

**University of Illinois at Urbana-Champaign
Facilities & Services
Division of Safety and Compliance**

Crane Safety Program Manual

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PURPOSE

The purpose of the Crane Safety Inspection Program is to define the work practices and the inspection procedures to help ensure that the operators of the overhead cranes at the University of Illinois at Urbana-Champaign (UIUC) are protected from potential hazards associated with the movement of equipment and material. The Crane Safety Inspection Program is part of the UIUC's compliance with regulation by the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) entitled "Overhead Cranes" (Code of Federal Regulations, 29CFR 1910.179, 1926.550). American National Standards Institute (ANSI) guidelines are also applicable to the operation and maintenance of overhead cranes (ANSI B30.2, ANSI B30.0, ANSI B30.9C).

This program also includes information on the safe operation and inspection procedures of small portable overhead hoists, chains, slings and hoists which are also regulated by the OSHA Code of Federal Regulation 29CFR 1910.184 and ANSI B30.9C.

POLICY

It is the policy of the UIUC to provide its employees with a safe and healthful working environment. This is accomplished as far as feasible by the Crane Safety Program and its inspection procedure.

SCOPE

The provisions of the Crane Safety Program shall apply to all employees who operate and use overhead cranes, portable hoists, chains and slings, and personnel platforms.

RESPONSIBILITIES

The UIUC Division of Safety and Compliance (S&C) shall:

- A. Review the Crane Safety Program on an annual basis and revise it as necessary.
- B. Provide the technical assistance regarding the regulatory requirements of cranes, chains, slings, and hoists.
- C. Provide or arrange training for the safe operation of overhead cranes, and the inspection procedure for chains, slings and hoists.

Deans, Directors of Academic and Administrative Units and Department Heads shall:

- A. Provide fiscal and administrative support towards the implementation of this Crane Safety Program.
- B. Establish budget support for this program for his/her unit.

Supervisors of employees who may be required to comply with the Crane Safety Program shall:

- A. Attend training on the requirements of the Crane Safety Program which includes the inspection requirements of chains, slings, and hoists.
- B. Assure that the requirements of the program are observed, with respect to daily, monthly and annual inspections. Establish and maintain an inspection checklist record keeping system. Ensure the fitness for duty of crane operators.

- C. Maintain a certification record for inspection which includes the date of inspection, the signature of the person who performed the inspection and an identifier for the rope.

The crane operator shall:

- A. Attend training on the requirements of the Crane Safety Program and the appropriate inspection procedures for chains, slings and hoists.
- B. Conduct the appropriate inspections when they are required and complete the required documentation. Notify the supervisor of any deficiencies identified during inspections by (S&C, IDOL, Equipment Manufacturer, etc.) The inspection checklist shall include the date of inspection, the signature of the person who performed the inspection, and an identifier (e.g., serial number) for the equipment or component being inspected.

FITNESS FOR DUTY

The operator of overhead cranes (cranes and hoists that are two tons or larger) must be a physically fit and thoroughly trained, competent individual, and not using any drug that could impair physical, visual, or mental reactions or capabilities, and must understand all the regulations regarding crane safety.

INSPECTIONS

Overhead crane inspections are divided into two general classifications: Frequent Inspections and Periodic Inspections. Inspection checklists are completed as part of the inspection process. Inspection checklists shall be available for inspection.

Frequent Inspection

Rope slings, hooks and other lifting equipment shall be visually inspected prior to each day's use. All parts including chains, cables, ropes, hooks, etc., on overhead and gantry cranes shall be visually inspected daily for deformation, cracks, excessive wear, twists, stretch, or other signs of deterioration that may pose a hazard during use.

Hooks and chains shall be visually inspected daily, and monthly with a certification record which documents the date of inspection, the signature of the person who performed the inspection, and serial number or other identifier from the equipment. Hooks that have cracks or have more than 15 percent in excess of normal throat opening or more than 10 percent twist from the plane of the unbent hook should be replaced (see **ATTACHMENT 1**).

Running ropes shall be inspected monthly. A certification record which includes the date of the inspection and signature of the person who performed the inspection should be prepared. Any deterioration which results in appreciable loss of strength shall be inspected and a determination made as to whether further use of the rope constitutes a safety hazard. The monthly inspection will consist of noting the following disqualifying conditions:

- A. Reduction of rope diameter below a nominal diameter due to loss of core support, internal or external corrosion, or wear of outside wires.
- B. Three broken wires in one strand in one lay length or six broken wires in any one lay length.

- C. Worn outside wires.
- D. Corroded or broken wires at connections.
- E. Corroded, cracked, bent, worn or improperly applied end connections on the equipment name plate.
- F. Severe kinking, crushing, cutting or un-stranding.

Periodic Inspections

Periodic inspections shall be conducted by a factory trained employee or a contract certified inspection service (see **ATTACHMENT 1**).

A complete inspection of the crane shall be performed at least every 12 months. The inspection should include the following:

- A. Noting any cracked, corroded, worn or loose members or parts.
- B. Noting and replacing loose bolts and tightening those bolts.
- C. Testing the limit indicators (wind, load, etc), power plant and electrical apparatus.
- D. Load testing must be performed at no more than 125 percent of the rated load, unless it is otherwise recommended by the equipment manufacturer.
- E. Examining the electrical apparatus for any signs of pitting, or any deterioration of controller contractors, limit switches and push button stations.
- F. Travel distance steering.
- G. Testing the braking system for excessive wear on the lining, pawls and ratchets.
- H. Hooks and cables.

If any adjustments have to be made to the unit, the crane will not be operated until all the guards have been installed, all safety devices reactivated, and all maintenance equipment moved. If any defect is found, the crane will not be operated until the repair or the adjustment is made.

RATED LOAD MARKING

The rated load of the crane shall be plainly marked on each side of the crane. If the crane has more than one hoisting unit, each hoist and each hoist attachment should have the rate load clearly marked. The marking shall be clearly legible from the ground or the floor. The load shall not exceed the rated load of the crane or hoist.

A common misconception is that the safety factor is built in and that the operator may exceed the rated load up to the safety factor. A load is defined as the total superimposed weight on the load block or hook and includes any lifting devices such as magnets, spreader bars, chains and slings.

Every load that is lifted by a crane shall be well secured and properly balanced in a sling or other lifting device. If the crane operator is not sure of how to appropriately rig a load, Facilities and Services Division of Safety and Compliance should be contacted.

CRANE OPERATION

Operators shall not leave their position at the controls while the load is suspended or pass under a suspended load on the hook. Other employees shall not walk under a suspended load.

Attaching The Load

The operator must be familiar with the appropriate rigging and hoisting techniques to safely move the load. Additionally, the following items should be used to attach the load:

- A. The hoist chain or hoist rope should be free of kinks or twists and shall not be wrapped around the load.
- B. The load should be attached to the load block hook by means of slings or other approved devices. The sling should clear all obstacles.

Moving The Load

The load should be well secured and properly balanced in the sling or lifting device before it is lifted more than a few inches. Before starting the hoist, the hoist rope should not be kinked and the multiple part lines should not be twisted around each other. The hook should be brought over the load in such a manner as to prevent swinging. There should be no sudden acceleration or deceleration of the moving load. The load should not contact any obstructions.

While any employee is on the load or hook, there will be no hoisting, lowering or traveling.

The operator will avoid carrying loads over people.

The operator will test the brakes each time a load approaching the rated load is handled. The brakes will be tested by raising the load a few inches and applying the brakes.

The load will not be lowered below the point where less than 3 full wraps remain on the hoisting drum.

The operator will not leave his position while the load is suspended. The operator needs to be aware of the appropriate chains, hoist, and sling requirements.

CHAINS, SLINGS AND HOISTS

Safe Operating Practices (All slings, chains and hoists)

Slings that are damaged or defective should be destroyed. Slings shall not be shortened with knots, belts or other makeshift devices. Sling legs shall not be kinked.

Slings shall not be loaded in excess of their rated capacities. They shall be securely attached to their loads.

Slings should be padded or protected from the sharp edges of their loads.

Suspended loads shall be kept clear of all obstructions. All employees shall be kept clear of suspended loads and about to be lifted loads.

Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.

A sling should not be pulled from under a load when the load is resting on the sling.

Alloy Steel Chain Slings

All steel chain slings should have a permanently affixed durable identification stating size, grade, rated capacity and reach, and inspection date. Worn or damaged alloy steel chain slings or attachments should not be used until it is repaired. All steel chain slings with cracked or deformed master links, coupling links or other components should be removed from service. Alloy steel chain slings shall be permanently removed from service if they are heated above 1,000°F.

Wire Rope Slings

Fiber core wire rope slings of all grades should be removed from service if they are exposed to temperatures in excess of 200°F.

Wire rope slings should be removed from service if any of the following is present:

- A. Six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay.
- B. Wear or scraping of one-third the original diameter of outside individual wires.
- C. Kinking, crushing, bird caging, or any other damage is noted.
- D. Corrosion of the rope or end attachments.
- E. There is evidence of heat damage.
- F. End attachments are cracked, deformed or worn.
- G. It is determined that hooks have been opened more than 15 percent of the normal throat opening measured at the narrowest point or twisted more than 10 degrees from the plane of the unbent hook.

Metal Mesh Slings

Each metal mesh sling shall have permanently affixed to it a durable marking that states the rated capacity for a vertical basket and choker hitch loadings.

If handles are used on metal mesh slings, the rated capacity must be at least equal to the metal fabric and exhibit no deformations after load testing. If handles are attached to fabric, they should be joined so that the rated capacity of the sling is not reduced, the load is evenly distributed across the width of the fabric, and the sharp edges will not damage the fabric.

Metal mesh slings shall not be used to lift loads in excess of their rated capacities. Metal mesh slings which are not impregnated with elastomers may be used in a temperature range of -20°F to 550°F without decreasing the working load limit. If the sling is impregnated with other materials, then the sling manufacturer's recommendations must be followed.

If metal mesh slings are repaired, they should not be used unless they are repaired by a metal mesh sling manufacturer. Once they are repaired, records must be maintained to indicate the date and the nature of repairs and the person or organization who performed the repairs.

Metal mesh slings must be immediately removed from service, if any of the following conditions are present:

- A. A broken weld or brazed joint along the sling edge.
- B. A reduction in wire diameter of 25 percent due to abrasion or 15 percent due to corrosion.
- C. Lack of flexibility due to distortion of the fabric.
- D. A 15 percent reduction of the original cross sectional area of metal at any point around the handle eye.
- E. Distortion of the female handle so that the depth of the slot is increased more than 10 percent.
- F. Distortion of either handle so that the width of the eye is decreased more than 10 percent.

Natural and Synthetic Fiber Rope Slings

Natural and synthetic fiber rope slings, except for wet frozen slings, may be used in a temperature range from -20°F to 180°F without decreasing the working load limit. For operations outside of this range, the manufacturer's recommendations should be followed. Fiber rope slings should not be spliced in any manner.

Natural and synthetic fiber rope slings shall be immediately removed from service if there is:

- A. Abnormal wear.
- B. Powdered fiber between strands.
- C. Variations in the size or roundness of strands.
- D. Discoloration or rotting.
- E. Distortion of hardware in the sling.

Only fiber rope slings made from new rope shall be used. Use of repaired or reconditioned fiber rope slings is prohibited.

Each sling should be marked or coded to show the rated capacities for each type of hitch and type of synthetic web material.

Nylon web slings should not be used where there are fumes, vapors, sprays, mists, or liquids of acids or phenolic present.

Polyester and polypropylene web slings shall not be used where there are fumes, vapors, sprays, mists or caustics present.

Web slings with aluminum fittings shall not be used where fumes, vapors, sprays, mists, or liquid caustics are present.

Synthetic polyester web slings should not be used with temperatures in excess of 180°F. Polypropylene web slings should not be used at temperatures in excess of 200°F.

Synthetic web slings shall be immediately removed and destroyed if there are:

- A. Acid or caustic burns.
- B. Melting or charring of any part of the sling surface.
- C. Snags, punctures, tears or cuts.
- D. Broken or worn stitches.

- E. Distortion of fittings.

Rigging of Personnel Platforms

When wire rope is used to connect to a personnel platform the following shall be done:

- A. Each bridle leg shall be connected to a master link or shackle in such a manner to ensure that the load is evenly divided among the bridle legs.
- B. Hooks on the overhaul ball assemblies, lower load blocks, or other attachment assemblies shall be of a type that can be closed and locked to eliminate the hook throat opening.
- C. Wire rope, shackles, rings, master links, and other rigging hardware must be capable of supporting, without failure, at least five times the maximum intended load applied or transmitted to that component. Where rotation resistant rope is used, the slings shall be capable of supporting, without failure, at least ten times the maximum intended load.
- D. All eyes in the wire rope sling shall be fabricated with thimbles.
- E. Bridles and associated rigging for attaching the personnel platform to the hoist line shall be used only for the platform and the necessary employees, their tools and the materials necessary to do their work, and shall not be used for any other purposes when not hoisting personnel.
- F. A trial lift shall be repeated prior to hoisting employees whenever the crane or derrick is moved and set up in a new location or returned to a previously used location. Employees shall not be hoisted unless the following conditions are determined to exist:
 - 1. Hoist ropes shall be free of kinks.
 - 2. Multiple part lines shall not be twisted around each other.
 - 3. The primary attachment shall be centered over the platform.
 - 4. The hoisting system shall be inspected if the load rope is slack to ensure all ropes are properly stated on drums and in sheaves.
 - 5. A visual inspection of the crane, derrick, or rigging, personnel platform and the crane or derrick base support or ground shall be conducted by a competent person immediately after the trial lift to determine whether the testing has exposed any defect or produced any adverse effect on the component or structure.
- G. Any defects found during the inspections which create a safety hazard shall be corrected before hoisting personnel.
- H. At each job site, prior to hoisting employees on the personnel platform and after any repair or modification, the platform and rigging shall be proof tested to 125 percent of the platform's rated capacity by holding it in a suspended position for 5 minutes with the test load evenly distributed on the platform. After proof testing, a competent person shall inspect the platform and rigging. Any deficiencies found shall be corrected and another proof test shall be conducted. Personnel hoisting shall not be conducted until the proof testing requirements are satisfied.

PERSONAL PROTECTIVE EQUIPMENT

All employees who handle the wire slings and the hoist cables shall wear leather gloves to prevent any hand injury.

MOBILE CRANES

The employing department shall comply with the manufacturer's specifications and limitations applicable to the operation of any or all cranes or derricks. The attachments that are used with a crane shall not exceed the capacity, rating or scope recommended by the manufacturer. The rated load capacities, recommended operating speeds, and special hazard warnings or instruction shall be conspicuously posted on all equipment.

The requirements are:

- A. A designated competent person will inspect all machinery and equipment prior to each use and during use, to make sure that it is in safe operating condition. If a defective part is found, all parts should be repaired or replaced.
- B. A thorough annual inspection of the hoisting machinery shall be made by a competent person. The dates and the result of the inspections for each hoisting machine and piece of equipment will be maintained by each department. The department will prepare a certification record which will include the date the crane items were inspected and serial number or other identifier for the crane that was inspected. The most recent certification will be retained on file until a new one is prepared.
- C. All accessible areas within the swing radius of the rear of the rotating superstructure of the crane shall be barricaded in such a manner as to prevent an employee from being struck or crushed by the crane.
- D. All exhaust pipes shall be guarded or insulated in areas where contact by employees is possible in the performance of normal duties.
- E. All windows in cabs shall be safety glass, or equivalent. There should be no visible distortion that will interfere with the safe operation of the machine.
- F. Guard rails, handholds, and steps shall be provided on cranes for easy access to the car and the cab.
- G. Platforms and walkways shall have anti-skid surfaces.
- H. An accessible fire extinguisher of 5BC rating or higher shall be available at all operator stations or cabs of equipment.
- I. If the equipment or machinery must be operated next to electrical lines, then the following procedures must be followed:
 1. For electrical lines that are rated 50 KV or below, the minimum clearance between the lines and any part of the crane or load shall be 10 feet.
 2. For lines rated over 50 KV, the minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 KV over 50 KV, or twice the length of the line insulator, but never less than 10 feet.
 3. If the equipment is in transit with no load and boom lowered, the equipment clearance shall be a minimum of 4 feet for voltages less than 50 KV and 10 feet for voltages over 50 KV, up to and including 345KV, and 16 feet for voltages up to and including 750 KV.
 4. A safety observer shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.
 5. Any overhead wire shall be considered to be an energized line unless documentation is available to determine that the electrical lines are de-energized.

PERSONNEL PLATFORMS

Standards

If personnel platforms are used for the hoisting of employees, then the following standards must be followed.

Note: The use of a crane to hoist employees on a personnel platform is prohibited, except where the erection, use, or dismantling of a worksite prohibit the use of conventional means of reaching a worksite (such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold) would be more hazardous or is not possible because of structural design or worksite conditions.

The hoisting of a personnel platform shall be performed in a slow, controlled, cautious manner with no sudden movements of crane or the platform.

The load lines shall be capable of supporting, without failure, at least seven times the maximum intended load, except that where rotation resistant rope is used, the lines shall be capable of supporting, without failure, at least 10 times the maximum intended load.

The load and boom hoist drum brakes, swing brakes, and locking devices (such as pawls or dogs) shall be engaged when the occupied personnel platform is a stationary working position.

The crane shall be uniformly level within one percent of level grade and located on firm footing. Cranes with equipped outriggers shall have them fully deployed following manufacturer's specifications, in so far as applicable, when hoisting employees.

The total weight of the loaded personnel platform and related riggings shall not exceed 50 percent of the rated capacity for the radius and the configuration of the crane.

Cranes with variable angle booms shall be equipped with a boom angle indicator that is readily visible to the operator.

Cranes with telescoping booms shall be equipped with a device to indicate clearly to the operator at all times the boom's extended length. An accurate determination of the load radius to be used during the lift shall be made prior to hoisting personnel.

A positive acting device (anti-two-blocking device) or other system shall be used which deactivates the hoisting action before damage occurs in the event of a two-blocking situation.

The load line hoist drums shall have a system or device on the power train, other than the load hoist brake, which regulates the lowering rate of speed of the hoist mechanism. Free fall is prohibited.

Design criteria:

The personnel platform and suspension system shall be designed by a qualified engineer or qualified person competent in structural design.

The suspension system shall be designed to minimize tipping of the platform due to movement of employees occupying the platform.

The personnel platform itself, except the guardrail system and body belt harness anchorages, shall be capable of supporting, without failure, its own weight and at least 5 times the maximum intended load.

Platform Specifications

Each personnel platform shall be equipped with a guard rail system, and the guard rail system shall be enclosed at least from the toe-board to the mid-rail, with either solid construction or expanded metal that does not have any openings that are greater than 1/2 inch.

A grab rail shall be installed inside the entire perimeter of the personnel platform.

Access gates, if they are installed, shall not swing outward during the hoisting. The access gates, including sliding or folding gates, shall be equipped with a restraining device to prevent accidental opening.

Headroom shall be provided which allows employees to stand upright in the platform. In addition to the use of hard hats, employees shall be protected by overhead protection on the personnel platform when employees are exposed to falling objects.

All rough edges exposed to contact by employees shall be surfaced or smoothed in order to prevent injury to employees from punctures or lacerations.

All welding of the personnel platform and its components shall be performed by a qualified welder that is familiar with the weld grade types and materials specified in the platform design.

The personnel platform shall be conspicuously posted with a plate or other permanent marking which indicates the weight of the platform and its rated load capacity or maximum intended load.

Personnel Platform Loading

Personnel platforms shall be used only for employees, their tools, and the materials necessary to do their work, and shall not be used to hoist only materials or tools when not hoisting personnel.

Materials and tools for use during a personnel lift shall be secured to prevent displacement.

Materials and tools for use during a personnel lift shall be evenly distributed within the confines of the platform while the platform is suspended.

Rigging

When a wire rope bridle is used to connect the personnel platform to the load line, each bridle link shall be connected to a master link or shackle in such a manner to ensure that the load is evenly divided among the bridle legs.

Hooks on overhaul ball assemblies, lower load blocks, or other attachment assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor type shackle with a bolt, nut, and a retaining pin may be used.

Wire ropes, shackles, rings, master links, and other rigging hardware must be capable of supporting, without failure, at least 5 times the maximum intended load applied or transmitted to that component. Where rotation resistant rope is used, the slings shall be capable of supporting, without failure, at least ten times the maximum intended load.

All eyes in wire rope slings shall be fabricated with thimbles.

Bridles and associated riggings for attaching the personnel platform to the hoist line shall only be used for the platform and the necessary employees, their tools, and the materials necessary to do the work, and shall not be used for any other purpose when not hoisting personnel.

Trial Lift, Inspections, and Proof Testing

A trial lift with the unoccupied personnel platform loaded at least to the anticipated lift weight shall be made from the ground level or any other location where employees will enter the platform to each location at which the personnel platform is to be hoisted and positioned. The trial lift shall be performed immediately prior to placing personnel on the platform. The operator shall determine that all systems, controls, and safety devices are activated and functioning properly, and that no interferences exist. The operator will also assure that all configurations that are necessary to reach those work locations and will allow the operator to remain under the 50 percent limit of the hoist's rated capacity.

The trial lift shall be repeated prior to hoisting employees whenever the crane or derrick is moved and set in a new location or returned to a previously used location. The trial lift shall be repeated when the lift route is changed.

After the trial lift and just prior to hoisting personnel, the platform shall be hoisted a few inches and inspected to ensure that it is secure and properly balanced.

Employees shall not be hoisted unless the following conditions are determined to exist:

- A. Hoist ropes shall be free of kinks.
- B. Multiple part lines shall not be twisted around each other.
- C. The primary attachment shall be centered over the platform.
- D. The hoisting system shall be inspected to ensure that all ropes are properly stored on drums and in sheaves if the load rope is slack

A visual inspection of the crane shall be conducted by a competent person immediately after the trial lift to determine whether the testing has exposed any defect or produced any adverse effect upon any component or structure.

Any defects found during inspections which create a safety hazard shall be corrected before hoisting personnel.

Work Practices

Employees shall keep all parts of the body inside the platform during raising, lowering, and positioning. This provision does not apply to an occupant of the platform performing the duties of a signal person.

Before employees exit or enter a hoisted personnel platform that is not landed, the platform shall be secured to the structure where the work is to be performed, unless the securing to the structure creates an unsafe condition.

Tag lines shall be used unless their use creates an unsafe condition.

The crane operator shall remain at the controls at all times when the crane engine is running and the platform is occupied.

The hoisting of employees shall be promptly discontinued upon the indication of any dangerous weather or any other dangers.

Employees being hoisted shall remain in continuous sight of and in direct communication with the operator and signal person.

The employees occupying the personnel platform shall use a body belt/harness system with a lanyard appropriately attached to the lower lead block or to a structural member within the personnel platform capable of supporting a fall impact for employees using anchorage.

Pre-Lift Meeting

Before the lift occurs, a pre-lift meeting must be held involving the operator, signal person, and employees to be lifted. The meeting should be held prior to the trial lift at each new work location and shall be repeated for any employees newly assigned to the operation.

Employees shall keep all parts of the body inside the platform during raising, lowering, and positioning. Before employees exit or enter a hoisted personnel platform that is not landed, the platform shall be secured to the structure where the work is to be performed, unless securing to the structure creates an unsafe condition.

The crane or derrick operator shall remain at the controls at all times when the crane engine is running and the platform is occupied. Hoisting of employees shall be discontinued upon indication of any dangerous weather condition or other impending danger.

Employees being hoisted shall remain in continuous sight of, and in direct communication with, the operator or signal person.

Hoisting of employees while the crane is traveling is prohibited.

ATTACHMENT 1

Inspection Checklist - Overhead Crane
Inspect Periodically and Annually

Date: _____ Inspected By: _____

Location: _____ Crane Make: _____ Model: _____

Lifting Capacity: _____ Serial Number: _____

Equipment		OK	N/A	Faulty
I.	Bridge			
	A. Motor	_____	_____	_____
	B. Brake	_____	_____	_____
	C. Shaft Couplings	_____	_____	_____
	D. Shaft Bearings	_____	_____	_____
	E. Gears	_____	_____	_____
	F. Wheels	_____	_____	_____
	G. Girders and Connections	_____	_____	_____
	H. Guards and Covers	_____	_____	_____
	I. Bumpers	_____	_____	_____
	J. Bumper Bolts	_____	_____	_____
II.				
	A. Master Switches	_____	_____	_____
	B. Pushbutton	_____	_____	_____
	C. Wiring	_____	_____	_____
III.	Main Hoist			
	A. Motor	_____	_____	_____
	B. Brake	_____	_____	_____
	C. Couplings	_____	_____	_____
	D. Gears, Shaft and Bearings	_____	_____	_____
	E. Upper Block	_____	_____	_____
	F. Lower Block	_____	_____	_____
	G. Hook, Magnetic Particle	_____	_____	_____
	H. Hook and Throat Opening Measurement	_____	_____	_____
	I. Hook	_____	_____	_____
	J. Hoist Cable	_____	_____	_____
	K. Rope Drum	_____	_____	_____
	L. Guards	_____	_____	_____
	M. Limit Switch	_____	_____	_____
	N. Cable attachment to drum	_____	_____	_____

Facilities & Services

DIVISION OF SAFETY AND COMPLIANCE

	Equipment	OK	N/A	Faulty
IV.	Trolley			
	A. Motor	_____	_____	_____
	B. Brake	_____	_____	_____
	C. Couplings	_____	_____	_____
	D. Gears, Shaft and Bearings	_____	_____	_____
	E. Frame	_____	_____	_____
	F. Wheels	_____	_____	_____
	G. Bumpers	_____	_____	_____
	H. Guards	_____	_____	_____
	I. Rails	_____	_____	_____
	J. Conductors	_____	_____	_____
	K. Collectors	_____	_____	_____
V.	Runways			
	A. Rails Including Span	_____	_____	_____
	B. Rail Joints	_____	_____	_____
	C. Main Conductors	_____	_____	_____
	D. Main Collectors	_____	_____	_____
	E. Inspection Copy and Date	_____	_____	_____
	F. Authorized User Sign	_____	_____	_____
VI.				
	A. Lubrication	_____	_____	_____
	B. Capacity Signs	_____	_____	_____
	C. Warning Signs	_____	_____	_____
	D. Lockout Mechanism	_____	_____	_____

Comments:

Send copy to: Division of Safety and Compliance, 1501 S. Oak Street, MC-821

ATTACHMENT 2

Inspection Checklist - Ratchet Chain Hoists

Inspect Monthly

Date: _____ Inspected By: _____

Location: _____ Crane Make: _____ Model: _____

Lifting Capacity: _____ Serial Number: _____

Equipment	OK	N/A	Faulty
Load Chain			
A. Remove any foreign material from the chain.	_____	_____	_____
B. Inspect both load and lift chain for wear using a gauge.	_____	_____	_____
C. Inspect chain for gouges, nicks, arc burns, twisted, bent and worn or damaged links.	_____	_____	_____
D. Lower hook and throat opening measurement	_____	_____	_____
E. Upper hook and throat opening measurement	_____	_____	_____
F. Safety Latch	_____	_____	_____
G. Hook Swivel	_____	_____	_____
H. Hook Pin	_____	_____	_____
I. Self Energizing Brake	_____	_____	_____
J. Ratchet Mechanism	_____	_____	_____
K. Inspect sheaves for wear and freedom of movement.	_____	_____	_____
L. Inspect dead end pins	_____	_____	_____
M. Attachment of the Chain to Hoist	_____	_____	_____

Note: After the inspection, lubricate the chain with a light coat of penetrating oil and graphite.

Comments:

Send copy to: Division of Safety and Compliance, 1501 S. Oak Street, MC-821

ATTACHMENT 3

Inspection Checklist - Electric Chain Hoist
Inspect Monthly

Date: _____ Inspected By: _____

Location: _____ Crane Make: _____ Model: _____

Lifting Capacity: _____ Serial Number: _____

Warning: Disconnect power (and discharge the capacitor on single phase units) before inspecting hoists.

<u>Equipment</u>	<u>OK</u>	<u>N/A</u>	<u>Faulty</u>
I. Structural Support System			
A. Mounting Base	_____	_____	_____
B. Vertical Support Column	_____	_____	_____
C. Horizontal Support Column	_____	_____	_____
D. Support and Beam - Maximum rated capacity stenciled on the beam.	_____	_____	_____
II. Main Hoist			
A. Clean the chain by removing any foreign material such as dirt and grease and inspect the chain for wear using a gauge.	_____	_____	_____
B. Slack the chain and observe if wear exists at interlink bearing surface between the links.	_____	_____	_____
C. Inspect the chain for gouges, nicks, arc burns, twisted, bent, worn or damaged links.	_____	_____	_____
D. Inspect the loose end-link, loose end screw and dead end block and clevis pin on the double reeved units.	_____	_____	_____
E. Inspect sheave wheel for freedom of movement.	_____	_____	_____
F. Mechanical load spring brake	_____	_____	_____
G. Electric brake	_____	_____	_____

<u>Equipment</u>	<u>OK</u>	<u>N/A</u>	<u>Faulty</u>
H. Lower hook and throat opening measurement	_____	_____	_____
I. Upper Hook	_____	_____	_____
J. Hook Swivel	_____	_____	_____
K. Hook Pin	_____	_____	_____
L. Chain Drum	_____	_____	_____
M. Guards	_____	_____	_____
N. Limit Switches	_____	_____	_____
III. Operational			
A. Inspect that all connections are made and screw terminals are tight.	_____	_____	_____
B. Check the groundscrews to see that the ground wires of the pendant push button cable and power cord are secure.	_____	_____	_____
C. Master Switch	_____	_____	_____
D. Other	_____	_____	_____

Note: After the inspection, lubricate the chain with a light coat of penetrating oil and graphite.

Comments:

Send copy to: Division of Safety and Compliance, 1501 S. Oak Street, MC-821