STANDARD OPERATING PROCEDURE

SAFEWORK PRACTICES
MOBILE HOISTING EQUIPMENT
CAT A-2 SOP #17

Date Issued:	**June 2010**	Revision Date:	**November 2012**
Review Date:	**November 2015**	**Revision #**	**2012-01**

1.0 PURPOSE

This document provides the necessary information required to ensure that all personnel are knowledgeable about the safe work practices involving the use of cranes and hoisting equipment.

2.0 SCOPE

This procedure applies to all Distribution Personnel and Contractors who are required as part of their regular job function to make use of any crane or hoisting equipment.

This policy establishes minimum requirements for the use of any type of mobile hoisting equipment for use at any Suncor Distribution Terminal.

Due consideration must be given to all applicable provincial legislation.

3.0 REFERENCED DOCUMENTS:

- Canadian Occupational Health & Safety Regulations, Sections 14.20-14.45
- WorkSafe BC – Part 14
- Saskatchewan Occupational Health and Safety regulations, Part XIII
- Alberta Occupational Health and Safety Code, Part 6
- Ontario Regulation 213/91, Part II, Sections 150-156
- Quebec Occupational Health & Safety Code, Division XXII, Sections 245-264

4.0 PRECAUTIONARY STATEMENTS

4.1 Training

- Any Personnel utilizing cranes, personnel lifts, or other similar hoisting equipment on Suncor property shall first submit documentation verifying competency, experience and training.
- Operators must have a valid hoisting ticket suitable for the crane capacity and type and shall be trained and experienced on the model crane being operated.
- All crane operators, upon arrival at this site, must review a copy of this policy.
- All contractors that will be using the services of a crane on this site, prior to doing so, must review a copy of this policy.

4.2 Specific Hazards

CAUTION:

If at any time while carrying out work with a crane you should come into contact with a live overhead wire, stay on the machine until it has been made safe. Never step down. If part of your body contacts the ground while another part touches the machine, current will travel through you.

CAUTION:

If an emergency forces you to leave the machine jump clear with feet together and shuffle or hop away in small steps. Don't take big steps. Voltage differential across the ground, one foot may be in a higher voltage area than the other. The difference can kill you.

Typical hazards that may be encountered while operating cranes may include;

Work Environment Hazards

- Slips or Trips Possible
- Position of Hands, Pinch Points
- Exposure to Electrical Hazards

Ergonomic Hazards

- Walk Area Not Clear / Level
- Uneven Terrain
- Parts of Body in Line of Fire

Equipment Hazards

- Operating Power Equipment
- Specialized Equipment / Tools

Personal Limitations

- Distractions in Work Area

4.3 Personal Protective Equipment

- Personal protective equipment as outlined in Distribution Standard Operating Procedure, Cat A-1, SOP #10 or as specified in the Safe Work Permit depending on the work to be completed as per the job scope requirements.

5.0 ROLES & RESPONSIBILITIES

Terminal Management;

- Accountable to ensure full implementation and compliance of this standard operating procedure.
- Responsible to complete regular inspections of work areas for compliance with this standard.
- Accountable to ensure all Personnel are fully trained and competent prior to using any crane or hoisting device.
- Accountable to ensure all cranes / hoisting devices are inspected as per manufacturer and regulatory requirements.

Operating Authority / Performing Authority;

- Responsible to ensure full compliance with this procedure.
- Responsible for safe and efficient execution of this procedure.
- Responsible to ensure daily inspections of equipment is conducted and any defects are identified to Terminal Management immediately,

6.0 SUSTAINMENT AND CONTINUAL IMPROVEMENT

This document is classified in Process Safety terms as a Safework Practice Procedure and as such must comply with the Safework Practice Procedure Standard as outlined in Distribution Procedure Program, Cat B-3, SOP #14.

Edmonton Terminal Management is to initiate document review process.

To ensure this Standard Operating Procedure documents meets all applicable OEMS / PSM standards, this document is to be reviewed at a frequency not to exceed 3 years or when conditions change to warrant a review

7.0 SAFE CRANE OPERATION:

The following primary rules shall be enforced at all times regarding use of cranes in any work area:

1. No crane shall lift any load in any configuration, unless there is, in or on the crane, a current, published rating chart from the crane manufacturer, valid for the crane in the configuration in which it is to be used. Any crane for which such a rating chart is not available in or on the crane shall be prohibited from any operation, except movement off the site, until such a proper rating chart is provided.

2. **Rigging Hardware** shall be thoroughly inspected by a competent and knowledgeable person for the following warning signs:
    a. **Cracks**: Inspect closely as cracks could be very fine.
    b. **Missing Parts**: Ensure that parts such as catches on hooks, nuts on cable clips, and cotter pins in shackle pins are still in place and secure.
    c. **Stretching:** Check hooks, shackles and chain links for opening up, elongation, and distortion.
    d. **Stripped threads:** Inspect turnbuckles, shackles, and cable clips.
    e. **Cable clips**: Check for wear on saddle. Check that original parts are in place and in good condition. Check for cracks. Check for proper size of the wire rope.
    f. **Shackles**: Check for wear and cracks on the saddle pin. Check that the pin is straight and properly seated. Check that legs of shackle are not opening up.
    g. **Hooks**: Check for wear twisting and cracks. Make sure the hook is not opening up.
    h. **Turnbuckles**: Check for cracks and bends. Check rods for straightness and damage to threads.
    i. **Chains** shall be inspected for: worn or cracked fittings, flattening, corrosion, stretching/elongation, damage from heat or chemicals, missing parts. All chains shall be inspected by a competent person and removed from service whenever in question.

j. **Wire Rope** shall be thoroughly inspected by a competent and knowledgeable person for the following warning signs:
k. **Broken wires:** Replace rope if there are 6 or more broken wires in one lay, 3 or more broken wires in one strand in one lay, 3 or more broken wires in one lay in standing ropes.
l. **Worn/abraded wires**: Replace rope if outer wires become flat from friction, becomes shinny from wear and the wear exceeds 1/3 of the diameter.
m. **Stretch:** Replace 6 strand rope if stretch reduces diameter by more then 1/16
n. **Corrosion:** Difficult to detect because it is inside the rope. Look for rust, discoloration, and pitting inside.
o. **Cuts/burns**: Replace rope if any wires or strands are cut or burned.
p. Damaged ends can be removed and seized. Otherwise rope must be replaced.
q. **Bird-caging**: Look for strands opening up in cage-like clusters. Rope must be replaced.
r. **Core protrusion**: Replace rope when inner core starts poking through strands.
s. **Kinks**: Kinks seriously reduce wire rope strength. Sections with kinks should be cut off. Otherwise rope must be discarded.

3. Always check the area where a crane is to be utilized for overhead hazards.

4. No crane shall lift any load at any radius which exceeds the manufacturer's specified rating for that crane in its present working configuration. Attempting or performing any lift which exceeds the specifications shown on the rating chart shall be grounds for immediate disciplinary action. Such action may result in the dismissal of the crane and/or operator from the worksite.

5. Wind effects must be included when calculating the crane lifting capacity margins. Lifts should never be attempted in winds of greater than 50 km/h. Consideration to postponing the lift should be given in winds exceeding 30 km/h.

6. No crane shall travel in the plant site, unless the positive (mechanical) house lock is in the engaged position with the exception of trailering (boom on travel dolly).

7. All multiple crane lifts must have a pre-lift meeting.

8. All cranes used on this site shall be equipped with anti-two-block devices.

9. All cranes used on site shall have only one hoisting function reeved at one time unless additional hoist lines are also equipped with an anti-two block with hydraulic function cut out feature.

10. No crane shall pick and carry a load with a jib.

11. All cranes must be verified within 1 (one) degree of level.

12. All loads being picked and carried shall be tied off and accompanied by a signal person.

13. Prior to each use, all below the hook lifting devices (e.g. spreader bars, barrel lifts, pail cages, etc.) shall be visually examined by the rigger and/or crane operator. All such equipment must also have been inspected within the previous 12 months by a competent person.

14. Tag Lines should be used to control loads being hoisted. Tradesperson to determine appropriate length in consultation with the Crane Operator.

15. Lift areas must be flagged with Caution Tape for required personnel protection. For short duration lifts in small lift areas that can be adequately controlled by the lift crew, pylons and signage may be used to prevent unnecessary personnel from entering the site.

16. Appropriately sized rigging in good condition must be utilized based on the weight of the lift, dimensions and stability of the load. Nylon web slings must be protected from sharp edges with the use of softeners when lifting steel sections and or objects that could cut the webbing.

17. Outriggers must be fully extended unless crane has chart for partial extension and or “On Rubber” capabilities. Prior to deploying or retracting outriggers, ensure all personnel are clear.

18. Timber or Steel pads must be placed under outriggers when the under outrigger pad ground condition is unknown. Outrigger pads should never be set up on top of red concrete. When steel outrigger mats are not used and the crane is set up off the road outrigger pad softeners must be used. Outrigger softener pads must be in good condition.

19. Horn must be sounded before each lift when other personnel are near lift area.

20. Designated signal person will wear a signal vest & operate the warning horn (during critical lifts).

21. Lifts that require the load to swing over live operating equipment must have the load weight and swing path reviewed by the Crane Operator prior to the lift.

22. Rigging must be inspected and in sound condition. Sound rigging procedures must be used.

23. Ensure that all hooks used for lifting are turned out and have their safety latches 'keepers' in place.

24. Walking under a load is not permitted at any time.

25. Never remain in a vehicle while it is being loaded or unloaded, in the case that a suspended load shall fall.

26. Always inspect all equipment, slings, shackles, hooks, chains, and edge protectors prior to each lift.

27. Never exceed the safe working loads for any piece of lifting equipment. See manufacturer specifications particular to every piece of lifting equipment prior to lifts to verify safe working loads are not exceeded at any point. 'A chain is only as strong as its weakest link'.

28. Never use a sling that is: torn, cut, frayed, burnt from heat or chemicals, broken at the stitching, rotting, contains holes, stretched, taken on an impacted fall that has compromised its rating as per manufactures directions. Always replace damaged lifting materials and tag and or destroy damaged or compromised rigging.

29. Ensure that prior to lifting; a signal-person has been designated that is competent and familiar with the proper hand signals in accordance with proper lifting procedures.

30. Operators should not move any load until they receive and understand your signal. If contact between the operator and signal-person is broken for any reason, the operation must stop.

31. Where a difficult lift demands voice communication, use two way radios instead of hand signals.

32. Only one person should signal the operator. But anyone can give the STOP signal and must be obeyed immediately.

33. Always ensure all loads are balanced so that there is no risk of endangering fellow workers or causing equipment damage.

8.0 CRANE INSPECTION AND CERTIFICATION

1. Only good quality, commercially manufactured and tested cranes in good repair and safe operating condition shall be utilized for hoisting work on this worksite. Toward that end, the following requirements shall be enforced:

2. No crane shall be allowed to perform any hoisting work on the site unless a copy of the current annual engineering certification report for that crane is submitted for examination upon arrival of the crane at the site. A copy of this report shall be retained in the project file or on the machine.

3. If there is any question as to the safe and proper condition of the crane, a qualified independent third party shall be requested to perform a thorough examination and condition survey of the crane. The results of this survey shall be submitted in written form and shall be the basis for the acceptance or rejection of the crane from work on the site.

4. No crane showing evidence of repairs or modifications shall be allowed to begin work at the site unless documentation can be shown which demonstrates the manufacturer's or a Professional Engineer's approval of the repair or modification.

5. All cranes on this site must have a current logbook. Daily or shift entries must be made in this logbook and are subject to inspection at any time while on site. Any hazardous conditions noted in the log book shall be repaired before the crane is used.

9.0 CRITICAL LIFTS

All lifts which include any of the following criteria shall be considered as a "Critical Lift" and will require completion of the Critical Lift Approval Form before the lift is attempted.

- Lifts that require the use of a manbasket/bucket to hoist personnel. Manbaskets / buckets must have an up to date inspection record, (within 1 year).
- Total lift exceeds 75% of the mobile crane or similar hoisting equipment's rated capacity.
- Any lift where the loads exceeds 50 tons.
- Mobile crane or similar hoisting equipment component or load can swing within the approach limit of power lines.
- Any lift utilizing two mobile cranes or similar hoisting equipment where the load on either mobile crane or similar hoisting equipment is below 75% of capacity.
- Loads over live equipment.
- Engineered Lifts.

10.0 ENGINEERED LIFTS

A special category of critical lifts is recognized which shall require the review and approval of a qualified engineer with crane(s) and heavy lifting expertise. Lifts considered to fall within this classification are lifts which meet any one of the following criteria:

- Lift exceeds 90% of the crane's rated capacity of the specific crane configuration.
- Lift utilizes a crane or lifting device in any configuration not specified as standard.
- Any lift involving two cranes, where the total lift exceeds 75% of the rated capacity of any or all the cranes involved in the lift.

Any lift classified as an engineered lift shall require the preparation of a lifting study. The study shall include a lifting drawing(s) showing the lifting configuration of the crane(s) and load, boom length(s), radii and/or boom angles, and clearances of critical components. Lifting capacity margins shall be determined and shown on the drawing(s). Details of rigging and rigging components shall be included in the lift study. An experienced rigging foreman shall be involved in all aspects of the actual lift. A detailed lifting procedure emphasizing any special concerns or operations shall be included. Such lifting study shall be prepared and stamped by a qualified professional engineer, registered in the applicable province, with expertise in the area of cranes and heavy lifting.

The lifting study shall consider the following:

a. The extent of all underground services (piping, electrical ductbanks, etc.) in the area.

b. The soil conditions underneath the outrigger mats.

11.0 CRITICAL LIFT CHECKLIST

A pre job planning meeting is required to ensure complete job preparation for any crane operated lift deemed critical.

- Hoisting personnel in a manbaskets / buckets
- Total lift exceeds 75% of the mobile crane rated capacity
- Any lift where the loads exceeds 50 tons
- Mobile crane component or load can swing within the approach limit of power lines.
- Any lift utilizing two mobile cranes
- Loads over live equipment
- Engineered Lifts

12.0 SAFE LIMITS OF APPROACH

Where work is to be conducted in the vicinity of high voltage electrical conductors, OH&S regulations specify the safe limits of approach that must be maintained by any worker, tool, machine equipment or material. OH&S regulations vary provincially, therefore each site must reference the oh7s regulations which govern their facility.

13.0 PROCEDURAL DEVIATION

Deviations from this standard operating procedure must be authorized using the Management of Change procedure. Deviations must be documented and documentation must include the relevant facts supporting the deviation decision

DATE	AUTHOR	DESCRIPTION	REVISION
June, 2010	R. Rattray	New document issue.	Initial Issue
Nov 2012	R. Rattray	Addition details re critical lift & checklist	2012-01

DISTRIBUTION TERMINALS

CRANE OPERATION CRITICAL LIFT CHECKLIST

PRE JOB PLANNING MEETING

ATTENDEES;

Maintenance / Contractor Supervisor _____

Contract Company _____

Terminal Management _____

Crane Operator _____

Rigger(s) _____

Signalperson_____

JOB DESCRIPTION _____

_____

_____

_____

LOCATION _____

_____

CRANE / HOISTING EQUIPMENT USED _____

_____

REASON FOR CRITICAL LIFT _____

_____

_____

	Yes	No	N/A
CRITICAL LIFTS GENERAL			
Has safe plan / lift procedures been reviewed by all parties?			
Do all workers clearly understand their responsibilities?			
Is the crane operator qualified and competent?			
Are weather conditions favourable for the lift?			
Is there an emergency plan in place?			
Are all workers aware of the emergency plan?			
Is there demonstrated evidence of current crane certification on site?			
Is the crane configured in accordance with the lift plan?			
Are outriggers fully extended?			
Has the supporting ground surface been verified as stable?			
Has all rigging been inspected by a competent person?			
Do any underground installations within the lift area require special considerations?			
Is there a person assigned to control the load with a tag line?			
Has the lift area been isolated from unauthorized entry?			
SIGNALPERSON			
Is the signalperson competent in all areas of their responsibility?			
Will the signalperson have unobstructed view of the lift intended path?			
How will the signalperson be identified?			
How will the signalperson and crane operator communicate?			
If communication is by radio, will a dedicated frequency be used?			
HOISTING PERSONNEL IN A MANBASKET / BUCKET			
Is the crane inspected and approved for use with a manbasket?			
Are manbasket drawings available and approved by an engineer?			
Will a test lift of the manbasket be performed?			
Does the total load including manbasket and personnel weights fall within crane chart acceptable capacities?			
LIFT EXCEEDS 75% OF THE MOBILE CRANE RATED CAPACITY			
What is the total load weight?			
What is maximum boom length?			
What is maximum radius?			
What is counterweight?			
What is chart capacity?			
What is the calculated crane capacity? (Must be less than 90%)			
LIFT EXCEEDS 50 TONS			
What is the total load weight?			
What is maximum boom length?			
What is maximum radius?			
What is counterweight?			
What is chart capacity?			
What is the calculated crane capacity?			

	Yes	No	N/A
MOBILE CRANE COMPONENT OR LOAD CAN SWING WITHIN THE APPROACH LIMIT OF POWER LINES.			
Has alternate lift / swing positions been examined?			
Is de-energizing lines / conductors feasible?			
Are all workers aware of the electrical hazard?			
Is there a separate designated person to monitor power line / conductor clearance?			
What is the line voltage?			
What is the closest allowable safe limit of approach distance?			
LIFT USING TWO CRANES			
Total Load Weight			
Hoisting Equipment “A”			
Hoisting Equipment “ B “			
	“A”	**“ B “**	
Percent of load weight carried			
Total rigging weight including deductions			
Total load weight			
Boom Length			
Maximum Radius			
Chart Capacity at Maximum Radius			
Percent of Chart Capacity			
LOADS OVER LIVE EQUIPMENT			
Has alternate lift / swing positions been considered?			
Are all workers aware of the potential hazard?			
Is there a separate designated person to monitor live equipment clearance?			
What is the live equipment being lifted over?			
What is the closest allowable clearance distance?	4 meters		
ENGINEERED LIFTS			
Engineering Study Completed by Certified Engineering Firm?			
Engineering Study Available at Job Site?			
Engineering Study Reviewed with all Participants?			

NOTES / COMMENTS:

_____

_____

_____

_____

_____

_____

_____

_____

SIGNATURES:

Maintenance / Contractor Supervisor

Print; _____ Signature _____

Terminal Management

Print; _____ Signature _____

Crane Operator

Print; _____ Signature _____

Signalperson

Print; _____ Signature _____

Date; _____