gear slung from a dedicated pad eye to lift a motor with specified lifting points.
Safety Factor	The ratio of a failure-producing load to the maximum safe stress a material can carry. To calculate the safety factor, divide the breaking strength by the safe working load.
Safe Working Load	The safe working load (SWL) is the maximum load that may be imposed on a piece of lifting equipment. The actual load must not

Term	Definition
	exceed the SWL.
Signalman (Dog-man or Banksman)	A Qualified Rigger designated by the Work Team Leader to guide the lifting appliance operator using either hand signals or two-way radio.
Sling	The piece of equipment used to connect the load to the main hook or stinger.
Stinger/Single Leg Sling/Crane Pennant	A single multi-leg wire rope sling equipped with a hook fitted with a safety latch and a master link the other end. It is used to keep the main hoist load block or auxiliary hoist headache ball from coming in contact with personnel.
Tag Line	A length of rope attached to the load that is used by the qualified riggers to aid in the control of the load.
Two-Blocking (Dead Heading)	Occurs when the load block or auxiliary line ball is pulled up into the boom tip sheaves. The most common occurrence is when a hydraulic boom is extended without lowering the hoist line. This can also occur when the load block is positioned near the boom tip sheaves and the boom is lowered without lowering the load block.

4.0 Roles, Responsibilities and Training Requirements

There must be clearly defined roles, and personnel must meet the training and competency requirements of this standard prior to starting work. JO or local regulations may specify additional training and competency requirements.

A single individual may fulfill more than one role as long as he or she meets the competency requirements and is able to fully meet multiple responsibilities.

The following roles and responsibilities are specific to lifting and rigging:

- Qualified Crane Operator
- Qualified Crane Inspector
- Qualified Rigger/ Signalman (Dog-man)
- Qualified Lifting and Rigging Inspector
- Qualified Crane Assembly/Disassembly Director
- Competent Person for developing/reviewing written lift plans

4.1 Initial Training

Personnel must meet the competency requirements of this standardized safe work practice prior to starting work. Refer to the JO – Training Requirements Tool.

4.2 Refresher Training

Refresher training must be provided as follows:

- As required by local regulations or JO policy
- As needed when identified by: verification, incidents and/or audits

5.0 Standard Instructions

5.1 Safety Precautions

The following safety precautions must be followed when personnel are involved in lifting and rigging operations:

- The boom and basket load limit specified by the manufacturer must not be exceeded.
- Workers must not be permitted to use or operate any lifting equipment unless they are instructed, trained and qualified by a competent person in the use and operation of the equipment. Documentation of contractor qualified crane operator qualifications must be provided upon request as per the contract.
- Lifting equipment and work areas must be kept free of oil, grease and trash.
- Assembly and disassembly of cranes shall be under the direction of a competent and qualified assembly/disassembly director.
- The crane or lifting equipment must not be moved when the boom is elevated in a working position.
- The crane or lifting equipment must not be moved when workers are in a basket or on an elevated platform (unless equipment is specifically designed for that use).
- Workers must wear a full-body harness and an approved lanyard while working from a basket, and ensure 100 percent tie-off at all times.
- Anchor points shall be provided as per the “JO Working At Heights Standard” or local requirements.
- Workers must not sit, stand or climb on the guardrail of the basket.
- Personnel must be instructed in safe lifting and hoisting procedures before handling materials or cargo.
- The correct cargo handling tools must be used, and these tools must be regularly checked and maintained.
- The load being lifted must be watched until it is set in place and disconnected from the lifting device.
- Workers must not stand or pass under a suspended load.
- Workers should stand clear of any rope, line or cable that is under strain. When these conditions are present, workers shall pay adequate attention to review and mitigate these hazards. An example would include completing a Job Safety Analysis that addresses site-specific conditions before beginning the work.
- Workers must not get any part of their bodies between unsecured objects (pinch points).
- Workers must not put their hands or fingers in the possible path of any heavy machinery or load.
- Workers must not wear loose clothing when near rotating machinery.
- Workers must not handle rope or cables when wearing finger jewelry.
- Gloves must be worn at all times when handling and using a tag line.

- Taglines must not be wrapped around any body part (e.g., hands, arm, torso) at any time.
- Workers must never ride on a load being hoisted.

5.2 Documentation

5.2.1 Permit to Work

A Permit to Work is required during lifting and rigging operations where overhead power lines may pose a threat, and a Permit to Work may also be required for other lifting and rigging operations. Refer to the JO– Permit to Work Standard for instructions.

5.2.2 Additional Work Permits

Other at risk work may be in progress while lifting and rigging activities occur. In those scenarios other safe work practice standards may be applicable requiring additional permitting, hazards recognition and analysis, etc.

5.2.3 Contractors

Contractors shall use JO's procedures unless they have been cleared by JO (usually through the CHESM process) to use their own procedure(s).

5.3 Supervision of Lifting Operations

The degree of required supervision is dependent upon the type of lifting operation to be undertaken and is proportionate to the risk. The Qualified Crane Operator or Qualified Rigger shall be in control of the operation. This person will:

- Coordinate and control all aspects of the lifting operation, including the pre-lift job safety meeting.
- Ensure that personnel are aware of their specific responsibilities regarding each lift.
- Critical or Non–Routine Lift operations will always require additional supervision by the Work Team Leader who will write the JSA and produce the Critical or Non-Routine Lift Plan.

5.4 Undertaking Lifting Operations

Prior to carrying out any lifting operation, selected precautions shall be observed, including the control measures above. These are applicable to all lifting operations and include holding a pre job safety meeting where details of the task are discussed.

Before conducting critical or non-routine lifts, a written lift plan shall be required, developed/reviewed by competent personnel and include, but not limited to:

- Complicated lifts
- Complex lifts
- Heavy lifts
- Blind lifts
- Lifts involving man riding work baskets
- Other types of lifts designated by management or a certified crane operator due to its uniqueness

Written lift plans shall describe how a lift will be undertaken and include, but not limited to:

- Specific crane and rigging equipment used
- Required personnel and training
- The load characterized with respect to dimension, weight and approximate center of gravity (as assessed by a qualified person)
- Verification that the selection of equipment and rigging is appropriate for the type of lift
- Verification that the load is within the capacity and specifications of lifting and rigging equipment
- Inspection requirements
- Communication requirements
- Identification and mitigation of potential hazards associated with lift, including environmental considerations
- Emergency plans
- Required approval for lift plan

The Qualified Crane Operator and the assigned Signalman shall ensure that the following activities are carried out.

1. The Signalman should be in high-visibility wear so all personnel involved in the lifting activity can see the person assigned to give hands signals to the crane operator.
2. Ensure the lifting equipment is certified for current use.
3. Confirm that the appropriate rigging for the lift is correctly installed, and the lifting sets are not twisted or snagged.
4. Ensure slings of equal length are used, placed to ensure balance and correctly choked on tubulars.
5. Ensure shackle bolts are tight and adequately secured and locked.
6. Confirm the weight of any particular load or bundle.
7. Ensure the hook is positioned above the load's center of gravity (if known).
8. Ensure that a clear and effective communication system is employed and understood by personnel involved with the lifting operation.
9. Ensure there is adequate lighting in the pick-up and lay-down areas and unobstructed access ways and escape routes exist.
10. Ensure that the pick-up and lay-down areas are within the crane radius for the load being lifted.
11. Ensure that the load does not pass over personnel.
12. Ensure that any restraints to the lift are removed (e.g., hold-down bolts, sea fastenings, etc.).
13. Ensure that only one Cargo Carrying Unit is lifted at any one time.
14. Prior to the use of a mobile crane, the ground condition must be known and suitable for the intended lifting operation. The location of underground services must also be verified.

5.5 Safety in Crane Operations

5.5.1 Anti-Two Block

Anti-two-blocking devices will be installed and maintained on main blocks and auxiliary whip lines and will be of the type that stops the lifting function and winch of the crane affected by the device.

5.5.2 Boom Hi-Angle Limit (Boom Kick-out)

Boom Hi-Angle limit (Boom Kick-out) devices will be installed on all lattice boom type cranes and will be of the type that stops the function of the crane. Overrides for boom kick out devices will not be used unless the Supervisor (or designee) responsible for the work area grants an exception.

5.5.3 Weight Indicators

Weight indicators must be fitted equipment on cranes, or weight must be determined by use of an appropriately designed dynamometer (crane scale). Weight indicators (attached or portable) shall be maintained in operational condition.

When a portable dynamometer (crane scale) is used to determine the weight of a load, the load weight will be recorded onto the shipping manifest. For loads sent from field locations into the shore-base locations, the load weights will be verified with the shore-base cranes. Any significant deviations from the shipping manifest will be communicated.

The calibration frequency for dynamometers (crane scales) shall be annually or more frequently if reason exists.

5.5.4 Load Blocks

The main hoist load block and auxiliary hoist headache ball will be painted with a highly visible paint, such as bright orange or green, for maximum visibility.

NOTE: Photo Luminescence paint must not be used on head balls, as this may interfere with a ship's station keeping equipment.

5.5.5 Confined Space

Any crane pedestals that are determined to meet requirements for "confined space entry" will be identified as such using labels or stenciling. All entries into these pedestals for maintenance and inspection will be done in accordance with the JO - Confined Space Entry Standard.

5.5.6 Unattended Control Stations

Before leaving the crane controls unattended for any period, the Qualified Crane Operator will:

1. Land any attached load
2. Disengage the master clutch, where applicable
3. Set all locking devices
4. Put controls in the off or neutral position
5. Stop the prime mover
6. Assure that no component of the crane will interfere with normal helicopter flight operations

NOTE: Some operations require the crane to be left attached. This is an acceptable practice as long as a hazard analysis has been completed and the procedures listed above have been followed.

5.5.7 Swing Brake (Mechanical Slew Locking Device)

The swing brake should be set when the machine is parked, in idle or holding a load for an extended period of time.

5.5.8 Bypass of Critical Protection Devices

Verbal (by radio) permission from the Supervisor (or designee) responsible for the work area and lifting activity is required before any critical protection device is disabled.

The bypassing of critical protection devices during pre-use inspections and maintenance work is acceptable if permission is granted.

When the bypass is removed and the system restored, the Supervisor (or designee) responsible for the work area shall be informed.

Bypassing the boom kick-out, anti-two-blocking, or other limiting device on a crane for reasons other than inspections requires authorization by the person in charge of the facility.

A tag will be attached in plain view of the Qualified Crane Operator with the date and name of the authorizing person when bypass is authorized to perform a lift.

In addition, a written JSA is required before performing a lift with critical protection devices in bypass mode. See the JO - Bypassing Critical Protections Standard for further requirements.

5.5.9 Load Charts

Load charts will be prepared in a standard format and tailored to the particular rigging configuration of each crane. Load charts will be securely positioned to the crane in a location that is easily visible to the qualified crane operator at the primary control station. A copy of the load chart will also be maintained in the crane file.

Any changes to the crane configuration (boom length, wire rope size, hoist, etc.) will be accurately reflected on the posted load chart. Revisions to load charts will be reviewed by a licensed API Spec 2C (Specification for Offshore Pedestal Mounted Cranes) crane manufacturer or a licensed engineer, experienced in the design of cranes.

Load charts for cranes used to transfer personnel will include capacity rating for personnel lifts.

5.5.10 Dynamic Shock Loading and Weather Effects

Dynamic shock loading is a major factor contributing to the replacement of wire rope. Rope that is stretched or broken as the result of dynamic shock loading shall be replaced. Factors contributing to dynamic shock loading, such as wind and sea conditions, must be considered when making a dynamic lift.

Dynamic load charts are designed based on capacity, engineering & load tests. If the wind and sea conditions exceed the stated chart values, the crane must be removed from service until such time the weather and sea conditions return within the crane's operating limits.

Crane operations should be stopped under the conditions shown in Table 2, "Typical Crane Operations Stoppage", below. The table is intended as a guide: Sea conditions vary greatly due to a variety of conditions, such as water depth, wave frequency, swell and wind direction. A risk-based approach, such as the "JO Hazards Analysis Procedure", should be used in consultation with the facility responsible person and ship Captain.

Table 2. **Typical Crane Operations Stoppage**

Weather Condition	Suggested Operations to be Stopped
Seas meet or exceed 12 feet (3.7 meters) (wave height, may be double the average sea height)	All dynamic crane operations
Winds meet or exceed 35 mph (56.3 kph) (wind gusts, may be double to average wind speed)	All crane operations, static and dynamic
Lightning is in the vicinity	All crane operations (lower the boom, if possible)

It is a requirement of each JO to clearly identify and communicate the weather parameters for each work location and/or individual crane set-up. This table above is a guidance, and may be changed for individual lifts depending on the conditions, such as lift type, size, geometry of the load, location, visibility, temperature, etc.

5.5.11 Hand Signals

The Work Team Leader is responsible for assigning the Signalman to each lift. It is essential that the Signalman understands what to do during crane operations, as well as what not to do. In all cases, the Crane Operator and Signalman must agree on the hand signals.

Every hazardous situation that an operator might encounter cannot be covered by a written set of rules, but the use of standardized hand signals from a designated Signalman can reduce risks.

Use Standard Hand Signals

The hand signals shown are standard signals **recommended** in the API RP 2D (Operation and Maintenance of Offshore Cranes):

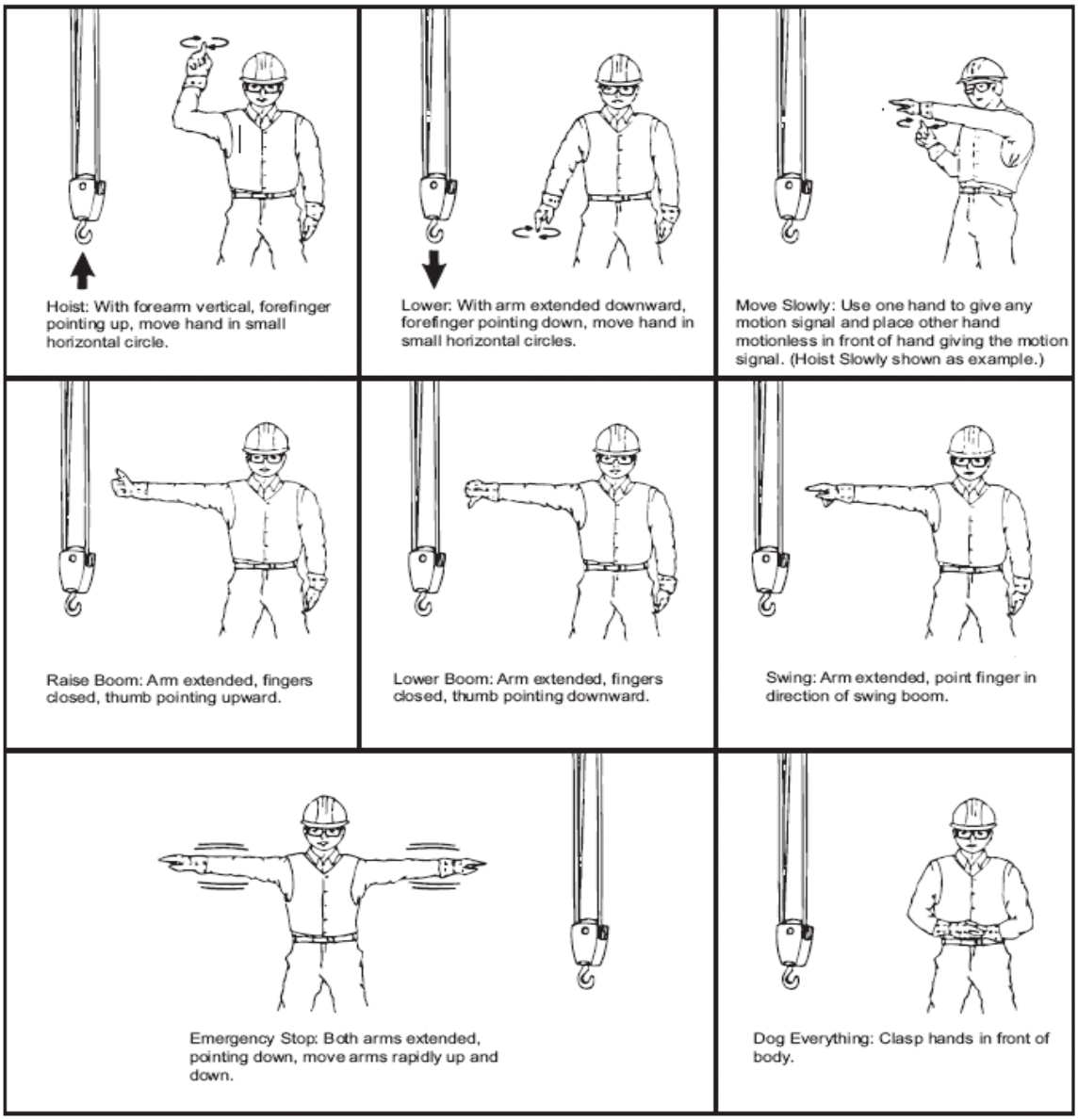

Figure 1. **Standard Crane Hand Signals.**

In some cases there may be a need for special signals not covered in the signal charts. In these cases, the special signals used MUST BE AGREED UPON IN ADVANCE BY THE QUALIFIED CRANE OPERATOR AND THE SIGNALMAN. These special signals must not be confused in any way with the standard hand signals.

5.6 Pre-Use Inspection

The pre-use inspection will be performed and documented before crane use, typically daily and then as the Qualified Crane Operator deems necessary during the day for extended operations.

The Crane Pre-Use Inspection Checklist, Appendix A, shall be maintained in the crane. The Qualified Crane Operator will perform this inspection.

If the Qualified Crane Operator changes, a new crane pre-use inspection should be performed and documented by the new Qualified Crane Operator.

Each crane (excluding out-of-service cranes) will be operated at least once per month. This will include operation of all crane functions and testing of each safety device (Appendix B: Monthly Crane Inspection Checklist). This requirement will help extend component life and, because of regular lubrication, will help prevent sticking of other components.

5.6.1 Stinger (Crane Extension Safety Sling (CESS), Pilot Sling, Crane Pennant)

A stinger should be used to keep the main hoist load block or auxiliary hoist headache ball from coming into contact with workers handling the load.

For those cases where the use of a stinger is not practical (such as heavy lifts), special precautions should be taken to protect rigging personnel.

Slings will be removed from the stinger or crane hook before performing any rigging procedure on the deck of a vessel.

5.6.2 Alternate Lifting Devices (Accessories)

Several lift assist devices (e.g., stiff legs, other temporary cranes, hydraulic masts, air tuggers, runway beams, trolleys, pad-eyes, etc.) currently fall outside the scope of API RP 2D.

Personnel involved in installation, operation, and maintenance of these devices will be Qualified Riggers knowledgeable of the manufacturer's recommendations, guidelines, and procedures.

Personnel involved in installation, operation and maintenance of knuckle boom cranes, and the Qualified Crane Operators, will be knowledgeable of the manufacturer's recommendations, guidelines, and procedures.

Before use of these devices, a visual inspection shall be performed to ensure equipment is in good working condition. In addition, a written JSA will be prepared and consideration should be given to the following items:

- Weight capacity limitations
- Cargo weights
- Stability and anchor points
- Device placement
- Weather and site conditions
- Operator qualifications
- Wire rope and loose gear inspection
- Containment and spill potential
- Safety devices
- Lift team communication
- Lift path

5.6.3 Rigging Equipment

5.6.3.1 Pre-Use Inspections

If an item of equipment is seen to be defective or suspected of being defective either during the pre-use inspection or in service, it must be removed from service immediately and the Work Team Leader notified.

When an item is being scrapped, it is to be physically destroyed in order to prevent any further use of any kind. If it is not immediately physically destroyed, it must be clearly marked **"NOT TO BE USED"** and should be placed in a "quarantine area" until it can be destroyed.

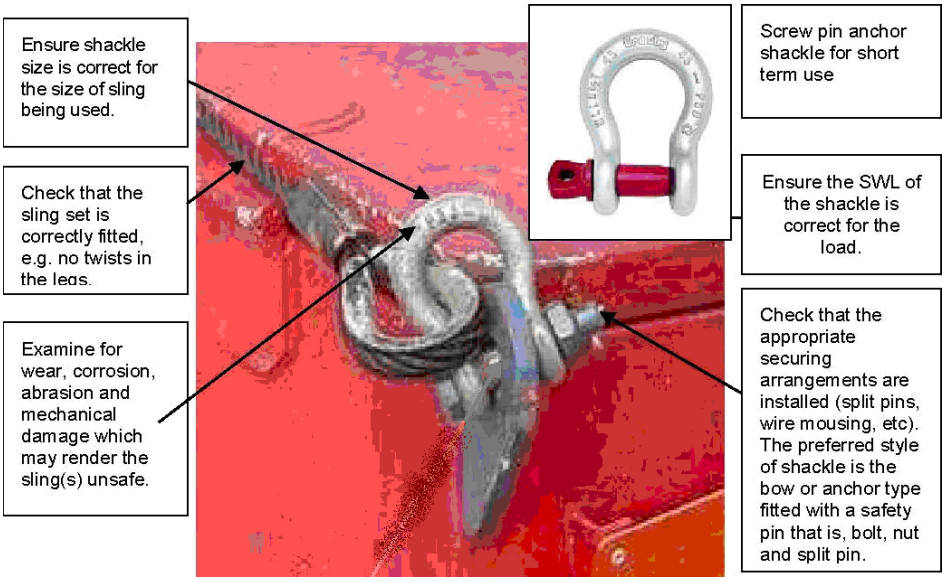

Figure 2. **Pre-Use Inspection Steps**

Ensure the correct type of shackle bolt or pin is fitted. A common problem exists where high-grade shackle pins are replaced with standard bolts that are not capable of taking the load.

Check that the sling set is correctly fitted, e.g., no twists in the legs.

Check that the appropriate securing arrangements are installed (split pins, wire mousing, etc.). The preferred style of shackle is the bow or anchor type fitted with a safety pin that is, bolt, nut and split pin.

5.6.3.2 Wire Rope Sling – Pre/Post-Use Inspection

Each day before being used, the sling shall be inspected for damage or defects by a competent person. Additional inspections shall be performed during sling use, where service conditions warrant. Damaged or defective slings shall be immediately removed from service.

Recommended Inspection Procedure

Wire rope slings shall be immediately removed from service if any of the following conditions are present:

1. Six (6) randomly distributed broken wires in one rope lay or three (3) broken wires in one strand in one rope lay (See - API RP 2D).
2. Wear or scraping of one-third the original diameter of outside individual wires.

3. Kinking, crushing, bird caging, or any other damage resulting in distortion of the wire.
4. Evidence of heat damage
5. Excessive corrosion
6. End attachments (terminations) that are cracked, deformed or worn
7. Sling certification tag is missing or not legible

NOTE: The integrity of slings used in the handling of tubulars may be compromised once the U-bolt is released. The immediate inspection of slings after they are used for this purpose is recommended. Consider implementing a policy requiring the destruction of all slings once the U-bolt clamp has been released at the end of the transportation phase.

5.6.3.3 Synthetic (Web) Sling - Pre-Use Inspection

Certified Synthetic (Web) Slings are approved for lifting operations that would otherwise be susceptible to damage from other slinging methods.

NOTE: Synthetic (Web) Slings shall **NOT BE USED** for routine lifts from or to boats/vessels when salt water may come in contact with the sling. Synthetic slings may be used under exceptional circumstances when recommended by the manufacturer.

When synthetic slings are used in marine operations a JSA/HA and Permit to Work is required.

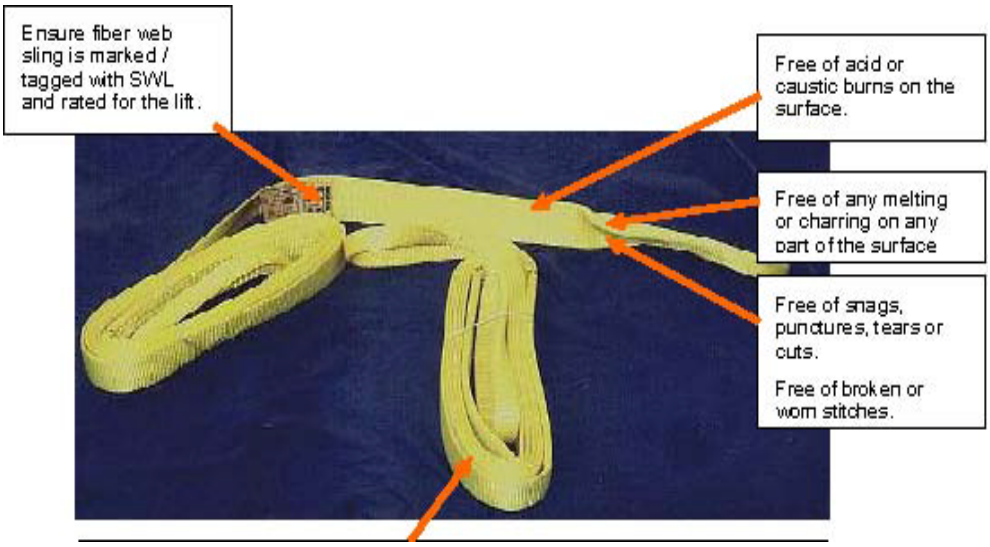

Figure 3. **Synthetic (Web) Sling**

Ensure the fiber belt of the synthetic (web) sling is of uniform thickness and width and not worn or elongated beyond the amount recommended by the manufacturer.

The following is a brief guide for using a webbed sling:

- Know the weight of the load.
- Check the weight units – metric tons, short tons, etc.
- Know the Safe Working Load (SWL) of the fiber sling.
- Check that the load is slung correctly.

- Never use slings with a knot.
- Do not use to pull/drag loads.
- Never tie 2 slings together with the eyes.
- Make sure that the slings are located correctly on the load.
- Whenever web slings are rigged with angles (including when used as a choke sling), ensure that the appropriate limitations for load are assessed as indicated in section 5.11.2.3 Sling Angles.
- Protect the webbing from sharp edges that could damage fibers during use and possibly resulting in a dropped load.
- When not in use, slings should be returned to suitable storage location.
- Do not trap slings between load and floor. Place the load on skids or other suitable packing.
- Never drag slings out from under a load.

5.6.4 Cargo Carrying Units (CCU)

Certified Cargo Carrying Units are approved for lifting operations. The following are examples:

- Container - Standard Closed (Food, Cargo, Explosives, Radioactive Sources, etc.)
- Chemical Transit Tank, Chemical Transit Tank - Plastic
- Aviation (jet fuel) Tank, Tote Tank
- Basket
- Rubbish skips
- Drum Racks
- Gas Cylinder Rack or Carrier
- Long Basket or Tool Carrier
- Logging Unit, Power Pack, Toolbox

Best practice for CCU inspections is six month intervals, but shall be renewed at a minimum of twelve month intervals. Check that test certifications are in date for the period of use.

CCUs must have the Maximum allowable weight, Tare weight and net weight clearly marked and visible to the qualified crane operators and signal man.

Containers with less than one month of certification remaining should not be shipped offshore.

Unless, specifically designed to do so, CCUs must not be double stacked.

Tubulars and all other CCUs listed above shall be checked for potential dropped objects where forklift pockets are included on the frame of the CCU.

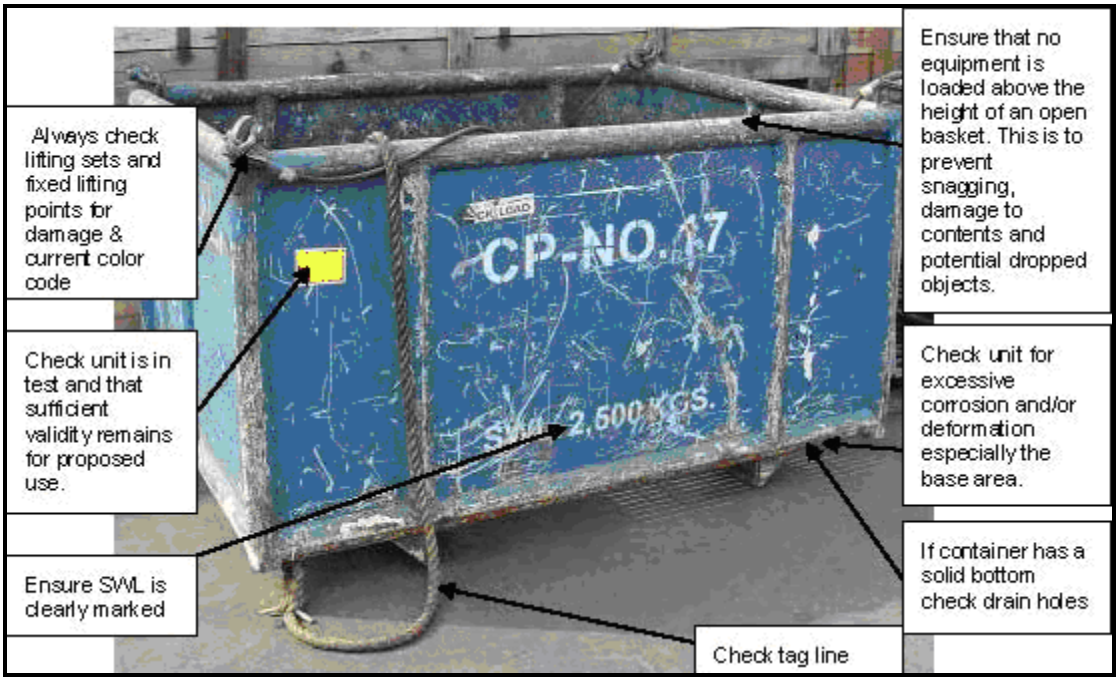

Figure 4. **Open Top CCU – Pre-Use Inspection**

Figure 5. **Stackable Baskets – Pre-Use Inspection**

Stackable baskets are designed for stacking 2 high (maximum) on site or for storage at warehouse facilities or drilling rigs. The stacking of baskets shall be prohibited on all marine vessels.

5.6.5 Snagging Hazards for Open Top Containers

Prior to shipping, the person responsible for packing must ensure control measures are in place to prevent snagging of lifting arrangements with contents during cargo operations.

Where there is a risk of lifting arrangements snagging the cargo, use suitable material to cover the cargo, including cargo nets, tarpaulins, and grating.

When loading CCUs onto trucks ensure that all Master links on the lifting equipment hang over the same side of the truck. This minimizes risk of personnel from falling from the truck.

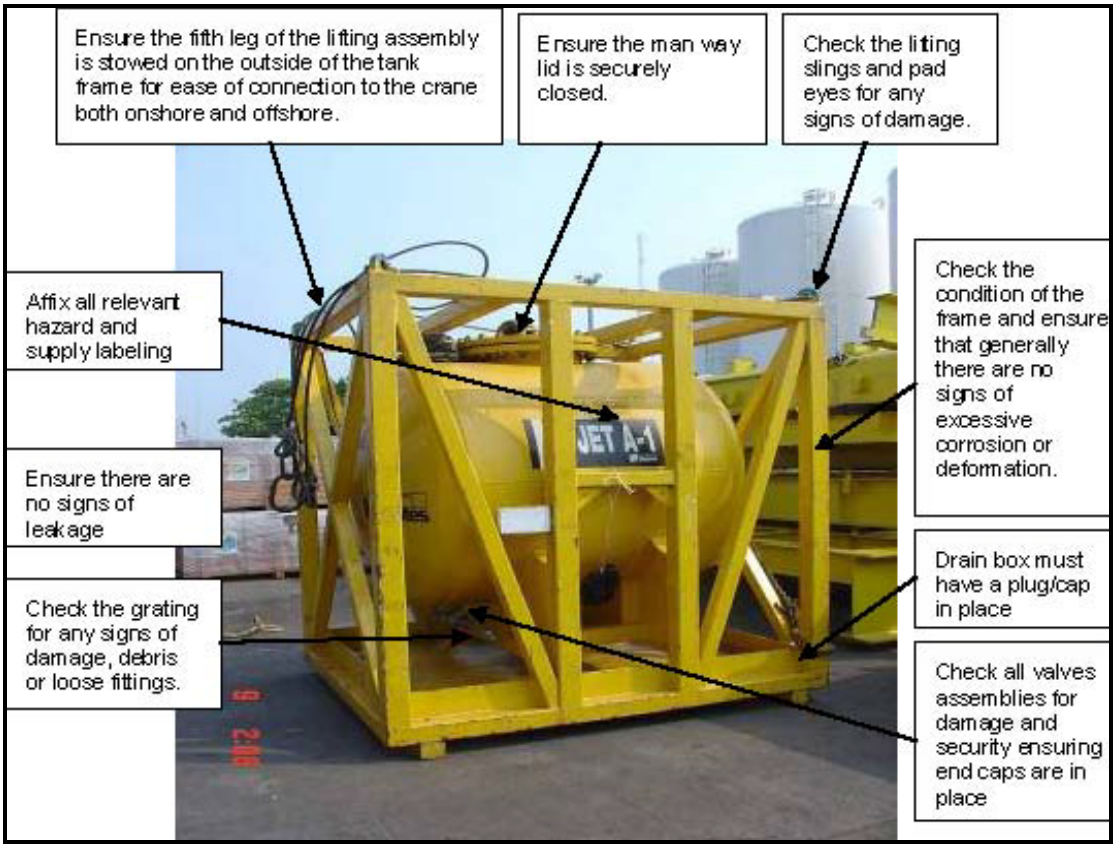

Figure 6. **Offshore Tanks – Pre-Use Inspection (Chemicals, Oils, Fuels)**

5.6.6 Tubulars – Pre-Use Inspection (Drill Pipe Tubing)

Refer to Appendix C: Lift Procedure for Tubulars for specific steps in lifting tubulars. Table 3 below shows the approximate weight of tubulars.

Table 3. **Nominal Tubular Size, Weight and Length**

Size	Weight (lbs per foot)	Length (feet)
3 - 1/2" DP	15.0	31.5
4" DP	16.0	31.5
5" DP	21.9	42
2 - 7/8" Tbg	6.4	44
3 - 1/2" Tbg	9.2	44
7" Casing	29.0	40
9 - 5/8" Casing	40.0	40

Size	Weight (kg per meter)	Length (meters)
8.9 cm DP	22.3	9.6
10.2 cm DP	23.8	9.6
12.7 cm DP	32.6	12.8
7.3 cm Tbg	9.5	13.4
8.9 cm Tbg	13.7	13.4
17.8 cm Casing	43.2	12.2
24.4 cm Casing	59.5	12.2

Size	Weight (lbs per foot)	Length (feet)
13 - 3/8" Casing	54.4	40

Size	Weight (kg per meter)	Length (meters)
34.0 cm Casing	81.0	12.2

Tubulars must always be slung with two slings, each of the same length and of the same SWL.

Slings must be placed at equal distance (approximately 25 percent) from the ends of the load. They must be double wrapped and choked around the tubular.

Figure 7. **Tubulars**

This picture illustrates double wrapping and securing of hold on the pipe bundle.

The number of tubes in each bundle should be such that the middle tubes are gripped and will not slip out of the bundle.

Tubulars over 5.5 inches (14 cm) in diameter must be bundled in ‘odd’ numbers.

Figure 8. **Tubulars Vee-Racking Example**

Vee-Racks can be used to tight-pack bundles of pipes for safe lifting. Tubulars should be of similar diameter and length when bundling. As illustrated in Figure 9 the slings shall be equally distant from the ends so as to have even distribution of weight to the slings. Thread protectors and end caps must be secure so as to avoid falling objects when tubulars are lifted.

Figure 9. **Tubular Stacking Example**

Tubular packing can be accomplished by other means different than using a Vee-Rack. The pictures above illustrate another packing technique (stacking) for safe transport of tubulars. Use manufacturer and supplier and Materials Handling SME recommendations to determine safe packing configurations to use.

Figure 10. **Tubulars**

5.6.7 Casing Transfer and Pre-Use Inspection of Casing Hooks

For routine lifts, casing hooks are not permitted. Pre-use inspection of casing hooks should include manufacturer's recommendations, and at minimum, the instructions in Figure 11 below. Any casing hook used shall be of an engineered design and certified, such as in a stamp on the device that is readable.

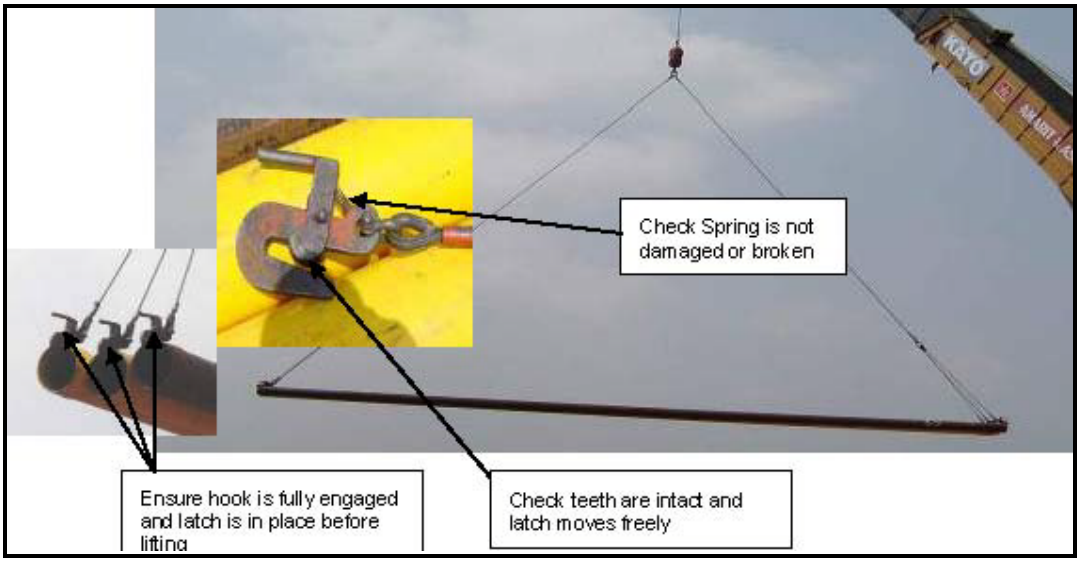

Figure 11. **Casing Hooks**

NOTE: The use of any casing hook or other similarly designed clamp that works on the principle of using gravity and friction to hold onto the load should be discouraged wherever there is risk of bumping the load or having dynamic forces causing sudden vertical or horizontal movement. These lifting hazards can have the effect of reducing the downward force of the load mass, thus unloading the friction mechanism of the hook or clamp and possibly resulting in a dropped load. This would include conditions such as tight spacing for lift maneuvers, marine applications and higher wind scenarios.

5.6.8 Pallets Pre-Use Inspection

Note that if the load is not distributed equally on the pallet, the Safe Working Load (SWL) will be reduced. Pallets shall be inspected before loading to ensure they are in sound condition. If there is any obvious damage (as indicated in the following picture), the pallet shall be removed from use.

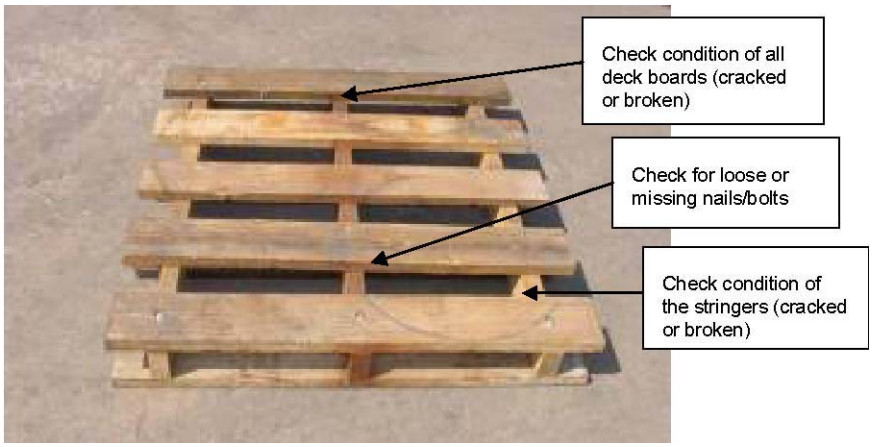

Figure 12. **Pallet**

5.6.9 Pallets Carriers Pre-Use Inspection

Pallet Carriers are used to carry loaded wooden pallets. Pallet Carriers are composed of an engineered metal frame that has a four-leg bridle sling attached which allows it to be lifted properly. Some pallet-carriers in use today include four rigid sides allowing for the attachment of the four-leg sling to be higher over the base of the load.

Proper design and construction are important to ensure pallets are transported safely. The frame and slings must be inspected prior to use, using the same procedure as for other wire rope slings. In addition, the frame needs to be checked for any signs of cracks or distortion.

Figure 13. **Pallet Carrier Example**

Figure 14. **Pallet Carrier with Load**

5.6.10 Hooks Pre-Use Inspection

Hooks are used as connectors on cranes. They can be connected to slings, shackles and eyebolts. Hooks come in many shapes and sizes.

Hooks should be equipped with safety latches. Safety latches prevent accidents by positively securing lifting equipment to the hook. If the load is bumped or released suddenly, the latch should prevent the load from jumping off the hook. All crane hooks used shall have an operable latch.

A crane hook that can be closed and locked with a pin or positive locking device eliminating the hook throat opening should be used for personnel lifts. (See - API Spec 2C.)

Figure 15. **Hook**

The Qualified Rigger is responsible for ensuring the safety latch is in good working condition prior to use.

Figure 16. **Hooks: Original Style (left), and New Style (right)**

NOTE: This type of 'Crosby Shur-loc' hook has a design problem. If a load jumps and causes the hook to double back and strike the sling ferrule, the safety catch can open allowing the load to drop.
Catches of this type should be changed for the modified type that has protective 'ears' on each side of the release to prevent accidental opening.

The Qualified Rigger should inspect the hooks for wear and damage before each use. Two main things to look for are:

1. **Spreading of the throat opening**
   To check for spreading, the size of the throat is measured with a ruler. If the measurement is more than 5 percent greater than the nominal size as stated in the manufacturers' manual, the hook shall be scrapped. Any elongation of the eye is cause for scrapping the hook.

2. **Cracking**
   Cracking usually occurs along the inside of the shank close to the bend. If any sign of cracks are found, the hook must be scrapped.

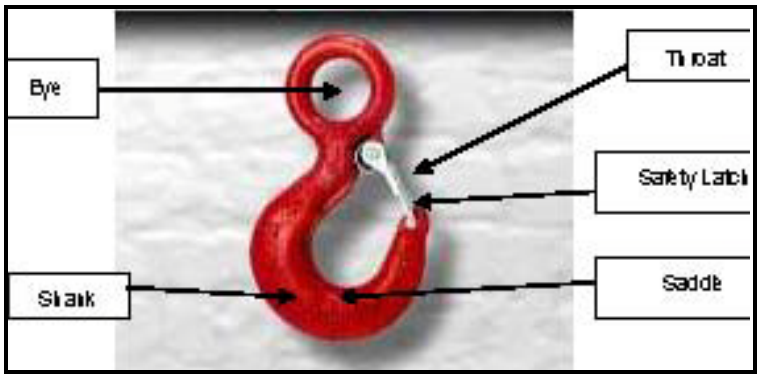

Figure 17. **Parts of a Hook**

5.6.11 Eyebolts Pre-Use Inspection

NOTE: Usually used to move electrical motors.

Eye bolts must be inspected for four kinds of damage:

- Cracking
- Stripped threads
- Bending
- Distortion of the eye

Figure 18. **Straight-shank Eyebolt**

Straight shank eyebolts can be used ONLY for straight vertical lifts, the direction of force must be directly in line with the shank of the eyebolt.

Shoulder-type eyebolts may be used either for straight lifts or angled lifts of up to 45 degrees from the shank.

NOTE: Shoulder-type eyebolts may bend if they are mounted improperly.

Figure 19. **Shoulder-type Eyebolt**

Table 4. **Drop-Forged Steel-Shoulder Type Eye Bolts**

DROP FORGED STEEL SHOULDER TYPE EYE BOLTS									
Stock Diameter (in)	Stock Diameter (cm)	Typical Safe Working Loads Corresponding to Angle of Pull							
		Vertical		75°		60°		45°	< 45°
		lbs.	kg.	Lbs.	kg.	lbs.	kg.	lbs.	kg.	
¼	0.6	500	227	275	125	175	79	125	56	NOT RECOMMENDED
3/8	1	1,200	544	660	299	420	191	300	136	
1/2	1.3	2,200	998	1210	549	770	349	550	249	
5/8	1.6	3,500	1,558	1,925	873	1,225	556	875	397	
3/4	1.9	5,200	2,359	2,860	1,297	1,820	826	1,300	590	
7/8	2.2	7,200	3,266	3,960	1,796	2,620	1,188	1,800	816	
1	2.5	10,000	4,536	5,600	2,540	3,500	1,588	2,500	1,134	
1 ½	3.8	21,400	9,707	11,770	5,339	7,490	3,397	5,350	2,427	

5.6.12 Tag Lines Pre-Use Inspection

Lifts that use a tag line shall be performed as follows:

- Tag lines should be attached to the load (not to the sling).
- For large loads, two tag lines are recommended with one being placed at each end of the load.
- When using a tag line to direct a load into place, be aware that the load can swing into other objects when there is too much force applied in the wrong direction at the wrong time. Pull easily until the load turns and then direct it into place by using only enough force to get it there.
- Special lifting configurations may require longer tag lines.

In cases where a tag line may not be considered a safe option, the situation shall be discussed and included on a JSA and in a pre job safety meeting.

Tag lines shall be free of any knots, splices, or loops, except for attaching to load.

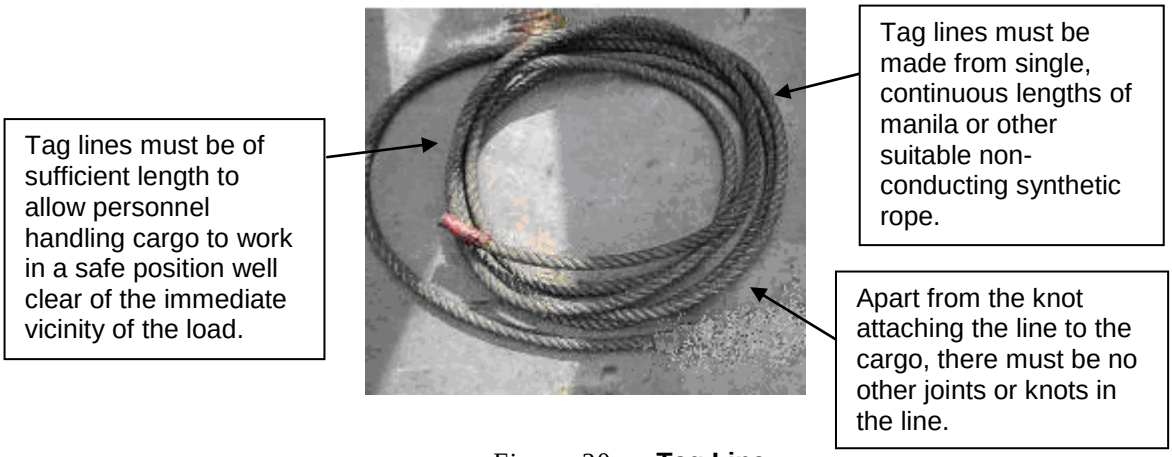

Figure 20. **Tag Line**

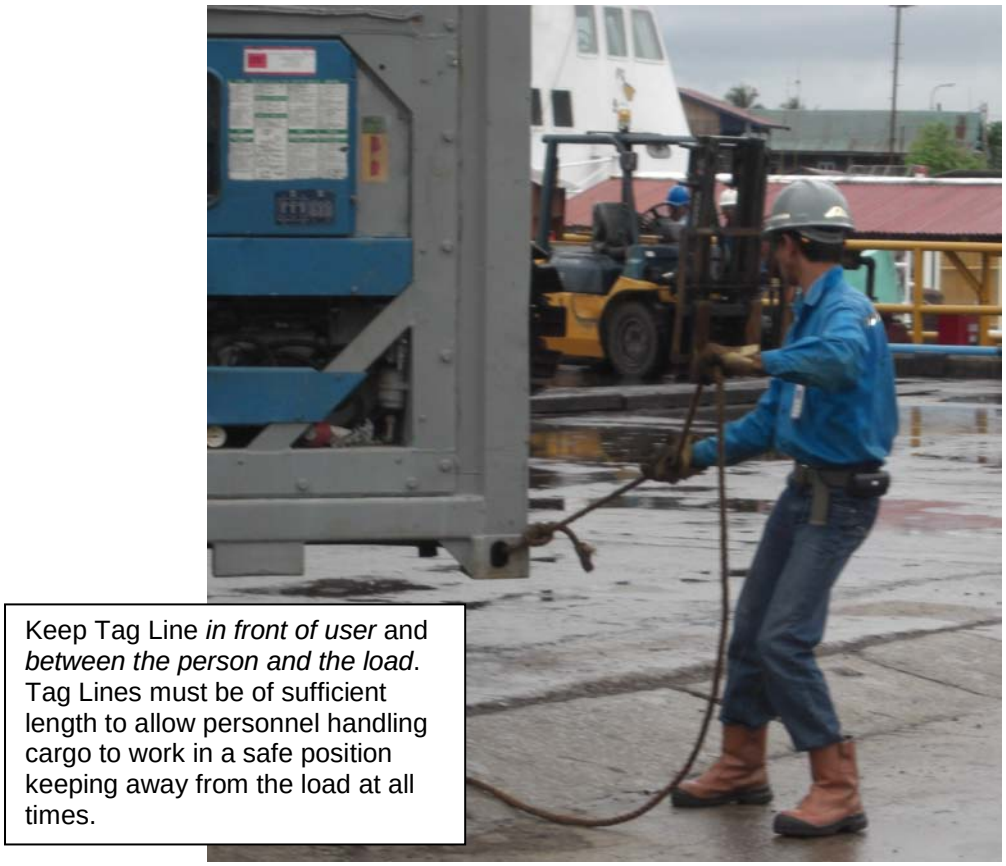

Figure 21. **Tag Line**

5.6.12.1 Hazards

Additional hazards associated with the use of tag lines include the following:

- Potential injuries from dropped objects as a result of the personnel handling cargo having to work closer to suspended loads than would normally be the case.
- Potential injuries from slips, trips and falls associated with distracted personnel.

- Potential injuries resulting from the personnel handling cargo being dragged across the handling area because of a heavy load rotating in an uncontrolled manner and/or the tag line becoming entangled in limbs or clothing.
- Potential injuries resulting from tag lines being secured to adjacent fixed structures parting and whipping back as a result of a heavy load rotating in an uncontrolled manner.

5.6.12.2 Do's

- Make sure that at all times the personnel handling tag lines work at a horizontal distance from the load equivalent to its height above the handling area, maintaining an angle between the line and the horizontal of not more than 45 degrees.
- Keep all sections of the line, including slack, in front of the body, between the handler and the load.
- Ensure that when two or more persons are handling the same line, ALL of them must work on the same side of the line. Any slack must be kept in front of the group.
- Hold the tag line in such a manner that it can be quickly and totally released.
- Take extra care when using tag lines while wearing gloves to ensure that the line does not become entangled with the glove.

5.6.12.3 Don'ts

- Don't secure or attach tag line in any manner to adjacent structures or equipment. This includes the practice of making a "round turn" on stanchions or similar structures and surging the line to control the load.
- Don't loop tag line around wrists, or other parts of the body.
- Don't retrieve taglines by going under load.

5.6.13 Chain Hoist Pre-Use Inspection

The inspection procedure for chain hoists is basically the same whether it is a differential, screw gear, spur gear, air or electric.

There may be some specific inspection procedures for specific hoists, so always consult the manufacturer's manual.

Figure 22. **Chain Hoist**

5.6.13.1 Pre-Use Inspection Procedure

1. **Braking Mechanism –** Check by lifting a load a short distance and then lowering to its original position while checking for slippage or free run.
2. **Load Chain –** Look for wear, twists, broken or damaged links. Chain should be clean and free of foreign material or excessive rust. Chain should be properly lubricated.
3. **Hook –** Look for wear, heavy nicks, cracks or deformation. The hook must turn freely and the latch should be operative.

   NOTE: Any hook that is twisted or has throat opening in excess of normal indicates overloading or abuse of the hoist and requires an inspection of all other load bearing components on the hoist for damage.

5.6.13.2 Chains Pre-Use Inspection

Chains may typically be used for chain hoists, come-a-longs and on burn baskets. Whenever chain slings are used for other lifting activities, the chain sling must be certified and fully inspected before use. Use of chain slings should be discouraged in corrosive environments such as offshore locations, and whenever accurate inspections for chain slings cannot be assured on or offshore. Lift plans incorporating the use of chains should document the specific steps used to assure appropriate use of chain slings, and include specific steps detailing how tie-down chain use will be prevented.

Note: If only one link fails, the whole sling fails, unlike a wire rope sling that can have several broken wires before it will fail.

Chain inspections include 4 areas: (1) Stretch, (2) Cracked or broken welds, (3) Cracked Links, and (4) Excessive wear.

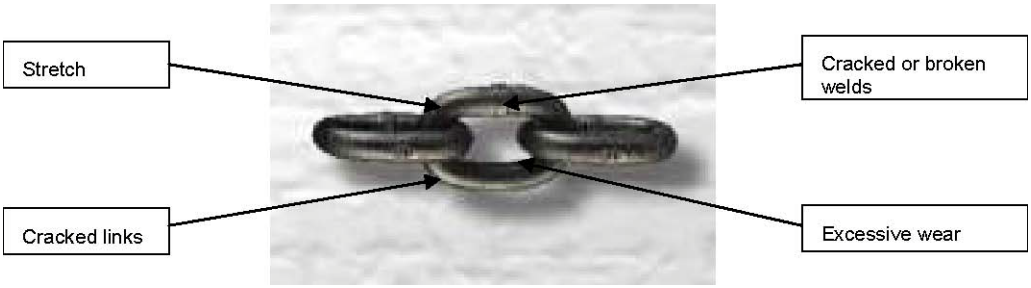

Figure 23. **Chain**

Pre-use inspection of chain slings intended for lifting activities shall include the following:

- The inspection shall be conducted before each use by a Qualified Rigger or other competent person qualified to complete an inspection of the chain sling and associated components;
- The chain sling shall be confirmed as suitable for the specific lifting activities sited in the lift plan and JSA/HA and have legible identifying marks and/or certification ; and
- The chain inspection shall confirm that the following are satisfactory before use:
  - The chain shall show no indication of corrosive action;
  - Each chain link shall be free from

- Cracking anywhere
- Broken or repaired welds
- Elongation
- Deformation
- Thinning or wear points
- Indicators showing excessive heat (burned) or electrical arc exposure
- The chain shall be free of non-original equipment manufacturer (OEM) components or parts

5.6.14 Pad Eye Pre-Use Inspection

Pad eyes will be engineered and certified to ensure suitability for the intended load and service. To ensure a smooth surface in the direction of the lift, holes in pad eyes fabricated in the shop or fabrication yard shall be drilled, reamed, punched or cut with a mechanically guided torch at right angles to the surface of the metal.

Pad eyes should be inspected for signs of damage, corrosion, cracking of the welds and correct color code or equivalent certification and/or inspection indication such as stamping onto the pad eye. Pad eyes that are no longer required for routine lifting operations and are not required to be routinely recertified shall be disabled from use by:

- Blanking off
- Cutting out the top web of the eye
- Removing completely from service

5.6.15 Trolley Pre-Use Inspection

Trolleys are mounted on beams with a chain hoist connected to the lower end. They should be inspected on a regular basis for wear or damage. Items to check include:

1. Capacity markings
2. Current color code
3. Assembly bolting
4. Load bar assembly
5. Steel frame condition
6. Wheel bearings
7. Wheels

Figure 24. **Beam Trolley**

Particular attention shall be paid to the condition of the beam stops at either end of any beam prior to use. Ensure that they are in good condition and securely fixed.

5.6.16 Drum Lifters Pre-Use Inspection

Engineered drum lifters of the types shown below are approved for use for deck-to-deck lifts ONLY. They are not approved for deck to boat lifts.

Verify that the drum is of suitable construction for the engineered drum lifter to be used before lifting.

NOTE: No drum lifters are suitable for drums that have been converted by cutting out the top lid. These modified drums run the risk of structural collapse if lifted by this method with any weight inside.

For drum lifts deck to vessel, baskets must be used. Web belt slings are not allowed.

Figure 25. **Drum Lifters**

5.6.17 Lifting Sling Sizing Pre-Use Inspection

Verify that all lifting slings are properly sized for the lift activity planned. Use Qualified Crane Operators or Qualified Riggers, or other engineering resources to make this determination. Refer to section 5.11.2 Slings for additional information.

5.6.18 Personnel Transfer by Basket

Personnel transfer may be accomplished by a Billy Pugh or other manufacturer's personnel basket. A personnel basket is made up of a main ring, netting, upper ring, lifting ring, lifting sling, and two steady ropes.

It must be constructed so it is capable of serving as a temporary life raft for the maximum number of persons that it is designed to carry.

5.6.19 Minimum Crane Specification for Personnel Transfers

The recommendations outlined in API Spec 2C and API RP 2D shall be followed when using cranes to transfer personnel.

These cranes will be classified as "personnel handling" and will be identified using a label depicting a personnel basket. The hoists will be equipped with a personnel handling certification tag. The hoist certifications will be maintained in the crane file. Personnel certified hoists will be maintained as per manufacturer's recommendations.

Cranes classified as "personnel handling" will be equipped with the following:

- **Boom hoist pawl (when crane design requires device):** Located on Lattice Boom Cranes to prevent unintentional lowering of the boom in mechanical crane design applications.
- **Emergency load lowering kit:** Available on the platform.

NOTE: Only trained personnel will perform 'Emergency Load Lowering Procedure'.

- **Integrally mounted counter balance valve**: A holding device for hydraulic boom cylinders on box boom cranes.
- **Hooks on headache balls or blocks:** Will be of a type that can be closed and locked. (See - API Spec 2C)

Figure 26. **Hook**

5.6.20 Personnel Basket - Pre-Use Inspection

It is the responsibility of the Qualified Crane Operator and deck crew involved to ensure that the personnel basket is in serviceable condition before use. This inspection should include, but not be limited to:

- Check top flotation ring for deterioration or damaged closed cell foam.
- Check sidewall rigging line splices (top and bottom) for wear, UV degradation (blistering, discoloration or cracking) and unraveling.
- Ensure all synthetic rope splices have a 3 tuck minimum.
- Check bottom flotation ring for deterioration or damaged closed cell foam.
- Inspect bottom platform ring for deterioration, cracks or angular distortion.
- Visually inspect safety load line when attached to crane.
- Inspect crane hook positive locking device for function and physical condition.
- Check date of last inspection.
- All personnel baskets will be changed out after 5 years service life, or more frequently based on inspection.
- All personnel baskets must be stored in a weather proof container.

Each personnel basket will contain a stainless steel certification tag provided by the manufacturer that includes the following information:

- "JO" or owner's name
- Description
- Pertinent Working Load Limits

- Size and length of the sling
- Supplier's name
- Proof test certification number and date

Check top flotation ring for deterioration or damaged closed cell foam.

Check sidewall rigging line splices (top & bottom) for wear, UV degradation (blistering, discoloration, or cracking), and unraveling. All synthetic rope splices should have a 3 tuck minimum.

Check bottom flotation ring for deterioration or damaged closed cell foam. Inspect bottom platform ring for deterioration, cracks or angular distortion.

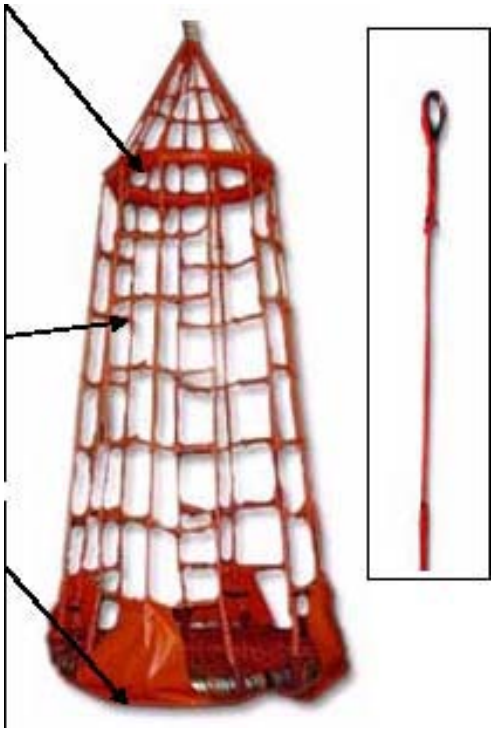

Figure 27. **Personnel Basket**

5.6.21 Personnel Transfer Capsule –Pre-Use Inspection

Visually inspect safety load line when attaching to crane. Inspect crane hook positive locking device for function and physical condition. Verify that the personnel transfer capsule certification is current before each use.

Recommended tag line incorporates horizontal wrapping on a urethane dipped polydac base rope for non-slip gripping. This tag line may incorporate a snap hook for quick installation.

The most common lengths are 3.6 – 4.5 meters (12 - 15ft).

The Frog is a personnel transfer capsule that is an alternative to the Billy Pugh Personnel basket. The Frog Personnel Transfer Capsule includes:

- A stainless steel frame with an inner spring-dampened seating assembly mounted on a central column
- Three landing feet with anti-skid design to provide shock protection
- A low center of gravity which helps when landing on a heaving vessel and on uneven surfaces
- Floating and self-righting capabilities if immersed in water
- Ability to be converted into 'Marine Ambulance' mode

Figure 28. **Frog Personnel Transfer Capsule**

5.6.22 Man Riding Work Baskets –Pre-Use Inspection

Due to the dangers involved, Man Riding Work Baskets should ONLY be used when the use of scaffolding, ladders, aerial lifts or other conventional means of access are more hazardous or are not possible because of structural design or worksite conditions. Employee safety, not convenience, must determine which method is to be used.

Minimum crane requirements for use of man riding work baskets are the same as for the use of personnel baskets. Before hoisting employees, Qualified Crane Operators must conduct a trial lift to 125 percent of the Safe Working Load (SWL) of the man basket immediately prior to any personnel entering the basket. The Crane Operator shall move the unmanned work basket through all anticipated crane movements and basket path operations during the trial lift. The trial lift shall keep the work basket suspended for at least five minutes before re-landing the basket to grade.

After the trial lift and before personnel enter the basket, a visual inspection of the crane and man basket will be conducted to determine if the lift test exposed any defects or produced any adverse effects on any component or structure. If repair or replacement is deemed necessary, a new trial lift will be necessary before using the man riding work platform once repair(s)/replacement(s) have been implemented.

Each time there is a need to move to a different worksite, or the man riding work basket had been detached from the crane rigging, or the scope of work basket movement has been changed, a trial lift shall be completed prior to the manned lift.

A pre-job safety meeting shall be held with personnel involved in the man riding work baskets lifting to ensure that everyone understands their job assignment. Work vests (for offshore or dock work) and safety harnesses shall be used in all cases.

A dedicated Qualified Rigger will be assigned to watch the work basket at all times and remain in radio contact with the Qualified Crane Operator, the personnel being hoisted and any other assigned Signalman. Additional guidance is available at JO MSW Work at Heights Standards.

Figure 29. **Work Baskets**

5.7 Crane Operations (stationary and mobile)

5.7.1 Crane File/Record Book

A crane file or record book will be prepared and maintained for each crane. Any permanent modification to critical components will become part of the permanent crane file. The file or book will contain:

- Name of the crane's manufacturer (life of crane)
- Manufacturer's address and telephone number (life of crane)
- Manufacturer's model and serial number (life of crane)
- Copy of the rated load chart for the existing reeving configuration and boom length at corresponding load radii and boom angles (life of crane)
- Copies of each pre-use, monthly, quarterly and annual inspection record (for four years)
- Copies of required load testing including the company, inspector, procedures and results (life of crane)
- Master file containing proof of qualification for each Qualified Crane Operator authorized to operate the crane shall be maintained at each field office. Contract Qualified Crane Operators are required to provide proof of qualification at the work location.
- Master file containing proof of qualification for each Qualified Rigger authorized to rig loads shall be maintained at each location/field office. Contract Qualified Riggers are required to provide proof of qualification at the work location.
- Copies of wire rope certifications (running rope and standing rope; life of rope)
- Date and description of each alteration (life of crane).
- Date and description of each repair (four years)

- Certifications for personnel handling hoist (life of hoist)

NOTE: Required records for Qualified Crane Operators and Qualified Riggers will be maintained on site. Providers of cranes owned by third parties (i.e., crane barges, rental cranes, etc.) are required to provide crane files and records containing the equipment information outlined above. A copy of this information will be available at the work site where the crane is located.

5.7.1.1 Weight Indicators

Weight indicators and portable dynamometers (crane scales) shall be maintained in operational condition at all times of use.

The weight of all cargo over 1000 pounds will be recorded on the shipping manifest and marked legibly on the cargo before shipping. If the cargo weight is unknown and a weight indicator is not installed, the cargo weight shall be determined using a dynamometer or some other means. Dynamometers must not be used under dynamic conditions.

When a dynamometer is used to determine weight, the dynamometer serial number and load weight must be documented on the shipping manifest. For loads sent from field locations into shorebase locations, the load weights will be verified with the shorebase cranes. Any significant deviations from the shipping manifest will be communicated to the Operations Supervisor.

The calibration frequency for dynamometers should follow the manufacturer's recommendations (typically annually).

5.7.2 Load Blocks

The main hoist load block and auxiliary hoist headache ball will be painted with a highly visible paint, such as bright orange or green, for maximum visibility. Photo Luminescence paint must not be used on head balls, as this may interfere with a ships station keeping equipment.

5.7.3 Crane Operations near Overhead Power Lines

In areas where overhead power lines may pose a threat to safe crane operations (shore bases, land locations, etc.) the following safety precautions shall be observed:

1. Notify the local area Electrical Engineer or I&E Specialist at least 24 hours before beginning any work that requires identification of voltages and clearances, or de-energize, apply safety grounds, or relocate lines.
2. Power lines shall be presumed energized until the utility owner/operator confirms that the power line has been deenergized and visibly grounded at the worksite.
3. A **Permit to Work** form is required for this work.
4. Inform employees of the hazards and precautions when working near overhead lines.
5. Ensure that crane operations are not conducted in proximity to overhead power lines. Proximity is defined as within 10 feet (3 meters) to 50 kV (refer to Table 5 below for additional minimal clearance requirements). If the Qualified Crane Operator is not sure of voltage on the overhead power lines, he or she must get approval from their supervisor before crane operations begin and follow instructions in item seven below.
6. The work zone is defined as 360 degrees around the equipment, up to the equipment's maximum working radius.

7. All tag lines used shall be clean and non-conductive (this includes the material properties of the tag line and other conditions that may affect tag lines, such as wet conditions due to weather).
8. Post warning decals, labels, or signs on cranes and similar equipment regarding the **10-foot (3 meters) minimum clearance.**
9. Ensure that when equipment is working near the proximity of overhead lines a '"spotter(s)" is dedicated to observing for safe working clearances around all overhead lines. The spotter shall be able to communicate directly with the Crane Operator.

   NOTE: The communication system used between the spotter and crane operator shall be tested and proved reliable and clear on site before any lift near the proximity of overhead lines. The communications channel used by the spotter shall be dedicated and where the crane operator is able to receive the signals from the spotter hands free.
10. Use warning cones as visible indicators of the **3 meters (10-foot) safety zone** when working near the proximity of overhead power lines.

    NOTE: "Working near the proximity" is defined as working within a distance from any overhead power lines, which are less than combined length of the lifting device, the associated load length, and the required minimum clearance distance (as define in item 1). **Required Clearance from Crane Pivot Point = Lift Equipment Height + Load Length + At Least 10 feet (3 meters).**

Table 5. **Minimum Clearance Distances for Cranes Near Proximity to Overhead Power Lines**

Voltage (nominal, KV, alternating current)	Minimum (proximity) Clearance Distance (feet)
Up to 50	10 (3.1 meters)
Over 50 to 200	15 (4.6 meters)
Over 200 to 350	20 (6.2 meters)
Over 350 to 500	25 (7.6 meters)
Over 500 to 750	35 (10.7 meters)
Over 750 to 1,000	45 (13.7 meters)
Over 1,000	As established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution.

Note: These distances represent minimum safe working distances of all equipment and personnel that are not deemed qualified utility workers by the utility owner/operator

5.7.4 Personnel Transfers

The recommendations outlined in API Spec 2C and API RP 2D shall be followed when cranes are used to transfer personnel. These cranes will be classified as "personnel handling" and will be identified by a label depicting a personnel basket. The hoists will be equipped with a personnel handling certification tag.

The hoist certifications will be maintained in the crane file. Personnel certified hoists will be maintained per manufacturer's recommendations.

Cranes and/or lifting equipment classified as "personnel handling" will be equipped with a boom hoist pawl to prevent the unintentional lowering of the boom. For hydraulic

boom cylinders, the crane will be equipped with a holding device such as an integrally mounted check valve.

NOTE: If a stinger is used to transfer personnel, both hooks (i.e., headache ball/block and stinger) will be of a type that can be closed and locked.

Personnel baskets that are used to transfer people to and from rigs, platforms, and boats will be of a design and in a condition suitable for the intended purpose per API RP 2D. Each personnel basket will contain a stainless steel certification tag provided by the manufacturer. The certification tag should specify the **"Owner's" name, description, pertinent working load limits, size and length of the sling, the supplier's name, and proof test certification number and date.**

The service life of personnel baskets shall be verified during the routine monthly inspections. All personnel baskets shall be inspected and removed from service as per manufacturer's recommendations. However, any personnel basket found to be in service for five years or longer (from certification date) at time of inspection shall be replaced.

A tag line shall be used on all personnel transfer baskets. The tag line should be attached to the bottom center of the basket and shall be free of any knots, loops, or splices. Qualified Crane Operators shall ensure that Qualified Riggers do not get beneath the basket to retrieve the tag line. If necessary, hooks or other devices should be used.

All personnel being transported on a personnel basket are required to wear a personal flotation device (PFD) approved for such transfers and position themselves in accordance with the manufacturer's instructions. No cargo other than personal luggage or small tool bags/boxes will be carried in personnel baskets. To avoid unexpected shifts during the lift, luggage will be positioned in the centre of the basket, not stacked.

Personnel baskets should not be on a platform unless the platform crane is classified for personnel handling. The crane load charts will include capacity rating for personnel lifts.

It is the responsibility of the Qualified Crane Operator and the Qualified Rigger specifically to ensure that the personnel basket is in serviceable condition before use. At a minimum, the following conditions should be looked for: frayed or broken nylon ropes, worn or kinked cables, and dry-rotted canvas mat in center. See also Section 5.6.20.

It is the responsibility of any JO employee hiring a third-party Qualified Crane Operator that will perform personnel transfers to ensure that the person is a Qualified Crane Operator and is experienced with personnel lifts.

5.7.5 Suspended Personnel Platforms

The use of personnel baskets for performing work at suspended heights is prohibited; only approved personnel platforms are allowed. The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the work site, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous or is not possible because of structural design or work site conditions.

5.7.5.1 Simultaneous Crane and Helicopter Operation

Where cranes are positioned in the proximity of helidecks, approach/take-off zones or helicopter under slung load operations, crane booms shall be retracted and the crane shall be shut down while a helicopter is approaching, landing, taking off, running on the helideck or attaching or releasing load.

If a crane is in use and helicopter operations begin (e.g., a helicopter approaches a helideck), the crane load shall be landed and secured before the aircraft lands (the Qualified Crane Operator must not leave a load suspended, except for Subsea lifts). The worksite shall communicate this information to the aircraft in a timely manner. After finishing the lift, the crane's boom shall be retracted and the crane shut down so there shall be no interference with flight operations. The Qualified Crane Operator shall not be at the control station during helicopter landing, take-off, or while a helicopter is running (except for Subsea lifts, if the crane boom does not encroach into the helideck or approach areas of the helideck).

5.7.6 Communication

Before a lift is made, the Lift team shall discuss and document, where necessary, the circumstances of the lift. The Qualified Crane Operator will obtain all pertinent information before the lift begins. The Qualified Crane Operator is responsible for the safe operation of the crane and has the authority to refuse to make any lift.

5.7.7 Radio Communication (Primary)

Lift team members will use radios and hand signals to communicate during the lift operation. If radio communication is not available for key members of the Lift team, a written JSA is required along with written approval by the Operations Supervisor (or designee) before conducting the lift operation.

NOTE: When working near proximity to overhead power lines that have not been deenergized and visibly grounded at the work site (per section 5.7.3) suitable electronic communications shall be required at all times during lifting operations.

NOTE: Caution must be taken to ensure that the type of radio used is suitable for the work environment.

5.7.8 Hand Signals (Secondary)

Hand signals are a key link between the Qualified Crane Operator and the Qualified Rigger. Using hand signals allows the Qualified Rigger to direct the Qualified Crane Operator. Therefore, learning these hand signals is necessary to Crane Operations. The API RP 2D hand signal chart is the "generally accepted standard" for hand signals used in the oil industry. Other appropriate hand signals may be used in crane operations.

Hand signals used for a lift must be agreed upon in advance by the Qualified Crane Operator and Qualified Rigger(s). Any person may give the "emergency stop" signal. However, only the designated Signalman may give any other signals.

5.7.9 Pre-Use Checklist and JSAs

A written JSA must be prepared by lift team members before beginning a lift operation. For lift operations where a written JSA may not be feasible, particularly dynamic lifts where part of the Lift team is on a platform and the other part on a boat, a pre lift check list will be used (Appendix A: Crane Pre-Use Inspection Checklist). This tool contains a bulleted list of key safety checkpoints for crane operations that should be considered. Before beginning the lift operation, members of the Lift team (e.g., Qualified Crane Operator, Qualified Riggers, and Vessel Captain) will have access to a copy of this checklist and verbally (by radio) check each bullet to ensure that all safety requirements have been met.

Before the operation, members of the Lift team have these responsibilities:

- Prepare a written JSA and lift plan for all critical and non-routine lifts

- Evaluate the lift operations to determine if additional Qualified Riggers are needed to assist in loading or offloading operations
- Conduct a pre-lift meeting to review scope of work and execution plan
- Review pre lift check list with all members of Lift team
- Ensure that a clear method of communication is established
- Assess site conditions to ensure that the lift operation can be conducted safely (sea state, currents, wind speed and direction, weather, size of vessel, position of cargo, and adequate lighting)
- Review the lift path and weight of loads to determine if specific simultaneous operations procedures are required to protect production equipment from falling loads. Refer to the JO – Simultaneous Operations Standard

5.7.9.1 During Operation

During the operation, members of the Lift team have these responsibilities:

- Maintain constant communication between Lift team members.
- If site conditions change or if the lift operations change from the original plan, stop work and conduct another pre-lift meeting. Complete Crane Pre-Use Inspection Checklist and JSA, as required, before continuing with the lifts.

5.8 Mobile Crane Operations

5.8.1 Inspections

Each mobile crane must be inspected by a competent person for mechanical defects upon its arrival, again before its use on the site, and monthly thereafter. A Safety Inspection Checklist for Construction Equipment must be completed and retained in the maintenance records. The operator must perform a daily inspection and must document the findings prior to the crane's use on each shift.

It is recommended that the equipment be load-tested only in accordance with the manufacturer specifications and limitations and local regulations.

No modifications or alterations that affect the capacity or safe operation of the equipment can be made without written approval from the manufacturer.

5.8.2 Operator Training

Qualified Mobile Crane Operators must be competent to read and understand the manufacturer's operations manual for the assigned make and model of machine, the applicable standards, and any additional applicable information concerning the operation of their assigned machines.

A mobile Qualified Crane Operator must be qualified to operate the specific type of crane assigned.

5.8.3 Operations Restrictions

The operations restrictions must be followed:

- Accessible areas within the swing radius of the rotating superstructure counterweight of a crane must be barricaded to prevent workers from being struck or crushed by the counterweight.

- Hand signals or radio communication must be used.
- Copies of the manufacturer operator's manual for each make and model machine must be in the cab of the crane. The manufacturer specifications and limitations must be followed.
- Attachments used with cranes must not exceed the capacity of rating or scope recommended by the crane manufacturer.
- Workers must not ride the headache ball, the hook, or the load being handled by the crane. All operations involving the use of suspended personnel baskets or platforms must comply with the requirements specified in this chapter. The crane must be equipped with an anti-two-blocking device.
- Only one load may be hoisted at a time. Two or more separately rigged loads must not be hoisted in one lift, even if the combined loads are within the rated capacity.

5.8.4 Electrical Hazards

These electrical hazard requirements must be followed:

- When operating equipment in the vicinity of electrical distribution or transmission lines, never place any part of the machine or load closer than the identified working clearances found in the JO Electrical Safe Work Practice.
- Equipment may be operated in the vicinity of electrical distribution or transmission lines if the following is verified:
  - The lines are de-energized and are grounded at the point of work
  - Insulating barriers that are not part of the equipment are erected
  - All lines must be considered energized unless the owner of the lines indicates in writing that they are not energized and that the lines are grounded at the point of operation

5.8.5 Pick and Carry

Traveling with a load (pick and carry) is not recommended as a means of transporting loads from one location to another on the site. If traveling with a load is necessary, follow the guidance in section 5.8.5.1 below. Forklifts, boom trucks, and flatbed trucks should be used to transport these loads rather than pick and carry operations.

Traveling with suspended loads entails many variables (for example, the type of terrain, boom length, and momentum in starting and stopping). Therefore, it is impossible to formulate a single standard procedure with any assurance of safety.

5.8.5.1 Traveling Precautions

When forced to travel with a load, the Crane Operator must evaluate the prevailing conditions and determine the applicable safety precautions, which include, but are not limited to, the following:

- Do not exceed the rated equipment manufacturer "on rubber" capacity chart
- Position the boom parallel to the direction of travel
- Engage the swing (house) lock
- Maintain as short a boom length and as low a boom angle as possible
- Secure the load to the carrier

- Provide tag or restraint lines to snub load swing
- Carry the load close to the ground
- Ensure that outriggers are fully stowed (retracted).
  Never use outriggers for carrying a load/object.
- Verify that the terrain is smooth, firm, and level
- Maintain a travel speed that is suitable to terrain
- Avoid sudden starting and stopping
- Maintain correct tire pressure for the type of tire used
- Always use a flag person (boom watch), both front and rear, to direct and watch for hazards. The flag person must watch for power lines and for other overhead obstructions.
- Do not raise the load any greater than needed, maintain as low as reasonably practicable

5.8.6 Notices and Posting

The following information must be posted and be visible to the crane operator:

- Rated load capacities
- Recommended operating speeds
- Special hazard warnings
- Operating notes
- Special instructions
- Illustrations of the hand signals used
- Controls must be clearly marked with their function

5.8.7 Tower Cranes

Tower cranes must have:

- Flags or other indicators on the jib identifying to the crane operator the working load radius
- Limiting devices to limit trolley travel at both ends of the jib
- Anti-two blocking safety devices
- An operating radius in accordance with the lifted load
- Pressures in hydraulic or pneumatic circuits
- Crane travel at both ends of the runway tracks
- A copy of the manufacturer operator's manual in the crane while onsite
- Load-limiting devices and acceleration and deceleration limiters, when provided, installed in enclosures that can be locked or sealed to inhibit unauthorized tampering
- Operational tests conducted, and a load-limit device setting verified by applying test loads of 100 percent of the applicable ratings

These tests must be performed prior to the use of newly erected and altered cranes and the records dated and kept onsite.

- A wind-velocity indicating device must be mounted at or near the top of the crane

A velocity readout must be provided at the operator's station in the cab, and a visible or audible alarm must be triggered in the cab and at remote control stations when a preset wind velocity is exceeded.

- Regular inspections and maintenance

Regular inspections and maintenance of the cranes must be conducted and performed in accordance with the manufacturer specifications and ANSI standards. Maintaining the tower crane in good working condition must be of the utmost consideration to eliminate unnecessary downtime and to prevent possible incidents. Inspection and maintenance documentation must be available and must be checked regularly.

- Trained, experienced and qualified Crane Operator

The Crane Operator must be trained, experienced, and qualified for operation of the specific make and model of tower crane being operated. The Operator must have prior tower crane experience because of the dissimilarity between tower cranes and other types of equipment. Documentation of operator qualifications must be provided.

5.8.8 Passenger Pickup Truck Mounted Cranes

Passenger pickup truck mounted cranes must comply with the following at a minimum:

For passenger pickup truck mounted cranes rated for loads of 3200-pounds (1450 kg) or less:

- Consist of a purpose built permanently mounted crane
- Be used in accordance with the manufacturer's recommended practices as defined in the owner's manual. These practices shall address the following:
  - Operator Training
  - Crane Operation
  - Crane Inspection
  - Crane Qualification (re-certification)
  - Crane maintenance

For passenger pickup truck mounted cranes rated for loads greater than 3200-pounds (1450 kg):

- All truck mounted cranes that exceed a load rating greater than 3200-pounds capacity shall comply with the full requirements of this standard.

NOTE: Whenever evaluating the load limit of the truck mounted crane, determination shall be made regarding the lowest load limit of any component of the system, including limitations of the load limit chart for the crane-truck system. Consult with the manufacturer for this determination. Confirm with the certification documentation.

5.9 Material and Personnel Hoists

This section provides guidance for protecting workers using personnel, material hoists and winches. Only dedicated hoists and winches are used for personnel lifting, and those hoists and winches must not be used for any other purpose.

5.9.1.1 Inspections

All Personnel hoists must be:

- Visually inspected by a qualified inspector before daily use.
- Inspected and the documentation written at 30-day intervals.
- Tested in accordance with manufacturer specifications, local regulatory authority requirements, and with applicable ANSI requirements.
- Hoists dedicated for personnel lifts must be inspected and tested according to local regulations, but not greater than at three month intervals.
- Records of inspections and tests must be maintained and filed at the work site.

All Material hoist must be:

- Inspected by a competent employee who is instructed in the nature and extent of the inspection and unsatisfactory conditions reported to local management and corrected before material hoists are used. All reports must be maintained and filed at the work site.
- Hoists dedicated for lifting materials must be inspected and tested according to local regulations, but not greater than at six-month intervals.
- Records of inspections and tests must be maintained and filed at the work site.

5.9.1.2 Operations

The following must be conspicuously posted at the operator's station for the hoist (or on the car frame or crosshead):

- Rated load capacities
- Recommended operating speeds
- Special hazard warnings
- Operating rules
- Signal systems
- Operating instructions
- Overhead protection of 2 in (5 cm) planking, 0.75-in (2 cm) plywood, or the equivalent must be provided on the top of every hoist.

Hoists must not be placed in service until they are inspected and tested by a competent craftsman under competent supervision. There must also be a signed and dated written report of such inspection and test.

5.9.1.3 Material Hoists

Personnel must not ride on material hoists at any time except for the purpose of inspecting or maintaining the hoist. A sign stating “No Riders Allowed” must be posted on the car frames or crosshead.

Entrances to material hoist ways must be protected by gates or bars, which must:

- Guard the full width of the landing entrance.
- Be painted with diagonal contrasting colors.
- Be equipped with a latching device.

NOTE: Bars must not be less than 2-inches by 4-inches (five-cm by 10-cm) lumber or an equivalent, be 42 in (107 cm) above the floor, and must be 2 ft (61 cm) from the hoist way line.

Ensure that inspection, testing, construction, operation, and maintenance of material hoists is in accordance with the requirements of ANSI 10.5 1969 or the local regulatory authority requirements, if more stringent.

5.9.1.4 Personnel Hoists

The requirements for personnel hoists are:

- Personnel hoist way doors must be no less than 6.5 feet (2 m) high. Solid doors, where used, must be provided with a vision panel opening, with a width that does not exceed 6 inches (15 cm) and an area that does not exceed 80 in2 (516 cm2) that is covered with expanded metal.
- Landing doors must be provided that may be locked mechanically so that they cannot be opened from the landing side. These locks must be of a type that may be released only by a person in the car.
- For hoists located outside of structures, the enclosures on the building side of the hoist way must be full height or a minimum of 10 ft (3 m) at each floor landing.

5.10 Rigging

5.10.1 Wire Rope

5.10.1.1 Wire Rope Certifications

For wire rope used on JO-owned cranes, all wire rope certifications will be maintained on file by our current wire rope suppliers, as per their ISO 9001 requirements. A copy of the wire rope certification will be sent to JO with each wire rope delivery ticket. The wire rope certification will also be maintained in crane file.

Each wire rope supplier will also provide the stainless steel tag, similar to the tag used on all JO slings, with each spool of wire rope. This tag will be nailed to the wire rope spool before shipment. The tag will state the description, size, and length of the wire rope, along with the supplier's name and certification number. For running rope, this tag will be tie wrapped in a conspicuous location. Each time a wire rope is changed, the old tag will be discarded and the new tag installed. For standing rope (pendant lines), this tag will be affixed to the cable by the manufacturer. The use of these tags is a recommended practice to facilitate maintaining accurate certifications. JO will provide the vendor with the platform, crane, and hoist location information at the time wire rope is purchased.

Providers of third-party-owned cranes are required to supply wire rope certifications as part of the crane records.

5.10.1.2 Wire Rope Inspections

Wire rope will be visually examined during the following inspections:

- Pre-use visual inspection
- Monthly inspection (if required)
- Annual inspection (best practice bi-annual)
- Certain wire ropes may require more frequent inspection, such as wires deployed subsea

5.10.1.3 Wire Rope Replacement

The condition of the wire rope will be evaluated during inspections, at which time a determination will be made about whether the wire rope should remain in use. Wire rope identified as unfit for use will be removed from service and marked accordingly. For JO-owned cranes, the following requirements also apply:

Running Wire Rope – The service life of all running wire rope will be verified during routine monthly, quarterly, annual, or heavy lift inspections. All running wire rope found to have been in service for 5 years or more (from installation date) at time of inspection will be replaced in a timely manner.

Standing Wire Rope (pendant lines) – The service life of all standing wire rope will be verified during routine monthly, quarterly, annual, or heavy lift inspections. All standing wire rope found to have been in service for 5 years or more (from installation date) at time of inspection will be replaced in a timely manner. The safe use of standing rope with more than 5 years of service life must be verified through testing recommended by the manufacturer or consistent with industry practice.

All running and standing wire rope contaminated with drilling or well fluids will be replaced as soon as possible.

NOTE: whenever running ropes have been identified in inspection as having failed to some level, the running rope may be down-rated by a competent person before continued use, or immediately removed from service if deemed not useable. Consult manufacturer's recommendations and local regulations.

5.10.1.4 Wire Rope Maintenance

Guidelines and maintenance tasks for wire rope include:

- Do not contaminate, nick, scrape, or sharply bend the wire rope.
- To minimize internal and external corrosion or friction, maintain the wire rope in a well-lubricated condition. Apply lubricant to wire rope as the rope passes over a sheave.
- Ensure that field-applied lubricants are compatible with the lubricants applied by the manufacturer.
- Do not apply used oil as a lubricant because of possible contamination.

5.10.2 Slings

5.10.2.1 Sling Inspections

Slings must be visually inspected before each lift by a Qualified Rigger. This inspection should include visual examination for kinking, crushing, bird-caging, or any other damage to the wire rope or end attachments. Additionally, the Qualified Rigger shall verify that all slings have proper certification tags or markings (such as information stamped onto the sling end ferrule). For synthetic web slings, inspection should include holes, tears, cuts, embedded particles, and broken or worn stitching.

No foreign substance, including spray paints, marker, ink, lubricants, and protective coatings, should be applied to synthetic straps and slings unless specifically approved by the manufacturer. Should any foreign substance be found on synthetic slings and straps, an evaluation should be made by a Qualified Rigger to determine suitability for intended use. Any sling or strap found unfit for intended use will be rendered unusable and disposed of properly.

5.10.2.2 Periodic Inspection

Slings shall be inspected by a Qualified Rigger, in accordance with local regulations and requirements. Best practice for sling inspections is six month intervals, but shall be inspected at a minimum of twelve month intervals. This record will be maintained for the life of the sling.

5.10.2.3 Sling Angles

The rated capacity of any sling depends on its size, its configuration, and the angles formed by the legs of the sling and the horizontal. Seemingly insignificant changes in the sling angle may drastically affect loading.

A sling with two legs that is used to lift a 1,000-lb (454-kg) object has a 500-lb (227-kg) load in each leg when the sling angle is 90º. The load in each leg increases as the angle is decreased, and at 30º, the load is 1,000 lb (454 kg) in each leg. See Figure 30 below.

If possible, keep the sling angles greater than 45º; sling angles approaching 30º should be considered extremely hazardous and be avoided at all costs. Never use a sling at a sling angle not recommended by the sling manufacturer.

To make sure that the angle is adequate once a load is rigged, verify that the horizontal distance between the attachment points on the load is less than the length of the shortest sling leg. If this is the case, then the angle is greater than 60º.

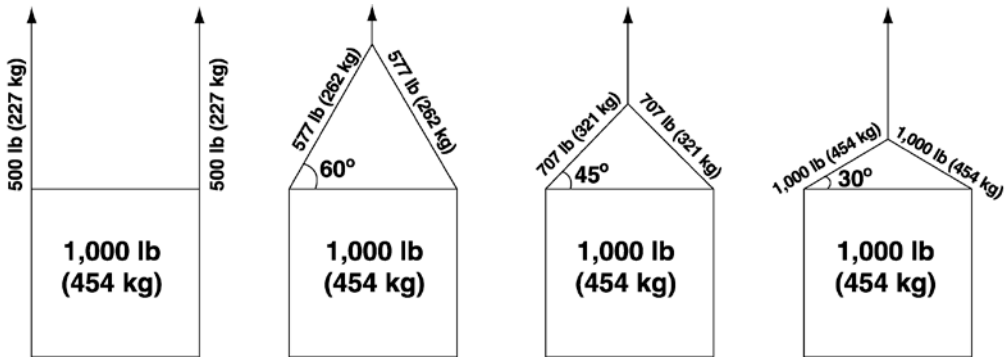

Figure 30. **Sling Angles**

5.10.2.4 Man-made or Natural Fiber Rope

It is difficult to accurately determine the integrity of man-made or natural fiber ropes due to the ease with which these ropes can fray or become damaged. It is prohibited to lift using man-made or natural fiber ropes on any Chevron controlled site or installation.

Man-made and fiber ropes may only be used during a lift in a "Tag-Line" application. No tension over and above a manual handling application shall be applied. Further guidance in the use of tag-lines can be found in section 5.6.12.

Table 6 below is a guideline only. The manufacturer load ratings should be consulted.

Table 6. **Safe Working Loads**

Safe Working Loads			
Manila Rope		Nylon Rope	
Diameter	Load	Diameter	Load

Safe Working Loads							
Manila Rope				Nylon Rope			
Diameter		Load		Diameter		Load	
(in)	(cm)	(lb)	(kg)	(in)	(cm)	(lb)	(kg)
1/2	1.3	530	240	1/4	0.64	244	111
3/4	1.9	1,080	490	5/16	0.80	380	172
7/8	2.2	1,540	698	3/8	0.95	540	245
1	2.5	1,800	816	7/16	1.1	730	331
1-1/4	3.2	2,700	1,225	1/2	1.3	960	435
1-1/2	3.8	3,600	1,633	9/16	1.4	1,200	544
1-3/4	4.4	5,200	2,359	5/8	1.6	1,490	676
2	5.0	6,200	2,812	3/4	1.9	2,120	962

5.10.3 Wire Rope Clips

When applying wire rope clips, follow these guidelines:

- Make sure that the U-bolts of wire rope clips are on the short (dead) end of the rope.
- Tighten nuts evenly to the manufacturer recommended torque.
- After several lifts, re-torque all clips.
- Wire rope clips or bulldog clips must not be used in lifting or hoisting operation.
- Use the number and spacing of clips recommended in Table 7, below.

Table 7. **Number and Spacing U-Bolt Wire Rope Clips**

Number and Spacing of U-Bolt Wire Rope Clips					
Improved Plow Steel Rope Diameter		Number of Clips		Minimum Spacing	
(in)	(cm)	Drop Forged	Other Material	(in)	(cm)
½	1.3	3	4	3	7.6
5/6	0.8	3	4	3-3/4	9.5
¾	1.9	4	5	4-1/2	11.4
7/8	2.2	4	5	5-1/4	13.3
1	2.5	5	6	6	15.3
1-1/8	2.9	6	6	6-3/4	17.0
1-1/4	3.2	6	7	7-1/2	19.0
1-3/8	3.45	7	7	8-1/4	21.0
1-1/2	3.81	7	8	9	22.9

The correct and incorrect methods for applying wire rope clips are shown in Figure 31, below.

Note: ***It is prohibited to field modify or create slings by using wire rope clips. Slings shall be manufactured and certified.***

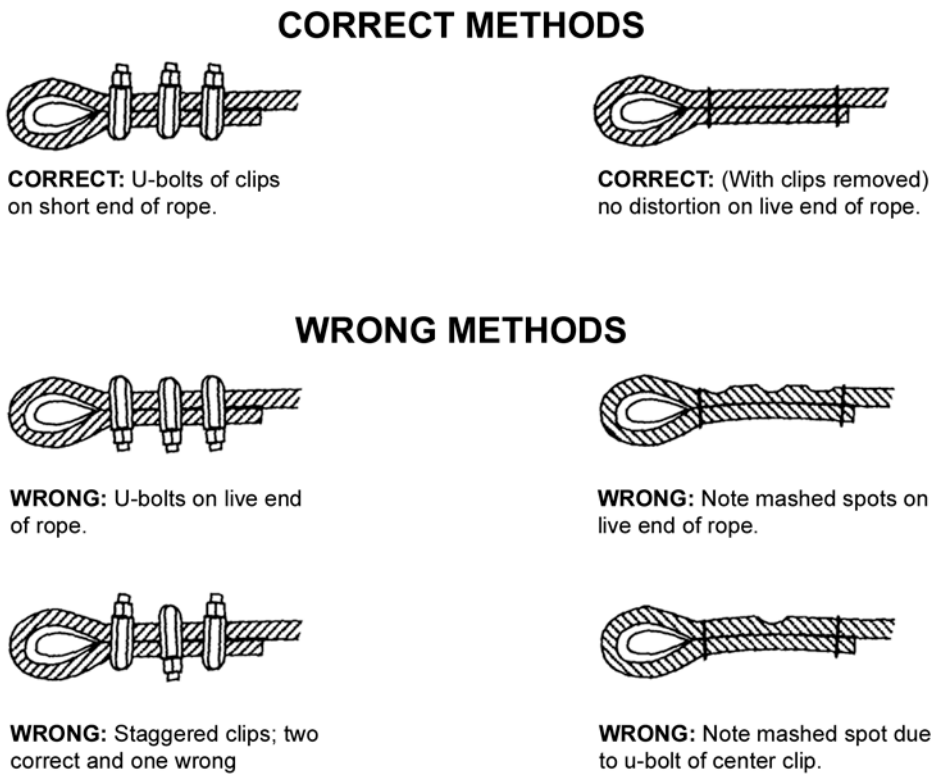

Figure 31. **Correct and Incorrect Methods for Applying Wire Rope Clips**

5.10.4 Rigging Practices

5.10.4.1 Sling Certification

For JO-owned slings, certifications will be maintained on file by our current sling suppliers, per their ISO 9001 requirements. Each wire rope sling supplier will provide a stainless steel identification tag attached to the sling. Each synthetic web sling supplier will provide an identification tag sewed onto the sling. Tags for both wire rope and synthetic slings will contain the following information:

- The "JO" name
- Description, size, and length
- Pertinent working load limits
- The supplier's name
- Proof test certification number and date
- Color or shape code identification

NOTE: All wire rope slings and synthetic slings owned by third-party contractors will contain identification tags consistent with the required information outlined below:

- Diameter and length

- Pertinent working load limits
- The supplier's name
- Proof of test certification number and date
- A valid color code identification

If the identification tag is missing, the sling will not be used, until recertified by a third-party.

5.10.4.2 Wire Rope Defects

Wire rope with one or more of the following defects must be removed or replaced immediately. If one wire rope of a set (for example, multi-leg slings) requires replacement, the entire set of ropes must be replaced.

Table 8. **Wire Rope Defects**

Defect	Description
Corrosion	Any development of slight corrosion should be noted and watched closely. Severe corrosion is cause for replacement.
Broken wires	Six randomly distributed broken wires in one rope lay, or three broken wires in one strand in one rope lay, are cause for replacement. In standing ropes, more than two broken wires in one lay in areas beyond end connections, or more than one broken wire at an end connection, are cause for replacement. In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay are cause for replacement.
End attachments	Development of broken wires in the vicinity of attachments is cause for replacement. If this condition is localized in an operating rope, and the section in question can be eliminated by making a new attachment, this may be done rather than replacing the entire rope.
Abrasion	Abrasion, scrubbing, flattening, or peening, causing the loss of more than one-third of the original diameter of the outside wires, is cause for replacement.
Kinking	Severe kinking, crushing, bird-caging, or other damage resulting in distortion of the rope structure is cause for replacement.
Heat	Evidence of heat damage resulting from contact with a torch, or any damage caused by contact with electrical wires is cause for replacement.

Reduction from the normal rope diameter of more than the following amounts is cause for replacement:

- 1/64 in (0.04 cm) for diameters up to and including 5/16 in (0.8 cm)
- 1/32 in (0.08 cm) for diameters from 3/8 (0.95 cm) in up to and including 1/2 in (1.27 cm)
- 3/64 in (0.12 cm) for diameters from 9/16 in (1.4 cm) up to and including 3/4 in (2.22 cm to 2.86 cm)
- 1/16 in (0.16 cm) for diameters from 7/8–1-1/8 in (2.22–2.86 cm)
- 3/32 in (0.24 cm) for diameters from 1.25–1.5 in (3.18–3.81 cm)

5.10.4.3 Sling Storage

Slings will not be stored on the deck. Slings should be stored in a well-ventilated building or shed. If space limitations require storing slings along the side of the platform, they should be secured in a manner to prevent abrasion from rubbing and maintained in a manner to minimize corrosion. Synthetic slings should be stored in a way that provides UV protection.

Never use the guardrail or handrail as an anchor point for lifting or supporting a load (i.e., sling storage), or as an anchor point for fall protection gear. (Light lifesaving devices, such as buoys and floats, as well as ESD stations may be mounted to guardrails.)

5.10.4.4 Loading and Offloading

Loading and offloading items in a particular sequence prevents accidents and helps organize work for others. The sequence will vary depending on the equipment or material, the truck or vessel, the conditions that exist at that time, and the people involved. The uniqueness of each loading/offloading operation prevents a single best sequence from being identified. However, the most important consideration is communication among the Lift team. The loading and offloading of similar sling combinations saves time, energy, equipment, and money.

Before making a lift, Qualified Crane Operators or Qualified Riggers must examine all cargo (including slings, pad eyes, and cargo containers), and will refuse to attach or lift any cargo which they judge to be unsafe. Contractors sending cargo to JO facilities will be notified of minimum acceptable requirements for rigging equipment, padeyes, and cargo containers.

5.11 Identification Codes

A color and/or shape code is a means to easily identify a component or item of rigging gear to show the current inspection status. Each JO shall use a minimum of three colors and/or shapes, which shall be conspicuously displayed at the workplaces. The color and/or shape code identification should not be applied directly to the load-bearing part of a synthetic sling; it should be placed on the identification tag in a way that does not obscure any critical data. The color and/or shape code must be changed every twelve months, following its inspection. Details of the current color and/or shape code must be placed conspicuously around the work place.

5.12 Do's and Don'ts for Various Components and Load Types

5.12.1 Hooks and Shackles

Lifting equipment, such as shackles, hooks and padeyes, will not be altered by welding or cutting.

5.12.1.1 Hooks

Hooks should be visually inspected for cracks, corrosion, bends or twists, wear, general damage, and missing or corroded pins and bolts. Hooks that have been opened more than 5 percent of their nominal throat opening or twisted more than 10º from the plane of the unbent hook shall be replaced. No paint should be on the hook.

All hooks, excluding choker hooks, should have functional safety latches. The latch must be completely closed when in use. Hooks used in Personnel Transfer operations must have a functional safety latch with a positive locking device (i.e., a lock pin). See also Section 5.6.10.

5.12.1.2 Shackles

Only stainless and forged alloy shackles shall be used. All shackles must have their rated capacity clearly embossed.

Before making a lift, the shackles used in lifting must be visually inspected by:

- Checking the pin for straightness and complete seating.
- Looking for cracks, deformities, and evidence of heat damage or alterations.
- Checking the distance between eyes for signs of opening up.
- Checking the eyes for roundness and twisting.
- Ensuring that the safety pin is in place or the shackle pin can be secured by another suitable means.

Shackles with the above conditions must be discarded. Those that do not clearly show the rated capacity and those worn by more than 10 percent of original diameter in the crown or pin must also be discarded.

As a standard practice, each shackle in a bridle hitch should be one size larger than the size of the wire rope (sling) in use. As shown in Table 9, below, the pin size is one size larger than the shackle size (e.g., 5/8-in (1.69 cm) shackle will have a 3/4-in (1.91 cm) pin diameter).

Table 9. **Summary of Sling Diameter, Shackle Size, and Pin Size**

Sling Diameter (in)	Sling Diameter (cm)	Shackle Size (in)	Shackle Size (cm)	Pin Size (in)	Pin Size (cm)
½	1.3	5/8	1.6	3/4	1.9
5/6	1.6	3/4	1.9	7/8	2.2
¾	1.9	7/8	2.2	1	2.5

5.12.2 Padeyes

All padeyes will be of an engineered design to ensure their suitability for intended load and service.

Padeyes should be visually inspected before making a lift. They should be checked for bent, crushed, bulged, or otherwise deformed material. In addition, they should also be inspected for cracks, excessive rust, wrinkled paint, and indications that the padeye has been modified. To prevent point load stress failures during lift operations, all padeyes must be smooth in the direction of the lift. If any of the above conditions are exhibited, careful consideration should be given to replacement of the padeye. See also Section 5.6.16.

5.12.3 Grating

Grating will be shipped from the shore base in grating racks rigged for a single-point hook-up. For infield grating, handling no more than three sheets of grating will be allowed at one time. Handling any more than three sheets at one time will require using a grating rack.

Slings used for grating handling must be adequately protected. Synthetic slings can be purchased with sling protectors. All sharp or abrasive edges (top and bottom) of the load being lifted must be padded to protect the slings from cuts or abrasions.

All mandatory rigging practices will be followed and include a pre-use inspection of slings (sling condition, load rating of slings, etc.). When using multi-legged slings, the sling angle needs to be taken into consideration for determining the lifting capacity of the slings. Slings will be inspected after each lift to ensure that they were not damaged (cuts, abrasions, etc.) during the previous lift.

5.12.4 I-Beams

I-beams will be shipped from the shore base pre-rigged for a single-point hookup (e.g., containerized racks). Padeyes can be welded, not tacked, to the I-beam for use with slings. For infield moves of I-beams synthetic slings adequately sized may be used, provided that the slings are padded at the top and bottom of the load to protect them from cuts and abrasion. The synthetic slings must be of appropriate working load limits and of adequate length to provide a safe working angle. Wire rope slings may be used as long as padeyes are welded, not tacked, to the I-beams.

5.12.5 Cargo Containers

Loose items, such as drums, sacks, valves, and buckets, will be placed in appropriate containers (i.e., CCUs) to make loading and offloading more safe and efficient at offshore facilities.

All cargo containers will be design engineered to ensure that structural components are sufficient for the intended load and service. Specifications will be detailed in standard drawings and include:

- Types of material used in construction
- Maximum weight capacity of the container
- Container dimensions
- Padeye locations and dimensions
- Space for marking each container with a unique identification number

NOTE: Maximum design “gross” weight capacity and “net” (empty) weight will be permanently marked on cargo containers, such as trash baskets, tool baskets, drum racks, gas cylinder racks, cutting boxes, sensitive material bins, hazardous material bins, and portable racks. The Facilities Engineering group will be consulted when a modification to the basic design of a cargo container is needed.

Vendors that provide skid-mounted equipment (i.e., welding machines, air compressors, pumps, etc.) that exceeds 1,000 lbs (450 kg) are required to permanently mark the maximum load weight on the equipment. Upon request, vendors must also provide documentation certifying that the cargo containers and skids are of an engineered design capable of withstanding the stated maximum loads.

Cargo placed in cargo baskets should not go over the top of the basket and should not protrude over or through the sides of the basket. If the cargo does not safely fit in the basket, it should be lifted as a separate or single load.

5.12.6 Eyebolts

Eyebolts must be carefully inspected before each lift by checking for wear or damage, cracks, bending, elongation or other deformities, and damage or dirty threads. In addition, eyebolts should also be checked for receiving holes and evidence of grinding, cutting, machining, or other alterations. Eyebolts that exhibit any of the above conditions must be removed from service and discarded. See also Section 5.6.11.

6.0 Records

6.1 Required Records

The following records will be kept:

- Copies of permits and associated documentation (including records of inspection, maintenance, hazard analysis and competencies) shall be maintained in accordance with the JO Permit to Work SWP Standard.

6.2 Records Retention

Documentation shall be retained as required by local regulation, JO policy or for a minimum of six months, whichever is greater.

7.0 References

The following is a complete list of the documents referenced by this standard:

Table 10. **Document List**

Title	File Name
JO – Bypassing Critical Protections Standard	JO_MSW_BypassingCriticalProtectionsStandard.doc
JO – Confined Space Entry Standard	JO_MSW_ConfinedSpaceEntryStandard.doc
JO – Permit to Work Standard	JO_MSW_PermittoWorkStandard.doc
JO – Simultaneous Operations Standard	JO_MSW_SimultaneousOperations.doc
JO – Training Requirements Tool	JO_MSW_TrainingRequirementsTool.doc

8.0 Other Guidance Documents

Table 11. **Document List**

Title	File / Link Name
American Petroleum Institute (API) Recommended Practice (RP): ▪ 505 Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, and Zone 2 ▪ 500 Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2	American Petroleum Institute (API) **NOTE:** You may need a subscription to access API documentation. If so, consult a librarian listed on the home page.
American Petroleum Institute (API) Specifications (Spec): ▪ 2C Specification for Offshore Pedestal Mounted Cranes	American Petroleum Institute (API) **NOTE:** You may need a subscription to access API documentation. If so, consult a librarian listed on the home page.
American Petroleum Institute (API) Recommended Practice (RP): ▪ 2D Recommended Practice for the Operation and Maintenance of Offshore Cranes	American Petroleum Institute (API) **NOTE:** You may need a subscription to access API documentation. If so, consult a librarian listed on the home page.
Global Upstream – Marine Safety Process	GU_MS_marinesafetyprocess.doc
JO – SWP Confined Space Entry Standard	JO_MSW_ConfinedSpaceEntryStandard.doc
JO – SWP Work at Height Standard	JO_MSW_WorkAtHeightStandard.doc

Table 12. **Document History**

Version Number	Date	Notes
1.0	27 February 2008	Initial Release
1.1	24 April 2008	Align application of Crane Pre-Use Inspection Checklist

Version Number	Date	Notes
1.2	August 2009	Add prohibition on locally modified and fabricated equipment; expand requirements for work near power lines; align and clarify specific, existing requirements. Edits are shown in green highlight.
1.2.1	16 August 2009	SAPNZ SBU Version
1.2.1.A	17 August	JO Version Created
1.3	02 April 2013	Updated document to include Corporate Required MSW Process requirements

Appendix A: Crane Pre-Use Inspection Checklist

The Crane Pre-Use Inspection will include, but not be limited to, the following:

1. Visually inspect boom and lattice for any sign of damage.
2. Visually inspect crane, rigging and hooks for missing nuts, bolts, pins or keepers.
3. Ensure the area around the base of the crane is free from all obstructions.
4. Check fluid levels in the engine fuel, water and oil, also check the hydraulic oil level.
5. Ensure the engine safety devices, i.e., controls are set.
6. Visually inspect all wire rope for damage and correct spooling.
7. Check all controls for correct operation, control levers are spring loaded and must return to the center or neutral position when released.
8. Check weight and radius indicator, load chart.
9. Start engine and run at idle speed for 3 to 5 minutes to allow the engine to warm up. While warming up the engine, check around for any sign of water, oil or hydraulic leaks.
10. Raise the boom, test the anti-two block and boom kick out functions.
11. Lower the boom and check boom tip sheaves, and ensure the wire rope is on the sheave.
12. Report any abnormalities and DO NOT operate the crane.
13. On completion of crane operations, lay the boom in the boom rest or away from the helideck, set all controls to off or neutral, and set the swing lock.

Appendix B: Monthly Crane Inspection Checklist

Monthly Crane Inspections

This inspection will be performed once per month for all cranes assigned a heavy usage category. This inspection will be performed by a Qualified Crane Operator or a Qualified Crane Inspector and shall be recorded.

Monthly inspections will include, but not be limited, to the following:

1. Check all ladders and cages
2. Check boom rest
3. Inspect crane structure
4. Inspect outriggers and outrigger load pads
5. Inspect boom
6. Check condition of cab
7. Inspect load block and head ache ball
8. Inspect electrical system
9. Check anti-two block system
10. Check boom hi-angle kick out
11. Lubricate boom foot pins
12. Lubricate ball ring and pinion
13. Lubricate all pins
14. Inspect wedge sockets
    a. Main
    b. Auxiliary
    c. Boom
15. Engine
    a. Oil level
    b. Coolant level
    c. Fuel level
    d. Drive belts
    e. Hoses
    f. Exhaust system
    g. Starter
    h. Emergency Shut Down (ESD)
16. Hydraulic System
    a. Hydraulic oil level
    b. Hoses and fittings

17. Control station
    a. Check all controls for proper labels
    b. Check all controls for proper operation
    c. Check boom angle/radius indicator
    d. Check drains and drip pans
18. Winches, cylinders and gear boxes
    a. Check for exterior leaks or damage
    b. Check winch oil level
    c. Check all mounting bolts
    d. Ensure wire rope is lubricated
    e. Check hydraulic cylinder operation

Appendix C: Lift Procedure for Tubulars (Suggested)

Tubular handling and tubular management is a complex process. Full information for the handling and management of Oilfield Casing and Tubular Goods (OCTG) can be found in API RP 5C1 "Recommended Practice for the Care and Use of Casing and Tubing". This is carbon steel, hot drawn, extruded pipe. There are other procedures for the handling of special steels such as 13% and 25% Chrome tubing and casing – API 5CT 13 Cr L80 and for other exotic steels such as Stainless Steel API 5CT 13Cr C95 (Stainless) and Titanium.

The items below are abbreviated guidelines for the handling of OCTG.

1. The safe working load (SWL) of each sling shall not be exceeded by the entire bundle weight.
2. Make odd number joints of tubular in each bundle to make bundles more round. (3 x 13.3/8"; 5 x 9.5/8" & 7 x 7.5/8" are common pipes within a bundle)
3. Slings should be placed at equal distance (approximately 25%) from the ends of the load with the internal angle at the hook not to exceed 90 deg.
4. The slings should be double wrapped and choked (using a bulldog grip and tie wrap) around the tubular bundle.
5. Tubulars are graded in three grades of length, Range 1 (16 – 25 Feet), Range 2 (25 – 34 feet) and Range 3 (34 – 48 feet). Only tubulars within a specific range should be bundled together. Tubulars below 16 feet in length are referred to as pup joints and these should be transported by marine vessels in either a basket or shipping container. When it is necessary to bundle tubulars of different lengths within the range, the shortest tubular should not be less than 75% of the length of the longest tubular
6. In the case of slung tubulars a wire rope grip (bull dog grip) should be used above the reeved eye that forms the choke.
7. A tie wrap should be used on the reeved eye of the sling to prevent the eye from slipping over the roped grip.
8. Excessively long tubular lifts may have two tag lines attached. The tag lines shall not be attached to the slings but may be attached round the bundle outside of the sling area.
9. Only tubulars of the same diameter should be bundled together and whenever possible should be of similar length.
10. Tubulars, whether individual or in bundles, shall be supported at various lengths along the tube, (minimum of 3 supports) to prevent hogging and sagging of the tube. Wood or soft materials shall be used to support the tube or bundle. It is also important that wedges or chocks are used on the end tubes in a stow to prevent them rolling. Wedges and chocks should be nailed to the supporting wood to minimize movement of the wedge or chock.
11. Extreme care should be taken when walking on top of tubulars. Handling crews must wear the correct PPE, in particular steel toe capped boots and gloves.
12. Ensure that protection end caps are correctly fitted prior to the movement of tubulars to trucks and vessels. End caps can be a dropped object incident if incorrectly fitted and tighten up.
13. Ensure that no foreign objects such as stones or short timber pieces are inserted into any of the open ended tubulars as these can also lead to dropped object incidents.

Appendix D: JO Lift Plan Document

CRANE CRITICAL LIFT REVIEW/PLAN CHECKLIST

Accidents can be avoided by careful job planning. The crane manufacturer's operation instruction manual must be followed. A written safety procedure must be developed for critical-lifts. (A lift should be considered critical if the load requires exceptional care in handling because of size, weight, close-tolerance installation, more than one crane is used or other unusual factor) Work Team Leader who is competent to do so, must conduct this operational inspection of the crane. The mobile crane pre-use check list duly completed must be available before commencing this inspection. A **Critical Lift Operation** is a hazardous activity during which, failure / loss of control could result in the loss of life, loss of or damage to critical process equipment. A critical lift is a non-routine lift requiring detailed planning and additional or unusual safety precautions. Critical lifts include lifts which require the load to be lifted, swung, or placed out of the view of the operator; lifts of objects with awkward shapes; lifts in proximity to overhead power lines; lifts greater than 75% of the cranes capacity; lifts made with more than one crane; lifts involving non-routine or technically challenging rigging arrangement or any lift which the crane operator considers critical because of safety concerns beyond normal lifting hazards.

Date:	Time:

Draw or attach a sketch of the layout with plan (overhead) view. Show the lifting spot, landing spot, crane(s) position and any relevant features, such as obstructions/equipment the load will pass over, overhead power lines, buried culverts/piping, etc. Indicate the path that the load will travel.

Load to be lifted from the spot:	Elevation of the lifting spot:……..Meters
Load to be landed at spot:	Elevation of landing spot……..Meters

Pre-lift meeting held prior to crane operation ☐ Yes

Crane Operator Name……

Expiration date of Crane Operator License……

Qualified Rigger Name……

Load Details

Load Dimensions (Meter)…… Height…… Width/Diameter……Length……

Load Weight……Ton.....Kg

Rigging Weight (including spreader/equalizer bar)……Ton……Kg

Total weight below hook……Ton……Kg

Crane Details

ID, Description……

Gross load on this crane……Ton……Kg

Maximum lift radius for this crane…… Meters

Load Chart capacity at this radius……Ton……Kg

Total Boom Length……Meters

Is electronic load indicator and overload cut off working and online ☐ Yes

Rigging Details

Hitch Type……

No. of Slings……Size……Type……

Sling Assembly Rated Capacity…… Kg……

Shackle Size……No. of Shackles……Kg……

Shackle Rated Capacity……Kg

Shackle Secured to Load by ……

Important Instructions

If response is No for a question, address item before beginning lift
Do not attempt to lift if gross load on any one crane exceeds Load Chart Capacity
Do not attempt to lift any load containing liquid
Do not lift if lighting is not adequate
Cranes must not be used to handle materials or loads stored under electric power lines without permission of the HE&S Division
Operation of mobile crane is not permitted near energized electric power lines until the line is de-energized and visibly grounded
Stop crane operation if wind speed exceeds 35 KMPH (20 MPH) or if there is possible lightning.

Mobile Crane Operation Inspection

Item	Response		
1. Has the load transport route to the location been checked for overhead obstructions/power lines?	☐ Yes	☐ No	☐ NA
2. Are there any culverts or underground piping to cross? Are they capable of supporting the imposed load?	☐ Yes	☐ No	☐ NA
3. Are there any other activities in the area that may interfere with the lift(s)?	☐ Yes	☐ No	☐ NA
4. Will the lift area need to be barricaded or roped off?	☐ Yes	☐ No	☐ NA
5. Has the center of gravity of the load been determined? Are the lifting points properly positioned and in line with the direction of pull?	☐ Yes	☐ No	☐ NA
6. Is the surface area large enough to create control swinging problems due to wind?	☐ Yes	☐ No	☐ NA
7. Are timber mats/metal sheet placed below the outrigger pads and keepers properly installed	☐ Yes	☐ No	☐ NA
8. Do the crane(s) have a current annual inspection and load test certificate?	☐ Yes	☐ No	☐ NA
9. Crane test certificate discrepancies resolved?	☐ Yes	☐ No	☐ NA
10. Is there sufficient room at the planned crane spot to fully extend the outriggers and crane-up level is set	☐ Yes	☐ No	☐ NA
11. Is each outrigger visible to the operator or to a signal person during extending or retracting	☐ Yes	☐ No	☐ NA
12. Is there a common language for oral communication or translators for key individuals and signal person wearing fluorescent vest and using whistle	☐ Yes	☐ No	☐ NA
13. Can the rigger(s) control load rotation throughout the lift path?	☐ Yes	☐ No	☐ NA
14. Will there be adequate room for tail swing?	☐ Yes	☐ No	☐ NA
15. Do the cranes have anti-two block and boom kick out devices?	☐ Yes	☐ No	☐ NA
16. Have all the slings been pull tested and certified? Has the capacity of all the rigging gear and spreader/equalizer bar been verified?	☐ Yes	☐ No	☐ NA
17. If rigging will produce sling angles, has the increased tension due to the angle been allowed for?	☐ Yes	☐ No	☐ NA
18. Will there be mechanics and spare parts available to repair the crane should it become necessary?	☐ Yes	☐ No	☐ NA
19. Have the lifting eyes been subjected to Non-Destructive Testing (NDT)?	☐ Yes	☐ No	☐ NA
20. Has the soil compacted to withstand the load	☐ Yes	☐ No	☐ NA
21. Are there any overhead power lines in the vicinity? Can the lift be made while maintaining the minimum allowable clearance?	☐ Yes	☐ No	☐ NA
21. Is radio communication required/needed? Available & rated for hazardous locations?	☐ Yes	☐ No	☐ NA
22. Is the crane positioned so that the load is initially lifted from the least stable area and swung to the most stable area? (Lifting the load over side and swinging to front)	☐ Yes	☐ No	☐ NA

Note: For lift involving more than one crane, use separate checklist for each crane
Crane lift is not permitted when auto cut off is either defeated or not functioning

Crane Operator (Name)…… Signature……Date……Time……

Riggers (Name)…… Signature……Date……Time……

Riggers (Name)…… Signature……Date……Time……

Work Team Leader (Name)…… Signature……Date……Time……

2

Appendix E: Critical or Non-Routine Lift Procedure (Suggested)

Placeholder for appendix materials if decision approved to add

This inspection shall be performed once per month for all cranes assigned a heavy usage category. This inspection shall be performed by a Qualified Crane Operator or a Qualified Crane Inspector and shall be recorded.

Monthly inspections will include, but not be limited, to the following:

1. Check all ladders and cages
2. Check boom rest
3. Inspect crane structure