

1.1 PURPOSE

- 1.1.1 The purpose of this policy is to outline TERRY R PITT CONSTRUCTION's procedures for safe crane operations, lifting practices, and training requirements regarding cranes, hoists, and rigging equipment.

1.2 GENERAL

- 1.2.1 All operators must be familiar with, trained, certified, and authorized to operate the equipment they are assigned to operate. Documentation of the operator's training must be available upon request. Crane assembly and disassembly will be supervised by a person who is qualified by education, training, certification, or experience and is deemed competent to recognize existing and predictable hazards and has the authority to take prompt corrective action, or a qualified person who is accompanied and assisted by a competent person during the assembly and disassembly of cranes. The competent person will be designated as the A/D director. The A/D director will be knowledgeable in the processes and procedures involved in the assembly and disassembly of the crane. The competent person deemed the A/D director is required to review the A/D processes and procedures prior to commencing operations unless he or she understands and is familiar with the applicable processes and procedures and has experience in A/D operations regarding the same type and configuration of the crane and associated equipment.
- 1.2.2 All provisions of this program must be followed, crane inspections must be performed, and equipment must remain in safe operating condition.
- 1.2.3 TERRY R PITT CONSTRUCTION will provide and ensure use of fall protection equipment for employees who are on a walking/working surface with an unprotected side or edge more than 6 feet above a lower level.
- 1.2.4 Procedures applicable to the operation of equipment must be readily available in the cab at all times. Procedures include rated capacities, recommended operating speeds, special hazard warnings, instructions, and operator manual. A substantial and durable chart with clearly legible letters and figures will be provided with each crane and securely fixed to the crane cab in a location easily visible to the operator while seated at the control station. The manufacturer's operation manual for the crane shall be located in the crane cab and readily available for use by the crane operator at any given instance along with specified rated load charts, recommendations on operating limits and speeds, and hazard warnings.
- 1.2.5 Manufacturer instructions, procedures, and prohibitions must be followed and complied with when assembling and disassembling equipment. Personnel will be familiar with and follow the instructions of the manufacturer, including exclusions. The manufacturer must approve any modifications in writing. A qualified engineer will ensure the safety factor of the equipment is not compromised.
- 1.2.6 While the crane is in operation, the crane operator should not perform any other work or leave the position at the controls until load has been safely landed and the machine secured.
- 1.2.7 All cranes should be equipped with a warning system. Proceed with load movement when personnel are clear.

- 1.2.8 Safety devices including crane level indicator, boom stops, jib stops, foot pedal brake locks, and horns are required to be on all equipment and must be in proper working order before operations begin. If any of the devices are not in proper working order, the equipment must be taken out of service and operations must not resume until the device is working properly.

1.3 SAFE WORK PRACTICES

- 1.3.1 All workers involved with a lift will participate in all JSAs, risk assessments, lift plans when applicable, and safety meetings concerning the lift operation.
- 1.3.2 The crane operator has the authority to stop work and refuse to handle loads whenever there is a safety concern until a qualified person has determined that safety has been assured.
- 1.3.3 Crane booms, cables, and rigging equipment should be inspected at the start of each shift. Any part showing signs of damage should be taken out of service, replaced, or repaired by a qualified technician.
- 1.3.4 Data plates should be attached to all cranes and should clearly indicate the safe load.
- 1.3.5 No crane will be loaded beyond the rated load, except for test purposes.
- 1.3.6 The crane operator should not move a load over any personnel.
- 1.3.7 Workers are not allowed to ride on any part of a crane not designed to hold personnel. When designed to hoist workers, it will be performed in a slow, controlled, cautious manner with no sudden movements of the equipment or the platform.
- 1.3.8 A competent and qualified person must direct the assembly and disassembly of equipment.
- 1.3.9 All cranes should be equipped with a 20# ABC fire extinguisher and within reach of the operator. Operating and maintenance personnel will be made familiar with the use and care of the fire extinguishers provided.
- 1.3.10 Cranes will have handrails around the cab where walkways are used.
- 1.3.11 Crane booms should never be used as scaffolding.
- 1.3.12 Any unsafe condition noted during the crane inspection will be repaired before the crane is used.

1.4 WORK ZONE

- 1.4.1 A pre-operation hazard assessment will be performed to identify the work zone. The work zone will be identified by determining boundaries, which will be identified by flags, range limiting devices, range control warning systems, or by limiting the work zone to the 360° radius of the equipment's maximum working reach. Crane operations will be limited to within the identified work zone and work outside the zone prohibited.

- 1.4.2 If equipment has the potential to strike and injure an employee or pinch/crush an employee against any other object, the swing radius will be identified by some form of warning line. The boundaries of the swing radius of the crane will be marked or barricaded by barriers, lines, railings, or comparable warnings.
- 1.4.3 Cranes must not be used unless ground conditions are able to support the equipment and supporting materials per manufacturer specifications. TERRY R PITT CONSTRUCTION will ensure equipment must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction with the use of supporting materials, equipment manufacturer specifications for adequate support and degree of level of the equipment are met. When needed, additional supporting materials will be used to meet the manufacturer's stability requirements.
- 1.4.4 When working around power lines, lines are presumed to be energized and un-insulated unless confirmed to be de-energized by the utility owner and visibly grounded at the worksite.
- 1.4.5 The lines will be de-energized, grounded, or other protective measures will be provided before work starts, to ensure accidental contact with power lines cannot be made. The hazard assessment must determine if any part of equipment can get closer than 20 feet to a power line. Crane operations are forbidden within 20 feet of an energized power line unless the power line is de-energized and grounded by the energy company owning/operating the power line. Should the power line not be able to be de-energized, a clearance of 20 feet must be maintained for the crane and associated equipment, load, and load line unless the line's voltage and minimum legal approach distance can be determined. If the line's voltage and minimum legal approach distance can be determined, the company must ensure that no part of the crane, associated equipment, load, or load line breaches the minimum approach distance.
- 1.4.6 Determine the line's voltage and minimum approach distance permitted in Table A.

1.5 CRANE OPERATOR

- 1.5.1 Must hold valid crane operator certificate for the applicable crane, be authorized by TERRY R PITT CONSTRUCTION, and be familiar with the crane.
- 1.5.2 Responsible for safe operation of the crane, which includes rejecting unfit lifting equipment or unsafe conditions. The crane operator has the authority to stop and refuse to handle loads until a qualified person determines it safe to resume the lift.
- 1.5.3 Crane operator must not leave the controls while load is suspended, except when operator remains adjacent to the equipment and is not engaged in any other duties, the load is to be held suspended for a period of time exceeding normal lifting operations, the competent person determines that it is safe to do so, and barricades are erected to prevent workers from entering the fall zone.
- 1.5.4 Crane operator must not engage in any practice or activity that diverts his/her attention while actually engaged in operating the equipment, such as the use of cellular phones (other than when

used for signal communications).

- 1.5.5 Keep condition of the crane in accordance with the planned maintenance program and certified according to class authority.
- 1.5.6 TERRY R PITT CONSTRUCTION crane operators are required to maintain a current physical and meet physical requirements specified as follows:
 - 1.5.6.1 Be able to distinguish between red, yellow, and green
 - 1.5.6.2 20/30 Snellen in one eye and 20/50 in other eye with or without glasses and have depth perception
 - 1.5.6.3 Be able to pass a hearing exam with or without a hearing aid
 - 1.5.6.4 Have no history of disabling medical condition which may be sufficient reason for disqualification
- 1.5.7 Crane operator qualifications must be maintained every four years and include vision and medical condition evaluations.

1.6 EQUIPMENT

- 1.6.1 Modifications or additions that may affect the capacity or safe operation of the equipment must not be made without written approval from the manufacturer. A registered professional engineer must be qualified with respect to the equipment involved and must ensure the original safety factor of the equipment is not reduced.
- 1.6.2 Manufacturer procedures applicable to the operational functions of equipment, including its use with attachments, must be complied with.
- 1.6.3 Safety devices are required to be on all equipment and must be in proper working order before operations begin. If devices are not in proper working order the equipment must be taken out of service and operations must not resume until the device is working properly.
- 1.6.4 Operational aids are required on all equipment. Operations must not begin unless the operational aids are in proper working order.
- 1.6.5 Rated load capacities, recommended operating speeds and special hazard warnings or instructions must be posted on cars and platforms.
- 1.6.6 Crane hooks should be equipped with a safety latch.
- 1.6.7 Lifting equipment will be maintained in a safe, effective working order and in good condition through a planned maintenance system. The maintenance program will include planned and recorded maintenance intervals per manufacturer recommendation or risk assessments.

- 1.6.8 When the load to be handled and operating radius require the use of outriggers or stabilizers, or at any time when outriggers or stabilizers are used, all of the following requirements must be met:
 - 1.6.8.1 Must be either fully extended or, if manufacturer procedures permit, deployed as specified in the load chart.
 - 1.6.8.2 Must be set to remove the equipment weight from the wheels
 - 1.6.8.3 When outrigger floats are used, they must be attached to the outriggers. When stabilizer floats are used, they must be attached to the stabilizers.
- 1.6.9 Each outrigger or stabilizer must be visible to the operator or to a signal person during extension and setting.
- 1.6.10 The competent person will notify the supervisor immediately upon discovery of any defect in the lifting equipment that, in the opinion of the competent person, is or could become a danger, so that appropriate action can be taken to repair or replace the equipment or otherwise ensure that potentially dangerous equipment is withdrawn from use.

1.7 WIRE ROPE PROGRAM

- 1.7.1 A safe and effective wire rope program will be in place prior to any crane operations.
- 1.7.2 Wire ropes must be maintained in accordance with manufacturer recommendations.
- 1.7.3 Comply with manufacturer procedures when assembling and disassembling equipment.
- 1.7.4 Wire ropes or cables will be inspected by a competent person at the time of installation and during operations and must be taken out of service if deterioration or damage is evident. The inspection must consist of observation of wire ropes (running and standing) that are likely to be in use during the shift for apparent deficiencies.
- 1.7.5 Wire ropes removed from service due to defects will be plainly marked or identified as being unfit for further use on crane or other load carrying devices.
- 1.7.6 At no time will a load be applied to a kinked rope.
- 1.7.7 Power greasing or treating of wire ropes is to be considered if ropes are to be out of commission for extended periods.
- 1.7.8 Connections, fittings, fastenings, parts, etc. used with wire cables and ropes will be of good quality, proper size and strength, and installed according to manufacturer recommendations.
- 1.7.9 Socketing, splicing, and seizing of wire rope will only be carried out by a qualified person who is approved by TERRY R PITT CONSTRUCTION.
- 1.7.10 Wire rope must be taken out of service when any of the following conditions exist:

- 1.7.10.1 In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay
- 1.7.10.2 Wear of $\frac{1}{3}$ the original diameter of outside individual wires
- 1.7.10.3 Kinking, crushing, bird caging, or other damage causing distortion of rope structure
- 1.7.10.4 Evidence of any heat damage from any cause
- 1.7.10.5 In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection

1.8 RIGGING

- 1.8.1 An important element of the TERRY R PITT CONSTRUCTION material handling program is proper rigging practices. Rigging of loads must be done with relative precision and performed by trained, experienced personnel.
- 1.8.2 Before commencing assembly/disassembly operations, the assembly/disassembly director must ensure that riggers understand all of the following: their tasks, the hazards associated with their tasks, and the hazardous positions/locations that they need to avoid. To ensure that safe practices are followed, a competent and qualified person must direct assembly and disassembly of equipment.
 - 1.8.2.1 Rigging equipment that has the necessary capacity to do the job is available
 - 1.8.2.2 Rigging equipment is in a safe working condition
 - 1.8.2.3 Loads are rigged correctly
 - 1.8.2.4 Safety of the rigging crew and other potentially exposed personnel is maintained
- 1.8.3 Only select rigging equipment that is in good condition.
- 1.8.4 Each sling will be inspected before being used. Slings, fastenings, and attachments will be inspected by a designated competent person. Defective equipment is to be removed from service and destroyed to prevent inadvertent reuse.
- 1.8.5 The load capacity limits will be stamped or affixed to all rigging components.
 - 1.8.5.1 If crane has more than one hoisting unit, each hoist will have its rated load marked on it or its load block and this marking will be clearly legible from the ground floor.
- 1.8.6 Devices are visually inspected prior to use and damaged equipment is removed from service.
- 1.8.7 Heavy machinery, equipment or parts which are suspended by use of slings or hoist should be substantially blocked or cribbed before men are permitted to work underneath or between them.
- 1.8.8 Determine the weight of the load - do not guess.
- 1.8.9 Determine the proper size for slings and components.

- 1.8.10 Do not use manila rope for rigging.
- 1.8.11 Ensure shackle pins and shouldered eyebolts are installed according to manufacturer recommendations.
- 1.8.12 Ensure ordinary (shoulderless) eyebolts are threaded in at least 1.5 times the bolt diameter.
- 1.8.13 Use safety hoist rings (swivel eyes) as a preferred substitute for eye bolts wherever possible.
- 1.8.14 Pad sharp edges to protect slings.
- 1.8.15 Machinery foundations or angle iron edges may not feel sharp to the touch but could cut into rigging when under several tons of load.
- 1.8.16 Wood, tire rubber, or other pliable materials may be suitable for padding.
- 1.8.17 Do not use slings, eyebolts, shackles, or hooks that have been cut, welded, or brazed.
- 1.8.18 Install wire rope clips with the base only on the live end and the U-bolt only on the dead end.
- 1.8.19 Follow manufacturer recommendations for the spacing for each specific wire size.
- 1.8.20 Determine the center of gravity and balance the load before moving it.
- 1.8.21 Loads should be controlled with taglines having a length of at least 6' and no knots.
- 1.8.22 Initially lift the load only a few inches to test the rigging and balance.
- 1.8.23 No sudden acceleration or deceleration of the moving load.
- 1.8.24 Make sure the load does not contact any obstructions.
- 1.8.25 No hoisting/lowering/swinging/traveling while a worker is on the load or hook.
- 1.8.26 Operator should avoid carrying loads over people.
- 1.8.27 The load and the boom will not be lowered where there is less than two full wraps of rope on their respective drums.
- 1.8.28 Operator does not leave his position at the controls while the load is suspended.

1.9 SIGNALING

- 1.9.1 A signal person must be provided for the following situations:
 - 1.9.1.1 The point of operation is not in full view of the operator
 - 1.9.1.2 The view is obstructed when the equipment is traveling
 - 1.9.1.3 Operator or person handling load determines it necessary for site specific concerns

- 1.9.2 Signals to operator will be in accordance with hand signal standards prescribed by applicable ANSI standards for the type of crane in use unless voice communication equipment is used.
- 1.9.3 Signalers must be qualified.
- 1.9.4 Signals will be discernible or audible at all times.
- 1.9.5 Some special operations may require addition to or modification of the basic signals.
 - 1.9.5.1 Special signals will be agreed upon and thoroughly understood by both parties and will not conflict with standard signals.
- 1.9.6 Where a signal person is in communication with more than one crane, a system must be devised for identifying the crane each signal is for.
- 1.9.7 Assigned signal person will give all hand signals and radio communications clearly, correctly, and in sufficient time to allow the crane operator to respond.
- 1.9.8 The crane operator should never move the machine until the signal is understood and must obey an *EMERGENCY STOP* signal from anyone.

1.10 INSPECTION

- 1.10.1 The crane operator must conduct a visual inspection of equipment prior to each shift. The inspection must consist of observation for obvious deficiencies. Some inspection items will include control mechanisms, pressurized lines, hooks and latches, wire rope, electrical apparatus, tires, and ground conditions.
- 1.10.2 Inspection must include checks prior to equipment being used and checks at appropriate and periodic intervals or under prevalent conditions as may be identified by the lift plan and as a result of the risk assessment. The periodic inspection should include components such as deformed, cracked, or corroded members in the crane structure and boom, loose bolts or rivets, cracked or worn sheaves and drums, worn parts, and excessive wear items.
- 1.10.3 Equipment must be inspected monthly by a competent person. Inspection reports will detail the defects found or include a statement to the effect that the equipment is fit or unfit for continued safe use. Inspection reports will be documented and retained for three months. The inspection documentation will, at a minimum, include the name and signature of the competent person conducting the inspection, date, items inspected, and the findings of the inspection. TERRY R PITT CONSTRUCTION will maintain the inspection records for a minimum of three months. A daily inspection by a competent person may be utilized in lieu of the monthly inspection as long as the daily inspection contains the same information.
- 1.10.4 Wire rope will be inspected on the following schedule:
 - 1.10.4.1 Shift inspection – Before each shift

- 1.10.4.2 Monthly inspection
- 1.10.4.3 Annual inspection – At least every 12 months, unless not feasible due to set up. This will be a more detailed inspection including wire rope that is normally hidden during daily or monthly inspections and the inspection will be documented.
- 1.10.5 Equipment must be inspected monthly by a competent person. A documented inspection must include the following:
 - 1.10.5.1 What items were checked
 - 1.10.5.2 Results of inspection
 - 1.10.5.3 Name and signature of who performed the inspection
- 1.10.6 All ropes and slings must be thoroughly inspected monthly and before each use and certified by recording the date of inspection, ID of the rope inspected, and the signature of the person performing the inspection.
 - 1.10.6.1 An identifier for the ropes will be prepared and kept on file where readily available.
 - 1.10.6.2 All inspections will be performed by an appointed or authorized person.
 - 1.10.6.3 Any deterioration, resulting in appreciable loss of original strength will be carefully observed and determination made as to whether further use of the rope would constitute a safety hazard.
- 1.10.7 Monthly inspections will be made and documented of critical items on the crane including brakes, hooks, ropes, hoist chain, boom, back-up alarm, horn, lights, and fire extinguisher. Certification records shall include the date of inspection, the signature of the person who performed the inspection, and the serial number or other identifier of the crane that is inspected.
- 1.10.8 A crane or overhead gantry that has not been used for a period of one month or more will be inspected by the employee trained to use such equipment before each use.
 - 1.10.8.1 Inspect all functional operating mechanisms.
 - 1.10.8.2 Check for damage to or leaks from lines, tanks, valves, drain pumps, and air or hydraulic systems.
 - 1.10.8.3 Check the load hook for deformities or cracks.
 - 1.10.8.4 Check all hoist chains for excessive wear, including end connectors.
 - 1.10.8.5 Check all chains for kinks, twists, and distorted links and stretches that are beyond what is recommended by the manufacturer.
 - 1.10.8.6 Inspect the rope for damage such as kinks, cracks, cutting, bending, broken wires, and unraveling, corroded, or improperly connected end connections.

- 1.10.8.7 Hooks—if deformations or cracks are found, the hook will be tagged out of service until repaired and tested by qualified personnel.
- 1.10.8.8 Hoist chains, including end connections, will be checked for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer recommendations.
- 1.10.9 Equipment deficiencies found during inspections creating a safety hazard will be tagged *OUT OF SERVICE* until repairs are made.
- 1.10.10 Regardless of how often a crane or overhead gantry is used, the unit will be inspected annually by an outside contractor qualified to inspect the unit. This inspection will be the responsibility of the department to arrange. The contractor will document and provide the owner with a copy of the findings who will in turn provide copies to the safety department.

1.11 MAINTENANCE

- 1.11.1 Equipment will be inspected with planned maintenance schedules per the following:
 - 1.11.1.1 Before use and on each occasion (pre-use check, written record not required).
 - 1.11.1.2 At weekly intervals for items of lifting equipment in use (weekly check list required).
 - 1.11.1.3 At other intervals or under conditions identified by the manufacturer or risk assessment.
 - 1.11.1.4 Where review of lifting equipment records indicates that it may be practical to do so.
- 1.11.2 Written reports will be maintained on rated load tests showing the test procedure and confirming the adequacy of any repairs or alterations.
- 1.11.3 Preventive maintenance will be performed as prescribed by the manufacturer as detailed in the owner's manual. Maintenance of the units will be performed by an outside contractor qualified to perform maintenance.

1.12 TRAINING

- 1.12.1 Crane operators will be trained and participate in competency assessments prior to working alone. Training will take place prior to competency assessment.
- 1.12.2 Training will consist of classroom sessions, hands-on training, and operator performance evaluation. At a minimum, the training will comprise of:
 - 1.12.2.1 Lubricating points, adjustments, principles of crane operators, load charts, hand signals, and inspections.
 - 1.12.2.2 Knowledge of regulatory requirements such as ASME, OSHA, etc.
 - 1.12.2.3 Pre-use inspections
 - 1.12.2.4 Use of fire extinguishers

- 1.12.2.5 Signal man (dogman)/Visibility and communication during lifting operations
- 1.12.2.6 Below hook device safety systems
- 1.12.2.7 Stop Work Authority
- 1.12.2.8 Environmental/weather conditions
- 1.12.2.9 Use of lifting equipment in restricted areas
- 1.12.2.10 Proximity hazards such as electrical lines or parallel activity by others
- 1.12.2.11 Prevention of load striking any person or object
- 1.12.2.12 Attaching, securing, detaching loads, and tagline usage
- 1.12.2.13 Overloading lifting equipment
- 1.12.2.14 Overturning, tilting, slipping, and dragging loads
- 1.12.2.15 Not working under suspended load/Not leaving loads suspended

1.12.3 Only trained, qualified, certified, and authorized crane operators will be allowed to operate equipment and machinery. TERRY R PITT CONSTRUCTION ensures operators are qualified by one of the following methods:

- 1.12.3.1 Certification by an accredited crane operator testing organization that includes a written examination of the safe operating procedures for the particular equipment the operator will be operating and technical understanding of the subject matter criteria required under 29 CFR 1926.1427(i) as well as a practical exam demonstrating that the crane operator has the skills needed to safely operate the equipment, including, among other skills, the ability to properly use load chart information and recognize items as required in the shift inspection.
- 1.12.3.2 Qualification by an audited employer program
- 1.12.3.3 Qualification by the U.S. military
- 1.12.3.4 Licensing by a government entity
- 1.12.3.5 Refresher training is required every four years