1.0 Purpose and Introduction

The purpose of this procedure is to provide safe working instructions for employees who operate overhead cranes.

2.0 Responsibilities

The President is responsible to ensure that this work instruction is communicated and implemented.

The Safety Coordinator is responsible for:

- ensuring that the requirements of this procedure are followed;
- ensuring that affected employees receive training in this procedure and that relevant records are kept and are available upon request;
- In addition, the Safety Coordinator is responsible to ensure that overhead cranes are thoroughly examined by a competent person to determine the devices' capability of handling the maximum load as rated. Overhead crane examinations will be conducted at least annually, or more frequently, if recommended by the manufacturer. Overhead cranes will be re-examined following any structural repair or modifications. The re- examination shall be performed prior to the device's first use.

Supervisors are responsible for:

- ensuring that employees are trained on, and comply with the requirements of this work instruction;
- regularly monitoring the workplace to ensure that hazards are controlled;
- ensuring that employees receive and wear required personal protective equipment specified in this work instruction.

Workers are responsible for:

- working in compliance with this work instruction;
- using required personal protective equipment specified in this work instruction;
- reporting to their supervisors any safety hazards, defects or damage of which they are aware.

3.0 Potential Hazards Associated with Overhead Cranes

The following summarizes **some** of the hazards associated with overhead cranes:

- material falling from crane when load is elevated;
- being struck by moving material;
- equipment damage from moving material.
- Pinch hazards associated with rigging and slings.

4.0 Work Instructions

4.1 Training

Only trained and competent persons or a worker who is being instructed and accompanied by a competent person is permitted to operate an overhead crane.

A competent person is a person who is:

- qualified to do the work;
- aware of the hazards associated with the work; and
- familiar with all applicable regulations.

4.2 Required Personal Protective Equipment

All operators of overhead cranes must wear CSA-certified safety shoes or boots, safety glasses.

4.3 Pre-Use Inspections

The following daily inspections should be conducted prior to using an overhead crane:

- Know the weight of the load and the capacity of the crane - Never exceed the lifting capacity of the crane.
- Refer to the manufacturer's manual / checklist for specific instructions on what to look for during an inspection.
- Examine cranes daily for loose parts, oil leaks, defects, etc. Report defects immediately to your supervisor. Check all controls.
- Test the limit switch at the beginning of each shift. Follow these steps:
  - Move the crane to an area where the block will not hurt anyone or damage equipment if it falls.
  - Raise the block to a point just below the limit switch. Slowly move the block up until it trips the limit switch.
  - If the hoist still moves at a point where it shouldn't, stop it with the controller. Do this before the block is pulled into the hoist drum or hits the upper sheave unit. This limit switch is unsafe. Report it immediately.
  - If the limit switch works, lower the block enough to permit a full-speed test. Hoist the block at full speed into the limit switch. Leave the hoist controller on until the hoist stops. Again, report any malfunctions to your supervisor.
- Make sure that buttons and controls are clearly marked. If buttons become worn or identification plates loosen and fall off, they must be replaced. Report this to your supervisor.
- Ensure that you are familiar with the controls on the pendant or remote controller and the way in which the trolley or bridge will move when you activate the controls or press the buttons. Test the limit switch at the beginning of each shift.
- If adjustments are needed or something doesn't seem right, report this at once to your supervisor.
- Know how to shut down your crane in an emergency.
- If you find the main or emergency switch open, don't close it, even at the start of regular duty until you're sure no one is on or near the crane.
- Before closing the main switch, make sure that all controllers are in the "off" position.
- Make sure that the "address" of the transmitter and the "receiving" crane are clearly visible and that they match. Report missing or damaged labels.
- All push button and toggle switches must be equipped with springs that return them to the off position when released. Report any defects to your supervisor.

4.4 General Safety Instructions

- Never work under a suspended load.
- Never carry a load over yourself or anyone else.
- Don't allow anyone to ride on the load or hooks.
- Unless strict legal requirements are met, do not use a crane to support, raise or lower workers.
- To avoid tripping the limit switch, pay close attention to the block when long hitches are made.
- Don't reverse a motor until it has come to a full stop, except to avoid accidents.
- Don't bump into runway stops or other cranes. When authorized to push other cranes, do so with special care for the safety of persons on or below the cranes. First release the brakes of the crane being pushed.
- Keep a firm grip on the pendant controls. Failure to do so may cause a serious accident. If you are guiding a radio-controlled crane have firm control of the transmitter.
- Never use the limit switch to stop the hoist. Hoist limit switches are emergency stopping devices that prevent accidental over travel of the load block. They are not intended for constant duty. Control the movement of the hoist with the hoist controller (pendant or transmitter).
- Protect pendants and hand-held transmitters from damage. If damaged, they can malfunction.
- If appropriate, strap the transmitter to your body before you use it. Wear a waist belt or an over-the-shoulder type strap.
- Don't allow pendants to swing. If they strike against a column or any solid fixed object, they can be damaged. If they strike the operator or others nearby, they can cause injury.

4.5 Signals

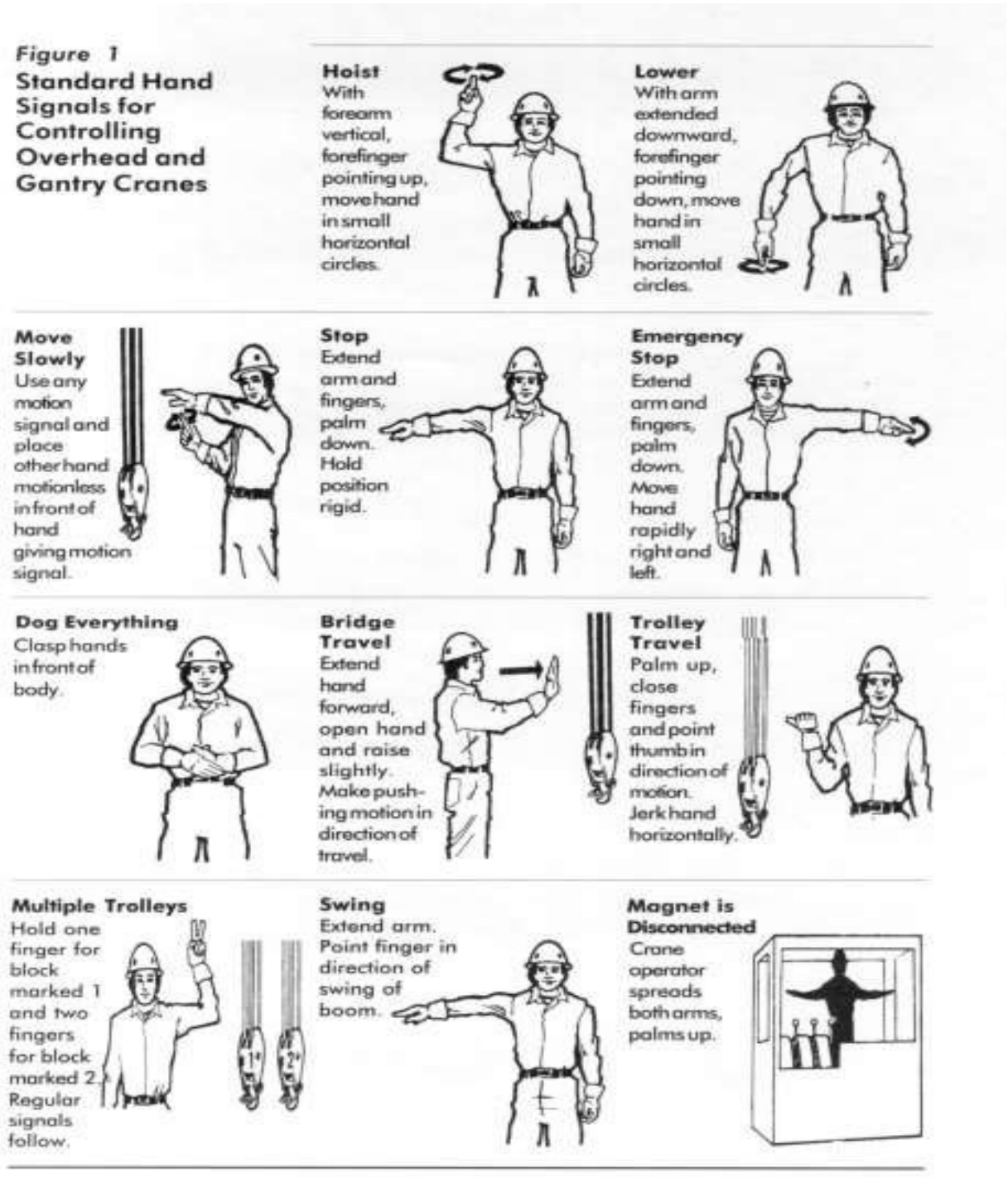
- Except for a stop signal, follow signals only from the authorized employee in charge of the lift.
- Don't accept signals from more than one person.
- Where two cranes are being used for one lift, both you and the second operator should recognize signals from the one person in charge of the lift.

Use hand signals that are deliberate and consistent with the standard signals.

- Give signals to the crane operator **only** if you are the person responsible for the safe hitching of the load. The only exception to this is a stop signal.
- When more than one person is slinging a load, make sure the crane operator knows who will be giving the signals. Except in the case of a stop signal, the crane operator must respond to signals from one authorized person only.

The following signals must be used when operating cranes:

Figure 1
Standard Hand Signals for Controlling Overhead and Gantry Cranes



4.6 General Operating Instructions

- When handling maximum loads, test the hoist brakes after the load has been lifted a few inches. If the brakes don't hold, lower the load at once so that the brakes can be adjusted or repaired.
- Make sure that the hoist hook is directly over the load so that the load will be balanced and won't swing when it's hoisted.
- Make sure that the load is properly hooked up and well secured.
- Ensure that all loose materials, parts, blocking, and packing have been removed from the load.
- Don't make any lifts that you consider to be unsafely rigged.
- Make sure the path is clear.
- Before moving the load, make sure that the path is clear of people, equipment and obstructions. If so equipped, sound the bell, siren, or other warning devices. Then start to hoist slowly.
- Take care that the chain or rope that is lifting the load isn't kinked or caught against any obstructions.
- Raise loads only as high as necessary to clear obstructions safely.
- Never carry a load over yourself or anyone else.
- Hoist and move the load carefully.
- Move the crane controls smoothly and gradually.
- Don't make sudden starts or stops. These movements are extremely dangerous because they can cause shock loading which can overload the lifting equipment.
- If a shock load occurs, report it to your supervisor so that the equipment can be inspected for damage.
- Grip the pendant firmly to prevent excessive swing during crane travel.
- To reduce the motion of the load, "plug" the controls by switching briefly from forward to reverse. If the load is still moving, move the bridge slowly in the direction of the swing.
- Don't make side pulls with the crane.
- Lower and park the load safely.
- When lowering a load, make sure that you have the load under full control.
- Don't lower the blocks below the point where less than two full wraps of cable remain on the drum.
- If your crane stops working while a load is suspended, tell your supervisor.
- Never leave your position at the controls while a load is suspended.
- Park the load in a safe place.
- Prevent unauthorized use of your crane.
- Raise all hooks to within a few inches of the upper limit switches, or in a low traffic area;
- At the end of the shift, move all controls to the "off" position, and open the main switch.
- Push the "off" button on the pendant or the remote control.
- At times, it may be desirable to use a lockout device on the control box or the lockable key switches on the hand-held transmitter. Only you and your supervisor should hold the keys for the lockout. If the control box has no lockout, lock out the main switch when you leave the crane.

PROCEDURES FOR THE SAFETY OF PERSONS WORKING ON CRANES OR FROM CRANE RUNWAYS

- Only work on a crane if you have been authorized and it is safe do so.
- Work on a crane or from the runway only if you receive permission from the supervisor of the department in which the crane or runway is located, and if you are satisfied that all safety procedures are in place.
- Follow proper lockout and tagout procedures.
- When there is only one crane on the runway, the main switch must be opened, locked out, and a tag placed on the lock. The box or handle must also be locked.
- When there are two cranes on the same runway, the switch of the crane being worked on must be locked open and a tag placed on it. In addition, rail stops must also be placed on the rails close to the idle crane.
- Where there are two cranes on the same run way, and one is used as a platform to work from while the other is out of service, the main switch feeding the idle crane must be opened, the box locked, and a tag placed on the lock.
- The crane operator must be satisfied that maintenance persons requesting use of the crane have complied with the above instructions before permitting them to work on or from the crane. If there is any reason to believe safe procedures aren't being followed, the crane operator must tell the supervisor.
- If work has to be done on or from a crane or a crane runway near conductor bars, the supervisor must ensure that the power is disconnected from the conductor bars, and that the switch is locked out.
- Warn others in the area.
- Place a "DANGER" sign or a sign reading "DANGER PERSONS WORKING OVERHEAD" on the floor beneath the crane to warn people in the area.
- Do repair work outside of regular hours, if possible.
- If the above can't be arranged, the repair person should place rail stops, warning signs and signals to protect both ends of the section to be repaired.
- When a contractor's employees are working from or on crane runways, it is the responsibility of the department supervisor to see that the above procedure is followed.
- Wear the proper personal protective equipment.
- A person exposed to the danger of falling more than 3 meters (10 feet) must wear a safety harness with a lanyard secured to a support or lifeline. The support or lifeline must be secured and arranged so that he or she is unable to fall freely for more than 1.5 meters (5 feet).
- Any other required equipment must be provided and worn.
- Clean up after the repair work is done.
- Instruct workers to remove all obstructions, tools, loose parts and other material from the crane or crane runway when the job is completed. Lockout tags, warning signs and barriers may then be removed and the crane returned to service.
- The person responsible for the repairs must record all inspections and service work in the crane log book and date and sign each entry.

HOOKING LOADS ONTO OVERHEAD CRANES

- Inspect your equipment.
- Inspect the condition of all slinging equipment before and after each lift.
- Never use a sling or device that looks unsafe. Report the condition to your supervisor.
- When in doubt about the condition of any accessory, ask your supervisor.
- Determine the weight of the load to be lifted and never overload the crane/hoist
- Choose the proper sling for the job. Check with the tables that list the safe capacities of chain, wire rope, and web slings. These tables should be posted in your workplace.
- Never overload the rated capacity of a sling or crane.
- When lifting boxes, know the weight of the contents and the carrying capacity of the box. Ensure this capacity is not exceeded.
- Keep the load level.
- Ensure the hoist hook is directly above the load's center of gravity.
- Make sure that the sling's attachment points are above the load's center of gravity.
- If the load tilts more than 5º when it is raised off the ground, land the load and re-rig it.
- Keep sling angles greater than 45º.
- The most important point in the hook-up of a sling is the angle between the legs of the sling and the load. This angle should always be at least 45º.
- The smaller the angle between the legs and the load, the greater the risk of overloading. This is because the load on each leg increases as the angle decreases.
- Protect slings and load surfaces from damage.
- Slings can be damaged by sharp edges. Also machined, polished or painted surfaces of loads can be damaged by lifting equipment. To protect slings and load surfaces, use materials such as wood or hard rubber.
- Don't drag slings on the floor.
- Set loads down on blocking, never directly on a sling.
- Remove all slings not in use. Don't leave unused slings, accessories, or blocking lying on the floor or hanging unnecessarily from load hooks. Hang slings on racks or store them in their proper places.
- Attach the load properly.
- Use slings or devices that are of the proper length.
- Never splice a broken sling.
- Don't attempt to pull or push loads to a spot under the hoist. Signal the operator to "spot" the load.
- With boxes, place the slings around the bottom of the box whenever possible.
- Never: Cross, kink, twist or tie knots in a sling to shorten it; Hammer the sling into place or "shock load" a sling
- Never carry a load on the hook point, or insert the point of the hook in a link of the chain;

* Carefully lift and move the load.

- Remove all loose material from the load before lifting.
- If it is necessary to steady slings or fittings while taking out slack, be careful of your hands and fingers. Step aside to a safe distance before the lift is made.
- Be sure that the load is high enough to clear all obstructions before signaling for the bridge of the crane to move.
- Warn all people out of the danger zone before the lift begins.
- Use one or more guide ropes to prevent rotation or uncontrolled motion of the load if such motion may endanger a worker.
- When turning a load, adequate means must be provided and used. Never work under the load.

PLATE CLAMPS

- Never use a clamp if its minimum jaw opening is larger than the thickness of the load.
- If a load is too long or too flexible to be handled safely with a single clamp, use two clamps and a spreader beam.

MAGNETS

- Limit the size of the load. If the load is too long, it may peel off (release) from either end on shock or impact.
- Make sure that the surface of the load to be lifted is free of oil and dirt. Don't lift with the magnet on a curved surface or any surface that doesn't completely cover the face of the magnet. You may lift on a curved surface if it has a designed rating.
- When lifting thin plates or plates that have rough, rusty or scaly surfaces, reduce the magnet's rating by half. Thinner material has less attaching strength than thick material.
- When lifting with a magnet, never move the load over the head of anyone.
- Store the magnet in a safe location.

4.7 Maintenance and Repairs

- Always check with the manufacturer's maintenance manual.
- When repairs are necessary, move the crane to a location where the work won't interfere with other crane and floor operations. When people are working below or there is a traffic aisle, clear the area and set up warning signs and barriers to prevent injury from falling objects. If possible, remove any load if there is one attached.
- Before starting repairs or adjustments, follow all lockout and tag out procedures. Make sure that all controls are placed in the "off" position, that the main or emergency switches are open, and that one of them is locked. The only exception to this is when power is needed to do the repair. Place an appropriate warning tag on the switch.
- Protect yourself and others when you do your work.
- Keep your hands free when going up and down ladders. Articles that are too large to fit into pockets or belts should be lifted or lowered by a hand-line.
- Place rail stops or make other safety provisions if another crane is operating on the same runway.
- Take all precautions to prevent loose parts or tools from falling to the floor below. Tie the tools to the crane if necessary.
- Check the crane before you return it to service.
- After completing repairs to a crane with a suspended load, carefully lower the load and remove the hooks. Thoroughly check the crane before you return it to service.
- Replace all guards and other safety devices before you leave the crane.
- Remove all stops, tools, loose parts and other materials.
- Record service inspections and repair work .