Applicable References: OSHA 29 CFR 1910.180, 1926.251, 1926.550; ASME B30.5-2004

1. Purpose & Scope

1.1. This program is intended to provide Cleveland Integrity Services Inc. personnel with a guideline for the safe operation, use and inspection of mobile cranes and hoists.

1.2. This policy applies to wheel mounted cranes of both truck and self-propelled wheel type, and any variations thereof that retain the same fundamental characteristics used at company-controlled work locations where company employees are performing work.

2. Definitions

2.1. *Accessory* -- A secondary part or assembly of parts which contributes to the overall function and usefulness of a machine.

2.2. *Axis of Rotation* -- The vertical axis around which the crane superstructure rotates.

2.3. *Base* -- The traveling base or carrier on which the rotating superstructure is mounted such as a car, truck, crawlers, or wheel platform.

2.4. *Boom Angle* -- The angle between the horizontal and longitudinal centerline of the boom. The boom longitudinal centerline is a straight line between the boom foot pin (heel pin) centerline and boom point sheave pin centerline.

2.5. *Boom Hoist* -- A hoist drum and rope reeving system used to raise and lower the boom. The rope system may be all live reeving or a combination of live reeving and pendants.

2.6. *Boom* -- Member hinged to the front of the rotating superstructure with the outer end supported by ropes leading to a gantry or A-frame and used for supporting the hoisting tackle.

2.7. *Boom Stop* -- A device used to limit the angle of the boom at the highest position.

2.8. *Brake* -- A device used for retarding or stopping motion by friction or power means.

2.9. *Cab* -- A housing which covers the rotating superstructure machinery and/or operator's station. On truck-crane trucks a separate cab covers the driver's station.

2.10. *Clutch* -- A friction, electromagnetic, hydraulic, pneumatic, or positive mechanical device for engagement or disengagement of power.

2.11. *Counterweight* -- A weight used to supplement the weight of the machine in providing stability for lifting working loads.

2.12. *Crane Safe Work Permit* -- The permit issued by the Site Supervisor or Crane Competent Person at the job site to the crane operator before any mobile hoisting work is performed.

2.13. *Critical Lift* -- A lift where:

2.13.1. The load exceeds 80% of the crane's capacity.

2.13.2. Weight of the lift exceeds 50% of the load chart rating of the equipment being used and the lift is over power lines, process equipment, piping, or personnel are being lifted.

2.13.3. Two booms are required.

2.13.4. Poles or derricks have been erected.

2.13.5. Personnel are being lifted.

2.13.6. Crane is traveling with load.

2.13.7. Any lift in a Critical Lift Area.

2.14. *Designated* -- Means selected or assigned by the Company or a representative of the Company as being qualified to perform specific duties.

2.15. *Drum* -- Cylindrical members around which ropes are wound for raising and lowering the load or boom.

2.16. *Dynamic* -- Means loads introduced into the machine or its components by forces in motion for hoisting and lowering loads.

2.17. *Gantry* -- Structural frame, extending above the superstructure, to which the boom support ropes are reeved.

2.18. *Jib* -- An extension attached to the boom point to provide added boom length for lifting specified loads. The jib may be in line with the boom or offset to various angles.

2.19. *Load (working)* -- Means the external load, in pounds, applied to the crane, including the weight of load-attaching equipment such as load blocks, shackles, and slings.

2.20. *Load block [lower]* -- Means the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended by the hoisting ropes.

2.21. *Load block [upper]* -- Means the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended from the boom point.

2.22. *Load hoist* -- A hoist drum and rope reeving system.

2.23. *Load Ratings* -- Crane ratings in pounds established by the manufacturer.

2.24. *Locomotive Crane* -- Consists of a rotating superstructure with power-plant, operating machinery and boom, mounted on a base or car equipped for travel on railroad track. It may be self-propelled or propelled by an outside source. Its function is to hoist and swing loads at various radii.

2.25. *Mobile Hoisting Equipment* -- Conventional rigid boom cranes, hydraulic cranes, and flex-lifts.

2.26. *Outriggers* -- Extendable or fixed metal arms, attached to the mounting base, which rest on supports at the outer ends.

2.27. *Reeving* -- A rope system in which the rope travels around drums and sheaves.

2.28. *Rigging* -- Any cables, chokes, slings, hooks, beams, spreaders, or other device used to attach or lift the load.

2.29. *Rope* -- Refers to a wire rope unless otherwise specified.

2.30. *Side Loading* -- A load applied at an angle to the vertical plane of the boom.

2.31. *Superstructure* -- The rotating upper frame structure of the machine and the operating machinery mounted thereon.

2.32. *Swing* -- Means the rotation of the superstructure for movement of loads in a horizontal direction about the axis of rotation.

2.33. *Swing Mechanism* -- The machinery involved in providing rotation of the superstructure.

2.34. *Tackle* -- Assembly of ropes and sheaves arranged for hoisting and pulling.

2.35. *Truck Crane* -- Consists of a rotating superstructure with power plant, operating machinery and boom, mounted on an automotive truck equipped with a power plant for travel. Its function is to hoist and swing loads at various radii.

2.36. *Wheel Mounted Crane* -- Consists of a rotating superstructure with power plant, operating machinery and boom, mounted on a base or platform equipped with axles and rubber-tired wheels for travel. The base is usually propelled by the engine in the superstructure, but it may be equipped with a separate engine controlled from the superstructure. Its function is to hoist and swing loads at various radii.

2.37. *Whipline* -- A separate hoist rope system of lighter load capacity and higher speed than provided by the main hoist.

2.38. *Winch Head* -- A power driven spool for handling of loads by means of friction between fiber or wire rope and spool.

3. Safety & Operational Requirements

3.1. Operator Qualification & Training

3.1.1. Only qualified operators and trainees, and specific persons who are authorized by a supervisor, will enter the cab of a crane. All persons will enter a crane cab only when their work-related duties require them to do so, and then only with the knowledge of the operator or other appointed individuals.

3.1.2. Only personnel who are trained and qualified in accordance with this program will operate a crane in the course and scope of work for the Company. The Company has adopted crane operator requirements specified in ASME B30.5-2004. Provisions explained in this program are intended to coordinate with this ASME standard.

3.1.3. The crane operator will operate only the specific type of crane(s) for which he or she is qualified under this program. The operator will be qualified through the successful completion of classroom and hands-on training and a written examination.

3.1.4. Experienced crane operators beginning employment with the Company will provide written documentation of successful completion of such training and examination, as well as any prior certification(s) and crane operations experience, before operating a crane at work.

3.1.5. Each crane operator will:

3.1.5.1. Demonstrate his or her ability to read, write, comprehend, and use arithmetic and a load/capacity chart, in the language of the crane manufacturer's operation and maintenance instruction materials;

3.1.5.2. Successfully pass a written examination that covers operational characteristics; routine control skills; emergency control skills (such as response to fire, power line contact, loss of stability, or control malfunction); and characteristic and performance questions appropriate to the crane type for which qualification is being sought;

3.1.5.3. Successfully complete a combination written and verbal test on load/capacity chart usage that covers a selection of the configurations for the crane type for which qualification is being sought;

3.1.5.4. Complete with a satisfactory grade an operation test demonstrating proficiency in handling the specific crane type,

including both prestart and poststart inspection, maneuvering skills, shutdown, and securing procedures; and

3.1.5.5. Demonstrate understanding of the applicable sections of the B30 Standard and federal, state, and local requirements.

3.2. Qualified operators for a specific crane type will be required to re-qualify if supervision deems it necessary. Re-qualification shall include, but not be limited to:

3.2.1. Showing evidence of successfully passing a current physical examination in accordance with this program's medical qualification requirements;

3.2.2. Successful completion of written, verbal and operational testing as specified for initial qualification of crane operators.

3.3. Crane operator trainees will operate cranes only in accordance with training procedures established by the Company and under the direct observation of a designated, qualified operator.

3.4. Qualification requirements for each trainee will include, but not be limited to:

3.4.1. Successfully passing a physical examination by a qualified medical provider in accordance with this program;

3.4.2. Satisfactory completion of a written examination that covers safety, operational characteristics and limitations, and controls of the crane type for which qualification is being sought;

3.4.3. Demonstrated ability to read, write, comprehend, and use arithmetic and a load/capacity chart, in the language of the crane manufacturer's operations and maintenance instruction materials;

3.4.4. Satisfactory completion of a combination written and verbal test on the use of a load/capacity chart covering various crane configurations.

3.5. Qualification of operators and trainees, as well as the re-qualification of operators, will be performed by an individual designated by the Company who is qualified by experience and training to perform this function.

4. Medical Qualifications

4.1. As part of the required physical examination by a qualified medical provider, crane operators and operator trainees will meet physical qualifications as specified below.

4.1.1. Vision of at least 20/30 Snellen in one eye and 20/50 in the other, with or without corrective lenses;

4.1.2. Ability to distinguish colors, regardless of position, if color differentiation is required;

4.1.3. Hearing that is adequate to meet operational demands, with or without use of a hearing aid;

4.1.4. Strength, endurance, agility, coordination and reaction speed that are sufficient to meet the operational demands of the work;

4.1.5. Normal depth perception, field of vision, reaction time, manual dexterity, coordination, and no tendencies to dizziness or similar undesirable characteristics;

4.1.6. A negative result for a substance abuse test, with the type and level of testing as specified by the Company based on standard practices for the industry where the crane is employed (with testing and collection of the sample(s) done in accordance with the Company's written substance abuse program, and analysis performed by a NIDA-certified laboratory);

4.1.7. No evidence of having physical defects or emotional instability that could render a hazard to the operator or others, or that in the opinion of the examiner could interfere with the operator's performance; and

4.1.8. No evidence of being subject to seizures or loss of physical control.

4.2. Exception to the above qualifications will be considered by the Company if it can be demonstrated that failure to meet a specific qualification will not affect the operation of the crane. Such demonstration may require specialized clinical or medical judgments and tests.

4.3. Physical examination of each crane operator by a qualified medical provider will be required every three years, or more frequently if Company supervision deems it necessary.

5. Responsibilities

5.1. Site Supervisor -- The Site Supervisor or his or her designate is responsible for assuring that:

5.1.1. Employees know, understand, and comply with the requirements of this policy.

5.1.2. Employees are trained in the procedures and use of equipment they are to use to complete the job.

5.1.3. Audit and inspect for compliance of this policy.

5.1.4. Each crane is on a regular (daily, monthly, annual) inspection schedule.

5.1.5. Proofs of regular inspections using the checklist in this policy are available.

5.1.6. Rental or leased cranes have a valid annual certification sticker or other documents prior to the use of the cranes.

5.1.7. Competent, qualified operators are used when lifting.

5.1.8. A Crane Safe Work Permit is issued for the following:

5.1.8.1. All lifts with cranes having a capacity greater than 10 tons.

5.1.8.2. All critical lifts.

5.1.9. Joint responsibility with the crane operator for the safe operation of the crane(s) and the safety of the lift is maintained.

5.1.10. Failure to comply with this policy will result in disciplinary action, up to and including discharge.

5.2. Crane Operators -- The crane operator is responsible for:

5.2.1. Knowing, understanding, and complying with this policy.

5.2.2. Inspecting cranes on a daily basis and reporting defects noted during these inspections.

5.2.3. Reporting any unsafe conditions to supervision.

5.2.4. Knowing the weight of loads PRIOR to lifting.

5.2.5. Knowing the wind speed PRIOR to lifting.

5.2.6. Performing a daily inspection using the Daily Operators Inspection Report at the beginning of each days work PRIOR to the crane use. Any deficiencies that affect the safe operations of the crane shall be repaired PRIOR to use. Each daily inspection report shall remain with the operator during the operation of the crane and turned in at the end of the work day.

5.2.7. Perform a lifting job specific pre-task assessment using Operators Lift Pre-Task Safety Assessment for each lift.

5.2.8. Insure the load, rigging, procedures, and lifts are safe to use. The operator is responsible for the load and lift when the crane is connected to the load. Do not load rigging equipment beyond its recommended safe load rating. Attach load identification to the rigging.

5.2.9. When the rigging equipment is not in use, it should be removed from the work area to ensure the safety of workers at the site.

5.2.10. Assume joint responsibility with the Site Supervisor for the safe operation of the crane(s) and the safety of the lift.

5.2.11. Understand that failure to comply with this policy will result in disciplinary action, up to and including discharge.

6. General Requirements

6.1. Pre-Lift

6.1.1. Manufacturer's lifting procedures and methods shall be observed at all times.

6.1.2. No modifications or additions which affect the capacity or safe operation of the equipment shall be made by Cleveland Integrity Services Inc. without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals, shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

6.1.3. All cranes shall have a qualified competent operator.

6.1.4. Inspect cranes when they arrive on site for mechanical integrity, load chart, operating manual and annual certification decal/sticker. The load rating chart will be substantial and durable, with clearly legible letters and figures. A copy of the manufacturer's load rating chart will be maintained in each crane, securely fixed to the crane cab in a location that is easily visible to the operator while seated at the control station. The load rating chart will not be removed from the crane cab.

6.1.5. The crane operator must complete an Operator's Lift Pre-Task Assessment and Mobile Hoisting Safe Work Procedure PRIOR to lifting.

6.1.6. Rated load capacities, recommended operating speeds, special hazard warnings, or instructions shall be in a conspicuous place on all equipment, as required, and shall be visible to the operator while at the control station

6.1.7. Inspect all rigging devices before use. Follow manufacturer's capacities and recommendations. Remove any defective rigging material from service immediately.

6.1.8. Rigging will be done only by qualified personnel who have successfully completed rigger training as approved by the Company, and who have the experience necessary to perform this work safely. Crane operators and inspectors will not perform rigging unless they are similarly trained and qualified.

6.1.9. Obtain a Crane Safe Work Permit for all cranes with capacities of 10 tons or more and critical lifts.

6.1.10. Work with lifts, cranes, or any hoisting equipment must be supervised at all times.

6.1.11. A qualified Signal Person must be provided.

6.1.12. Wooden pads on outriggers will be used on all non-concrete surfaces. Mats will be used as needed.

6.1.13. The rear of the rotating superstructure of a crane will be barricaded to warn of the pinch point hazard.

6.1.14. The area where an overhead lift is made will be barricaded if personnel can have access and walk under the load.

6.1.15. Load block, headache ball, hooks, boom tip, and anti-2 block devices shall be marked with highly visible fluorescent orange paint.

6.1.16. Hooks on overhaul ball assemblies, lower load blocks or other attachment assemblies will 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 retaining pin may be used.

6.1.17. All jibs shall have positive stops to prevent their movement of more than 5 degrees above the straight line of the jib and boom on conventional type crane booms. The use of cable type belly slings does not constitute compliance with this rule.

6.2. Lifting

6.2.1. Lifting multiple loads, "Christmas treeing", is prohibited.

6.2.2. Hand signals to crane operators shall be those prescribed by the applicable ANSI standard for the type of crane in use. An illustration of the signals shall be posted at the job site.

6.2.3. All employees shall be kept clear of loads about to be lifted and of suspended loads.

6.2.4. There shall be no sudden acceleration or deceleration of the moving load.

6.2.5. Side loading of booms shall be limited to freely suspended loads. Cranes shall not be used for dragging loads sideways.

6.2.6. No hoisting, lowering, swinging, or traveling shall be done while anyone is on the load or hook.

6.2.7. On truck-mounted cranes, no loads shall be lifted over the front area except as approved by the crane manufacturer.

6.2.8. The operator shall test the brakes each time a load approaching the rated load is handled by raising it a few inches and applying the brakes.

6.2.9. Outriggers shall be used when the load to be handled at that particular radius exceeds the rated load without outriggers as given by the manufacturer for that crane. Where floats are used they shall be securely attached to the outriggers.

6.2.10. Wood blocks used to support outriggers shall:

6.2.10.1. Be strong enough to prevent crushing.

6.2.10.2. Be free from defects.

6.2.10.3. Be of sufficient width and length to prevent shifting or toppling under load.

6.2.11. Neither the load nor the boom shall be lowered below the point where less than 2 full wraps of rope remain on their respective drums.

6.2.12. When two or more cranes are used to lift one load, one designated person shall be responsible for the operation. He/she shall be required to analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made.

6.2.13. In transit the following additional precautions shall be exercised:

6.2.14. The boom shall be carried in line with the direction of motion.

6.2.15. The superstructure shall be secured against rotation, except when negotiating turns when there is an operator in the cab or the boom is supported on a dolly.

6.2.16. The empty hook shall be lashed or otherwise restrained so that it cannot swing freely.

6.2.17. Before traveling a crane with load, a designated person shall be responsible for determining and controlling safety. Decisions such as position of load, boom location, ground support, travel route, and speed of movement shall be in accord with his determinations.

6.2.18. A crane with or without load shall not be traveled with the boom so high that it may bounce back over the cab.

6.2.19. When rotating the crane, sudden starts and stops shall be avoided. Rotational speed shall be such that the load does not swing out beyond the radii at which it can be controlled. A tagline or restraint line shall be used when rotation of the load is hazardous, unless use of the tagline or restraint line would in itself create a hazard or unsafe situation.

6.2.20. When a crane is to be operated at a fixed radius, the boom-hoist pawl or other positive locking device shall be engaged.

6.2.21. Ropes shall not be handled on a winch head without the knowledge of the operator.

6.2.22. While a winch head is being used, the operator shall be within convenient reach of the power unit control lever.

6.2.23. The operator shall not be permitted to leave his position at the controls while the load is suspended.

6.2.24. No person should be permitted to stand or pass under a load on the hook.

6.2.25. If the load must remain suspended for any considerable length of time, the operator shall hold the drum from rotating in the lowering direction by activating the positive controllable means of the operator's station.

6.3. Other Requirements

6.3.1. Cranes shall not be operated without the full amount of any ballast or counterweight in place as specified by the maker, but truck cranes that have dropped the ballast or counterweight may be operated temporarily with special care and only for light loads without full ballast or counterweight in place. The ballast or counterweight in place specified by the manufacturer shall not be exceeded.

6.3.2. Necessary clothing and personal belongings shall be stored in such a manner as to not interfere with access or operation.

6.3.3. Tools, oil cans, waste, extra fuses, and other necessary articles shall be stored in the tool box, and shall not be permitted to lie loose in or about the cab.

6.3.4. Refueling with small portable containers shall be done with an approved safety type can equipped with an automatic closing cap and flame arrester.

6.3.5. Machines shall not be refueled with the engine running.

6.3.6. When working in an enclosed area with a combustible engine, tests must be conducted and recorded to assure that the employees are not exposed to harmful gasses or oxygen deficient atmospheres.

6.3.7. A carbon dioxide, dry chemical or equivalent fire extinguisher shall be kept in the cab or vicinity of the crane.

6.3.8. Operating and maintenance personnel shall be made familiar with the use and care of the fire extinguishers provided.

6.3.9. Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or other moving parts or equipment shall be guarded if such parts are exposed to contact by employees, or otherwise create a hazard. Guarding shall meet the requirements of the American National Standards Institute B 15.1-1958 Rev., Safety Code for Mechanical Power Transmission Apparatus.

6.3.10. Accessible areas within the swing radius of the rear of the rotating superstructure of the crane, either permanently or temporarily mounted, shall be barricaded in such a manner as to prevent an employee from being struck or crushed by the crane.

6.3.11. All exhaust pipes shall be guarded or insulated in areas where contact by employees is possible in the performance of normal duties.

6.3.12. If rigging equipment is not being used, remove it from the area to avoid a potential trip and fall hazard.

6.3.13. Crane maintenance, repairs and “out of service” procedures

6.3.14. Prior to making repairs or adjustments to a crane, specific procedures shall be followed and precautions taken:

6.3.14.1. Move the crane to be repaired to a place where it will cause the least interference with other cranes and operations in the area.

6.3.14.2. Set all controllers to the off position.

6.3.14.3. Open the main or emergency switch and lock it in the open position.

6.3.14.4. Place prominent warning or "out of order" signs on the crane so that they are in plain sight of workers in the area.

6.3.14.5. After repairs and adjustments are completed, replace all guards, reactivate all safety devices and remove maintenance equipment before operating the crane.

6.3.15. Operations Near Overhead Electrical Lines

6.3.15.1. Except where electrical distribution and transmission lines have been de-energized and visibly grounded at point of work or where insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines, equipment or machines shall be operated proximate to power lines only in accordance with the following:

6.3.15.2. For lines rated 50 kV. or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet.

6.3.15.3. For lines rated over 50 kV., 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.

6.3.15.4. 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 345 kV. and 16 feet for voltages up to and including 750 kV.

6.3.15.5. A person 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.

6.3.15.6. Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not alter the requirements of any other regulation of this part even if such device is required by law or regulation.

6.3.15.7. Any overhead wire shall be considered to be an energized line unless and until the person owning such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.

6.3.15.8. Prior to work near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter shall be de-energized or tests shall be made to determine if electrical charge is induced on the crane.

6.3.15.9. The following precautions shall be taken when necessary to dissipate induced voltages:

6.3.15.9.1. The equipment shall be provided with an electrical ground directly to the upper rotating structure supporting the boom; and

6.3.15.9.2. Ground jumper cables shall be attached to materials being handled by boom equipment when electrical charge is induced while working near energized transmitters. Crews shall be provided with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.

6.3.15.10. Combustible and flammable materials shall be removed from the immediate area prior to operations.

6.3.15.11. The rated load of the crane shall be plainly marked on each side of the crane, and 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 or floor.

6.3.15.12. Bridge trucks shall be equipped with sweeps which extend below the top of the rail and project in front of the truck wheels.

6.3.15.13. Except for floor-operated cranes, a gong or other effective audible warning signal shall be provided for each crane equipped with a power traveling mechanism.

6.3.15.14. All overhead and gantry cranes in use shall meet the applicable requirements for design, construction, installation, testing, maintenance, inspection, and operation as prescribed in the ANSI B30.2.0-1967, Safety Code for Overhead and Gantry Cranes.

7. Inspection Requirements

7.1. The Crane Operator and the Crane Competent Person are responsible for performing inspections using Daily Operators Inspection Report -- Mobile Crane Operation, Monthly Hydraulic Crane Inspection Report and Monthly Inspection of Truck Cranes.

7.2. Inspection of critical components of the crane shall be performed at least monthly. Components inspected shall include crane hooks and safety latches; brakes and braking components; slings and ropes.

7.3. Inspection records shall be filed and maintained by the Safety Coordinator at the Company main office. Crane certification records shall include the inspection date, signature of the inspector, and identification of the component by serial number or other identifier. This certification record shall be maintained so that it is readily available for inspection and confirmation.

7.4. A written record also shall be maintained of reports showing rated load test procedures and confirming the adequacy of repairs or alterations.

7.5. Test loads shall not exceed 110 percent of the rated load at any selected working radius.

7.6. If re-rating is required, crawler, truck, and wheel-mounted cranes shall be tested in accordance with SAE Recommended Practice, Crane Load Stability Test Code J765 (April 1961). Re-rating test report shall be readily available.

7.7. No re-rating in excess of a crane's original load rating shall be performed unless the manufacturer or designated technician who is in charge of final assembly gives their approval in writing. Such written approval shall be maintained in a file by the Safety Coordinator.

7.8. A thorough annual inspection of the hoisting machinery shall be made by a competent person, or by a government or private agency recognized by the U.S. Department of Labor. Cleveland Integrity Services Inc. shall maintain a record of the dates and results of inspections and rated load tests for each hoisting machine and piece of equipment.

7.9. Any defects found will be repaired by a qualified person before the crane is used.

7.10. Before a crane is placed in service for use, rope components shall be inspected by a qualified person for defects, damage and deformities and at least monthly thereafter. Certification of this inspection shall be in writing and document the date of inspection; inspector's name and signature; and identification number of the rope component inspected.

8. **Inspection of wire rope**

8.1. Wire rope shall be taken out of service when any of the following conditions exist:

8.1.1. In running ropes, 6 randomly distributed broken wires in 1 lay or 3 broken wires in one strand in one lay;

8.1.2. Wear of 1/3 the original diameter of outside individual wires.

8.1.3. Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure;

8.1.4. Evidence of any heat damage from any cause;

8.1.5. Reductions from nominal diameter of more than 1/64 inch for diameters up to and including 5/16 inch, 1/32 inch for diameters 3/8 inch to and including 1/2 inch, 3/64 inch for diameters 9/16 inch to and including 3/4 inch, 1/16 inch for diameters 7/8 inch to 1 1/8 inches inclusive, 3/32 inch for diameters 1 1/4 to 1 1/2 inches inclusive;

8.1.6. In standing ropes, more than 2 broken wires in 1 lay in sections beyond end connections or more than 1 broken wire at an end connection.

8.2. Wire rope safety factors shall be in accordance with American National Standards Institute B 30.5-1968 or SAE J959-1966.

8.3. Heavy wear and/or broken wires may occur in sections that have contact with equalizer sheaves or other sheaves (where rope travel is limited) or with saddles. Particular care shall be taken to inspect ropes at these locations.

8.4. If rope has not been used for a month or longer (i.e. due to shutdown or storage of a crane on which it is installed) this rope shall be given a thorough inspection before it is used.

8.5. This inspection shall be made by a designated person who is authorized by the Company. This inspector shall examine rope for any kind of damage, deterioration or defect that might compromise the safety and specifications of the rope. Specific attention and care shall be given to the inspection of non-rotating rope.

8.6. Only this designated and authorized inspector shall give approval for use of this rope following satisfactory safety inspection as described above.

8.7. A written record of the inspector's certification shall be maintained by the Safety Coordinator in a file and be readily available for review and confirmation. This certification shall include the inspection date, name and signature of the inspector, and the identification number of the rope component that was inspected.

9. **Inspection of hoist chains**

9.1. Hoist chains and end connections shall be inspected daily for damage, deterioration, excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations.

9.2. Chains shall be inspected visually by the operator each day or before first use.

9.3. Chains also shall be inspected monthly for safety certification. The written certification shall include the date of inspection, name and signature of the inspector, and the identification number of the chain that was inspected. Written certification records shall be maintained by the Safety Coordinator in a file.

10. **Inspection of hooks and hook components**

10.1. Crane hooks and safety latches shall be visually inspected each day or at the beginning of a shift prior to use for damage, cracks or deformation.

10.2. Hooks and safety latches also shall be inspected monthly for safety certification. The written certification shall include the date of inspection, name and signature of the

inspector, and the identification number of the hook that was inspected. Written certification records shall be maintained by the Safety Coordinator in a file.

10.3. Hooks that have cracks or a throat opening that is greater than 15 percent in excess of normal, or more than 10 degree twist from the plane of the unbent hook shall be discarded.

11. **Preventive maintenance**

11.1. The Company has implemented a preventive maintenance program to help ensure the safety of cranes, hoists, rigging and related equipment. Preventive maintenance shall be performed in accordance with manufacturer's recommendations. Each crane shall have a written record of preventive maintenance that is maintained by the Safety Coordinator.

12. **Inspection and safe use of slings**

12.1. Slings will be inspected prior to each use to ensure that they are not damaged, defective or otherwise unsafe.

12.2. Synthetic web slings shall not be used with loads in excess of the rated load capacities.

12.3. Slings should be used only in accordance with sling manufacturer's recommendations.

12.4. Each sling shall be marked to show rated capacities for each type of hitch and type of synthetic material.

12.5. Each sling shall be marked for inspection identification.

12.6. Webbing shall be of uniform thickness and width and selvage edges shall not be split from the webbing's width.

12.7. Inspect fittings to ensure that they have no sharp edges or projections that could damage the sling.

12.8. Stitching shall be the only method of attachment of fittings to webbing and to form eyes.

12.9. The following restrictions apply:

12.9.1. Nylon web slings are not to be used where fumes, vapors, sprays, mists, or liquids of acids or phenolics are present.

12.9.2. Polyester and polypropylene web slings are not to be used where fumes, vapors, sprays, mists, or liquids of caustics are present.

12.9.3. Web slings with aluminum fittings shall not be used.

12.10. Synthetic web slings of polyester or nylon shall not be used at temperatures in excess of 180(F. Polypropylene web slings shall not be used at temperatures in excess of 200(F.

12.11. Repaired synthetic web slings are not to be used unless the repair is done by the sling manufacturer or an equivalent entity.

12.12. Each repaired sling shall be proof tested to twice the rated capacity by the sling manufacturer or an equivalent entity prior to returning to service.

12.13. The certificate of the proof test shall be maintained for the life of the sling.

12.14. Synthetic web slings shall be immediately removed from service if any of the following conditions exist:

12.14.1. Snags, punctures, cuts or tears,

12.14.2. Broken or worn stitches,

12.14.3. Distorted fittings.

13. **Training Requirements**

13.1. Employees who perform crane, hoist and rigging operations will be qualified through both experience and training as specified by the Company.

13.2. Training will include classroom instruction, hands-on experience and familiarization with components including rigging systems and parts; cables; chokes; slings; hooks; beams; spreaders or other device used to attach or lift the load.

13.3. Classroom training will include instruction on:

13.3.1. Concepts and practices of pre-planning a lift;

13.3.2. Identifying both specific and potential hazards;

13.3.3. Safe rigging, balance and lift procedures;

13.3.4. Standard signaling procedures;

13.3.5. Equipment and inspection procedures; and

13.3.6. Other subject matter that pertains to the actual type or types of rigging and lifting operations to be performed in the Company workplace.

13.4. Hands-on training and observations will address the pre-use inspection of all components; proper selection and use of rigging components; familiarization with and proper use of lift equipment.

13.5. Additionally, training will be conducted annually on the requirements of this policy, and also whenever this policy is revised.

13.6. All new crane operators and rigging crew members will review this policy as part of their training prior to starting work.

13.7. Crane operators and the rigging crew will review this policy prior to lifts.

13.8. If the job involves multiple types of lifts, this policy will be reviewed prior to starting each such lift. This will help ensure that safety situations specific to the type of lift are considered.