HEALTH, SAFETY & ENVIRONMENTAL MANUAL	11.3 Cranes Program					
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CRANES PROGRAM

PURPOSE

All J-AAR employees who are involved in direct work with cranes are reviewed by J-AAR management and deemed competent for their role. Crane operators are all licensed (or registered apprentices) for the crane they are operating as per the Regulations and are required to receive working at heights training. Swampers and riggers have demonstrated competency at their role and have received training. All applicable Regulations regarding cranes and hoisting and rigging operations will be followed and complied with, including O. Reg 213/91 149.1 – 156, 157-165, 168-180.

PROCEDURE

General Operation Procedure

- Only licensed and qualified crane operators who have been properly instructed may operate the controls.
- Operators must be familiar with operator manuals supplied by the crane manufacturer. The manual must be available in the cab.
- Operator must complete the Operator Crane Logbook.
- All outriggers' beams (if equipped) are to be fully extended and outriggers pads are to be placed on a solid footing or blocking. All tires are to be clear of the ground.
- The boom angle, boom length and the load radius and the crane rated capacity must be known to the operator.
- Crane must be set up level.
- The lifting hook is directly above the load's center of gravity. Load weight must be known.
- Rigging must be correct for the task.
- Crane is set up level on firm, stable ground, or blocking. (Crawlercranes).
- Crane controls will be moved smoothly and gradually to avoid abrupt, jerky movements of the load. Slack must be removed from the slings and hoisting cables before the load is lifted.
- Be sure that everyone in the immediate area is clear of the load and aware that a load is being moved.
- Do not make any lifts beyond the rated capacity of the crane, slings chains, cable slings, etc.
- Do not operate the crane if the limit switches (if equipped) are out of order, or if cables show defects or wear.
- Make certain that before moving the load, load slings, load chains, or other lifting devices are fully seated in the saddle of the hook with the latch closed.
- At no time will a load be left suspended from the crane unless the operator is at the controls with the power on.
- When two or more cranes are used to make one lift, the design of the lift shall be engineered, and communication shall occur through the designated signal person.

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- The operator has total care and control of any lifts, and their decision is final and must not be influenced or pressured to make any lift they feel uncomfortable with.
- Weather conditions must be considered when making a lift.
- All cranes must be inspected annually, or more frequently as required, and recertified by a competent professional engineer.
- A JHA shall be completed for critical lifts.
- Load charts must always be legible and visible to the operator.

Note: Loads with friction such as buried pipe or poles buried in the ground must not be lifted by a crane under any circumstances. The load must be free of force to hoist.

Rigging From Booms and Buckets

Performing Hoisting from Forklifts, Telescoping Boom Equipment, Backhoes and Excavators

Rigging and hoisting from masts, forks, buckets or attached devices to lift trucks, telescoping boom equipment and excavation equipment can only be performed as per manufacturer's instructions and identified attachment points. Buckets, forks, booms, hoists, telescoping booms and other load handling attachments must only be installed and used on mobile equipment as specified by the equipment manufacturer for use on that equipment.

The installation, inspection, testing, repair and maintenance and usage of a tool, machine, device attached to a piece of equipment must be carried out in accordance with the manufacturer's instructions by a qualified person and must otherwise meet regulations and standards for the jurisdiction in which it is to be used.

Note: Certain types of fork extensions may require engineering documentation prior to use

Note: Cutting holes in forks or buckets for the purpose of rigging and hoisting or making similar alterations equipment is not permitted.

Falling Material

No material shall be stacked, piled, or stored within 1.8 meters (6 feet) of:

  - An opening in a floor or roof.
  - The open edge of a floor or roof or balcony.
- Material or equipment used on work platforms, roofs, and other surfaces must be adequately secured to prevent it from falling or tipping.
- Where there is a risk of falling objects, overhead protection must be provided. If this is not practical, the hazardous area must be barricaded with warning signs to prevent access. Entry must not take place in the area unless the overhead work is suspended.

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- All materials must be adequately secured while being moved from one location to another.
- Special attention must be paid during structural steel erection. Nuts, bolts, and tools must be secured and properly stored at all times.
- Supervisors will evaluate the work and travel areas for open grating and falling material hazards. This evaluation will include but is not limited to:
  - Erecting or dismantling scaffolds or work platforms
  - Moving material
  - Craning
  - Moving forklifts, hand carts, transport, and work equipment
  - Performing housekeeping activities on the work site
  - Cutting and welding activities

To review for falling material hazards, use a Job Hazard Assessment (JHA) procedure.

Freeze Down

Environmental conditions must be considered when identifying hazards prior to hoisting any materials such as jersey barriers, pipe, lumber, skids, sea containers or equipment. Material that has been sitting on a surface where the "load" may be frozen down, which typically occurs during winter (freeze/thaw) conditions, present unique hazards.

Unexpected resistance (from frozen loads or components) during hoisting or material moving operations can result in release of unexpected energy in an uncontrolled manner resulting in a high potential for injury or damage. Slings, chains, other rigging components, or the load itself may break or shatter causing injury or damage.

Applying force to break loads free using other equipment may also apply uncontrolled/ uncalculated stress to points on the equipment, or material.

This also applies to existing buried pipelines that are required to be hoisted in order to tie into a new section of pipe.

The following safe work practices are necessary to ensure workers recognize freeze down / friction hazards and provide the controls required to prevent an incident/accident. Prior to hoisting the object, it's important to determine the following:

- Is the object frozen to the ground?
- What force will be applied to move the object from its friction state?
- Is a dynamometer available on site or a means to measure the potential force applied when attempting to break the object free?

- Do I have the necessary equipment and rigging to hoist the object?
- Can engineering controls such as salt or heat be applied to dislodge the object from the ground?
- Do you need to dig further back on the pipe to release pressure?

If you cannot answer these questions, further planning will be necessary such as use of thawing equipment or tenting and heating to release the material from the frozen ground.

Prevention

To eliminate or reduce the risk of uncontrolled force / energy caused by friction, apply the following controls:

- When storing equipment in potentially frozen conditions use plywood, 2x4's or other material as a barrier between the equipment and ground.
- Conduct a JHA to ensure hazards have been identified and controlled.
- All personnel not directly involved in the hoisting must be clear of the operation.
- Use the right tools and rated equipment for the task.
- Always remain clear of the line of fire.
- Be aware of the potential for stored energy in any load.
- Plan your work.
- Back out /stop when unsure or at the limit of the equipment.

Landing Loads

Landing loads and material presents potential danger both at the moment, and afterwards. Always ensure that the area for landing the material has been inspected and secured and is able to support the load safely.

Observe the following safe practices when landing or disengaging from load:

- Ensure chocks are available to land pipe to prevent rolling away.
- Ensure dunnage is available in sufficient dimensions and strength to land the load and safely extract forks or rigging components.
- Only land loads where the ground or surface can safely support the load without settling or shifting.
- Never stack multiple tiers of material unless the landing area can support the cumulative weight over time. Stacks may tip if they settle causing injury or damage.
- Confirm the capacity of racks, decks, or platforms (including trucks) before landing loads.
- Use signalers to assist in the accurate and safe placement of loads whenever the operator does not have a clear line of sight to all perspectives of the landing area.

Legislation

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The following sections from the Construction Regulations must be complied with at all times while using and operating cranes, and using rigging components (cables, slings, chains).

O. Reg 213/91 Sections 149.1 – 156
Cranes, Hoisting and Rigging
Sections 157-165
Tower Cranes

Sections 168-180
Cables, Slings, Rigging

A competent person will review the legislation and regulations, at least annually, to ensure all current programs and procedures are in compliance.
If new or changed procedures are required, this will be communicated to Top Management, the health and safety team, and all affected operators and workers. The changes will be enacted and enforced by the timelines required.