• SUBJECT:
  ✓ Cranes and Hoists

• REGULATORY STATUTES:
  ✓ 29 CFR 1910.179 (Overhead and Gantry Cranes)
  ✓ 29 CFR 1910.184 (Slings)
  ✓ AMSE standards may also apply

Purpose: This SOP applies to stationary hoists and cranes used by Case Western Reserve University personnel and is based on several Occupational Safety and Health Administration (OSHA) and American Society of Mechanical Engineers (ASME) standards, including but not limited to: 29 CFR 1910.179 (Overhead and Gantry Cranes); 29 CFR 1910.184 (Slings); ASME B30.21 (Manually Lever Operated Hoists); ASME B30.11 (Monorails and Underhung Cranes); ASME B30.16 (Overhead Hoists); ASME B30.17 (Overhead and Gantry Cranes); ASME B30.10 (Hooks); ASME30.20 (Below-the-Hook Lifting Devices); ASME B30.26 (Rigging Hardware)

General: Case Western Reserve University (CWRU) will ensure that all potential hazards from use of Cranes and Hoists are inspected. This standard practice instruction is intended to address the inspection process and to identify potential deficiencies in crane use.

Responsibility: The Case Western Reserve University Directors of EHS or their designees are solely responsible for all facets of this program and has full authority to make necessary decisions to ensure success of the program. The Directors of EHS are the sole persons authorized to amend these instructions and are further authorized to halt any operation where there is danger of serious personal injury.
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I. **Written Program**

   a. Case Western Reserve University, Environmental Health and Safety Department, (EHS), will review and evaluate these standard practice instructions on an annual basis, when changes occur to the governing regulatory statutes that prompt revision of this document, or when facility operational changes occur that require a revision of this document. Effective implementation requires a written program for job safety, health, that is endorsed and advocated by the highest level of management within this company and that outlines our goals and plans. This written program will be communicated to all required personnel. It is designed to establish clear goals, and objectives.

II. **Equipment Selection and Installation**

   a. Cranes, hoists, and all ancillary equipment (e.g., hooks, slings, etc.) must meet ASME/ANSI design and installation standards and have sufficient rated capacity for the intended load. The load must not exceed the lowest rated capacity of any single component. Each component should have readily visible load rating markings. A thorough inspection, including load testing, by a professional engineer or manufacturer representative of the crane and its supporting structure must be performed after installation and following modification.

III. **Equipment Maintenance and Inspection**

   a. Cranes, hoists, and all ancillary equipment (e.g., hooks, slings, etc.) must be maintained in accordance with manufacturer recommendations. Defective or damaged components must be removed from service. Replacement of defective or damaged components is often advised (rather than repair).

   b. Operators must inspect cranes and hoists prior to each day’s use.
      i. Verify that the crane or hoist has not been removed from service.
      ii. Visually confirm that controls are clean and function/direction labels are intact and legible.
      iii. Test to confirm that control devices, limit switches, and brakes, as applicable, are functional. Test the upper limit switch of each hoist under no load conditions. If the switch does not operate properly, notify a supervisor and do not use the crane/hoist.
      iv. Verify that guards are in place.
      v. Check for signs of motor fluid leaks.
      vi. Ensure all safety labels are present and legible.
      vii. Visually inspect hooks for damage, cracks, nicks, gouges, deformations of the throat opening, wear on saddle or load bearing point, and twist. If a hook latch is required, check for proper operation.
      viii. Visually inspect ropes and chains for frays, broken strands, knicks, nicks, gouges, or other damage.
      ix. Visually inspect slings for condition and sufficient rated load capacity for intended use. Remove from service if defective. Do not exceed the rated capacity and recognize that the rated capacity may need to be reduced based on sling angle.
         1. Inspect nylon/synthetic fiber slings for holes, tears, cuts, burns, snags, embedded particles, or exposure of warning yarns. Look for excessive wear or elongation, knots, distortion, pitting, corrosion or broken fittings.
2. Inspect wire rope slings for broken wires, kinks, distortion, burns, or other defects.
3. Inspect wire mesh slings for broken welds, nicks, cracks, breaks, gouges, stretch, broken wires, corrosion, discoloration, broken or cracked fittings, or loss of flexibility.

c. Monthly Inspections
   i. Monthly inspections can be conducted by qualified persons designated by the department. Monthly inspections should be documented; include all items described for the daily inspections, as well as the following:
      1. Deformed, cracked or corroded members and braces, or missing fasteners.
      2. Cracked or worn sheaves, drums, sprockets, clamping devices, bumpers, etc.

d. Annual Inspections
   i. Inspections are conducted by a qualified outside contractor. CWRU current contract can be found in the Crane inspection binder on file with the Facilities Safety Manager at EHS. The facility safety manager is responsible for coordinating the inspections.

**** These daily inspections are to be supplemented with monthly and annual inspections ****

IV. Operator Qualifications

a. Operators must be appropriately trained in the use, controls, limitations, inspection, proper rigging/loading, maintenance, and site operating conditions/characteristics of the specific crane or hoist that they are assigned to use. This is the responsibility of the employing department. Verify that new operators have acquired requisite skills through observation by an experienced operator.

V. Operator Considerations

a. Loads slowly to take up slack. Ensure that the load is balanced and holding action is secure, and that everything is seated and operating properly and smoothly.

b. Use the proper load attachment slings or other approved devices with sufficient load rating. Do not wrap hoist chains/ropes around a load. Slings may be made from chain, wire rope, metal mesh, natural or synthetic fiber rope, or synthetic web and must be manufactured for this purpose- do not attempt to assemble a “sling” from ordinary materials.

c. Keep fingers and other body parts from between the sling, hooks, and the load while securing and moving.

d. Before moving a load, test the brake by raising the load a few inches and applying the brake.

e. Avoid sudden acceleration or deceleration.

f. Do not allow people under or near loads. Verify the absence of other nearby hazards and obstructions.

g. If more than one person is involved in the operation/load movement, establish and maintain clear means of communication. Maintain visual contact when possible.

h. Lift loads vertically. Do not use a side pull

i. Do not use the hoist’s travel limits to stop operation. Approach end stops slowly and carefully to avoid load swings.

j. Do not swing loads.

k. Do not leave a load suspended.
l. Do not use a crane or hoist to lift, support, or transport people.

m. Pad loads with sharp edges to prevent them from damaging the sling.

n. Do not shorten slings with knots, bolts, or other makeshift devices.

o. Do not use the hoist upper and lower limit device/switch as an operating control.

p. Stop load movement before reaching these limits.

q. Move a load at the lowest safe height. Do not position the load unnecessarily high.

r. Ensure that loads are not lifted over people, and the path of travel is clear of obstructions. The operator should be positioned in a manner that they will not be at risk of injury during movement of a load or a mishap.

s. Avoid distractions and do not operate a crane or hoist if impaired.

t. When not in use, position hoists/hooks above head level.