

Cranes Operations Practice

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1.0 Purpose

The Cenovus Crane Operations Practice describes the processes Cenovus Supervisors are to implement to effectively monitor and manage crane operations on Cenovus worksites. This document provides guidance for Cenovus Supervisors to assist in ensuring crane operations are properly planned and only safe equipment is used by competent workers on Cenovus worksites.

This practice supplements OHS legislations and is designed to establish Cenovus’s minimum requirements and expectations for the safe operation, inspection and maintenance of cranes, rigging equipment and materials.

2.0 Scope

This practice applies to all Cenovus operations and worksites and governs work completed by Cenovus staff, contractors and service providers.

The terms **crane** and **crane equipment**, as used in this practice, shall mean all fixed overhead cranes and mobile cranes (including boom trucks) and their associated equipment used in support of Cenovus work to lift, move or lower loads, as defined within the Alberta OHS Code or the Saskatchewan OHS Regulations.

In the Alberta OHS Code:

- “crane” means equipment that is designed to lift loads, lower loads, and move loads horizontally when they are lifted
- “mobile crane” means a crane, other than a boom truck, that
 - incorporates a power driven drum and cable or rope to lift, lower or move loads
 - is equipped with a lattice or telescoping boom capable of moving in the vertical plane
 - is mounted on a base or chassis, either crawler or wheel mounted, to provide mobility
- “boom truck” means a truck that is equipped with a hydraulically driven structure or device that
 - a) is mounted on a turret that is secured to a truck
 - b) is supported to provide stability, and
 - c) is equipped with a boom that
 - i. is telescoping or articulating, and
 - ii. can swing or hoist or raise and lower its load

In the Saskatchewan OHS Regulation:

- “crane” means equipment that is designed to lift, lower and move loads horizontally and that consists of a rotating superstructure, operating machinery and a boom
- “mobile crane” means a crane mounted on a truck, wheel or crawler base that can move freely under the crane’s own power without being restricted to a predetermined path

Site-specific procedures may be developed using this practice as a guide to the minimum acceptable level of performance of crane activities.

3.0 Process Requirements

3.1 Lift Hazard Assessment

The Lift Coordinator is responsible to confirm that all lift types have a completed Crane/Hoisting Hazard Assessment Form. The hazard assessment must be used in the lift planning process. There may be additional safety considerations not listed on the Crane/Hoisting Hazard Assessment Form that may need to be addressed based on the lift

3.2 Crane Moves

The Cenovus representative responsible for supervising the crane movement and the Lift Coordinator must complete the Crane/Hoisting Hazard Assessment and the Crane Movement Checklist prior to the movement of the crane.

The Crane Movement Checklist must be completed and signed by the participants prior to moving a crane from one work location to another. The Cenovus representative or Lift Coordinator, in consultation with the Crane Operator, will determine under what conditions the Crane Movement Checklist does not have to be completed for a specific short distance move within a working location using the risk assessment process.

3.3 Daily Crane Operation Worksheet

The Lift Coordinator is responsible to confirm that the Crane Operator enters the particulars for each lift that used a lift (load) calculation onto a Daily Crane Operations Worksheet. The completion of this Cenovus document is in addition to any similar lift log sheet or register required by the Crane Equipment Owner. A Daily Crane Operation Worksheet must be maintained for, and kept in each crane used under this practice.

3.4 Cold Weather Operation

The Lift Coordinator must take into additional consideration the operation of cranes in cold weather, for the following reasons:

- Steel is susceptible to embrittlement (brittle fracture) in cold temperatures.
- Hydraulic fluids not designed to be used in very cold temperatures become more viscous (thicken) and cause slowed/decreased hydraulic response, increased hydraulic system pressure and hydraulic system component failures.

Temperature ranges and limitations will depend on the type of crane equipment being used and the crane manufacturer's specifications with regard to the temperatures at which the crane equipment is designed to operate. Fundamental considerations for lifting in cold temperatures are slow and smooth operations, conducted only when necessary, and as infrequently as possible.

The Lift Coordinator must maintain a close liaison with the Crane Equipment Owner and the Crane Operator to become familiar with, and account for, individual crane equipment manufacturer's instructions and guidelines, which shall be followed for all lifts in cold weather.

3.5 Lift Plans and Associated Assessments

The Lift Coordinator is responsible for developing the lift plan and ensuring that where a lift requires a lift calculation it is completed by a competent person. They must also

ensure engineered lift studies are completed by a licensed Professional Engineer approved to operate within the applicable jurisdiction.

There are many variations of a lift plan and Cenovus has established guidance on what a lift plan should include for each type of lift classification.

3.6 Critical Lift Authorization

A Critical Lift has been defined by Cenovus as a Non-Standard Lift that incorporates unusual issues requiring special handling, risk mitigation, engineering and approval. A more complete definition is provided within the Lift Classification and Planning Requirements table (Appendix A).

The Lift Coordinator is responsible for identifying the conditions that require a Non-Standard Lift to be considered a Critical Lift. Critical Lifts require an additional level of authorization, namely from the Area Owner/Cenovus Representative reviewing and signing a Critical Lift Authorization Form. The Lift Coordinator is responsible to coordinate the completion of the form with the applicable participants and obtain the necessary confirmatory signatures prior to presenting the document to the Area Owner (a person other than the Lift Coordinator, who cannot fulfill both roles in this circumstance). The Area Owner may require that the document signatories be present in order to respond to any questions the Area Owner may have.

3.7 Hoisting of Personnel

The conduct of Cenovus activities frequently requires personnel to be raised above ground level by crane to accomplish their tasks. Personnel hoisting is a special category of crane operations and requires additional precautions.

These precautions relate to the capabilities and arrangements of the lifting equipment, the procedures used in the lift, and the training and personal protective equipment used by the personnel during their hoisting. The hoisting of personnel requires the completion of the Hoisting of Personnel Authorization Form.

The Lift Coordinator is to apply the Cenovus requirements for the safe attachment of a personnel basket to a crane lift assembly. Whereas the regulatory requirements differ between Alberta and Saskatchewan (the two regulatory jurisdictions in which Cenovus primarily operates), Cenovus has established a performance requirement more stringent than either authority:

- A separate support, referred to as a lifeline, capable of withstanding the entire weight of the personnel basket, materials, equipment and workers with a load factor of 10:1, is to be attached between the suspended personnel basket and the hoist line, above the hook assembly.
- Each worker within the suspended personnel basket is to wear a separate personal fall arrest system attached to a suitable point on the personnel basket.

The Lift Coordinator is responsible to confirm the following requirements are applied to personnel hoisting in Cenovus workplaces:

- Personnel baskets shall only be used when other access methods create a greater hazard, or other methods are impractical due to structural design or site conditions. Alternate access methods shall be considered before using a personnel basket.

- Personnel baskets must be acquired from a commercial manufacturer of personnel baskets, or otherwise must be engineered, manufactured and approved by a Professional Engineer registered in the applicable provincial jurisdiction. The personnel basket must be engineered in accordance with the requirements of CSA Z-150 (current version).
- The personnel basket shall be marked with its maximum total rated capacity and shall be fitted with a nameplate clearly displaying the basket identification number and the date of its last annual inspection.
- The number of personnel in the basket must not exceed the rated capacity and must only include those workers required for the work.
- The crane hoist used for personnel hoisting must be equipped with an Anti-Two Block device, and the crane hook must have a positive type hook latch.
- Friction cranes must be equipped with power down capabilities. No free falling of workers in a basket is allowed at any time.
- The crane operator must have visual or voice contact with workers in the basket at all times.
- A trial lift must be performed as per CSA Z-150 (current version).
- A tag line must be used where practical on a personnel basket.
- Crane travel with workers in basket is strictly forbidden.
- A personnel basket inspection is to be performed prior to each use.
- The basket must be inspected and certified annually by a Registered Professional Engineer from within the jurisdiction having authority.

3.8 Rigging

The Lift Coordinator shall confirm the rigging practices and procedures used by Riggers supporting Cenovus operations comply with the applicable contractor's Rigging and Hoisting Policy Requirements. Contractors' rigging and hoisting policies shall be made available on ISNetworld for review and shall be readily available at the Cenovus worksite.

To support this requirement, the Lift Coordinator will review the contractor's policy and documentation prior to the contractor being authorized to perform lifts for Cenovus. The Lift Coordinator should confirm the following Cenovus requirements are followed.

3.8.1 Legislation, Codes and Standards

OHS legislation governing cranes, cranes equipment hoists, and rigging must always be consulted when planning for lifting operations and training personnel. Compliance all provincial OHS legislative requirements is expected when conducting lifting operations.

All worksite specific or contractors crane, hoisting and rigging procedures must comply with the Alberta OHS Act, Regulations and Code, the Saskatchewan OH&S Regulations and ASME standards or other related standards as required. Alberta OHS Code Part 21 – Rigging requires compliance with the following as minimum requirements:

- ASME B 30.5, Mobile and Locomotive Cranes
- ASME B 30.9, Slings
- ASME B 30.10, Hooks
- ASME B 30.20, Below The Hook Lifting Devices
- ASME B 30.21, Manual Lever Operated Hoists
- ASME B 30.26, Rigging Hardware

3.8.2 Manufacturer Operating Instructions

In addition to codes and standards, personnel operating cranes, crane equipment or installing rigging are accountable to abide by all specifications and instructions required by the manufacturer of the equipment.

Manufacturer operating instructions or manuals must be made available to workers operating cranes, crane equipment or installing rigging.

All cranes including overhead hoists must have the manufactures user manual with the equipment at all times.

3.8.3 Inspection and Testing of Rigging Components

Riggers must confirm all rigging components have the necessary certificates and are inspected as required by the manufacturer.

The Lift Coordinator must verify that inspection of rigging components is planned and executed and that only certified rigging components are used.

3.8.4 Competency and Authorization of Personnel

Service Providers or Contactors shall independently address how they will verify personnel are competent to perform job requirements related to crane operations and rigging. Service Providers or Contactors must confirm that only competent personnel are authorized to perform rigging and lifting activities.

Cenovus personnel shall have industry recognized training (in accordance to manufacturer’s recommendations) on lifting equipment and rigging. This training must be approved by a Cenovus Functional Leader who is competent in the area of cranes and rigging.

3.8.5 Rigging Practices

The Lift Coordinator must confirm that the contractor’s rigging policy includes the following specific rigging requirements applied to the contractor’s equipment. Any Cenovus-supplied equipment must meet the same requirements.

For the purposes of this practice, rigging includes but is not limited to wire rope slings, nylon slings, chain falls, shackles, hooks, spreader bars and other load bearing hoisting attachments. Requirements to be implemented include the following:

- Slings must be designed, maintained and used in accordance with ASME B30.9.

- Used slings brought onto a Cenovus site must be inspected, proof load test certified if required and tagged before use.
- Tags should contain information on the size, length and the capacity for different configurations.
- Rigging must be inspected prior to use, and defective rigging taken out of service and either destroyed or sent to a certified body for repairs.
- Spreader bars or other hoisting attachments must be engineered and documentation available to support the load capacities of the equipment.
- Latest inspections on lifting attachments must be clearly legible or the equipment taken out of service and recertified.
- Softeners are to be used when rigging is subjected to sharp corners or edges.
- Shackles are to be inspected before use and removed if deficiencies are found.

3.8.6 Hooks/Sorting Hooks

- All hooks, with the exception of sorting hooks, shall have functioning safety latches.
- Open sorting hooks shall only be used to offload/load pipe at ground level.
- Risk Assessment must be performed to establish the hazards and the methods to protect against those hazards involved in the use of open hooks.
- Hooks and other lifting attachments on the buckets of loaders and backhoes are prohibited from use.

3.8.7 Plate/Beam Clamps

- Plate and beam clamps shall be used for hoisting only where they cannot be replaced with another acceptable rigging component.
- Beam clamps must be locking or designed so that slackening of the hoist cable does not release the clamp.
- Manufacturers' specifications on capacity, size and method of inspection must be available on site prior to using the equipment.
- Prior to the use of a plate or beam clamp, such use must be approved by the Lift Coordinator.

3.9 Load Indicator Systems

Crane load indicator systems or load moment indicators (LMI) are designed to provide the crane operator with important information about the load and lift parameters. These devices alert operators when a lift is exceeding the safe operating range of the crane.

Load indicator systems are safeguards that must NOT be bypassed, disabled, overridden, tampered with. If the crane manufacturer permits a load indicator to be bypassed or overridden then the following requirements must be met:

- a formal risk assessment and mitigation plan is developed
- a professional engineer is consulted
- authorization is granted by a competent person in charge of the work

3.10 Operation of Cenovus-Owned Cranes & Hoists

Cenovus conducts most of its crane lifting activities with contractor equipment and personnel. Cenovus facilities are equipped with, and Cenovus personnel operate, a number of Cenovus’s own cranes (overhead cranes, gantry cranes, etc.).

The requirements identified in the foregoing sections apply to Cenovus crane equipment and Cenovus personnel (Crane Operators, Riggers, Signal Persons, as applicable), and are to be verified by the Lift Coordinator just as if a contractor’s equipment and personnel were conducting the work. Access to the Cenovus equipment’s operational history, maintenance records, and the Cenovus employees’ training records should assist the Lift Coordinator in his/her responsibilities.

3.11 Documentation Requirements

All forms required to comply with this practice will be completed, recorded and retained by the functional team accountable for the work.

Form Number	Form Name
CEN790	Crane/Hoisting Hazard Assessment Form
CEN791	Crane Movement Checklist
CEN792	Lift Evaluation Form
CEN793	Critical Lift Authorization Form
CEN794	Hoisting of Personnel Authorization Form
CEN795	Daily Crane Operation Worksheet Form

4.0 Roles and Responsibilities

The following responsibilities apply to this practice:

Table 1: Roles and Responsibilities

Role	Description
Crane Equipment Owner	<p>The Crane Equipment Owner is the organization or individual responsible for the crane equipment and the crane operator. Crane Equipment Owners are responsible for the following:</p> <ul style="list-style-type: none"> • Assigning appropriate equipment and personnel to do the job • Supplying crane equipment in a safe, operable condition and in compliance with manufacturers’ operating and maintenance requirements and applicable regulations • Ensuring their Crane Operators participate in a crane operations specific orientation for each new work location, including such activities as site permit practices, sign in systems, PPE, lock outs

Role	Description
	<p>and voice/hand signals</p> <ul style="list-style-type: none"> • Empowering the Crane Operator to refuse to make a lift for safety reasons without fear of reprisal • Providing Crane Operators who fully understand how to use load charts • Ensuring the Crane Operator is well trained, experienced and competent to operate the crane being used • Ensuring the applicable regulations for Alberta (OHS Code, Parts 6 and 14), or Saskatchewan (OHS Regulations Parts XIII and XIV) are met or exceeded • Ensuring a crane maintenance and inspection program is implemented and maintained, including the creation and retention of records of all inspections and all work conducted on the crane equipment • Providing ongoing training for all Crane Operators and confirm that a consistent competence level exists among crane operators supplied to Cenovus • Ensuring the site supervision provided by the Crane Owner is aware of the responsibilities and what work is required to prepare site for crane set up and to execute the lifts in a safe manner • Providing a support system to the operator for consultation regarding safety issues prior to and during the lift • Providing adequate direction and support to the crane operator to confirm the crane equipment shall not be used on soft or uneven surfaces, or on slopes in circumstances in which the stability is likely to be affected unless adequate precautions are taken to maintain stability • Confirm a ground history review has taken place with the permit issuer or client representative prior to positioning the crane
Crane Operator	<p>The crane operator is responsible for the following:</p> <ul style="list-style-type: none"> • Being competent and certified to operate the specific make and model of crane/lifting equipment to be used • If there are reasons that the lift might be dangerous or unsafe, reporting those reasons to the Area Owner or Lift Coordinator and refuse the lift until the hazards have been rectified and safe conditions are established. • Being totally familiar with the crane’s operating manual and load charts. The operator must understand the correct meaning of all notes and can calculate the crane’s net capacity under all possible conditions. • Ensuring the crane is inspected and maintained as prescribed by both the Equipment Owner and the manufacturer • Informing the Crane Equipment Owner of any maintenance the machine requires. This shall be done in writing in both the log book and inspection reports. • Checking that the site is adequately prepared for the crane • Reviewing the planned lift with the site supervision/crew, performing the appropriate final checks before the lift proceeds,

Role	Description
	<p>and participating in the completion of the Crane/ Hoisting Hazard Assessment</p> <ul style="list-style-type: none"> • Maintaining the Cenovus Daily Crane Operation Worksheet documenting each lift before it is made • Maintaining visual and/or verbal communications with the Signal Person at all times. All operations are to cease when communication is lost. • Remaining in the crane at all times when a load is in the air • Ensuring that safety devices such as the Load Moment Indicator (LMI) are not overridden during lifting operations without case specific approval from a Cenovus representative, crane operations specialists and/or professional engineer, knowledgeable in the lift situation under consideration • Ensuring the lift zone has been adequately flagged or barricaded to restrict entry for personnel not involved in the lift • Lowering the load, shutting down and securing the crane when the equipment is not being used or attended by a competent or qualified person
<p>Area Owner/Cenovus Representative</p>	<p>The Area Owner is generally the most senior site-based Cenovus representative with execution responsibilities for the scope of work associated with the crane lift. The Area Owner has overall responsibility for the safety of the ongoing activity, including the crane lift, and must verify the Crane Equipment Owner or Crane Operator properly executes the operational phases of the lift as planned, according to this practice. The Area Owner is responsible for the following:</p> <ul style="list-style-type: none"> • Developing a risk assessment (as required) including an emergency action plan for crane work and communicating the information to the Lift Coordinator • Confirming the lift classification has been determined for all crane activities and the proper controls are in place prior to the crane starting work • Ensuring applicable encroachment permits in place. • Ensuring access roads are prepared, including a suspended warning line below any overhead power lines • Provide a well-prepared working area for the crane before it arrives on site, including operating locations being graded, levelled and compacted as appropriate for the lift. • Confirming that adequate space is available to safely erect and dismantle cranes • Confirming the Crane Equipment Owner or Crane Operator has arranged for blocking or matting for use under outriggers at all times when the ground conditions dictate, such as unconsolidated soil; muskeg or wet ground; nearby surface or subsurface water courses; nearby excavations, subsurface pipelines, vaults or structures that could collapse under load; etc. • Confirming the party identified as responsible within the contract/purchase order has positioned ropes, red ribbon with tags or barricades to restrict access into the working radius of the

Role	Description
	<p>crane for those persons not authorized to be there</p> <ul style="list-style-type: none"> • Determining, in advance of the arrival of the crane, the correct load weight and maximum permissible movement radius and informing the Crane Equipment Owner, as these restrictions may impact the choice of the lifting equipment • Ensuring the rigging crew is supervised by a competent supervisor, to meet or exceed the requirements as stipulated by the authority having jurisdiction. • Ensuring that the Crane Equipment Owner is complying with the applicable rigging and supervision requirements. • Ensuring the designated Signal Persons are competent and knowledgeable of the international hand signals. • Clearly identifying the Signal Persons to the Crane Operator. • Ensuring that the employer has designated signallers in compliance with the requirements of the authority having jurisdiction. • Ensuring Signal Persons understand that signaling should be continuous and there will be no response to unclear signals • Ensuring all involved personnel in the operation understand their jobs and responsibilities • Confirming all lifts have been assessed and planned as per this Cenovus practice
Lift Coordinator	<p>The Lift Coordinator is the person designated by the Area Owner as responsible for the overall safe execution of the lift by the crane equipment. Lift Coordinators are generally Cenovus employees, but may be competent contractors as appointed by Cenovus for supervising the crane operation. The Lift Coordinator is responsible for the following:</p> <ul style="list-style-type: none"> • Assessing lift specifics to determine what class of lift applies • Participating in the development of the lift plan for all Standard, Non-Standard and Critical Lifts • Confirming lift plans have been reviewed by the appropriate personnel • Ensuring the hoisting controls applied for the lift classification are followed explicitly and that any required changes to the controls are reviewed with the appropriate personnel (e.g. Crane Operator, Lift Engineer) prior to implementing the change • Ensuring if the lift cannot be carried out as per the plan, then the lift must be stopped until a formal review has been conducted and all parties understand the revised plan • Confirming the ground beneath the crane/hoisting equipment can support the loads imposed by the crane equipment • Ensuring the Area Owner/Cenovus Representative has provided adequate space to safely assemble, erect and operate the crane equipment • Where the responsibility has been assumed by Cenovus, ensuring required materials such as timber mats, cribbing and blocks are provided.

Role	Description
	<ul style="list-style-type: none"> • Confirming the appropriate level of training and/or certification required by the authority having jurisdiction is valid and current for each person conducting a function that requires such training or certification • Ensuring the Crane Operator is aware of known hazards, or requirements from the Area Owner, e.g. maximum swing radius; shoring locations; ground elevations; slopes; trenches; cellars; excavations; embankments; underground cavities; buried pipes; overhead high voltage lines; telephone and process lines/pipes; obstructing structures; and all other pertinent site features • Ensuring the requirements of the Cenovus Overhead Power Line Encroachment Practice are implemented where overhead power lines may be present, • Ensuring the load weight, center of gravity and the maximum radius required is communicated to the Crane Equipment Owner and Crane Operator • Organizing pre-lift meetings and determining required attendance (e.g. permit receiver, ground crew, riggers, trades and Crane Operator) • Where Cenovus is responsible for providing Riggers and/or Signal Persons, assigning only competent Riggers and Signal Persons to work with the crane equipment, pursuant to the requirements of the authority having jurisdiction. • Where the Crane Equipment Owner is responsible for designating Signal Persons, ensuring those same regulatory requirements are followed. • Working with the Area Owner to develop an appropriate emergency action plan and communicate it to all personnel involved in the lift • Assessing weather conditions at time of lift to determine if the lift can proceed safely (including any regulatory or manufacturer restrictions regarding environmental limits), and authorizing the lift to proceed
Rigger	<ul style="list-style-type: none"> • Rig loads and equipment to the manufacturer’s recommendations • Be capable of identifying different rigging components and to be knowledgeable in their proper application • Identify the appropriate rigging components for the load to be lifted • Visually inspect rigging components on a regular basis and prior to each lift to ensure compliance with appropriate safety standards and codes as well as manufacturer specifications and procedures • Know and understand the load parameters (e.g. weight, height, balance, contents, etc.) • Know and understand rigging hardware charts and data • Participate in hazard assessment prior to conducting the lift • Participate in the lift plan development • Knowledgeable and capable of using the hand signal chart for

Role	Description
	hoisting and moving loads. <ul style="list-style-type: none"> • Aware of overhead hazards and obstructions. Be aware that the swing path must be kept • clear of vehicular and pedestrian traffic • Aware that the load should never be brought over the top of people • Communicate with the crane operator throughout all stages of the rigging and lifting process

5.0 Training and Competency

Competency describes the knowledge and skills required to successfully perform the technical aspects of a job. A worker must be able to demonstrate competency in safely performing work tasks or using equipment.

5.1 Training

It is expected that all personnel involved in this process will have training and the appropriate competency to perform their roles.

While the onus of providing and managing the appropriate training for Crane Operators, Riggers and Signal Persons ultimately rests with the employer providing those personnel (i.e. usually the Crane Equipment Owner), Cenovus will verify that the personnel assigned by contractors, or even Cenovus personnel assigned by the Area Owner, are appropriately trained, currently qualified and competent to undertake critical portions of the rigging and hoisting work.

Within Cenovus, this focus is initially applied through a supply chain management evaluation and contractor safety information. However, even the best of these evaluations cannot detect all of the gaps in contractor performance. The final checkpoint for training verification is the Lift Coordinator.

It is the responsibility of the Lift Coordinator to confirm that the personnel assigned to participate in the lifting operation are appropriately trained and maintain a current certification where applicable:

- Proof of training qualifications shall be in the worker’s possession at all times when on the work site and presented for review by a Cenovus representative upon request.
- Training for overhead crane operators and supervisors shall be in accordance with industry recognized best practices, as summarized in the Work Safe Alberta Health & Safety Bulletin IS009, Cranes & Hoists (See [Section 8.1.](#)).

5.2 Competency Verification

Competency will be validated through formal, theory-based evaluations and practical skill demonstration. All theory-based training requires a written knowledge check (e.g. test, quiz, exam) that will be reviewed and assessed by a competent instructor. Practical skill assessments of task completion and equipment use must be conducted by a competent supervisor or mentor.

Workers may be required to attend additional training sessions or complete further on-the-job training if performance deficiencies are identified through formal assessments.

All written evaluations and practical skill assessments must be documented and retained in the worker's personnel file. Records may be maintained in hard copy or electronically.

6.0 Quality Assurance

6.1 Performance Measurement

Compliance with this practice and program effectiveness shall be assessed through program assessments and internal audits, or other measurement criteria as specified in the COMS Assurance Standard. Measurement can also be accomplished through the tracking of appropriate Key Performance Indicators (KPI).

Functional teams impacted by this practice must include compliance and program effectiveness verifications in their H&S assurance program. Performance will be monitored and reported within the responsible departments at least every three years.

Central Health and Safety Services will review Cenovus-wide program KPIs at a minimum every three years in conjunction with program review and update activities.

6.2 Management of Change

Proposed changes to this practice can be directed to H&S Programs and Projects.

6.3 Practice Verification

The document owner will complete and document reviews of this practice, as follows:

- at minimum once every three years
- if there is a significant regulation or industry best practice change that indicates the need for review
- if an incident investigation indicates the causes were related to unclear or inadequate written instructions described within this practice

If frequent and multiple variances are required due to operational needs, the reason(s) will be investigated and the document owner will determine if there is a business need to update the practice.

If submitted MOC requests indicate gaps or significant improvement opportunities, the document owner will determine if there is a business need to update the practice.

7.0 Glossary

Definitions and acronyms for safety documents are described in CEN-EHS243, Definitions and Acronyms. The following definitions and acronyms are specific to this document:

Table 2: Terms and Definitions

Term	Definition
Area Owner/Cenovus Representative	The individual responsible for the work/area where the crane operation is being carried out and is requiring the crane equipment to be used.
Crane Equipment Owner	The organization or individual responsible for the provision and maintenance of the crane, and the safe use of the equipment by a competent crane operator.
Designated Crane Operator	A person designated by the employer who is trained in the operation of that lifting device. Jurisdictions may require additional information, including on-site written proof of training, and additional qualifications such as “competent operator” or “qualified operator” depending upon lifting equipment type, and load weight.
Hours of Darkness	Is the period from 30 minutes after sunset to 30 minutes before sunrise or any time when, because of insufficient light or unfavourable atmospheric conditions, persons or vehicles cannot be seen from 150 metres.
Lift Calculation	<p>A lift calculation ensures relevant and applicable factors for lifting a load have been considered and calculated. These factors include the following:</p> <p>load information (total weight of item to be lifted, weight of load block, weight of rigging/attachments, load centre of gravity, if applicable)</p> <p>crane information:</p> <ul style="list-style-type: none"> ▪ mobile cranes, i.e. maximum radius, boom length/angle, configuration, relevant deductions, etc. ▪ overhead cranes, i.e. capacity <p>calculated percentage of crane capacity</p> <p>sketch, i.e. crane placement, clearance to surrounding facilities like buildings and power lines</p>
Lift Coordinator	The person designated by the Area Owner to exercise authority and conduct oversight of the safe execution of the crane operations for Standard and Non-Standard lifts. This roles can be fulfilled by an employee of contractor. The Lift Coordinator has ultimate responsibility at the site for the safe execution of the lift.
Engineered Lift Study	Established by Cenovus as a document stamped by a Professional Engineer of the Province of Alberta or Saskatchewan, required to perform a Non-Standard Lift over 75% of the lift capacity of the current lifting arrangement.
Lift Engineer	A person who is a Professional Engineer, as defined by the OHS Regulation or Code of the authority having jurisdiction, appropriately trained in the preparation and development of lift calculations.
Lift Plan	A lift plan describes how to lift and hoist safely. The plan demonstrates that the work crew executing the lift have:

Term	Definition
	<ul style="list-style-type: none"> • Effectively identified, assessed and controlled the hazards of the load handling activity • Selected the appropriate life classification and fulfilled the life planning requirements • Verified worker training • Received appropriate approval to execute work based on the lift classification • Planned for and prepared an emergency response plan <p>Further guidance can be found in the Cenovus Crane Operations Practice: Appendix A - Lift Classification and Planning Requirements.</p>
Major Assembly	The set-up of conventional crawlers or truck-mount lattice boom cranes, including all types of jib assemblies and the set-up of any jib assembly on hydraulic telescoping boom cranes, with the exception of the standard optional foldaway jib.
Rigger	A competent worker designated as rigger by the Area Owner or Lift Coordinator. The degree of competency and responsibilities for the rigger must match the requirements of the lift to be performed.
Rigging	Includes, but not limited to wire rope, chain, polyester, Kevlar and Nylon slings; shackles; hooks; spreader bars; and other load bearing hoisting attachments.
Signal Person (Signaller)	Required where the crane operator does not have a clear and unobstructed view of the pick-up point, the load and the setting point throughout the lift. A Signal Person must be trained in, competent with, and use international hand signals for crane lifts (pursuant to the current version of CSA167-08 Annex C or ASME B 30.2). This person must also have a basic understanding of crane operations, limitations and load rigging.

Table 3: Acronyms, Initialisms and Abbreviations

Term	In Full
ASME	American Society of Mechanical Engineers
CMT	Construction Management Team
LMI	Load Moment Indicator

8.0 References

8.1 External Documents

The following external documents support this practice:

Table 4: External Document References

Document Type or Number	Document Title
OHS Regulation	Alberta Occupational Health & Safety Code [Parts 6, 12 (Signallers), 21]
OHS Regulation	Saskatchewan Occupational Health & Safety Regulations [Parts IX (Signallers), XIII, XIV]
Standard	ASME B 30.5, Mobile and Locomotive Cranes
Standard	ASME B 30.9, Slings
Standard	ASME B 30.10, Hooks
Standard	ASME B 30.20, Below the hook lifting devices
Standard	ASME B 30.21, Manual Lever Operated Hoists
Standard	ASME B 30.26, Rigging Hardware
Standard	CSA Z-150 (Current Version) Mobile Crane Standards

8.2 Internal Documents

The following Cenovus documents support this practice:

Table 5: Internal Document References

Document Type or Number	Document Title
Policy	Corporate Responsibility Policy
LSR	Life-Saving Rule
CEN-EHSReg787	Regulatory Definitions and Acronyms
CEN EHS2837	Cenovus Overhead Power Line Encroachment Practice
CEN-EHS11071	Bypass Management Practice
CEN-EHS114	Safe Work Permit Code of Practice
CEN-EHS019	Hazard Assessment and Control Practice
CEN790	Crane/Hoisting Hazard Assessment Form
CEN791	Crane Movement Checklist
CEN792	Lift Evaluation Form
CEN793	Critical Lift Authorization Form
CEN794	Hoisting of Personnel Authorization Form
CEN795	Daily Crane Operation Worksheet Form

Appendix A: Lift Classification and Planning Requirements

Lift Type	Lifting Plan Requirements
Standard Lift	
<p>1. Any lift between 0% and 75% capacity of chart and are not deemed Non-Standard or Critical.</p> <p>The load handling activity can be accomplished through standard procedures, and can be executed using common methods, materials and equipment.</p>	<p>A. Complete the Crane/Hoisting Hazard Assessment</p> <p>B. Complete the Daily Crane Operation Worksheet (entry to be completed prior to lift)</p> <p>C. Review and follow job safety analysis and/or procedures</p> <p>D. Acquire applicable permits (e.g. Safe Work Permit; Overhead Power Line Encroachment, etc.)</p>
Non-Standard Lift	
<p>1. Any lift over 75% but less than 90% of chart.</p> <p>2. Any lift with a personnel basket.</p> <p>3. Any lift where the load or any part of the crane/hoisting equipment can come within the approach limits of transformers and power lines (10 metres or 30 feet).</p> <p>4. Any crane/hoisting equipment lift where the actual weight and/or the center of gravity of the load are unknown and have to be estimated.</p> <p>5. Any crane/hoisting equipment lift involving two or more cranes/hoisting equipment lifting the load simultaneously where:</p> <ul style="list-style-type: none"> • Total weight is less than 75% capacity of crane/hoisting equipment • Both cranes/hoisting equipment will not swing with the load • Where the main crane/hoisting equipment and tailing crane/hoisting equipment will be below 50% capacity and the second crane/hoisting equipment will only be used for tailing. 	<p>A. Complete the Crane/Hoisting Hazard Assessment</p> <p>B. Complete the Daily Crane Operation Worksheet (entry to be completed prior to lift)</p> <p>C. Review and follow job safety analysis and/or procedures</p> <p>D. Acquire applicable permits (e.g. Safe Work Permit; Overhead Power Line Encroachment, etc.)</p> <p>E. Complete risk assessment</p> <p>F. Complete Lift Calculation Form (to be completed prior to lift)</p> <p>G. Complete Hoisting of Personnel Authorization Form (if applicable)</p>

<p>6. Any crane/hoisting equipment that is working in another cranes/hoisting equipment working radius.</p> <p>7. Pick and carry operations</p> <p>8. A hoisting or lifting operation that has been determined to present an increased level of risk beyond normal lifting activities. For example, increased risk may relate to personnel injury, damage to property, interruption of plant production, delays in schedule, release of hazards to the environment, or other jobsite factors such as:</p> <ul style="list-style-type: none"> • Lifting over production/process facilities/equipment/buildings; occupied buildings or structures • Pulling/extracting tube bundles • Lifts where the crane is setup over any underground installations such as over manholes, catch basins, sewers, sinkholes, new excavations, underground gas lines, firewater lines or other known surface or sub-surface interferences. • Any lift where the movement of the crane/hoisting equipment or load created a danger to workers and where a worker could be caught between a moving part of the crane/hoisting equipment. (e.g. counterweight, outriggers, cab, etc.) <p>The risk assessment will determine if any of the above situations or other identified scenarios should be considered a critical lift. If so the lift such be classified as critical and all requirements followed.</p>	
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Critical Lift	
<ol style="list-style-type: none"> 1. Any crane/hoisting equipment lift involving two or more cranes/hoisting equipment lifting the same load simultaneously where: <ul style="list-style-type: none"> • Total weight of load is greater than 75% of cranes/hoisting equipment capacity • Both cranes/hoisting equipment will swing simultaneously with load 2. Any lift where the total load on the crane/hoisting equipment exceeds 90% of the crane/hoisting equipment capacity 3. Any lift involving special lifting equipment or rigging. Example – Multi-Level rigging, use of more than three (3) spreader bars, cargo nets, magnets or auto hook releases 4. Any lift or load handling activity identified through the risk assessment process that is considered critical. 	<ol style="list-style-type: none"> A. Complete the Crane/Hoisting Hazard Assessment B. Complete the Daily Crane Operation Worksheet (entry to be completed prior to lift) C. Review and follow job safety analysis and/or procedures D. Acquire applicable permits (e.g. Safe Work Permit; Overhead Power Line Encroachment, etc.) E. Complete risk assessment F. Complete Lift Evaluation Form (to be completed prior to lift) G. Complete Hoisting of Personnel Authorization Form (if applicable) H. Complete an Engineered Lift Study and ensure it is issued and reviewed prior to lift. The study must include: <ul style="list-style-type: none"> • Plot Plan View (including Ground Bearing Capacity Assessment) • Elevation Plan View • Rigging Detail View (including Lifting Lug Detail) I. Critical Lift Authorization Form to be completed prior to lift. J. For any lifts over 95% must have the crane/crane equipment manufacturers and/or a professional engineer approval.