



the human energy company™

MSW Initial/Refresher
Training:
Lifting & Rigging

Purpose, Objectives and Scope

Purpose

- Provide specific safety instructions for lifting and rigging activities and equipment
- Describe when lift plans and a Permit to Work are required
- Identify specific roles and responsibilities associated with the application of the Lifting & Rigging Standard
- Identify Permit Issuer and Approver responsibilities

Objective

- For the learner to understand the key concepts and requirements of the Lifting and Rigging standard
- Understand the steps involved with Lifting and Rigging
- Understand the forms and Permits involved

Scope

This standard applies to all Chevron employees and contractors working at Chevron facilities, job sites and/or any joint venture operations where joint venture agreements allow its use.

In Scope

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

This standard applies to equipment, which can hoist, lower and horizontally move a suspended load.

Out of Scope

This standard does not apply to equipment that is not specifically designed for lifting and rigging purposes and activities such as elevated work platforms, man lifts and forklifts (unless configured to hoist, lower and horizontally move a suspended load) that may be used for lifting operations.

Lifting & Rigging Standard

Introduction

- Lifting and Rigging procedures are designed to help prevent injuries to personnel, property damage and adverse environmental impact.
- Lifting and Rigging is the process by which loads are rigged, lifted and moved using mechanical devices.
- L&R standard does not apply to equipment that is not specifically designed for lifting and rigging purposes and activities such as elevated work platforms, man lifts and forklifts (unless configured to hoist, lower and horizontally move a suspended load) that may be used for lifting operations.
- This Lifting and Rigging module covers work performed by Chevron employees and their delegates and contractors within Chevron.



Scope

In Scope

- Overhead Cranes
- Gantry Cranes
- Jib Cranes



Scope

In Scope

- Carry Deck Cranes
- Mobile Cranes
- Track Cranes
- Boom Trucks
- Equipment Repair Trucks
- Tower Cranes



Scope

Out of Scope

- Forklifts (unless configured to hoist and move loads horizontally)
- Excavators / Backhoes
- Scissor Lifts
- Man Lifts



Lifting & Rigging Standard

Definitions

Anti Two Block Device

- A device designed to stop a hoist block and/or load from being hoisted into contact with the boom tip

Boom Hoisting Limiting Device

- 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

Center of Gravity

- Is the point in an object around which its weight is evenly distributed

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)

Crane

- Lifting devices used for the lifting, lowering and horizontal movement of a load with a hoisting mechanism. Cranes can be fixed or mobile and can be powered or manually driven.



Lifting & Rigging Standard

Definitions

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

Critical Lifts

- A lift that has been identified as: a complicated lift; a complex lift; a heavy lift; a blind 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.

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 padeye to lift a motor with specified lifting point



Lifting & Rigging Standard

Definitions

Blind Lift

- A lift for which the lifting operator does not have a direct line of sight with all or part of the object being moved.

Complex Lift

- A lift with additional hazards, for example, extremely heavy loads, 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.

Complicated Lift

- Complicated lifts are difficult because of the nature of the load, e.g., awkward shape, offset or high center 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.

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.



Lifting & Rigging Standard

Qualification & Competencies

Roles	Qualification & Competencies
Qualified Crane Operator	<p>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.</p> <p><i>NOTE: Qualified Crane Operator refresher training is required every four (4) years as per API RP2D.</i></p>
Qualified Rigger	<p>An individual with training and experience that has successfully completed an appropriate rigging training course and rigger skills training course.</p> <p><i>NOTE: Qualified Rigger refresher training is required every four (4) years as per API RP2D.</i></p>
Signalman (Dogman or Banksman)	<p>A Qualified Rigger designated by the work team leader to guide the lifting appliance operator using either hand signals or two-way radio</p>
Rigging	<p>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</p>
Safe Working Load	<p>The Safe Working Load (SWL) is the maximum load that may be imposed on a piece of lifting equipment. The actual load must not exceed the SWL.</p>



Lifting & Rigging Standard

Roles & Responsibilities

Qualified Crane Operator

The responsibilities of the Qualified Crane Operator are the following:

- Understands the equipment they will be working upon and the hazards associated with that equipment
- Ensure loads are within the safe limits of the crane and the scope of the lift plan (when applicable).
- Must perform a site evaluation prior to setting up the crane to assess ground conditions.
- Confirms that configuration of the crane is appropriate for the load to be lifted in accordance with the load chart.
- Safely performs the lift using the lift plan that has been designed for that particular lift.
- Maintains communication with the signaller throughout the lift.

Qualified Rigger

The responsibilities of the Qualified Rigger are the following:

- Understands the equipment they will be working upon and the hazards associated with that equipment
- Verifies that crane lifts are properly rigged by verifying load stability, requiring tag lines when needed, attaching the load to appropriate lifting gear.
- Assist in correctly setting up load landing locations and placing of the load.
- Inspects all rigging before each use.
- Inspect and maintain rigging equipment
- Understand when to stop work.

Crane Signaller

The responsibilities of the Signaller are the following:

- Knows the work planned and the hazards involved
- Maintain direct communication with the crane operator.
- Have basic understanding of equipment operation and limitations, including the crane dynamics involved in swinging and stopping loads and boom deflection from hoisting loads.
- Know how to utilize types of signals – hand, voice, etc.
- Know how to direct a multiple crane lift if required for circumstance.
- Understands when to stop work.



Lifting & Rigging Standard

Types of Lifts

Lifts are categorized into three consequence categories – **critical**, **high** and **low**.

critical

- Hoist Personnel in a Basket
- Multiple Cranes
- Greater than 85% of Lifting Equipment Load Capacity
- Greater than 35 Tons away from a Live Process Area
- Greater than 25 Tons over a Live Process Area
- Lifting near Live / Energized Electrical Power Lines

high

- Greater than 75% of Lifting Equipment Load Capacity
- Greater than 2 Tons to Less than 25 Tons over a Live Process Area
- Cross Hauling loads (transferring the load from one hook to another)
- Lifting Sub-Sea
- Lifts from a Barge

low

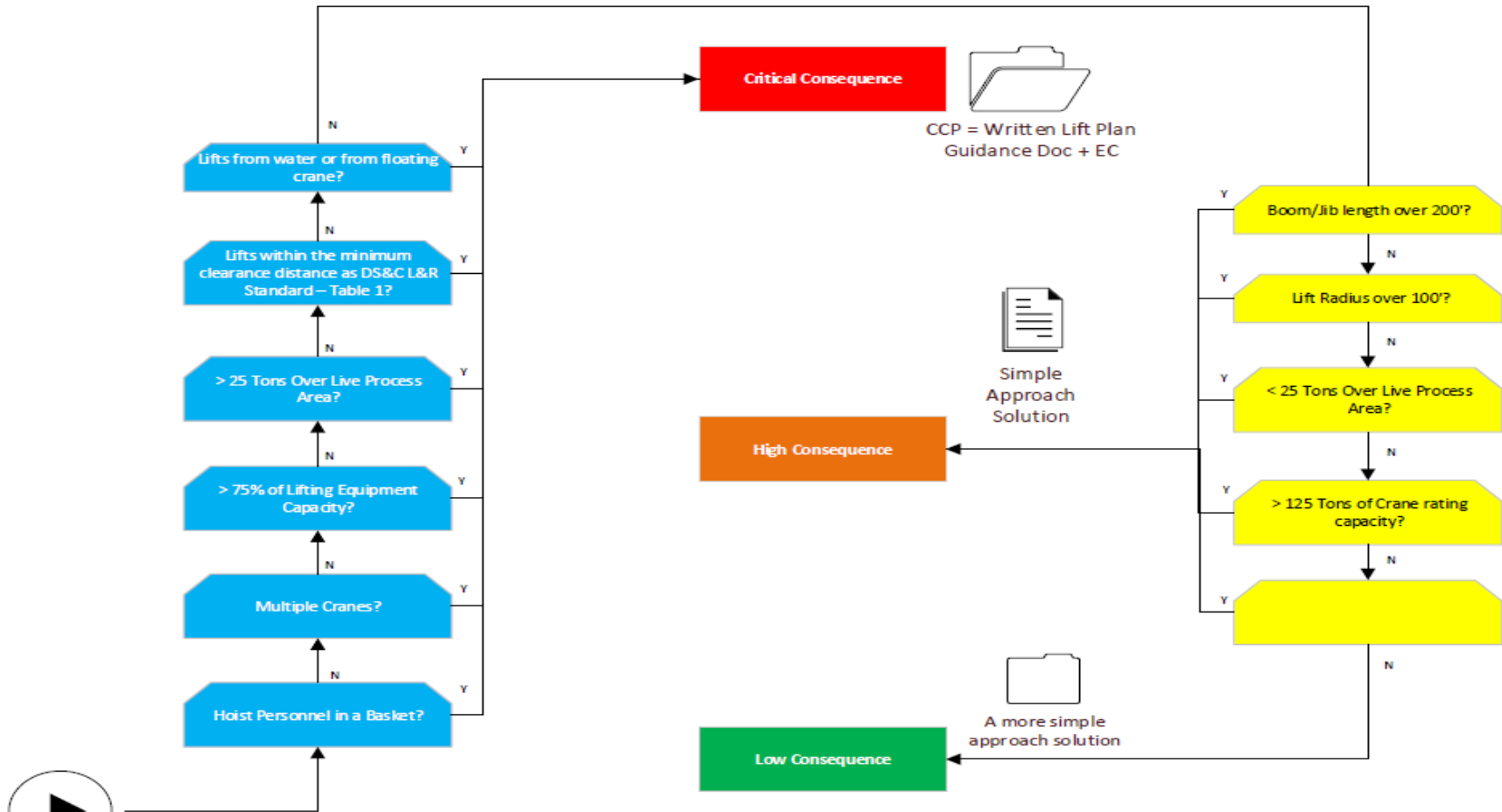
- lifts that are not otherwise classified as high or critical consequence.

Blind Lifts may occur in critical, high or low consequence lift categories and must have associated hazards mitigated as part of the lift plan.



Lifting & Rigging Standard

Decision Flow for Types of Lift



"Any high or low consequence lift can be elevated in consequence level if requested by any party involved in the lift (e.g., crane operator, signalman, lift approver, L&R SME, permit issuer). Examples to consider may include high center of gravity loads, fragile loads, equipment containing liquids, lifts requiring rotation, lifts over sensitive process equipment or other characteristics that may create complexity."



Lifting & Rigging Standard

Permitting Requirements

- A Permit to Work shall be required for lifting and rigging work within the scope of the standard, unless covered by an alternative approval process.
- Lifts shall be planned and documented prior start of lift and Lift Plan should be submitted to Chevron (HES and SME) for review as appropriately.
- Lift Plan should be submitted to Chevron HES for review in advance for review and comments.
 - i. Lifting Supervisor / SME and BU management approval is required for **critical consequence written lift plans**.
 - ii. Lifting Supervisor / SME or BU designee shall approve **high consequence written lift plans**
 - iii. Project Manager / Lifting Supervisor of the Contractor company performing the lift shall approve **low consequence written lift plans**.
- Approved Lift Plan shall be attached together with the Permit to Work and lift should be conducted per conditions stated in the Lift Plan.
- A Hazard Analysis (PPHA) and Job Safety Analysis (JSA) or equivalent shall be conducted prior to work involving Lifting and Rigging



Lifting & Rigging Standard

Hazard Analysis in Lifting & Rigging



- ◆ **Unclear communication** between crane operator and other personnel – including standing out of operator’s line of sight – may increase the risk for incidents.
- ◆ **Complex lifts (dynamic, blind, etc.)** increase the potential for incidents on all lift hazards.
- 🔧 **Un-chocked pipes** may become falling objects.
- 🔧 **Improper rigging, misidentifying the load or equipment failure** may cause dropped loads.
- 🔧 **Loads striking personnel, vehicles or equipment** can result in serious loss.
- 🔧 **Equipment overloading, overextension and overturning** can result from crane malfunction, outrigger setup, heavy winds, or the load exceeding capacity due to extended use or miscalculations.
- 🔧 **Shifting loads** may cause overloading or falling objects.
- ⚡ **High-voltage power lines** in a crane’s working area can pose a potential electrocution hazard.
- 🔧 **Congested work area** can limit rigger escape.

Lifting & Rigging Standard

Lift Plan

Lifts shall be planned and documented before starting work and include, but not limited to the following:

- a) Document the steps necessary to properly and safely conduct a lift specified by qualified personnel.
- b) Confirm the weight and center of gravity of the object to be lifted.
- c) Establish pick up and lay down zones that are within the lifting/rigging equipment manufacturer's recommended load lifting radius.
- d) Ensure that the load path from the pickup zone to the lay down zone is clear of obstructions, has adequate lighting and established escape routes.
- e) Establish a line of fire zone (e.g., swing radius of the crane (counterweight & boom)). and ensure that it is clear of all non-essential personnel.
 - Establish barricade around the lift area or equally robust management system to prevent unauthorized access.
- f) Establish the requirements for signal personnel. (e.g. High visibility vest, communication system, training requirements, establishes designated signal personnel, etc.)
- g) Ensure that communications (e.g., voice, radios and hand signals) are established and agreed to for personnel involved in lifting operations.
 - If radio communications are used, a designated channel with no other radio traffic or dedicated radio shall be used.



Lifting & Rigging Standard

Lift Plan

- h) Ensure that any restraints (e.g., hold-down bolts, sea fastenings or similar devices), debris or **obstructions to the load are removed** prior to conducting the lift.
- i) Ensure that there is **enough 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.
 - Determine **crane outrigger locations and matting requirements**.
- j) **Documented void inspections** are required for all critical consequence and high consequence lifts.
- k) Ensure that **loose items are placed in appropriate certified containers** (e.g., cargo carrying units) so that materials do not protrude outside the container.
- l) **Verify installed attachments**, i.e., platform, lights, instrumentation or potentially loose items are secured prior to beginning lifts
- m) Ensure **nothing will interfere with the rigging gear** during up-righting or down ending vertical vessels and columns.
- n) Consider the **suitability of weather, wind, sea state and environmental conditions** prior to conducting the lift.
- o) Ensure that lifting/rigging equipment **controls are not bypassed** or inhibited
- p) **A plan shall be in place to coordinate operations when multiple cranes are operating** in an area where a crane/derrick is within the radius of another crane/derrick.



Lifting & Rigging Standard

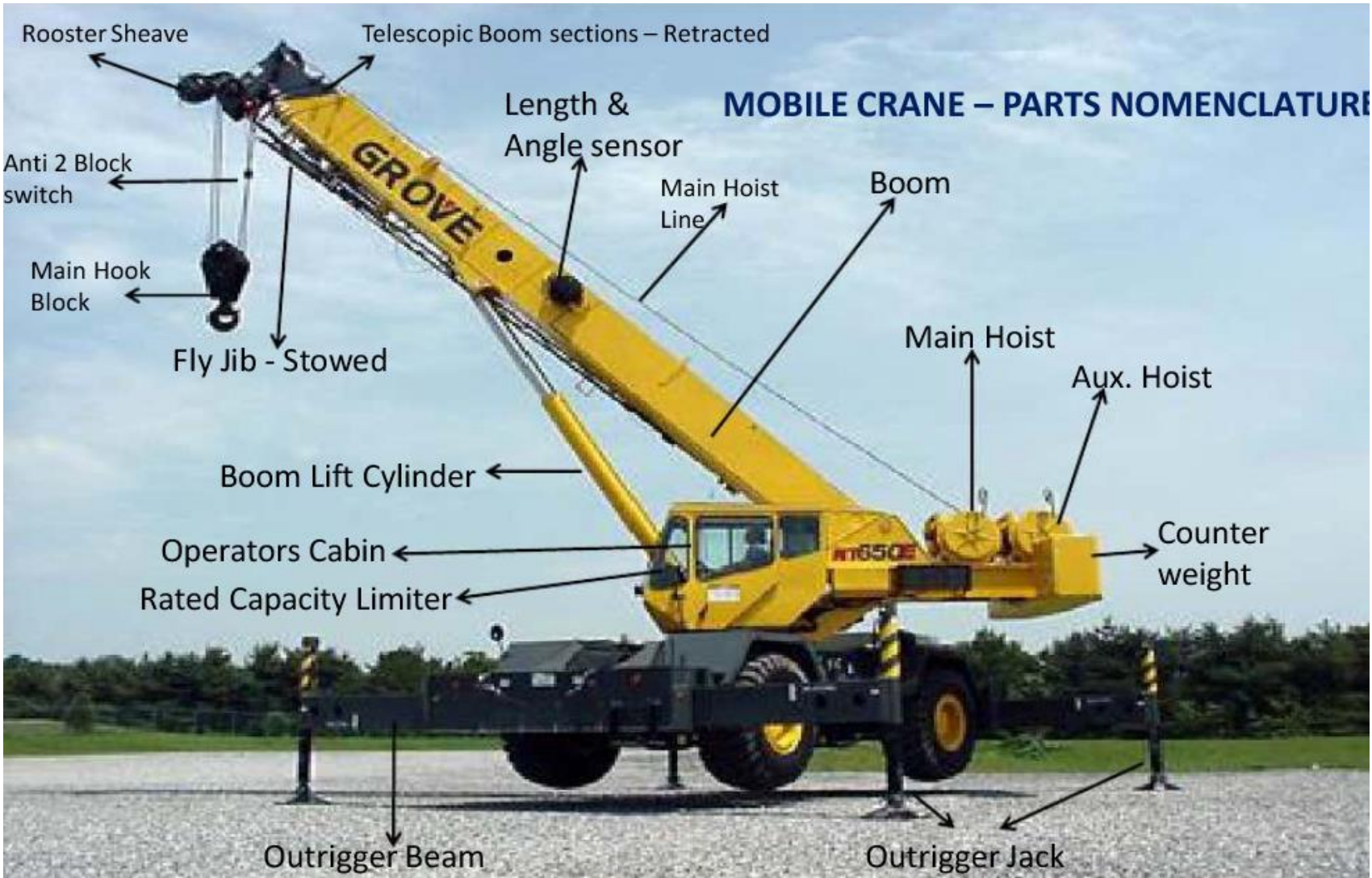
Components of a Lift Plan

- ❑ 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).
- ❑ Specific Manufacturer's recommendation of wind speed for the boom / jib configuration planned.
- ❑ 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 – include copy of any required void inspections along with name of inspector and date of inspection.
- ❑ Communication requirements.
- ❑ Identification and mitigation of potential hazards associated with lift, including environmental considerations.
- ❑ Emergency plans.
- ❑ Required approval for Lift Plan.



Lifting & Rigging Standard

General Crane Parts



Lifting & Rigging Standard

Lifting & Rigging Equipment Requirements

- ❑ Crane safety equipment and operational aid requirements shall meet manufacturer's recommendations (not limited to);
 - crane level indicators,
 - boom/jib stops,
 - foot pedal locks,
 - horns,
 - boom hoisting limiting device,
 - anti-two block devices,
 - load charts,
 - weight indicators,
 - load limiting devices,
 - stingers (jib end section) and similar devices).
- ❑ **No non-certified fabricated or modified lifting and rigging equipment shall be used.**
- ❑ L&R equipment must be in good working order/condition as verified through written pre-use and periodic inspections.
- ❑ Lifting and rigging equipment (e.g., stingers (jib end section), wire rope slings, synthetic slings, cargo carrying units, pallets, hooks, eyebolts, tag lines, chain hoists, pad eyes, trolleys, drum lifters, personnel work platforms and marine hoisted personnel transfer device, man riding work baskets, cranes and equivalent equipment) **shall be inspected by qualified personnel** according to applicable legal requirements, as well as Chevron Standards, manufacturer and/or accepted best practices.



Lifting & Rigging Standard

Lifting & Rigging Equipment Requirements

- ❑ Cranes and/or lifting equipment shall not be moved when the boom is elevated or in a working position unless manufactured for pick and carry purposes.
 - a. Cranes engaged in personnel man basket lifts shall not travel with personnel in the man basket.
 - b. Mobile cranes may be used for traveling within Manufacturer Limits (shall have load chart for pick and carry).
- ❑ Assembly and disassembly of cranes shall be under the direction of a competent and qualified assembly/disassembly director and shall be in accordance with applicable legal requirements, as well as Chevron standards and/or accepted best practices.
- ❑ The use of floating cranes/derricks or land cranes/derricks on some means of floatation shall meet applicable legal requirements as well as Chevron standards and/or industry best practices.



Lifting & Rigging Standard

Pre-use Inspection requirements

- ❑ The pre-use inspection to 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 Pre-use inspection documentation 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.
- ❑ The Crane Pre-Use Inspection will include, but not be limited to, the following:
 - Visually inspect the boom and lattice for any sign of damage.
 - Visually inspect crane, rigging and hooks for missing nuts, bolts, pins or keepers.
 - Ensure the area around the base of the crane is free from all obstructions.
 - Check fuel levels in the engine fuel, water and oil, also check the hydraulic oil level.
 - Ensure the engine safety devices, i.e., controls are set.
 - Visually inspect all wire rope for damage and correct spooling.
 - Check all controls for correct operation, control levers are spring loaded and should return to the centre or neutral position when released.
 - Check weight and radius indicator, load chart.
 - 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.
 - Raise the boom, test the anti-two block and boom kick out functions.
 - Lower the boom and check boom tip sheaves, and ensure the wire rope is on the sheave.
 - Report any abnormalities and DO NOT operate the crane.



Lifting & Rigging Standard

Lifting & Rigging Equipment Inspection Requirements

Equipment Types	New Equipment - First Use	Prior to Each Use	Monthly	Annually	Modifications / Repairs	After Assembly
Cranes & Equivalent Equipment Note 1	Certified	Documented	Documented	Certified	Certified	Documented
	Third Party Load Test 100-125%	Certified Crane Operator Each Shift	Certified Crane Operator	Third Party	Third Party Load Test – See note 3	Competent-Qualified Person
Overhead & Gantry Cranes Note 2	Documented	Visual		Documented	Documented	
	Qualified Load Test 100-125%	Qualified		Qualified	Qualified Load Test – See note 3	
Wire Rope / Synthetic Slings	Documented	Visual		Documented		
	Qualified Person/Rigger	Qualified Person/Rigger		Qualified Person/Rigger		
Cargo Carrying Units, Pallets	Documented	Visual		Documented		
	Qualified Person/Rigger	Qualified Person/Rigger		Qualified		
Lifting Hardware (Hooks, Shackles, Turnbuckles, Pad Eyes, Trolleys)	Documented	Visual		Documented		
	Qualified Person/Rigger	Qualified Person/Rigger		Qualified		
Manufactured Lifting Devices (e.g., Spreader Bars, Bundle Extractors, etc.)	Certified	Visual		Documented	Certified	
	Third Party by Vendor	Qualified Person/Rigger		Qualified	Third Party	
Chain Hoists, Come-Along	Documented	Visual		Documented	Certified	
	Qualified Person/Rigger	Qualified Person/Rigger		Qualified	Third Party	
Man riding work baskets	Documented	Documented		Documented	Certified	
	Qualified Person/Rigger	Qualified Person/Rigger		Qualified	Third Party	
Key	Type of Inspection	Notes:				
	Minimum Level of Inspector	<ol style="list-style-type: none"> 1) Does not include Tower Cranes, Side Boom Cranes, Floating Cranes/Derricks and Land Cranes /Derricks on Barges. 2) Hand operated and powered overhead and gantry cranes including cantilever gantry cranes, semi-gantry cranes and wall cranes as defined by ASME B30.2 Overhead and Gantry Cranes. 3) 100-125% load tests are required when the load-sustaining parts of the crane have been altered, replaced or repaired. 				



Lifting & Rigging Standard

Critical Consequence Lift – Void Inspection Requirements

Critical consequence lift

- Void inspections by a qualified personnel is required for all critical consequence lifts.
 - i. Acceptable void inspection methods include prodding, core drilling & prodding or ground penetrating radar.
 - ii. Crane lifting activity, or preparation for crane lifting activity should begin within 3 months of the void inspections.
 - iii. If no activity has begun within 3 months the area should be inspected again due to potential changes beneath the surface.
 - iv. The 3-month lifespan of the void inspections for a critical consequence lift is a recommendation. The lifespan could be shortened if subsurface anomalies such as clay drain piping, sandy soil, shallow conduit banks or piping were located; the lifespan could be extended if the ground conditions were favorable and no underground anomalies existed.
- An approved critical start work check (CSWC) shall be required for critical consequence lifts.



Lifting & Rigging Standard

High Consequence Lift – Void Inspection Requirements

High consequence lift

- Void inspections by a qualified person, facility civil engineer or facility crane lifting and rigging SME is required for all high consequence lifts
 - a. Acceptable void inspection methods include prodding, core drilling / prodding, ground penetrating radar or visual inspection by the facility civil engineer or facility crane lifting and rigging SME using historical documentation and information when available.
 - b. Prodding, core drilling & prodding or ground penetrating radar surveys have a site determined lifespan based on qualified advice and sub-surface conditions.
 - c. No assigned frequency to the approved void inspection; the local civil engineer or local crane lifting and rigging SME will visually inspect and approve the area.
 - d. A documented void inspection shall include a marked up drawing or hand sketch of the crane lift area along with notations of survey findings that are relevant to safe crane setup and operation. The documentation must be signed and dated by the lift site approver.



Lifting & Rigging Standard

Low Consequence Lift – Void Inspection Requirements

Low consequence lift

- For low consequence lifts the Crane Operator shall perform a site evaluation prior to setting up the crane to assess site conditions, including:
 - a. Location of any drains / appurtenances in the area.
 - b. Condition of ground surface, (firm compacted soil, no broken concrete or asphalt, no loose or uncompacted soil or backfill, proper distance from sloping ground, trenches, vaults, voids.)
 - c. The crane is set up so that no outriggers are on top of any drain hubs or adjacent to any sub surface valve boxes, open vaults, sloping berms/banks or at edge of retaining wall, etc.
- The Crane Operator shall consult with a Civil Engineer or SME if there are any concerns identified in the site evaluation and determine the appropriate ground bearing pressure limits for the lift.



Lifting & Rigging Standard

Lift Clearance from Overhead Lines

- ❑ Minimum clearance distance (Lift Equipment Height or Length + Load Length + At Least minimum clearance distance) (i.e., the lifting equipment and the load shall be kept outside the minimum clearance distance) to energized power lines for lifting and rigging operations shall meet the following requirements;

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.

- ❑ This work zone is defined as 360 degrees around the equipment up to the equipment's maximum working radius.



Lifting & Rigging Standard

Lift Clearance from Overhead Lines

- ❑ Identify the work zone work boundary by:
 - **Demarcating boundaries** consistent with the Minimum Clearance Distances (e.g., flags, range limit device, range control warning device and similar) and prohibiting the operator from operating the equipment past the boundary
- ❑ Approaches (of any part of equipment, load line or load) that are within 20 feet of a power line if the voltage is unknown or are within the minimum distances described in the minimum clearances;
 - Informing employees around the equipment or load of power line locations and the potential hazards and precautions required while working near a power line.
 - Using an elevated warning line, barricades, line of signs or similar devices as visible indicators of the safety zone based on line voltage (kV).
 - Using warning decals, labels or signs posted on cranes and similar equipment regarding minimum clearance of 20 feet of a power line or the minimum approach distance
 - Using a dedicated spotter (signal person),
 - Consideration of a proximity alarm, warning device, range limiter, or insulating device should be given in addition to the dedicated spotter.
 - Notifying a local responsible person (e.g., electrical engineer, Instrumentation and Electrical (I&E) specialist or utility company) at least 24 hours before any work begins for work that requires identification of voltages and clearances, de-energizing the lines, applying safety grounds (e.g., cranes), or relocating lines.
 - Ensuring all tag lines are of non-conductive material.



Lifting & Rigging Standard

Hoisting of Personnel

- ❑ Cranes and derricks used to hoist personnel on suspended personnel platforms (e.g., man riding baskets) shall be used only when other mechanisms of personnel transfer are considered potentially more hazardous (e.g., personal hoist, scaffolding, ladders or aerial lifts) or physical constraints of the work area make their use impractical.

- ❑ Personnel lifting operations shall include, but are not limited to the following requirements:
 - Cranes and/or lifting equipment used for personnel handling (e.g., personnel platforms, marine hoisted personnel transfer devices or other personnel transfer devices) and attachment/suspension systems) shall be intended and certified for such use or designed by qualified personnel to meet applicable legal requirements, as well as Chevron standards and/or accepted best practices.
 - Cranes and/or lifting equipment used to lift personnel shall be classified and labeled as “personnel handling”.
 - Personnel platforms, marine hoisted personnel transfer devices or other personnel transfer devices shall be set-up, rigged, used and loaded to meet applicable legal requirements, as well as Chevron standards and/or accepted best practices.
 - Personnel platforms, marine hoisted personnel transfer devices or other personnel transfer devices attachment/suspension systems shall be inspected and tested by qualified personnel prior to first use per shift.



Lifting & Rigging Standard

Hoisting of Personnel

- ❑ Personnel platforms (e.g., personnel baskets) shall undergo a trial lift and proof testing to 125% of the platform's rated capacity prior to first use per shift for personnel.
 - Trial lift of the unoccupied personnel platform with at least the anticipated lift weight and shall be performed immediately prior to each shift of hoisting personnel.
 - If the crane is moved, then the 125% proof test is required at the new site
- ❑ Tag lines shall be used, when required (e.g., Billy Pugh personnel transfer basket).
- ❑ Personal fall arrest systems shall be used, except for marine transfers.
- ❑ Personal floatation devices approved for such use for personnel in marine personnel transfers shall be used.



Lifting & Rigging Standard

Stop Work Scenarios

Stop Work Authority will be used if the following conditions are applicable (not limited to):

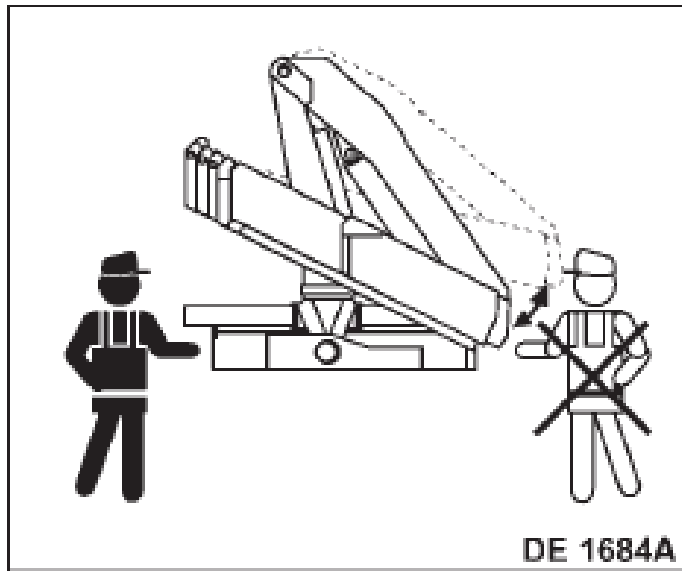
1. No Permit to Work (PTW) available for the lifting activity.
2. The PTW Permit Requester has left the site.
3. Wind Conditions meet or exceed 12m/sec.
4. Lightning, thunderstorms is in the vicinity.



Learnings from Incident

Boom Truck Fatality – Understanding Lifting Equipment Line of Fire

- Line-of-fire hazards exist with some boom trucks, particularly with ones of the knuckle boom type. To manage these potential hazards, each boom truck that enters the facility grounds needs to be evaluated for any potential line-of-fire hazards, and if they exist, to be addressed.
- Personnel at each facility that will serve as qualified persons to conduct an assessment for every boom truck that enters the facility. If unfit for use, understand if it can be safely loaded/offloaded with a forklift or other equipment, instead of using the crane. If this is not feasible, either:
- **reject the equipment, or**
- **Issue a General Work Permit that details the safeguards that must be in place and assurance activities that must be conducted.** The Operations Manager of the facility must Approve the work by signing the Approver section of the Permit.



Learnings from Incident

Boom Truck Fatality – Understanding Lifting Equipment Line of Fire (LoF)

Acceptable Units

- Any boom type (knuckle or box) that is operated by remote control
- A Box Boom - with the operator station (seat) fixed to the boom
- A Knuckle Boom - with the operator station (seat) fixed to the boom
- A Conventional Box Boom – with ground controls on one or both sides
- A Knuckle Boom – with ground controls on one side only, opposite side of where the boom folding / unfolding takes place
- Knuckle Boom – where the ground controls (both sides) are configured where the operator is fully clear of the boom travel path when folding / unfolding



Not Acceptable – Control Panel within Operator's LoF



Acceptable – Control Panel outside of LoF

Lifting & Rigging

Job Completion and Record Retention

Job Completion

- When the work has been completed, the Permit Requester/Holder must return the General Work Permit and all related documents to the Permit Issuer
- The Permit Issuer or the nominated Responsible Person will review the job site to ensure that:
 - i. The work area has been left in a safe, clean and tidy condition
 - ii. The work performed meets the specific work scope and task specifications
- If the above conditions have been met the Issuer or Responsible Person will sign and date the General Work Permit as completed.

Record Retention

- Copies of all Permit to Work and associated documents retained one year or from audit to audit, whichever is the lesser
- If an accident occurred while work was in-progress, then documentation must be retained for incident investigation
- If permitted job involved potential health hazard, consider retaining permit documentation for an extended period (beyond 90 days).

