## PURPOSE/APPLICATION

To provide guidance for the planning and execution of Critical Hoisting and lifting. Canadian Plains Energy Services (CPES) defines Critical Hoisting as any lift that meets any of the following criteria:

- Load exceeds 75% of equipment load chart for the position of the lift
- More than two mobile cranes used in tandem
- Engineered lift
- Lift over or between energized lines
- Lift of a person using a crane
- Lift is deemed critical by the Owner or Prime Contractor

Provincial Regulations will outline the specific Critical Lift designations. These must be reviewed prior to decision to deem a lift critical, see references section for definitions by Province.

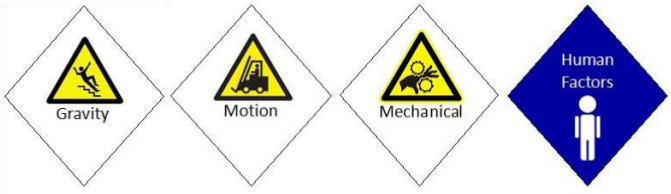
Additionally, there are situations where a Critical Lift Assessment is not required under the regulations but a formal assessment of the lift, and a pre-lift meeting would help mitigate the risks of the lift:

- Two cranes (where required by provincial code i.e. Manitoba)
- Two cranes being used for a lift of a building, piece of equipment or material over 100,000 lbs.
- Special rigging required (i.e. custom equipment or other components not commonly used)
- Operator not able to see load
- Load could potentially endanger existing facilities

**PPE**
- CPES minimum requirements

**TRAINING**
- Certification and on lifting equipment
- Review of CPES or Industry approved hand signals (Energy Safety Canada hand signal guideline)

**HAZARDS & CONCERNS**
- Rigging failures
- Facility damage
- Falling/shifting loads
- Pinch points
- Equipment damage
- Congested work areas
- Gravity
- Traffic
- Electrical (overhead powerlines)




## PRECAUTIONS

Where a lift had been deemed to be Critical according to the CPES (or Owner) criteria identified above, a planning team will work together to plan and document the lift plan and pre-lift meeting, this team should include at a minimum:

- Lift Supervisor
- Crane operator(s)
- Rigger(s)
- Owner/Client representative
- Safety Representative

The lift plan and pre-lift meeting will be documented using CPES's CF-S-42 Lift Plan (or equivalent Owner or Lifting Contractor Form).

**The Lift Plan**

The lift plan must include the following information:

1. An assessment of the load to be lifted, including:
   - Dimensions of the load (length, width, height)
   - The weight of the load (refer to drawings, material weight calculations or equipment scales), once the weight of the rigging has been calculated this must be included as well
   - The details of all involved lifting equipment (capacity, certification date, make and model)
   - The maximum capacity of the lifting device in the position it will perform the lift (if multiple positions will be required, calculate the position where the highest percentage of the equipment's capacity will be reached)
2. Outline the lift area details, this will include:
   - Identification of any additional hazards been identified in the lift area
   - Identification of any restricted areas within the lift area which must be avoided (including if details like crane lifting mats or specialized ground preparation is required)
   - How the lift area will be controlled, if facilities need to be evacuated prior to the lift, how the controlled area will be identified
3. If the lift will encroach on the safe limit of approach of any energized power lines (7 Meters where voltage is unknown), the plan must identify:
   - That the utility has been contacted and all their requirements have been met, this may include:
     - Deactivation of the line where practicable
     - Confirmation of the safe limit of approach depended on the voltage of the line
   - Work authorization from the Owner/Prime Contractor to complete the work
4. Assessment of the rigging to be used for the lift, including:
   - A full inspection on all rigging components
   - Confirmation that the capacity of each piece of rigging is higher than the total weight of the load
   - The total weight of all rigging to be used, including any clevises, spreader bars, or other components
   - Identify any potential wear points on the load and include softeners, clevises, lifting eye bolts etc. when developing your lifting plan
5. Verification of communication methods, if line of sight will be lost at any point how will this be managed. Will radio communication be required, who will have radios, how will commands be relayed
6. Potential impact of weather, what are the highest anticipated winds during the lift, what are the coldest anticipated temperatures, are all lift components rated for these
7. Are there additional special documents required (engineered lift plans, plot plans, elevation drawings, etc.). If so, are they available and have they been reviewed by all individuals involved in the lift?

**The Lift Diagram**

A detailed diagram of the lift must be developed and reviewed at the pre-lift meeting.

This diagram should include:

1. The load to be lifted
2. The positions of all lifting equipment
3. The starting positions of all spotters
4. The positions on taglines (the number of taglines to be used should be identified)

5. The approximate location of all rigging

Lift diagrams can be completed using the final page of CF-S-42.

**Pre Lift-Meeting**

The pre-lift meeting should include a detailed discussion on the plan with everyone involved in the lift. Discussion should include the following twelve points:

1. Does everyone know who oversees this lift?
2. Has the type of lift been identified; do we have all permits and authorizations we need?
3. Is everyone who will be involved in the lift part of this meeting? Has everyone reviewed the HIAC?
4. Have all the equipment and rigging been inspected?
5. Are all safety devices working? Do we have enough taglines to control this load?
6. Does everyone understand their role, does everyone feel competent to do their task?
7. Who is the Designated Signal Person for each part of lift (DSP)? Does everyone understand that except for a stop signal, the signals will only be accepted from the DSP?
8. Are signaling and/or communication methods agreed on between the operator(s) and DSP? What is the planned communication method(s)?
9. Does anyone have any questions on what the lift plan is? Does anyone have any suggestions for improvement?
10. Is the area around the lift controlled, and is everyone clear of the line of fire if the load falls or swings?
11. Does everyone know the environmental limits (e.g., maximum wind speed/ temperature) who will make the call to abort the lift?
12. Who can stop the job? (e.g., anyone) Who can restart the job?

**Special Considerations**

## THE DO's

**DO** Walk the lift route to identify and control hazards with everyone involved in the lift.
**DO** Make sure you have the lift plan available during the lift.
**DO** Complete a detailed HIAC for the task.
**DO** Let all other contractors in the area know that a critical lift will be taking place.
**DO** Ensure equipment certification and inspections are current.
**DO** Confirm the capacity of all rigging components, remember to consider the configuration.
**DO** Refer to the Plot Plan or Engineered Lift Plan where required.
**DO** Ensure Lift Lugs are in place as required.
**DO** Locate and identify underground and overhead utilities.
**DO** Assess ground condition and requirements for matting.
**DO** Review weather forecast and consult with crane operator(s) about the highest wind allowed for lift.
**DO** Confirm the lowest temperature allowed for lift, (check rigging components, equipment manuals, and consult with Prime Contractor/Owner).
**DO** Review the emergency response plan.
**DO** Discuss the best methods for communication (hand signals, radios, etc.).
**DO** Review elevation drawing showing clearances and facilities.
**DO** Consult others when developing a lift plan, there may be better ideas.
**DO** Ask workers questions during the pre-lift meeting, this is a great way to assess their understanding of their role.
**DO** Make as many practice lifts as required to verify the load is balanced.
**DO** Ask any questions you may have, even if you think you may know the answer, someone else may have the same question and be afraid to ask

**DO** Check the load chart of all equipment for the rating depending on the set-up position and boom angle, if the placement changes check it again.
**DO** Check for specific requirements from the client or Prime Contractor, many have additional processes that are required for a critical lift.
**DO** Verify you have all required Safe Work Authorizations/Permits.
**DO** Be detailed on your lift drawing, this can be a useful tool during the pre-lift meeting.
**DO** Review the lift plan with the equipment operator before the pre-lift meeting, many companies have additional rules or steps which must be taken for a critical lift.
**DO** Stop the lift you think anyone is in danger. We can always restart a lift, but we can't undo an incident.

## THE DON'Ts

**DO NOT** Make assumptions, this is a high-risk task. Verify weights, certifications, training, and experience before starting work.
**DO NOT** Be afraid to ask for second opinions. The whole point of a plan is to consider different options, just because we have done it one way before doesn't mean that is the best way.
**DO NOT** Exceed the working capacity of any component, the lifting equipment is only as strong as the weakest part, remember to check the ratings on clevises, lifting lugs etc.
**DO NOT** Side load any component of the lift, you may need to stop the lift and re-rig depending on the shape of the load.
**DO NOT** Be afraid to add additional tag lines, heavy loads are difficult to control, one or even two taglines may not be enough.
**DO NOT** Assume everyone know the hand signals, signals change from site to site, industry to industry, review the signals to be used at the pre-lift meeting and stick to them.
**DO NOT** "Wear multiple hats", the signal person can not also control a tag line, signaling is their only job.
**DO NOT** Give signals (except stop) if you are not the designated signal person, this leads to confusion and incidents, if you see a problem give the signal to stop and then discuss with the designated signal person.
**DO NOT** Start work if you are unclear of the plan, ask questions and if you do not understand, ask it again, everyone must understand their role for the lift to be successful.
**DO NOT** Put yourself between the load and any object, always have an escape route.
**DO NOT** Walk under a suspended load, rigging breaks, equipment fails.
**DO NOT** Try to stop a swinging load with your hands, heavy loads can generate immense force when they swing, you likely will not stop it and may injure yourself, taglines must be used to control the load.
**DO NOT** Allow anyone else into the area, equipment can wait, people can go around.
**DO NOT** Wrap a tagline around your hand, coil excess rope and hold it loosely, a tagline wrapped around your hand can cause serious injury if it is pulled tightly.
**DO NOT** Ignore the signal person, they may see something you do not or may hear something you do not.
**DO NOT** Ignore the signal to stop, anyone may give this signal and it must always be followed.

**Applicable Provincial Definitions for Lifts Requiring Plans**

**Alberta:**

Lift calculation: 68.1 An employer must ensure that a lift calculation is completed for any lift exceeding 75 percent of a crane's rated capacity

**British Columbia:**

A "critical lift" means:
(a) a lift by a mobile crane or boom truck that exceeds 90% of its rated capacity while it is lifting the load at a load radius of more than 50% of its maximum permitted load radius, taking into account its position and configuration during the lift,
(b) a tandem lift if the load on any one crane, hoist or other piece of powered lifting equipment exceeds 75% of the rated capacity of that crane, hoist or other piece of powered lifting equipment,
(c) a tandem lift involving the simultaneous use of more than two cranes, hoists or other pieces of powered lifting equipment,
(d) a lift of a person in a work platform suspended from or attached to a crane or hoist,
(e) a lift in which the centre of gravity of the load changes during the lift,
(f) a lift in which the length of one or more sling legs changes during a lift,
(g) a lift by a crane, boom truck or hoist, supported on a floating base, that exceeds 90% of rated capacity for the lifting system,
(h) a lift of a load over or between energized high voltage electrical conductors, or
(i) a lift of a submerged load.

**Saskatchewan:**

No Definition.

**Manitoba:**

Procedures for multiple crane lift

23.20 An employer must ensure that (a) a plan of procedures for the operation of a lift of a load involving two or more cranes is prepared in accordance with CAN/CSA Z150-16, Safety Code on Mobile Cranes:

(b) every worker involved in the lift is trained in the plan of procedures; and
(c) the lift is carried out in accordance with the plan and the standard referenced in clause (a).

**REFERENCES / ADDITIONAL INFORMATION**

- CPES SWP 54 – Rigging
- CPES SWP 48 - Pipe Handling

## REGULATIONS

**Alberta OHS Code:**

Part 6 Cranes Hoists and Lifting Devices

**British Columbia:**

Part 14 Cranes and Hoists

**Saskatchewan:**

Part 13 Hoists, Cranes and Lifting Devices

**Manitoba OHS Regulation**

Part 23 Cranes and Hoists

| | | | | | | |
|---|---|---|---|---|---|---|
| Developed by: | 1. | Angie Anton | | | Date: | Dec 2008 |
| Revised by: | 1. | Ray Dawson | 2. | John Artym | Date: | August 25, 2011 |
| Revised by: | 1. | Todd Penney | | | Date: | June 26, 2020 |
| Revised by: | 1. | Amanda Campbell | 2. | Jason Pilon | Date | May 19, 2021 |
| | 3. | Adam Harvey | 4. | James Main | | |
| | 5. | Gary Lyster | 6. | Allen Monk | | |
| | 7. | Brian McConnell | 8. | Brian Bruce | | |
| Approved by: | 1. | HSE Committee | | | Date | June, 2021 |