

# **Global Products**

# Lifting and Rigging Standard

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Version 2.0

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# Lifting and Rigging Standard

### 1.0 Introduction

This standard defines the Global Products and Enterprise OE requirements for Lifting and Rigging activities. This standard should be used in conjunction with applicable Chevron Engineering Standards (CES) which contain additional technical information and specifications for planning and performing lifting operations.

Lifting and Rigging is the process by which loads are rigged, lifted, and moved using manual and/ or powered mechanical devices including but not limited to cranes, hoist, and winches. Lifting and Rigging procedures are designed to help prevent injuries to personnel, property damage or adverse environmental impact through the safe planning and delivery of lifting operations including the use of procedures, lift plans, inspection, and selection of lifting equipment by trained and competent personnel.

Lifting and rigging operations that are in support of diving operations, but not directly part of the diving activities, (such as project mobilization, topside movement of material or equipment, and demobilization of the diving project) fall within scope and shall comply with requirements of this standard.

Lifting and rigging activities that are directly part of commercial diving activities are out of scope of this standard, including preparation of loads to go into the water, moving materials or equipment under water, and preparation of loads to come out of the water. Such activities shall meet guidance issued by International Marine Contractors Association (IMCA) D060 in accordance with IOGP 411 recommended practices for diving operations.

Out of Scope Operations: Fall protection and rope access equipment, Manual handling, Ship anchor handling, marine towing, and routine ship operations not directly associated with loading and offloading (e.g., ship maintenance), Lifting with Jacks (e.g., Mechanical, Hydraulic), Vehicle maintenance lifts, piling machines, Commercial Diving (See IMCA D060)

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/telehandler (<u>unless</u> <u>configured to hoist</u>, <u>lower and horizontally move a suspended load</u>) that may be used for lifting operations.

### 2.0 Requirements

A written program for Lifting and Rigging procedures shall be in place and include the following elements at a minimum.

- Lifts are categorized into three consequence categories Critical (Category 3), High (Category 2) and Low (Category 1).
  - a. Critical consequence (Cat. 3) lifts are defined by one (or more) of below criteria:
    - i. Greater than 90% of lifting equipment load capacity
    - ii. Hoisting personnel in a basket (excluding personnel transfer)
    - iii. Multiple cranes (tandem)

- iv. Lifting near live / energized electrical power lines or within the proximity of hazards (e.g., restricted area, confined space, etc.)
- v. Load be lifted over sensitive process equipment (as defined by the facility), or when the sensitive equipment is within the Red Zone (lifting path) of the lift.
- vi. Lift plan requires more than one shift to complete.
- vii. Lift plan requires technical input or calculations from a technical expert (e.g., load distribution in lifting equipment)
- viii. Load transferred from one powered lifting appliance to another.
- ix. Load lifted from one marine vessel to another and involve load complexities such as complex dynamics.
- x. Subsea lift
- xi. Lift involves proof load testing of appliances or lifting equipment.
- xii. Load to be rotated, up-ended/up-righted (e.g., roll-up, tailing or special lifting operations) or transferred from one appliance to another during operation (with load in suspension)
- b. High consequence (Cat. 2) lifts are defined by one (or more) of below criteria:
  - i. Greater than 80% of lifting equipment load capacity
  - ii. Unknown load weight and estimated to be over 60% of crane capacity.
  - iii. Lift involves personnel transfer to or from boat or barge.
  - iv. Crane operator's line of sight to the load be restricted/limited during the lift (i.e., 'blind lift')
  - v. The Center of Gravity of the load is unknown.
  - vi. The load has the potential to shift during lifting.
  - vii. Environmental condition will place restrictions on lifting operations.
  - viii. The load of an unusual shape (i.e., sail effect, offset center of gravity)
  - ix. An engineered lift plan or specialized tools (e.g., spreader bars) required to prevent permanent deformation of the load.
  - x. Necessary design and documented test results for lifting points absent or missing (Note: The lifting straps used in the choker configuration for low consequence lifts such as piping, valves, and associated piping equipment are out of scope)
  - xi. Load has excessive dimension (limited clearance from crane structures, surroundings
  - xii. The lifting operation taking place during SIMOPS or interfering with other concurrent activities.
- c. Low consequence lifts are lifts that are not otherwise classified High (Cat. 2) or as Critical (Cat. 3) consequence.
- d. Any High (Cat. 2) or Low (Cat. 1) consequence lift can be elevated in consequence level. Examples to consider may include possibility of the lifts to meet the criteria of a higher consequence lift category such as high center of gravity loads, fragile loads, equipment containing liquids, lifts requiring rotation, or lifts over sensitive process equipment.
- 2. A Permit to Work following Global Products Work Authorization Standard shall be required for lifting and rigging work within the scope of this standard, unless covered by an alternative

approval process (e.g., davits / gantry cranes / monorails in a shop environment or lifting associated with an operational activity such as truck loading).

- 3. Lifts shall be planned, and lift plan is required for all lifting operations.
  - a. The plan shall include the elements and level of detail required by each lift category as defined in Tabel 1 below.

Note that Products lift plan templates include information needed to align with requirements as described.

#### Table 1. Lift Plan Requirements based on Lift Category

Low (Category 1) Lift plans shall include the following information. This information can be listed within CoW Documentation, checklist, or stand-alone documents. This information is intended to help identify hazards and promote discussion with all personnel involved.	High (Category 2) Lift plans for Category 2 are specific to the lift being conducted and require the following information in addition to all the information in Category 1:	<b>Critical (Category 3)</b> Lift plans for Category 3 are specific to the lift being conducted and require the following information in addition to all the information in Category 1 and 2:
<ul> <li>Number of Personnel required (specific roles identified if multiple work groups involved).</li> <li>Communication method to be used.</li> <li>Restrictions on the lift(s) (e.g., weather conditions, wind speed, light, sea state, ground bearing pressure).</li> <li>The Center of Gravity (CoG) for each load, and/or lifting points identified prior to each lift.</li> <li>The weight of the load if known and covered on load charts, or the estimated weight of the load which is less than 60% of the crane capacity at the lift radius.</li> <li>Lifting equipment certified and adequately sized.</li> <li>Lifting equipment certified with current inspection (crane, slings, etc.).</li> <li>Pre-lift visual inspection of the load(s), including checks for dropped objects and load integrity.</li> <li>Safe access and egress for slinging and unslinging the load. (e.g., Work at Heights,</li> </ul>	<ul> <li>Specific roles identified for members involved in the lift.</li> <li>The weight, the Center of Gravity (CoG) position, and lifting points of the load identified and reviewed.</li> <li>Rigging configuration and lifting equipment positioning discussed and verified by the site lifting competent person for each category 2 lift.</li> <li>Load charts provided and reviewed.</li> <li>The crane ground bearing pressure (outrigger loading) reviewed, where applicable.</li> <li>Requirements to erect/dismantle the lifting equipment provided and reviewed, if applicable.</li> <li>Wind speed monitored and confirmed below maximum acceptable limit of the lifting equipment for the duration of the lift.</li> <li>Pick up zone, load path, and set down zone constraints (e.g., obstacles, spacing, and stacking) addressed and documented.</li> </ul>	<ul> <li>Names of personnel for each specific role that is involved in the lift. Including Site Lifting Competent Person, Approved Competent Person, engineers, SME involved.</li> <li>The weight, and the Center of Gravity (CoG) and verified lifting points identified and documented. Additional manufacturer documentation shall be included if obtainable.</li> <li>Supporting drawings or sketches (e.g., 2D or 3D computed aided drawings for complex lifting operations) including crane(s), load position, rigging diagrams, and operational steps (phases).</li> <li>Plot plans of the work area.</li> </ul>

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congested areas, walking working surfaces).	
• SIMOPS controls discussed and in place, if required.	
• Red Zone is identified and controlled.	

- 4. 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.
- 5. 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.
  - a. Determine crane outrigger locations and matting requirements.
- 6. Documented void inspections are required for all Critical consequence (Cat. 3) and High consequence (Cat. 2) lifts:
  - a. All Critical consequence (Cat. 3) and High consequence (Cat. 2) lifts require a documented void inspection by a qualified person, facility civil engineer or facility crane lifting and rigging SME.
    - i. 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.
    - ii. Prodding, core drilling & prodding or ground penetrating radar surveys have a site determined lifespan based on qualified advice and sub-surface conditions.
    - iii. 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.
  - b. For Low consequence (Cat. 1) lifts the <u>Crane Operator</u> shall perform a site evaluation prior to setting up the crane to assess site conditions, including:
    - i. 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).
    - ii. 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.
    - iii. The Crane Operator shall consult with a Civil Engineer or SME a. If there are any concerns identified in the site evaluation,
  - c. Refer to void inspection, soil compaction and allowable soil loads guidelines outlined in the Chevron Engineering Standard CIV-EN-800.1 Cranes, Rigging and Lifting.

- 7. Ensure that loose items are placed in appropriate certified containers (e.g., cargo carrying units) so that materials do not protrude outside the container.
- 8. Verify installed attachments, i.e., platform, lights, instrumentation, or potentially loose items are secured prior to beginning lifts.
- 9. Ensure nothing will interfere with the rigging gear during up-righting or down ending vertical vessels and columns.
- 10. Consider the suitability of weather, wind, sea state and environmental conditions prior to conducting the lift.
  - a. No lift shall be made when the wind velocity is above the crane manufacturer's recommendation. The size and shape of the load, along with the elevation of the load above grade needs to be considered.
- 11. Ensure that lifting/rigging equipment controls are not bypassed or inhibited (unless designed for this application and/or according to the <u>OE Bypassing Critical Protection Standard</u>).
- 12. 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.
- 13. A Hazard Analysis shall be performed in accordance with the Global Products standard when planning work involving Lifting and Rigging.
- 14. A Job Safety Analysis (JSA) or equivalent (e.g., pre-lift checklist or pre-lift meeting) shall be conducted at the work site in accordance with the Global Products Hazard Analysis Standard prior to work involving Lifting and Rigging.
- 15. A written lift plan shall be required as follows:
  - a. An approved written lift plan shall be required for Critical consequence (Cat. 3) and High Consequence (Cat. 2) lifts – see **Document Reference List section and TCC** for Critical consequence (Cat. 3) and High Consequence (Cat. 2) Lift Plan templates.
  - b. No additional documentation is required for low consequence crane lifting and rigging; beyond the local routine requirements such as permits, job hazard analysis and pre-lift meeting. See **Document Reference List section and TCC** for Low consequence lift plan template.
  - c. Start Work Check(s) (SWCs) shall be required for Critical consequence (Cat. 3), High Consequence (Cat. 2) and Low Consequence (Cat. 1) lifts depending on the relevancy of the lift. Multiple Start Work Checks may apply depending on the activity/operation see **Products TCC for relevant documents**
- 16. Written lift plan shall describe how a lift will be undertaken and include, but not limited to:
  - a. Specific crane and rigging equipment used.
  - b. Required personnel and training.

- c. The load characterized with respect to dimension, weight, and approximate center of gravity (as assessed by a qualified person).
- d. Specific Manufacturer's recommendation of wind speed for the boom / jib configuration planned.
- e. Verification that the selection of equipment and rigging is appropriate for the type of lift.
- f. Verification that the load is within the capacity and specifications of lifting and rigging equipment.
- g. Inspection requirements include copy of any required void inspections along with name of inspector and date of inspection.
- h. Communication requirements.
- i. Identification and mitigation of potential hazards associated with lift, including environmental considerations.
- j. Emergency plans.
- k. Required approval for Lift Plan.
- 17. Written Lift Plans shall be developed or reviewed and approved by competent personnel prior to beginning the lift.
  - a. Lifting Supervisor / SME **and** BU management approval is required for Critical consequence (Cat. 3) written lift plans.
    - i. BU Management approval is to ensure the right people were involved and the process was followed.
  - b. Lifting Supervisor / SME or BU designee shall approve High consequence (Cat. 2) written lift plans.
  - c. Any changes to a prepared lift plan shall be approved by a person with the same, or higher, competence level as the original lift plan approver.
  - d. High and Critical (Cat. 2 and 3) lifting plans shall be developed in consultation with subject matter experts in the mitigation of the hazards associated with the lift, such as:
    - i. Lifts involving two or more lifting appliances.
    - ii. Subsea lifting (non-Commercial diving support)
    - iii. Ground conditions for setting up mobile lifting appliances.
    - iv. Helicopter lifts
    - v. Lifts from floating barges/ vessels
    - vi. Lifts over live process areas or sensitive process equipment (containing hydrocarbons, pressurized, or hazardous substances).
- 18. Crane safety equipment and operational aid requirements shall meet manufacturer's recommendations, Global Products/facilities requirements and be defined (e.g., 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).
- 19. No non-certified fabricated or modified lifting and rigging equipment shall be used.
- 20. Lifting and Rigging equipment shall meet the following:

- a. Designed, engineered, and certified to meet manufacturer's specifications, Chevron requirements, local jurisdictional requirements, and the requirements of applicable local industry standards and only be used for the purpose it was designed.
- b. Marked for identification, documentation of inspection, and working load limits (e.g., nameplate, tag, or information plate)
- c. Maintained according to manufacturer's specifications, industry or Chevron standards, or the instructions of a Competent Person and in good working order/condition as verified through written pre-use and periodic inspections. (see Appendix A)
  - i. Including annotation of inspection and safe working loads (color codes, tags and/or documentation).
  - ii. All lifting equipment shall be inspected and certified by the Manufacturer prior to first use.
  - iii. Cranes shall have current certification in accordance with local regulations prior to use.
- d. Properly installed and supported.
- e. Used within the specified limits of the manufacturer.
- f. All safety devices are in proper working order. Damaged or defective equipment shall be removed from service, clearly marked as defective, and quarantined to prevent accidental usage.
- g. Used in accordance with applicable legal requirements, as well as Chevron standards and industry best practices.
- h. Not modified except in consultation with the original equipment manufacturer or certified repairer following the management of change process.
- i. Specialized and unique equipment that is specifically manufactured may be used if designed, tested, and approved by the appropriate authority (e.g., Professional engineer (PE), Design engineer, or equivalent).
- j. Non-engineered (handcrafted) equipment shall NOT be used for lifting operations.
- k. Existing structures or process equipment used as part of the lifting operation, shall be reviewed by the Site Lifting Competent Person in consultation with a structural engineer and other subject matter experts as appropriate, and confirm that the structure or equipment is suitable to support the planned lifting operation.
- I. All lifting and rigging equipment shall be recorded in a register which is stored in a controlled location.
- m. Equipment that is rented or brought onto the location by contractors shall be clearly marked to allow identification, documentation of inspection, and working load limits, and shall be inspected, maintained, and managed to the same standards as company lifting equipment.
- 21. 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.
  - a. See Appendix A for Cranes and Lifting Equipment Inspection Requirements.

- 22. Lifting and Rigging equipment inspections in accordance with requirement #21 above shall be documented and include, but not limited to:
  - a. Equipment checked and result of inspection.
  - b. Date of inspection.
  - c. Name and signature of competent or qualified inspector.
  - d. Method and detail of documentation will be decided locally.
    - i. The intent must conform to all governmental regulations.
    - ii. Not all rigging equipment is required by law to have a serial number.
      - 1. Without individual serial numbers a method of tracking the equipment shall be developed to ensure all company owned rigging equipment is being annually inspected by a qualified inspector
  - e. If workers are issued company owned rigging equipment a plan must be put in place to ensure the rigging equipment is annually inspected and documented by a qualified inspector
  - f. If the rigging equipment has an individual serial number the documentation, with annual notations, must be maintained for the life of the rigging equipment.
  - g. Specialized rigging equipment that is used at intervals beyond one-year may be locked away and inspected on an as need basis. This may include equipment such as large slings, chokers, shackles and hooks, equipment specific lifting devices, barrel clamps and pallet lifts. It must not be readily available to the workforce at any time.
  - h. Adjustable devices such as come-a-longs, chain-falls and turnbuckles must be included in the annual inspection inventory.
- 23. 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).
- 24. Assembly and disassembly of cranes shall be under the direction of a competent and qualified <u>assembly/disassembly person</u> and shall be in accordance with applicable legal requirements, as well as Chevron standards and/or accepted best practices.
  - a. Manufacturer procedures (or approved equivalent) and regulatory requirements for assembly and disassembly shall be followed.
- 25. 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.
- 26. 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 Table 2 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.

Table 2. Voltage and Minimum Clearance Distance (OSHA 1926.1408 Table A) (Table 1 in the Global <u>Products Electrical Safety Standard</u>).

- 27. Additional safeguards for Lifting and Rigging operations in which energized overhead power lines may pose a threat shall be described and include, but not limited to:
  - a. Working near power lines may pose a hazard if the equipment, its line, or load could enter the Minimum Clearance Distances noted in Table 2. This work zone is defined as 360 degrees around the equipment up to the equipment's maximum working radius. (I2)
  - b. Requiring a Permit to Work in accordance with Global Products Work Authorization Standard.
  - c. Identify the work zone work boundary by:
    - i. Demarcating boundaries consistent with the Minimum Clearance Distances noted in Table 2 above (e.g., flags, range limit device, range control warning device and similar) and prohibiting the operator from operating the equipment past the boundary.
  - d. **Table 2** shall be used along with Qualified Electrical Person support for known voltage encroachment situations. Encroachment controls shall be identified in the hazard analysis if there's any potential to enter the minimum clearance distance, these shall include at least one of the following: barriers, spotter, proximity alarm, or voltage detector.

- e. Approaches (of any part of equipment, load line or load) that are <u>within</u> 20 feet of a power line if the voltage is unknown or are <u>within</u> the minimum distances described in the minimum clearances (specified in Table 2 above) shall require:
  - i. Informing employees around the equipment or load of power line locations and the potential hazards and precautions required while working near a power line.
  - ii. Using an elevated warning line, barricades, line of signs or similar devices as visible indicators of the safety zone based on line voltage (kV).
  - iii. 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 based on line kV as noted in Table 2 above.
  - iv. Using a dedicated spotter (signal person),
  - v. <u>Consideration of a proximity alarm, warning device, range limiter, or insulating device should be given in addition to the dedicated spotter.</u>
  - vi. 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, deenergizing the lines, applying safety grounds (e.g., cranes), or relocating lines.
  - vii. Ensuring all tag lines are of non-conductive material.
- 28. Mechanical lifting device (e.g., 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 MEWP/aerial lifts) or physical constraints of the work area make their use impractical and meet the requirements in #29 below. A specific personnel lift plan and hazard analysis shall be developed along with a rescue plan.
- 29. Personnel lifting operations shall include, but are not limited to the following requirements:
  - a. Require a Level 2 Hazard Analysis
  - b. A specific personnel lift plan, or a dedicated lift plan with an incorporated rescue plan.
  - c. 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.
  - d. Cranes and/or lifting equipment used to lift personnel shall be classified and labeled as "personnel handling".
  - e. 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.
  - f. 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.
  - g. 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.
    - i. 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.
    - ii. If the crane is moved, then the 125% proof test is required at the new site

- h. Tag lines shall be used, when required.
- i. Personal fall arrest systems shall be used, except for marine transfers.
- j. Personal floatation devices approved for such use for personnel in marine personnel transfers shall be used.
- 30. Prior to starting the lifting operation:
  - a. The lift crew shall review the lift plan, hazard analysis, permit to work (if required) and agree to the roles that they are undertaking and the communication methods to be used.
  - b. The lifting operation shall be conducted in accordance with the lift plan and hazard analysis developed for the operation, including the number of people specified in the plan to carry out the lift safely. If conditions change or deviate from the plan, work shall be stopped, and the plan will be revised to address the conditions.
  - c. A Red Zone shall be established and controlled. All non-authorized personnel are restricted from entering the Red Zone, and all personnel shall be kept clear of suspended/travelling loads and lifting equipment.
  - d. The communication methods to be used by the lift team shall be agreed upon before the operations starts (radio communications/ hand signals).
  - e. Routes for suspended loads shall ensure that no employee is required to work directly below a suspended load.
    - i. The need for tag lines, push/ pull sticks, or other approved devices to distance crew members from the suspended loads and out of the Red Zone shall be assessed.
    - ii. The use of taglines for offshore vessels backload/offload is not recommended. However, where an assessment determines the use of taglines to be necessary, such use shall be approved by the lift team, including vessel captain or equivalent.
  - f. Where the load's center of gravity is undefined or unusual, a trial lift shall be performed to confirm the dynamics of the load, and if required, the load's rigging shall be reconfigured to balance the load properly, within rigging tolerances.
  - g. Lifting equipment shall be visually inspected before and after use to identify any defects.
  - h. Loose equipment and materials shall be put into a certified lifting container or secured by lashings or straps to avoid movement, shifting, or disintegration of the load during lifting.
  - i. Start work checks shall be completed to confirm that safeguards have been verified by the lift crew before the lifting operation starts.
- 31. Training requirements and competency assessment for personnel competent and qualified in Lifting and Rigging shall be documented and includes for:
  - a. Crane Operators.
  - b. <u>Riggers</u>.
  - c. Signal (e.g., Dog-Man or Banksman) personnel.
  - d. Inspection personnel.

- e. Maintenance and repair personnel.
- 32. The Lifting and Rigging standard shall define the policy for record retention that meets applicable legal, corporate, and operating company requirements (or at least 6 months, whichever is more).

### 3.0 Roles and responsibilities

- 1. There must be clearly defined roles, and personnel must meet the training and competency requirements of this standard prior to starting work. Site or local regulations may specify additional training and competency requirements.
- 2. **Competent Personne**l: Person who can identify potential hazards related to Lifting and Rigging operations and has the authority to prompt corrective measures.
- 3. **Qualified Personnel** Person who is qualified through recognized degrees, certificates or professional standings or has extensive knowledge, training and experience and has demonstrated ability to solve/resolve problems related to lifting and rigging.

Role	Responsibilities		
Site Manager	Accountable for the site and for applying the Lifting Management System requirements including the execution of safe lifting and hoisting operations at the site. Responsibilities include:		
	Appointing a Person in Charge of the lift and lifting crew.		
	Ensuring personnel are trained and competent for the task.		
	• Ensuring lifts are properly studied, assessed, planned, and conducted safely.		
	• Ensuring that only suitable, certified, and sound equipment and machinery are provided		
Site Lifting Competent Person (SLCP) (e.g., deck foreman, site lifting or rigging supervisor)	Possesses knowledge and experience to verify that lifting operations are planned and executed safely in compliance with legislation, standards, codes, and company requirements and that the lifting equipment used is in a safe to operate condition and suitable for the task. Responsibilities include:		
	• Providing lift plan(s) and risk assessment(s) that meet, legal or regulatory requirements and company requirements.		
	• Confirming that the lifting equipment is only operated within its safe operating limits and OEM operating instructions.		
	Advising others on preparation of the lift plan.		
	• Confirming that the categorization and technical content of the lift plan is correct.		
	Approving the lift plan prior to submission for authorization.		
	• Confirming that the lifting operations are untaken safely and in conformance the approved lift plan.		
	Participating in and deliver toolbox talks.		

 Table 3: Roles & Responsibilities

Role	Responsibilities		
	<ul> <li>Confirming that all personnel involved in a lifting operation have sufficient training, experience, and appropriate supervision to perform the task competently relative to the categorization.</li> </ul>		
Approved Competent Person	Assist and support stakeholders in the definition of any aspect related to the lifting process. Provide technical advice and guidance for the following:		
(e.g., Advisor, Engineer, or Subject Matter Expert)	• Internal auditing services required for the correct lifting management system implementation.		
	Design and selection of lifting appliances.		
	<ul> <li>Developing and/or approving the generic lift plan for Category 1 lifting operations.</li> </ul>		
	• Developing and/or approving the specific lift plan for Category 2 and 3 lifting operations as per BU.		
	• Developing and reviewing documented thorough examination schemes for lifting appliances.		
	• Developing and reviewing guidelines for the engineering and planning of the operations.		
	<ul> <li>Investigating lifting related HSE events and sharing of the lifting operations lessons learned.</li> </ul>		
	Reviewing lifting processes.		
	• Conducting capability assessments of contractors and subcontractors for lifting operations.		
	• Determining requirements for management of change and deviations in lifting operations.		
	Competence assessment, assurance, and training of lifting personnel.		
Person in Charge (PIC)	The only person with operational control of the lift and authorization to give instructions to the lifting crew during the operations. Possesses the required level of competence to plan and supervise the specific lifting and hoisting operation and ensure that the lift plan is suitable for the task. Responsibilities include:		
	Categorizing, risk assessing, and planning Category 1 lifting operations.		
	<ul> <li>Lifting appliance set-up/configuration, ensuring the correct equipment is available and safety devices are installed and operational.</li> </ul>		
	<ul> <li>Ensuring a Red Zone is established and controlled.</li> </ul>		
	• Ensuring the travel route of the lifting operation is clear and free from hazard and obstructions (e.g., overhead obstacles such as powerlines) to enable the lifting equipment and load to safely travel from the lifting to landing point without being impeded by any obstacles.		
	• Ensuring there are good access and egress routes for the lifting team, including putting in place safe alternative routes if walkways are obstructed.		
Appliance Operator / Qualified Crane Operator	Trained and competent to operate the lifting appliance to be used. The only person allowed to maneuver the lifting appliance during the activity unless a change of planning and control documentation is made. Responsibilities include:		
	Carrying out pre- and post-use inspections.		
	<ul> <li>Ensuring cranes are properly secured on firm and level foundation on outriggers and set up in accordance with the manufacturer's instructions.</li> </ul>		

Role	Responsibilities			
	• Checking the suitability of the routes for the forklift or mobile appliance to be used (e.g., ground conditions, slope, space).			
	<ul> <li>Not leaving a load unattended or suspended above people.</li> </ul>			
	• Operating the appliance properly, verifying weight of load does not exceed the safe working load (SWL) or Working Load Limit (WLL) of lifting appliances.			
	• Communicating with banksman before operation start to establish common understanding, signs, and instructions that will be used.			
	Contributing and participating in Toolbox Talks.			
	<ul> <li>Not starting the operation if Safeguards/ barriers are not in place.</li> </ul>			
	<ul> <li>May also assume responsibilities of the PIC.</li> </ul>			
Rigger / Slinger	Trained and competent in attaching slings, lifting accessories, and shackles onto the load to ensure that it can be lifted and moved safely. Responsibilities include:			
	<ul> <li>Inspecting and selecting lifting equipment correctly, ensuring certification is in place.</li> </ul>			
	<ul> <li>Inspecting the load and ensuring that any required certification is in place (e.g., integral lifting points).</li> </ul>			
	• Visual inspection of the load(s), including checks for dropped objects and load integrity.			
	<ul> <li>Securely connecting and disconnecting lifting accessories to loads and accessories to lifting appliances.</li> </ul>			
	• Establishing a Red Zone and ensuring task areas are kept clear of non- essential personnel including the deployment of physical barriers where required.			
	Maintaining a safe position during lifting.			
	Contributing and participating in Toolbox Talks.			
Signal Person/ Banksman	The only person authorized to give signals to the lifting operator. Responsibilities includes:			
	<ul> <li>Controlling of the lift area, ensuring all personnel are positioned safely and using physical barriers to prevent access to Red Zones.</li> </ul>			
	<ul> <li>Watching for anyone moving towards the 'line of fire' during the lift, and stopping work if anything unexpected happens, or if anybody begins to move towards the 'line of fire'.</li> </ul>			
	Checking for potential dropped objects.			
	• Maintaining direct sight of the load and clear communications with the appliance operator and making use of 2-way radios with designated channels.			
	<ul> <li>Maintaining an awareness of other ongoing operations that may affect lifting activities.</li> </ul>			
	<ul> <li>Directing the movement and placing of loads.</li> </ul>			
	<ul> <li>Not performing any other job while the lift is in progress.</li> </ul>			
	Contributing and participating in Toolbox Talks.			
Lifting Equipment Inspector	A person competent to assess the condition and compliance of lifting equipment.			

Role	Responsibilities			
Lifting Equipment Controller	Manages all lifting accessories and loose lifting gear at a lift site. Responsibilities include:			
	<ul> <li>Managing the Rigging Loft where accessories are stored</li> </ul>			
	<ul> <li>Keeping record, tracking, and verifying the accessories to determine the correct flow, disposal, certification availability and proper condition of all the accessories.</li> </ul>			

#### 4.0 Records requirements

- 1. Copies of permits and associated documentation (including records of inspection, maintenance, hazard analysis and competencies) shall be maintained in accordance with Global Products Work Authorization Standard and Control of Work OE Process.
- 2. Records shall be retained for the periods as specified below:
  - a. Copies of all Lifting and Rigging Lift Plans, JSAs, Work Permits / Work Forms and any other document related to the Lifting and Rigging job, shall be retained by the facility for at least 1 year after the job has been completed.

#### **5.0 Documents Reference List**

Title	Attachment
Example of Standard Hand Signals for Crane Operations	Standard Hand Signals for Crane Operations
Crane Safety Checklist for Personnel Basket Lifting	Crane Safety Checklist for Personnel Basket Lifting
Lift Plan Template – High (Category 2) & Critical (Category 3)	Lift Plan Template – High & Critical
Lift Plan Template – Low Consequence (Category 1)	Lift Plan Template – Low Consequence
Lift Plan Template – Low Consequence (Category 1) Crane Lift Checklist (Optional)	Low Consequence Crane Lift Checklist
Lifting Equipment and Crane Inspection Checklist Template (In-House Equipment)	Lifting Equipment and Crane Inspection Checklist

#### **Document Control**

Description	Corporate	Global Products
Approval Date	February 2024	September 2024

Final. Version 2.0 01 September 2024 Printed 11 November 2024. Uncontrolled when printed. Company Confidential

Next Process Document Review	February 2029	September 2029	
Control Number	Version 1.1	Version 2.0	

## **Document Change History**

Changes to this document are listed in the table below by change date.

Date (DD/MMM/YR) Version Number		Description of Change		
08 Nov 2021	1.0	New document		
01 September 2024	2.0	Included additional languages and requirements as highlighted red font to provide clarity and align with the Enterprise Lifting & Rigging OE Standard Version 1.1 February 2024		

# APPENDIX A: Lifting and Rigging Standard Cranes and Lifting Equipment Inspection Requirements

Equipment Types	New Equipment - First Use	Prior to Each Use	Monthly	Annually	Modifications / Repairs	After Assembly
Cranes &	Certified	Documented	Documented	Certified	Certified	Documented
Equivalent Equipment Note 1	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 &	Documented	Visual		Documented	Documented	
Gantry Cranes Note 2	Qualified Load Test 100-125%	Qualified		Qualified	Qualified Load Test – See note 3	
	Documented	Visual		Documented		
Synthetic Slings	Qualified Person/Rigger	Qualified Person/Rigger		Qualified Person/Rigger		
	Documented	Visual		Documented		
Cargo Carrying Units, Pallets	Qualified Person/Rigger	Qualified Person/Rigger		Qualified		
Lifting	Documented	Visual		Documented		
Hardware (Hooks, Shackles, Turnbuckles, Pad Eyes, Trolleys)	Qualified Person/Rigger	Qualified Person/Rigger		Qualified	1	
Manufactured	Certified	Visual		Documented	Certified	
Lifting Devices (e.g., Spreader Bars, Bundle Extractors, etc.)	Third Party by Vendor	Qualified Person/Rigger		Qualified	Third Party	
Chain Hoists	Documented	Visual		Documented	Certified	
Come-Along	Qualified Person/Rigger	Qualified Person/Rigger		Qualified	Third Party	
Man riding	Documented	Documented		Documented	Certified	
work baskets	Qualified Person/Rigger	Qualified Person/Rigger		Qualified	Third Party	
Key	Type of Inspection Minimum					

Notes:

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.

Inspector

### **APPENDIX B: Additional Safety Precautions during Lifting and Rigging Operations**

- 1. The following general safety precautions must be followed when personnel are involved in lifting and rigging operations:
  - a. The boom and basket load limit specified by the manufacturer must not be exceeded.
  - b. 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 and qualified rigger must be available and provided upon request.
  - c. Lifting equipment and work areas must be kept free of oil, grease, and trash slipping / tripping hazards.
  - d. The crane or lifting equipment must not be moved when the boom is elevated in a working position.
  - e. 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).
  - f. Workers must wear a full-body harness and an approved lanyard while working from a basket, while always ensuring 100 percent tie-off.
  - g. Lanyards must be attached to the lifting device platform, not at the basket.
  - h. Workers must not sit, stand, or climb on the guardrail of the basket.
  - i. Personnel must be instructed in safe lifting and hoisting procedures before handling materials or cargo.
  - j. The correct cargo handling tools must be used, and these tools must be regularly checked and maintained.
  - k. The load being lifted must be watched until it is set in place and disconnected from the lifting device.
  - I. Workers must not stand or pass under a suspended load.
  - m. The lift path is to be agreed upon as part of the risk assessment and the area is to be kept clear and where necessary cordon off to prevent load suspension over workers below in simultaneous job operations.
  - n. Workers must not get any part of their bodies between unsecured objects (pinch points).
  - o. Workers must not put their hands or fingers in the possible path of any heavy machinery or load.
  - p. Tag lines should be used to guide heavy, suspended loads.
  - q. Workers must not wear loose clothing or loose jewelry that could entangle whilst performing the rigging/lifting work or when near rotating machinery.
  - r. The correct type of Gloves must be worn when handling and using a tag line preferably leather.
  - s. Tag lines must not be wrapped around the workers hands or body while guiding the load.
  - t. Tag line handlers should not get under the load at any time while guiding the load.
  - u. Non-certified, fabricated or modified lifting and rigging equipment shall never be used.
  - v. Signal personnel should wear the appropriate reflective gear that will differentiate them from the rest of the work crew where lifting is taking place. (The type and color of these clothing could differ from site to site but once agreed the qualified signal man is to be clearly identified by means of the appropriate reflective gear).

- 2. Obtain the required level of review from HES and SME of the Lift Plan as according to lift consequence prior to the lifting operation.
- 3. Slings
  - a. Slings to be tagged by the manufacturer indicating the type of rope used in the sling and rating.
  - b. General slings are manufactured from wire rope, steel chain, natural fiber rope, or synthetic fiber rope.
  - c. Selecting the proper size sling, length, and hitching arrangement will achieve the desired orientation of the suspended load, will result in a stable lift, and will provide the required factor of safety.
  - d. Always inspect slings for damage prior to use. Slings used must have certification load tags/labels attached or they cannot be used. Slings and rigging components must be inspected each year by a Qualified Rigging Inspector, typically a 3<sup>rd</sup> party contractor. Do NOT use any slings that appear to be damaged.

### **APPENDIX C: Terms and Definitions**

Term	Definition	
Banksman	Title or role used to describe a person who directs crane operations.	
Blind Lift	A lift where, at any point during the lift, the appliance operator cannot directly see the load.	
Cargo Carrying Units (CCU)	Containers that are approved for lifting operations. Examples include 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, toolbox and similar.	
Centre of Gravity	The point on an object around which its weight is evenly distributed.	
Certified	Signifies that the equipment has valid certification.	
Certification	Written confirmation that an item of lifting equipment is compliant with / meets a required standard or process.	
Color Code	A method of marking equipment (tagged or painted), to give a visual indication of its certification status. This color should be changed at each thorough examination. Paint should not cover any structural welds or load bearing locations that will be subject to visual inspection.	
Competent	Description of individual who has sufficient training and experience or by defined assessment is capable of carrying out a task safely.	
Competent Person	Authorized individual, who has sufficient training and experience or by defined assessment is capable of carrying out a task safely.	
Generic Lift Plan	Used for Category 1 lifts and may be appropriate for multiple occurrences of similar routine lifts within specified limits but must be formally reviewed and re-issued periodically.	
Ground Bearing Capacity	The ground's ability to withstand an applied force.	
Hands Free Lifting	Method of keeping personnel away from lifting hazards while the load is lifted and being landed.	
Hazard Analysis	Identifies actual and potential hazards, establishes measures to eliminate or mitigate those hazards and verifies they are in place prior to performing work as well as monitoring their effectiveness during the work.	
Inspection	Visual and functionality check by the user.	
Lifting Accessory	Item of lifting equipment that is used or designed to be used directly or indirectly to connect a load to a lifting appliance and which does not form part of the load may also be called rigging.	
Lifting Appliance (machinery)	Work equipment that is used or designed to be used for lifting or lowering a load and includes any attachments used for anchoring, fixing, or supporting it.	
Lifting Equipment	Collective term for lifting appliances and lifting accessories. Lifting equipment comprises lifting appliances (equipment performing the lifting), lifting accessories (devices that connect the load to the lifting appliance) and lifted items (load).	

Term	Definition	
Lifting Equipment Contractor	A contractor who has been appointed to provide lifting operations and / or equipment and to carry out thorough examinations of designated lifting equipment as directed.	
Lifting Equipment Register	Record / list, which identifies the type, description, and location of all lifting equipment (e.g., platform's fixed equipment registers).	
Lifting Operation	Workplace, risk-based operation concerned with the lifting, lowering or suspension of a load.	
Lifting Plan	Written safe system / control of work document, which includes for example, step by step instructions, a list of lifting equipment to be used, along with identify control measure to manage the risks identified in the risk assessment. See Products TCC for lift plan requirements.	
Live Plant/ Sensitive Process Equipment	Equipment, protected or unprotected, having any single or combination of the following characteristics: plant containing hazardous, pressurized, energized, or strategic "fluid". It also includes primary power generation units and their exhaust systems.	
Load	Any material, person or animal, or any combination of these, that are lifted or lowered by lifting equipment.	
Load Chart	Diagram or table showing the rated capacity relative to the radius, environmental conditions, out of plane influences and type of operation.	
Load Integrity	Ability of the load to safely withstand the forces applied during lifting and lowering.	
Mechanical Lifting Operation	Activity that uses lifting equipment to lift or lower a load. If the lifting equipment parted the load would move.	
Management of Change	Documented process designed to ensure that change is managed safely and efficiently.	
Pre- and Post-Use Inspection	Visual checks and if necessary, function checks of lifting equipment by a trained / competent person (normally equipment user). Checklists may be used to aid this inspection and reference should be made to information such as manufacturer's instructions and relevant standards.	
Proof Load Test	Load applied, by a Lifting Equipment Examiner (Independent Competent Person), to an item of lifting equipment to verify its integrity and functionality.	
Red Zone	Sometimes also known as Exclusion Zones, Cone of Exposure, or No-Go Zones. Areas where access is controlled, and no one can enter unless authorized to do so. They should be clearly marked, ideally with physical barriers, so that a person cannot accidently enter one.	
Rescue Plan	Written document that describes the process of retrieving personnel safely in the event of an accident or incident.	
Safe Working Load (SWL) Working Load Limit (WLL)	Terms used to describe the maximum capacity that an item of lifting equipment is designed to raise, lower, or suspend under particular service conditions.	
Thorough Inspection	Recorded visual and functionality assessment of lifting equipment, carried out by a Lifting Equipment Examiner (Independent Competent Person), which may be	

Term	Definition
	supplemented with nondestructive testing and proof load testing, for the purpose of determining its condition / suitability for continued use for defined period of time.
Toolbox Talk	Recorded discussion between all members of a lift team prior to the commencement of work, in order to agree on all aspects of the work, the risk controls and the sequential steps to be taken to complete the work safely.
Utilization	Percentage of the maximum SWL / WLL being used.
Working Load Limit (WLL) and Safe Working Load (SWL)	Interchangeable terms used to describe the maximum capacity that an item of lifting equipment is designed to raise, lower or suspend under particular service conditions.

#### **APPENDIX D: References**

#### **Chevron References**

Chevron Control of Work OE Process Chevron Hazard Analysis OE Standard Chevron Work Authorization OE Standard Chevron Electrical Standard Chevron Training and Competency OE Standard Chevron Engineering Standards (CIV0800 Cranes, Rigging, and Lifting)

#### International Association of Oil & Gas Producers (IOGP)

IOGP Report No. 376:	Lifting and hoisting recommended practice (August 2022)
IOGP Report No. 411:	Recommended Practices for Diving Operations (January 2021)
IOGP Report No. 459	Life-Saving Rules

#### **Occupational Safety & Health Administration (OSHA)**

General Industry (29 CFR 1910)	1910.179 Overhead and gantry cranes 1910.180, Crawler locomotive and truck cranes 1910.181, Derricks
Marine Terminals (29 CFR 1917)	1917.71, Terminals handling intermodal containers or roll-on roll-off operations
Construction Industry (29 CFR 1926)	1926.552, Material hoists, personnel hoists, and elevators 1926.553, Base-mounted drum hoists 1926.554, Overhead hoists 1926.1408 Power line safety (up to 350 kV)—equipment operations. 1926.1409 Power line safety (over 350 kV). 1926.1410 Power line safety (all voltages)—equipment operations closer than the Table A zone.
Mineral Resources (30 CFR Chapter II- Bureau of Safety and Environmental Enforcement, Department of the Interior)	30 CFR 250.108, What requirements must I follow for cranes and other material-handling equipment?