POINT EIGHT POWER
Controlling the Power You Generate

HEALTH AND SAFETY MANUAL	
Title: Crane & Hoist Safety - Onshore/Offshore	
Approved by: Greg Savoy	Rev. 12/27/11

1 Purpose/Scope:

Overhead cranes, hoists, and rigging equipment are used by Company employees for lifting and moving materials. In order to maintain a safe workplace for it's employees, only qualified individuals shall operate these devices. This program outlines the procedures for safe operations and the training requirements regarding overhead cranes, hoists and rigging equipment.

This Plan applies to all Company employees who operate overhead cranes, hoists, and rigging equipment in the scope of their job duties and assignments. When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers Company employees and shall be used on owned premises, or when an operator's program doesn't exist or is less stringent.

2 Definitions/Responsibilities:

2.1 Definitions:

2.1.1 Crane - a machine for lifting and lowering a load and moving it horizontally, with the hoisting mechanism an integral part of the machine. Cranes, whether fixed or mobile, are driven manually or by power.

2.1.2 Floor-operated crane - a crane which is pendant or nonconductive rope controlled by an operator on the floor or an independent platform.

2.1.3 Overhead crane - a crane with a movable bridge carrying a movable or fixed hoisting mechanism and traveling on an overhead fixed runway structure.

2.1.4 Wall crane - a crane having a jib with or without trolley and supported from a sidewall or line of columns of a building. It is a traveling type and operates on a runway attached to the sidewall or columns.

2.1.5 Appointed - assigned specific responsibilities by the employer or the employer's representative.

2.1.6 ANSI - the American National Standards Institute.

2.1.7 Auxiliary hoist - a supplemental hoisting unit of lighter capacity and usually higher speed than provided for the main hoist.

2.1.8 Brake - a device used for retarding or stopping motion by friction or power means.

2.1.9 Holding brake - a brake that automatically prevents motion when power is off.

2.1.10 Bridge - that part of a crane consisting of girders, trucks, end ties, foot-walks, and drive mechanism that carries the trolley or trolleys.

2.1.11 Bridge travel - the crane movement in a direction parallel to the crane runway.

2.1.12 Bumper [buffer] - an energy absorbing device for reducing impact when a moving crane or trolley reaches the end of its permitted travel; or when two moving cranes or trolleys come in contact.

2.1.13 Designated - selected or assigned by the employer or the employer's representative as being qualified to perform specific duties.

2.1.14 Drum - the cylindrical member around which the ropes are wound for raising or lowering the load.

2.1.15 Hoist - an apparatus that may be a part of a crane, exerting a force for lifting or lowering.

2.1.16 Load - the total superimposed weight on the load block or hook.

2.1.17 Load block - the assembly of hook or shackle, swivel, bearing, sheaves, pins, and frame suspended by the hoisting rope.

2.1.18 Main hoist - the hoist mechanism provided for lifting the maximum rated load.

2.1.19 Rated load - the maximum load for which a crane or individual hoist is designed and built by the manufacturer and shown on the equipment nameplate(s).

2.1.20 Rope - refers to wire rope, unless otherwise specified.

2.1.21 Runway - an assembly of rails, beams, girders, brackets, and framework on which the crane or trolley travels.

2.1.22 Side pull - that portion of the hoist pull acting horizontally when the hoist lines are not operated vertically.

2.1.23 Span - the horizontal distance center to center of runway rails.

2.1.24 Standby crane - a crane which is not in regular service but which is used occasionally or intermittently as required.

2.1.25 Stop - a device to limit travel of a trolley or crane bridge. This device normally is attached to a fixed structure and normally does not have energy absorbing ability.

2.1.26 Emergency stop switch - a manually or automatically operated electric switch to cut off electric power independently of the regular operating controls.

2.1.27 Limit switch - a switch that is operated by some part or motion of a power-driven machine or equipment to alter the electric circuit associated with the machine or equipment.

2.1.28 Main switch - a switch controlling the entire power supply to the crane.

2.1.29 Trolley - the unit that travels on the bridge rails and carries the hoisting mechanism.

2.1.30 Trolley travel - the trolley movement at right angles to the crane runway

2.2 Responsibilities:

2.2.1 Managers/Supervisors are responsible to ensure that employees and contractors are trained and qualified on the proper operations and have been trained in crane and hoist safety. Modifications or additions which affect the safe operation of the equipment may only be made with the manufacturer's written approval.

2.2.2 Managers/supervisors are responsible to see that all provisions of this program are followed and that crane inspections are performed and the equipment is in safe operating condition.

2.2.3 Employee operators are responsible to follow the requirements of this program and report any damage or needed repairs immediately to their supervisor.

2.2.4 Employees designated as crane operators are responsible for the entire lift. In addition, crane operators are responsible to:

- ❑ Make the required inspections,
- ❑ Ensure that the crane is maintained,
- ❑ Ensure that all personnel working in the area around the crane are kept clear of all hazards related to crane operations.
- ❑ Determine the weights, and correct rigging required for loads to be lifted.

3 Requirements:

3.1 General:

The Company shall comply with the manufacturer's specifications and limitations applicable to the operation of any and all cranes. Where manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determination of a qualified engineer competent in this field and such determinations will be appropriately documented and recorded. Attachments used

with cranes shall not exceed the capacity, rating, or scope recommended by the manufacturer.

3.1.1 This program applies to all cranes including overhead cranes, wall cranes, (jib cranes) and others having the same fundamental characteristics. The operator has the authority to stop (exercise Stop Work Authority) and refuse to handle loads whenever there is a safety concern.

3.1.2 Only designated employees trained in crane and hoist safety shall operate cranes covered by this program. Operators shall be qualified/certified by one of the following methods: 1) Certification by an accredited crane operator testing organization. 2) Qualification by audited employer program. 3) Qualification by the U.S. Military. 4) licensing by a government entity. Manufacturer rated load capacities and operating speeds shall be followed.

3.1.3 All cranes in service and utilized by The Company shall meet, as a minimum, the design specifications of the American National Standard Safety Code for Overhead and Gantry Cranes, ANSI B30.2.0-1967.

3.1.4 Each crane shall have the load rating plainly marked on each side of the crane. Rated load capacities, and recommended operating speeds, special hazard warnings, or instruction, shall be conspicuously posted on all equipment. Instructions or warnings shall be visible to the operator while he is at the control station. If the crane has more than one hoisting unit, each hoist shall have its rated load marked on it or its load block and this marking shall be clearly legible from the ground floor. Procedures applicable to the operation of the equipment shall be readily available in the cab at all times.

3.1.5 All cranes shall be locked and tagged out while repairs are in progress to them or any other equipment or building structure that may have personnel or equipment in their path.

3.1.6 Whenever internal combustion engine powered equipment exhausts in enclosed spaces, test shall be made and recorded to see that employees are not exposed to unsafe concentrations of toxic gases or oxygen deficient atmospheres.

3.1.7 Modifications must be approved by the manufacturer in writing. A registered professional engineer must be qualified with respect o the equipment involved, and must ensure the original safety factor of he equipment is not reduced.

3.2 Inspections Onshore/Offshore:

3.2.1 General:

- ❑ Cranes and hoists that have been overloaded shall be inspected prior to being returned to service.

3.2.2 Initial inspection and test shall be performed by a qualified third party.

3.2.3 Daily inspections shall be performed by the crane operator prior to beginning shift and through observation during normal operation. Daily inspections shall include:

- ❑ All functional operating mechanisms for maladjustment interfering with proper operation.
- ❑ Safety devices. Examples of safety devices may include: crane level indicator, boo stops, jib stops, foot pedal brake locks, horns, etc.
- ❑ Deterioration or leakage in lines, tanks, valves, drain pumps and other parts of air or hydraulic systems.
- ❑ Hooks, if deformations or cracks are found the hook shall be tagged out of service until repaired and tested by qualified personnel.
- ❑ Hoist chains, including end connections, for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations.

3.2.4 Equipment must be inspected monthly by a competent person. Monthly inspections must be documented and retained for 3 months. Documentation must include the following: items checked, results of inspection, and name and signature of the inspector.

3.2.5 Annual inspections shall be documented with a certification record which includes the signature of the qualified third party who performed the inspection, the date, and identifier (serial number, unit number, etc.) for each piece of equipment. If safety hazards are found during inspections, the equipment in question shall be tagged out and not used until repairs are made.

3.3 Operational Procedures:

3.3.1 Only qualified personnel shall operate cranes and equipment covered by this program.

3.3.2 Operators shall comply with the following safety rules while operating cranes and hoists:

- ❑ Do not engage in any practice that will divert your attention while operating the crane.
- ❑ A signal person must be provided if the operator’s view is obstructed, if site specific safety concerns require it, or if the operator determines that it is necessary.
- ❑ Respond to signals only from the person who is directing the lift or any appointed signal person.
- ❑ Obey a stop signal at all times, no matter who gives it.
- ❑ Do not move a load over people.
- ❑ People shall not be placed in jeopardy by being under a suspended load.
- ❑ Do not work under a suspended load unless the load is supported by blocks, jacks, or a solid footing that will safely support the entire weight.
- ❑ Have a crane or hoist operator remain at the controls or lock open and tag the main electrical disconnect switch.
- ❑ Ensure that the rated load capacity of a crane's bridge, individual hoist, or any sling or fitting is not exceeded.

- ❑ Know the weight of the object being lifted.
- ❑ Check that all controls are in the OFF position before closing the main line disconnect switch.
- ❑ If spring-loaded reels are provided to lift pendants clear off the work area, ease the pendant up into the stop to prevent damaging the wire.
- ❑ Avoid side pulls.
- ❑ These can cause the hoist rope to slip out of the drum groove, damaging the rope or destabilizing the crane or hoist.
- ❑ To prevent shock loading, avoid sudden stops or starts.
- ❑ Shock loading can occur when a suspended load is accelerated or decelerated, and can overload the crane or hoist.
- ❑ When completing an upward or downward motion, ease the load slowly to a stop.
- ❑ Cranes must not be used unless ground conditions are able to support the equipment and any supporting material per the manufacturer's specifications.
- ❑ The manufacuturer's proceedures and prohibitions must be complied with when assembling and disassembling equipment.
- ❑ The assembly/disassembly of equipment must be directed by a competent and qualified person.

3.3.3 At the start of each work shift, the designated competent person operator shall do the following steps before making lifts with any crane or hoist:

- ❑ Test the upper-limit switch - slowly raise the unloaded hook block until the limit switch trips.
- ❑ Visually inspect the hook, load lines, trolley, and bridge as much as possible from the operator's station; in most instances, this will be the floor of the building.
- ❑ If provided, test the lower-limit switch.
- ❑ Test all direction and speed controls for both bridge and trolley travel.
- ❑ Test all bridge and trolley limit switches, where provided, if operation will bring the equipment in close proximity to the limit switches.
- ❑ Test the pendant emergency stop.
- ❑ Test the hoist brake to verify there is no drift without a load.
- ❑ If provided, test the bridge movement alarm.
- ❑ Lock out and tag for repair any crane or hoist that fails any of the above tests.
- ❑ Any deficiencies shall be repaired, or defective parts replaced, before continued use.

3.3.4 Moving a load:

- ❑ Center the hook over the load to keep the cables from slipping out of the drum grooves and overlapping, and to prevent the load from swinging when it is lifted.
- ❑ Inspect the drum to verify that the cable is in the grooves.
- ❑ Use a tag line when loads must traverse long distances or must otherwise be controlled.
- ❑ Manila rope may be used for tag lines.
- ❑ Plan and check the travel path to avoid personnel and obstructions.
- ❑ Lift the load only high enough to clear the tallest obstruction in the travel path.
- ❑ Start and stop slowly.

- ❑ Land the load when the move is finished.
- ❑ Choose a safe landing area.
- ❑ Never leave suspended loads unattended
- ❑ In an emergency where the crane or hoist has become inoperative, if a load must be left suspended, barricade and post signs in the surrounding area, under the load, and on all four sides.
- ❑ Lock open and tag the crane or hoist's main electrical disconnect switch.

3.3.5 Parking a crane or hoist:

- ❑ Remove all slings and accessories from the hook.
- ❑ Return the rigging device to the designated storage racks.
- ❑ Place the emergency stop switch (or push button) in the OFF position.

3.3.6 General rigging safety requirements:

- ❑ Only select rigging equipment that is in good condition.
- ❑ All rigging equipment shall be inspected annually; defective equipment is to be removed from service and destroyed to prevent inadvertent reuse.
- ❑ The load capacity limits shall be stamped or affixed to all rigging components.
- ❑ All devices shall be visually inspected prior to use and removed from service for any of the following conditions:
  - ✓ Nylon slings with:
    - ➢ Abnormal wear.
    - ➢ Torn stitching.
    - ➢ Broken or cut fibers.
    - ➢ Discoloration or deterioration.

  - ✓ Wire rope slings with:
    - ➢ Kinking, crushing, bird caging, or other distortions.
    - ➢ Evidence of heat damage.
    - ➢ Cracks, deformation, or worn end attachments.
    - ➢ Six randomly broken wires in a single rope lay.
    - ➢ Three broken wires in one strand of rope.
    - ➢ Hooks opened more than 15% at the throat.
    - ➢ Hooks twisted sideways more than 10 degrees from the plane of the unbent hook.

  - ✓ Alloy steel chain slings with:
    - ➢ Cracked, bent, or elongated links or components.
    - ➢ Cracked hooks.
    - ➢ Shackles, eye bolts, turnbuckles, or other components that are damaged or deformed.

3.3.7 Rigging a load:

- ❑ Determine the weight of the load - do not guess.
- ❑ Determine the proper size for slings and components.
- ❑ Do not use manila rope for rigging.
- ❑ Ensure that shackle pins and shouldered eyebolts are installed in accordance with the manufacturer's recommendations.

- ❑ Ensure that ordinary (shoulderless) eyebolts are threaded in at least 1.5 times the bolt diameter.
- ❑ Use safety hoist rings (swivel eyes) as a preferred substitute for eye bolts wherever possible.
- ❑ Pad sharp edges to protect slings.
- ❑ Remember that machinery foundations or angle-iron edges may not feel sharp to the touch but could cut into rigging when under several tons of load.
- ❑ Wood, tire rubber, or other pliable materials may be suitable for padding.
- ❑ Do not use slings, eyebolts, shackles, or hooks that have been cut, welded, or brazed.

- ❑ Install wire-rope clips with the base only on the live end and the U-bolt only on the dead end.
- ❑ Follow the manufacturer's recommendations for the spacing for each specific wire size.
- ❑ Determine the center of gravity and balance the load Before moving it.
- ❑ Initially lift the load only a few inches to test the rigging and balance.
- ❑ Before proceeding with the lift hazard areas must identified by marking boundaries of the crane swing radius with warning lines, railings, or similar barriers.

3.3.8 Cranes or hoists shall not be loaded beyond their rated capacity for normal operations.

- ❑ Any crane or hoist suspected of having been overloaded shall be removed from service by locking open and tagging the main disconnect switch.
- ❑ Overloaded cranes shall be inspected, repaired, load tested, and approved for use before being returned to service.

3.3.9 Working at heights on cranes or hoists:

- ❑ Anyone conducting maintenance or repair on cranes or hoists at heights greater than 6 ft (1.8 m) shall use fall protection.
- ❑ Fall protection includes safety harnesses that are fitted with a lifeline and securely attached to a structural member of the crane or building.
- ❑ Properly secured safety nets are another option for fall protection.
- ❑ Use of a crane, as a work platform should only be considered when conventional means of reaching an elevated worksite are hazardous or not possible.
- ❑ Workers shall not ride a moving bridge crane.
- ❑ Personnel shall not board any bridge crane unless the main disconnect switch is locked and tagged out of service.

3.3.10 Signals to the operator shall be in accordance with the standard hand signals prescribed by the applicable ANSI standard for the type of crane in use unless voice communications equipment (telephone, radio, or equivalent) is used.

- ❑ Signals shall be discernible or audible at all times.
- ❑ Some special operations may require addition to or modification of the basic signals.

- ❑ For all such cases, these special signals shall be agreed upon and thoroughly understood by both the person giving the signals and the operator, and shall not be in conflict with the standard signals.

3.3.11 All maintenance, tests and inspections shall be conducted in accordance with the manufacturers recommendations and prohibitions must be followed when assembling and/or disassembling equipment. A competent and qualified person must direct the assembly/disassembly of equipment.

3.3.12 All records of annual and load testing shall be retained at the facility where each crane, hoist or other equipment covered by this program is located.

3.3.13 The use and operation of client owned cranes, hoists and rigging equipment by qualified Company personnel will occur only at the express permission of the designated client representative.

3.3.14 An accessible fire extinguisher of ABC rating shall be available at all operator stations or cabs of equipment.

3.3.15 When operating cranes near power lines, a minimum clearance between the power line and any part of the crane or load shall be 20 feet. A pre-operation hazard assessment will be performed to identify the work zone (the work zone shall be identified by demarcating boundaries such as flag and range limiting devices, or defining the work zone as 360 degrees around the equipment up to the maximum working radius.) and determine if any part of the equipment could reach closer than 20 feet to a power-line. If it is determined that any part of the equipment, load line or load could get closer that 20 feet to a power line then at least one of the following measures must be taken: 1) Ensure the power lines have been de-energized and visibly grounded. 2) Ensure no part of the equipment, load line or load gets closer than 20 feet to the power line.

3.3.16 A pre-operation hazard assessment shall be performed to identify the work zone and determine if any part of the equipment could reach closer than 20 feet to a powerline.

3.5 Training:

3.5.1 Training shall include:

- ❑ Documentation of employee, date of training and subject matter, including method used to test knowledge of material by an accredited crane operator testing organization.
- ❑ No employee shall operate cranes or equipment covered by this program until training has been complete and management has approved and designated him or her as a qualified operator.

3.6 Offshore:

3.6.1 Company employees are not allowed to operate offshore pedistal cranes.

3.6.2 Only overhead cranes can be operated by qualifed employees.

4 References:

4.1 29 CFR 1910.179 Overhead and Gantry Cranes.

4.2 29 CFR 1926.550 Crane, Derricks, Hoists, Elevators and Conveyors.

4.3 29 CFR 1926.554 Overhead Hoists.

4 Exhibits:

C-6.1 Overhead Crane and Hoist Inspection Procedure

C-6.2 Daily Guide For Overhead Crane Inspections

Exhibit C-6.1

OVERHEAD CRANE AND HOIST INSPECTION PROCEDURES

Overhead Crane Inspection Procedure:

Inspections can be classified as either "frequent" or "periodic" based upon the intervals at which the inspections must be performed.

Frequent

1 Frequent inspection – daily: The following shall be inspected for defects as noted.

- ❑ All functional operating mechanisms for maladjustment interfering with proper operation.
- ❑ Daily – Must be performed by operator. (no documentation required)
- ❑ Deterioration or leakage in lines, tanks, valves, drain pumps, and other parts of air or hydraulic systems.
- ❑ Hooks with deformation or cracks. Hooks with cracks or having more than 15% in excess of normal throat opening or more than 10 degrees twist from the plane of the unbent hook should be discarded.
- ❑ Wire rope and nylon sling inspection

2 Daily inspections are to be conducted by the equipment operator. These inspections are visual inspections made daily when the overhead crane is used and record keeping is not required.

3 Periodic inspection – annual: The annual inspection shall be performed and documented by a qualified third party. Records shall be kept at the location of the completed inspection.

EXHIBIT C-6.2

DAILY GUIDE FOR OVERHEAD CRANE INSPECTIONS

Yes	No	All functional operating mechanisms for maladjustment interfering with proper operation
Yes	No	Deterioration or leakage in lines, tanks, valves, drain pumps, and other parts of air or hydraulic systems
Yes	No	Hooks for deformation, chemical damage, or cracks. Hooks having more than 15% in excess of normal throat opening or more than 10 degrees twist from the plane of the unbent hook.
Yes	No	Hooks. Dye penetrant, magnetic particle, or other suitable crack-detecting inspection performed at least once a year.
Yes	No	All functional operating mechanisms for excessive wear of components
Yes	No	Rope reeving for noncompliance with manufacturer's recommendations
Yes	No	Condition of wire rope.
Yes	No	Deformed, cracked, or corroded members
Yes	No	Cracked or worn sheaves or drums.
Yes	No	Loose bolts, nuts, or rivets
Yes	No	Worn, cracked, or distorted parts such as pins, bearings, shafts, gears, rollers, locking and clamping devices
Yes	No	Excessive wear in brake system parts, linings, pawls, and ratchets
Yes	No	Load, wind and other indicators over their full range, for any significant inaccuracies
Yes	No	Gasoline, diesel, electric, or other power plants for improper performance or noncompliance with applicable safety requirements.
Yes	No	Electrical apparatus, for signs of pitting or any deterioration of controller, master-switches, and push button stations.
Yes	No	Required warning labels absent or illegible.
Yes	No	Supporting structure, trolley and bridge for alignment and continued ability to support the imposed loads.