Planning for Load Handling Standard

1.0 PURPOSE

This standard is to promote safe load handling activities and reduce the frequency and severity of incidents. The purpose is to protect personnel from injury, the environment from harm, and equipment and property from damage.

2.0 SCOPE

The scope of this standard is the formation of considerations for planning, resourcing and executing load handling activities following the seven step process to establish safe and efficient load handling.

This standard is not a comprehensive technical set of load handling procedures rather it identifies the essential principles and requirements for planning of load handling activities.

3.0 APPLICABILITY

This standard applies to all load handling activities performed by workers on behalf of SaskPower.

4.0 EXCLUSIONS

This standard excludes load handling activities using the following equipment:

(1) Elevators, fixed personnel lifts or medical lifts;
(2) Power mobile equipment being used for excavation or pile driving activities;
(3) Bulk material handling equipment (e.g. conveyors, concrete pumpers, augers, pipelines, pumps, draglines, etc.);
(4) Engineered systems related to water conveyance structures (e.g. intake gates, spillway gates, etc.);
(5) Automated and or robotic material handling systems; and
(6) Aeroplanes.

5.0 REQUIREMENTS

This standard outlines the minimum requirements that shall be met or exceeded. Failure to comply may result in injuries, environmental harm, damage to equipment and property, performance management or any combination thereof.

The use of the word “shall” within this standard denotes a mandatory action, whereas the use of the word “should” or “may” denotes a recommended action.

6.0 IMPLEMENTATION

The requirements of this standard take effect June 27, 2017.

7.0 DEFINITIONS

The following definitions shall apply to this standard:

7.1 Aerodromes

Any area of land, water (including the frozen surface thereof) or other supporting surface used or designed, prepared, equipped or set apart for use either in whole or in part for the arrival, departure, movement or servicing of aircraft and includes any buildings, installations and equipment situated thereon or associated therewith.

Note: This definition of "Aerodrome" includes water aerodrome and heliports.

7.2 Competent

Person possessing knowledge, experience and training to perform a specific duty.

7.3 Employer

Person, firm, association or body that has, in connection with the operation of a place of employment, one or more workers in the service of the person, firm, association or body.

7.4 Fall Zone

The area (including, but not limited to, the area directly beneath the load) in which it is reasonably foreseeable that the load when partially or completely suspended/elevated could fall in the event of a mishap.

7.5 Lift

Execution of the load handling activity.

7.6 Lifting

See Load Handling.

7.7 Lifting Accessory

Device intended to be used directly or indirectly to connect the load to the load handling equipment and is not part of either the load or the load handling equipment, including rigging.

7.8 Lift Plan

Information, written or verbal, that, at a minimum, details how the load handling shall be undertaken, identifies the equipment to be used, how the load and lifting accessories shall be rigged up and the control measures to be implemented to manage risks.

7.9 Load

Object to be hoisted; may include materials, tools, equipment or workers with their accompanying tools and equipment.

7.10 Load Handling

Lifting a load vertically and or moving of a load horizontally or manipulating its configuration while in an elevated state using mechanical devices.

7.11 Load Handling Equipment

Mechanical device designed to move a load vertically, horizontally or otherwise manipulate the load.

7.12 Qualified Electrical Worker

As defined by clause 465(1)(c), clause 465(1.1) and clause 465(1.2) of the Regulations when conducting electrical work on voltages in excess of 750 V; for voltages 750V and lower only clause 465(1)(c) applies.

7.13 Regulations

The Saskatchewan Occupational Health and Safety Regulations, 1996.

7.14 Supervisor

A person, including a SaskPower contracted individual, who is authorized by an employer to oversee or direct the work of workers.

7.15 Worker

Person, including a supervisor, who is engaged in the service of an employer. This includes SaskPower contracted individuals.

8.0 METHOD/PRACTICE

Due to the inherent risks of load handling, the following seven step process shall be employed to establish safe load handling.

1. Define scope of the lift
2. Assess and categorize the lift (standard or critical)
3. Develop a lift plan (written or verbal)
4. Conduct a pre-lift review
5. Conduct preparations for the lift
6. Execute the lift
7. Conduct a post-lift review

8.1 Define scope of the lift

The first step is the determination of the scope of the load handling activity. Effective planning cannot be performed without the knowledge of details regarding, at a minimum, the:

- Load;
- Travel path
- Work site layout;
- Work site ground conditions; and
- Type and rated capacity of Load handling equipment (LHE) proposed.

8.2 Assess and categorize the lift

An evaluation of the proposed load handling activity shall be performed to determine the classification of the lift and degree of associated risks that may adversely impact safety and operations. The classification assessment takes into consideration such categories as:

- Potential hazards to persons;
- Hazards in proximity to work area;
- Complexity of load handling activity;
- Adverse impact from environmental conditions;
- LHE capacity and or performance; and
- Adverse commercial impact.

All lifts shall be classified using the *Lift Classification Reference Guide* found in Appendix A. Each lift shall be classified as either standard or critical prior to performing the lift.

8.3 Develop a lift plan

All load handling activities shall be planned and have a lift plan. The determination of a written or verbal lift plan shall be based on the *Determination of Written or Verbal Lift Plan Process* (Appendix B).

The lift shall be planned and performed in such a manner that, if a failure occurs, exposure to people and critical equipment from the hoisted load should be minimized.

8.3.1 Lift Plan Requirements

Every lift plan, regardless of lift classification, shall include (at a minimum):

- Scope of work (lift);
- Classification of lift;
- Information about the load, LHE, lifting accessories, and travel path;
- Site/Environmental conditions;
- Role assignments;
- Communication means;
- Site controls;
- Contingency plans; and
- Emergency response.

Confirm as part of the Site/Environmental conditions that the planned load handling activity will not compromise operational airspace in the vicinity of aerodromes thus impacting aeronautical safety and ultimately public safety. Refer to Appendix C, *Determination of Potential Interference with Aeronautical Safety* for a high level guide in assessing this aspect.

The following roles and responsibilities shall be included in every lift plan:

- *Lift Planner* – responsible for developing the lift plan;
- *Lift Director (Person in Charge)* – responsible for verifying the category of the load handling activity and reviewing and implementing the lift plan;
- *LHE Operator* – responsible for directly controlling the LHE's functions and fulfills the role of *designated operator* or *trained operator* for applicable LHE as per Regulations; and
- *Site Supervisor* – responsible for overseeing the work site on which the LHE is used and the work that is performed on the site.

Multiple roles may be performed by the same individual or entity at the same time given the roles do not conflict and doing so will not negatively impact the safety of the load handling activity.

Where one work site has multiple crews working in close proximity or the separate work activities of one or more crews may impact other crews the Site Supervisor should be a distinct individual from the Lift Director.

The following additional roles and responsibilities may be identified in the lift plan:

- *Rigger* – responsible for performing rigging tasks associated with the load handling activity;
- *Signalperson* – responsible for directing the movements of the LHE by providing signal commands to the LHE Operator and fulfils the role of *designated signaller* as per Regulations;
- *Spotter* – responsible for observing and reporting as directed on the movement of the LHE and the load;
- *Assembly/Disassembly Director* – responsible for directing the assembly/disassembly (erect/dismantle) of the LHE;
- *Engineer* – responsible for providing any required engineering documentation and support for the load handling activity; and
- *Transport Operator* – responsible for the operation of transport equipment used in support of the load handling activity.

For lifts that utilize lifting accessories the role of Rigger shall be a mandatory role.

If the LHE Operator does not have a clear line of sight throughout the entire travel path then a Signalperson shall be a mandatory role.

8.3.2 Standard Lift Plans

Lifts classified as a standard lift shall have lift plans developed; the lift plans may be verbal or written depending upon the outcome of the *Determination of Written or Verbal Lift Plan Process* (Appendix B).

The components of the Standard Lift Plan are identified in *Section 8.3.1 - Lift Plan Requirements*. If it is determined that a written Standard Lift Plan is required for the load handling activity then:

- SaskPower workers shall use the *Lift Plan Template* found in Appendix D; and
- Contracted workers shall either use the *Lift Plan Template* found in Appendix D or a form that meets or exceeds the required content listed in *Section 8.3.1 - Lift Plan Requirements*.

8.3.3 Critical Lift Plans

All lifts classified as critical lifts shall have written lift plans prior to executing the lift. Critical Lift Plans shall include at a minimum the components identified in *Section 8.3.1 - Lift Plan Requirements*.

Planning for critical lifts requires additional rigor, detail and consideration beyond that employed for standard lifts. The extent of planning for critical lifts should be scaled according to the level of risk and to the degree of complexity of the load handling activity. If the degree of complexity of a proposed load handling activity requires the application of engineering principles to sufficiently mitigate the associated risks to persons, environment, equipment or property, a lift plan shall be reviewed and certified by a professional engineer.

A Critical Lift Plan should consist of drawings, specifications and procedures necessary to accurately inform workers of all important load and site factors relating to the load handling activity. Calculations, elevation drawings, plan view drawings, rigging configuration, lift analysis and work procedures are some examples of additional documentation that may be part of a critical lift plan.

Test lifts with a test weight shall be part of the Critical Lift Plan when the load handling activity includes hoisting personnel with LHE that is not primarily designed to lift personnel.

Critical Lift Plans shall be reviewed by a competent worker, in addition to the Lift Planner, prior to being issued to the Lift Director for implementation.

8.4 Conduct a pre-lift review

It shall be the responsibility of the Lift Director to lead a discussion (pre-lift review) among the load handling workers prior to conducting preparations for the lift.

The purpose of the pre-lift review is to ensure all load handling personnel are aware of the lift plan, the associated hazards, barriers to be implemented, and their roles and responsibilities associated to the load handling activity.

The pre-lift review shall include (at a minimum):

- A review of the lift plan;
- Assessment of the site/environmental conditions (includes such conditions as weather, ground/surface, lighting, clearances and proximity to surrounding activities);
- Determination if changes are required to the lift plan due to site survey, weather conditions and or new information;
- Assignment of roles and responsibilities for lift preparations and executing the lift;
- Completion of a Hazard/Aspect and Risk Assessment (HARA); and

- For repetitive lifts, determination of the frequency of pre-lift reviews and LHE/lifting accessories inspections.

If the pre-lift review identifies that changes are required to the lift plan, the changes shall be communicated to all load handling personnel and documented on the lift plan. Additionally, the changes shall be assessed to ensure that they have not created new hazards/aspects or have increased the risk beyond an acceptable level.

At the conclusion of the discussion, the Lift Director should confirm that workers understand the lift plan and their roles and responsibilities associated to the load handling activity.

8.5 Conduct preparations for the lift

The following activities shall be conducted as part of the lift preparations:

- Implement site controls;
- Conduct preoperational inspections;
- Inspect load;
- Test communication means; and
- Verify the functionality of safety devices.

Additional activities such as, but not limited to, assembling LHE, setup of LHE, configuring lifting accessories and conducting a test lift may become part of the lift preparations dependant on the scope of the load handling activity.

The implementation of site control measures shall be as per the lift plan. The purpose of site control is to ensure only essential personnel are allowed within the fall zone and a means of egress is provided for all workers within the fall zone. Ensure all non-essential workers and public are removed from the fall zone prior to operating equipment.

Preoperational inspections shall be conducted on the load including the lifting point(s), LHE, lifting accessories and any other tools or equipment to be used during the lift. Inspections shall ensure, at a minimum that the LHE and lifting accessories are of adequate capacity for the load handling activity, deemed safe for use and meet all inspection and maintenance requirements.

Preoperational inspections shall include both visual and operational checks, when applicable, and should be conducted in accordance with manufacturers' recommendations. The inspection shall be recorded as per the requirements outlined in the Load Handling Equipment Record Keeping Standard.

The integrity and stability of the load shall be verified before lifting and the weight of the load shall not exceed the dynamic or static capacities of the LHE. The lifting points on the load shall be verified that they are designed and constructed for lifting the load in the manner intended in the lift plan. The load shall be interfaced with the LHE in such a manner as to ensure that the load stays balanced throughout the lift.

An effective means of communication shall be selected, and be understood and agreed upon by the load handling personnel. Prior to executing the lift, the communications method shall be tested; this may include a functional check (i.e. when using radios) and a review of the hand or word commands to be utilized to ensure understanding by the load handling personnel.

It shall be confirmed that the LHE and lifting accessories are outfitted with appropriate safety devices and, if possible, the safety devices' functionality shall be tested to ensure its effectiveness.

Test lifts with a test weight shall be performed prior to hoisting personnel with LHE that is not primarily designed to lift personnel. A test lift, without a load or with a mock-up load, should be carried out where clearance is limited or other hazards increase the complexity of the lift.

Any concerns or deviations from the lift plan that may impact the safety of the lift shall be communicated to the Lift Director.

8.6 Execute the lift

The load handling activity shall only commence after:

- The lift plan has been reviewed with all workers involved;
- The HARA has been conducted for the activity with all workers involved; and
- The Lift Director has confirmed that all preparations (including inspections of the load, LHE and lifting accessories) have been satisfactorily conducted.

Immediately prior to executing the lift, the Lift Director should determine that:

- The lift can proceed according to the lift plan; or
- A deviation exists and the lift shall not be initiated until the issues are resolved.

The LHE Operator shall obey a stop signal at all times regardless of who gives the signal. If the load handling activity is stopped for any reason, only the Lift Director shall initiate a restart.

In the event that it becomes necessary to deviate from the lift plan, the lift shall be stopped, re-evaluated and the lift plan revised. The lift shall not be restarted until the changes are communicated to all affected load handling personnel and if a written lift plan exists the changes shall be noted on the lift plan.

If the lift is stopped prior to completion the load and LHE should be secured until the lift is re-initiated by the Lift Director.

Additional rigor, regardless of lift classification, shall be applied by all involved in load handling activities when the load is comprised of personnel.

8.7 Conduct a post-lift review

It shall be the responsibility of the Lift Director to lead a discussion (post-lift review) among the load handling workers as soon as practicable after the completion of the load handling activity.

The purpose of the post-lift review is to identify opportunities for improvement for future load handling activities. The discussion should include, but not be limited to, the review of the lift plan, pre-lift meeting, preparations for the lift and the execution of the lift.

It shall be the responsibility of the Lift Director to assess the recommendations and determine which warrant further consideration. If the implementation of an acceptable recommendation is within the control of the Lift Director it shall be implemented in future lifts directed by the Lift Director. In addition, the Lift Director should, to the best of their ability, share the recommendation with other Lift Directors and Lift Planners working with similar load handling activities.

If the acceptable recommendations are outside the control of the Lift Director, the Lift Director shall communicate them to the appropriate supervisor for future consideration.

9.0 RESOURCES

Appendix A (Mandatory) – Lift Classification Reference Guide

Appendix B (Mandatory) – Determination of Written or Verbal Lift Plan Process

Appendix C (Informative) – Determination of Potential Interference with Aeronautical Safety

Appendix D (Mandatory) – Lift Plan Template

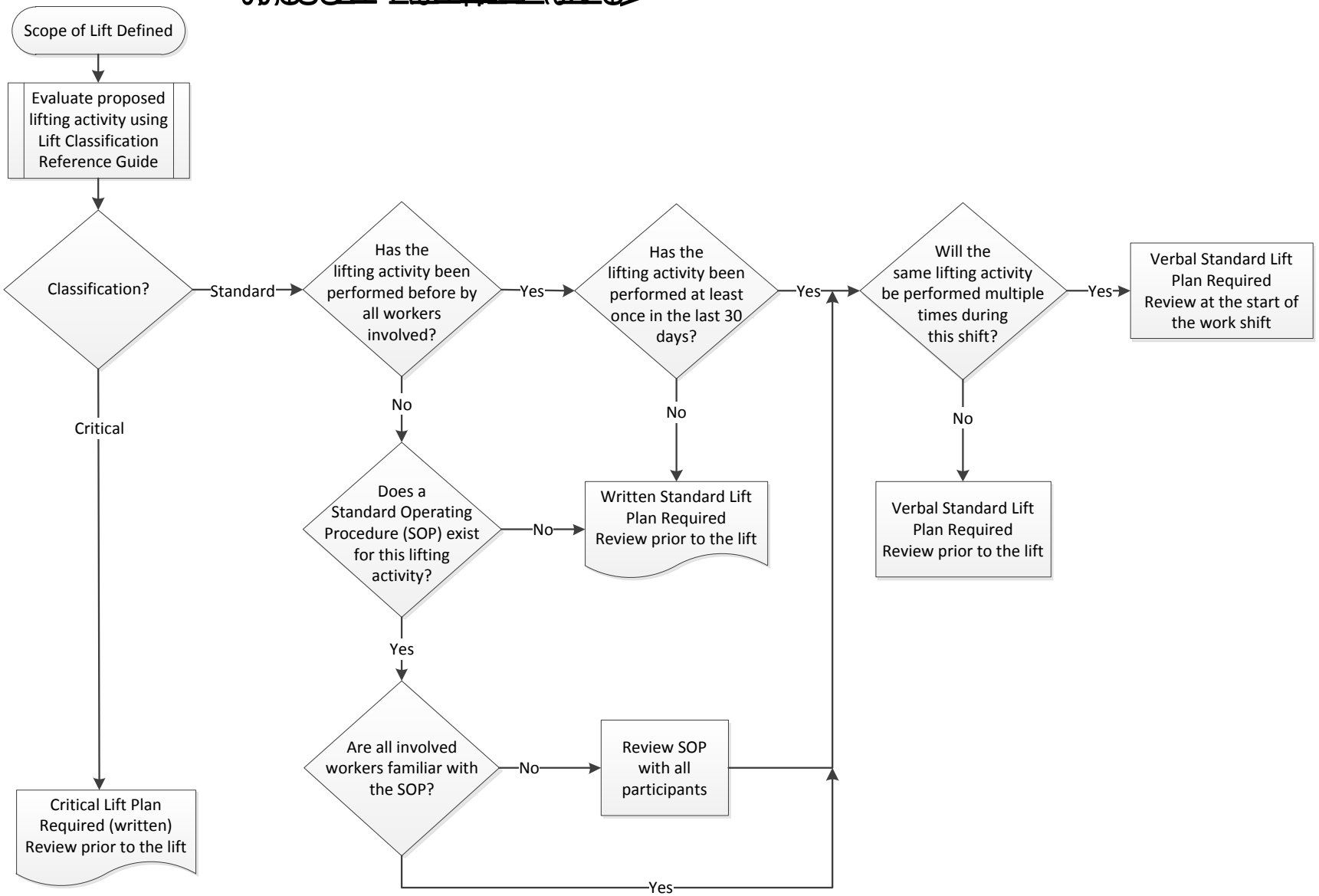
10.0 REFERENCES

- Saskatchewan
  - The Saskatchewan Employment Act, 2014
  - The Saskatchewan Occupational Health and Safety Regulations, 1996
- SaskPower
  - Load Handling Equipment Record Keeping Standard
  - Load Handling (Hoisting) Policy
- Third Party Standards
  - ASME P30.1-2014 Planning for Load Handling Activities
  - TP1247E Land Use In The Vicinity of Aerodromes, Transport Canada - Aviation

Appendix A (Mandatory) – Lift Classification Reference Guide

LIFT CLASSIFICATION REFERENCE GUIDE

Does this lift involve any of the following criteria? (Check all that are applicable.)	
a) Lifting personnel using LHE not designed for the explicit purpose of lifting people.	☐
b) Load containing material immediately dangerous to life and health or that has the potential for significant environmental or environmental regulatory consequences. (An exception is when using the appropriate SOP for handling oil-filled equipment containing PCBs.)	☐
c) The load is being lowered into or lifted from a confined space **and** the workers within the confined space are not visible to the LHE Operator or Signalperson.	☐
d) Moving or suspending the load over unprotected areas accessible to the general public, over unprotected buildings or over equipment containing material immediately dangerous to life and health.	☐
e) Lift is to be performed in a congested area (limited clearances, proximity to obstructions, etc.) *increasing the potential* for damage to the load, the LHE and or surrounding structures and or equipment.	☐
f) Load and or LHE encroaching within 7 m of exposed, live electrical conductors(> 750 V) **and** the LHE Operator is not a qualified electrical worker or a SaskPower employee holding an equipment operator position as part of a Distribution or Transmission crew.	☐
g) There is a *potential for instability or overload of **the LHE*** due to load handling activities involving any of the following: ☐ Suspended load transfers ☐ Off vertical loading ☐ Tandem lifting ☐ Increased loading (friction or suction)	☐
h) The weight or center of gravity of the load is unknown or difficult to estimate.	☐
i) There is *potential for instability or uncontrolled movement of **the load*** due to: ☐ Potential for significant weight shift (liquid filled, moveable parts) ☐ The location of the load's center of gravity relative to its lifting points ☐ Complex manipulation of a suspended load	☐
j) Load handling activity requires intentional dynamic loading (e.g. use of wrecking ball).	☐
k) LHE is a helicopter.	☐
l) Load handling activity involves lifting over environmentally sensitive areas (e.g. water bodies, archeological sites, critical habitats for species at risk, etc.).	☐
m) If ground conditions *increase the complexity* of the lift and or are *likely to affect equipment performance* (e.g. ground/surface type, moisture, underground services/voids/vaults, compaction, near excavation/waterbody, slope stability, ground contour).	☐
n) The total load including lifting accessories is > 85% of rated LHE capacity.	☐
o) The LHE equipment (i.e. hoist) is attached to structures that have no recorded load rating or approval by qualified personnel confirming the structure's capability to support the load.	☐
p) Load is comprised of equipment or the load handling activity has potential to damage equipment that is deemed critical to the bulk electric system or grid and the associated commercial impact is significant.	☐
q) SaskPower directives, standard operating procedures, work procedures, or other concerns mandate that this load handling activity be deemed critical.	☐
Note: If any of the above criteria are applicable then the lift is classified as a Critical Lift.	
Lift Classification: ☐ Standard Lift ☐ Critical	
Refer to *Determination of Written or Verbal Lift Plan Process*	


Scope of Lift Defined
Evaluate proposed lifting activity using Lift Classification Reference Guide
Classification?
Standard
Critical
Has the lifting activity been performed before by all workers involved?
Yes
No
Has the lifting activity been performed at least once in the last 30 days?
Yes
No
Will the same lifting activity be performed multiple times during this shift?
Yes
No
Verbal Standard Lift Plan Required Review at the start of the work shift
Does a Standard Operating Procedure (SOP) exist for this lifting activity?
No
Written Standard Lift Plan Required Review prior to the lift
Yes
Are all involved workers familiar with the SOP?
No
Review SOP with all participants
Yes
Verbal Standard Lift Plan Required Review prior to the lift
Critical Lift Plan Required (written) Review prior to the lift

Appendix C (Informative)

Determination of Potential Interference with Aeronautical Safety

1. Assess map for registered aerodromes in the vicinity of the work area.

   http://www.highways.gov.sk.ca/adx/aspx/adxGetMedia.aspx?DocID=221,139,1,Documents&MediaID=9706&Filename=Saskatchewan+Airports+Map.pdf

2. Consult the Canada Flight Schedule to acquire aerodrome reference point.
   a. Determine if the work site is within 6 km of the center of the identified aerodrome using the reference point.
   b. Confirm whether Airport Zoning Regulations exist for the identified aerodrome by searching the Transport Canada Regulations

      List of Regulations - Transport Canada (https://www.tc.gc.ca/eng/acts-regulations/regulations.htm)

      Note: At the time of development there were 10 communities in Saskatchewan that had Airport Zoning Regulations (Kindersley, La Ronge, Moose Jaw, North Battleford, Prince Albert, Regina, Saskatoon, Swift Current, Weyburn and Yorkton).

3. If Airport Zoning regulations apply or the worksite is within 6 km of the center of the identified aerodrome, complete and submit the:
   a. Aeronautical Assessment Form for Obstruction Evaluation; and the

      http://wwwapps.tc.gc.ca/wwwdocs/Forms/26-0427E_1412-05_E_X.pdf

   b. Land Use Submission Form

      NAV CANADA: Products and Services - Land Use Program (https://www.tc.gc.ca/eng/acts-regulations/regulations.htm) – Select the “Land Use Submission Form” hyperlink in the third paragraph.

Note: Processing time for authorization to proceed from Transport Canada is a minimum of 90 days and NAV CANADA is a minimum of 30 working days (6 weeks).

Reference Documents:

Standard 621 - Obstruction Marking and Lighting: http://www.tc.gc.ca/eng/civilaviation/regserv/cars/part6-standard-standard621-3868.htm

Aerodromes Standards and Recommended Practices (TP 312) 5th Edition (Revised 07/2015) - Transport Canada

Appendix D (Mandatory) – Lift Plan Template

Note: For hardcopies of this template email Printing Services (mailto:PrintingServices@saskpower.com) with "Lift Plan" in the subject line. Please include the quantity and cost centre when ordering. The form will come on a folded 11x17 card stock.

Lift Plan

SaskPower
Powering the future®

GENERAL INFORMATION

Job / Project Description: _____

Work Order / Project Number: _____

Location: _____

Date: _____

LIFT CLASSIFICATION

Classification: ☐ Standard Lift ☐ Critical Lift

Note: The lift shall be classified using the Lift Classification Reference Guide.

LOAD DETAILS

Type of Load(s): ☐ Personnel with accompanying tools & equipment ☐ Materials, Tools and or Equipment

Description of Load(s): _____

Overall Dimensions: (L *x* W *x* H) _____ **Load weight*:** _____

*Weight Determination: ☐ Marked on Load ☐ Weighed ☐ Calculated ☐ Estimated ☐ Other: _____

Weight calculated by: _____ *(attach calculations)*

(Print Name)

Centre of Gravity: ☐ Obvious ☐ Estimated ☐ Determined by Drawing: _____ (dwg #)

Lifting Points: ☐ Provided by Mfg. ☐ Engineered in Dwg: _____ ☐ Other _____

Working Notes:

LOAD HANDLING EQUIPMENT (LHE) DETAILS

Type of LHE: _____

Rated LHE Capacity: _____ Lifting Accessories SWL: _____ (list the lowest SWL)

Combined Weight of Load and Lifting Accessories: _____ Unused LHE Capacity: _____%

Working Notes:

LIFT DETAILS

☐ Single Lift ☐ Multiple Lifts ☐ Multiple LHE to be used to perform the lift
(Complete LHE Details for each LHE, attach extra pages as required)

Load Pickup Point: _____ Load Final Location: _____

Obstructions / Hazards in the travel path: ☐ None or _____ (list)

_____

SITE / ENVIRONMENTAL CONDITIONS

Note: Includes such conditions as weather, ground, lighting, clearances, and proximity to surrounding activities.

Conditions of Potential Impact:

Do the conditions deem the use of a *Test Lift*? ☐ Yes ☐ No

Is the worksite within 6 km of the center of a registered aerodrome? ☐ Yes ☐ No

ROLE ASSIGNMENTS OF LIFT TEAM

No worker shall be assigned or undertake a work assignment for which they do not possess the necessary skills, qualifications and or experience as per requirements.

An individual or entity may perform multiple roles at the same time given the roles do not conflict and doing so will not negatively impact the safety of the load handling activity.

Role	Person Assigned	Requirement Type
Site Supervisor		Mandatory
Lift Director (Person in Charge)		Mandatory
Lift Planner		Mandatory
LHE Operator		Mandatory
Signalperson		Optional
Rigger		Optional
Spotter		Optional
Assembly / Disassembly Director		Optional
Engineer		Optional
Transport Operator		Optional

Note: For lifts that utilize lifting accessories a Rigger becomes mandatory **and** for lifts that the LHE Operator does not have a clear line of sight throughout the entire travel path a Signalperson becomes mandatory.

COMMUNICATIONS MEANS

☐ Radio ☐ Hand Signal ☐ Verbal ☐ Other: _____

SITE CONTROL

Is the lift zone accessible to others outside of the lift team? ☐ Yes ☐ No

If yes, what barriers will be implemented to prevent unauthorized entry: *(Check all that will be implemented.)*

☐ Signage ☐ "Do No Enter" Barrier Tape ☐ Manned Access Points ☐ Locked Access Points

☐ Barricades ☐ Temporary Fencing ☐ Other: _____

CONTINGENCY PLANS

Identified Contingencies:

EMERGENCY RESPONSE

Site Specific Emergency Procedures / Protocol:

☐ Listed on Tailboard or HARA document

☐ Other:

POST-LIFT REVIEW NOTES

LIFT LAYOUT DIAGRAM (Attach extra pages if necessary)

Sketch intended to assist in clarification of LHE set-up in relation to load, surrounding structures, rigging, and lay-down location. **To be completed at the discretion of the Lift Planner.**