Regulation IO – 9.0: Equipment Operations & Machinery Installations

9.1 Fork Lifts
9.2 Mobile Crane
9.3 Overhead & Gantry Crane
9.4 Personnel Platform on crane operations
9.5 Hand Tools & Portable Power Equipment
9.6 Machinery Installation
9.7 Abrasive Wheel Grinder
9.8 Band Saw
9.9 CNC Machine
9.10 Compacting & Bailing Machines
9.11 Cut-Off Saw
9.12 Drill Press
9.13 Iron Worker
9.14 Metal Lathe
9.15 Wood Lathe
9.16 Milling Machine
9.17 Planer Machine
9.18 Portable Abrasive Grinder
9.19 Portable Belt Sander
9.20 Portable Circular Saw
9.21 Power Press
9.22 Power Roll Forming & Bending Machine
9.23 Belt Sander
9.24 Disk Sander
9.25 Shear Machine
9.26 Table Saw
9.27 Air Receiver Tank and Its Accessories
9.28 Dead Man's Switch
9.29 Portable Ladder / A Frame Ladder Or Step Ladder

Regulation IO – 9.0: Equipment Operations & Machinery Installations

9.1 Fork Lifts

9.1.1 Safe System:

9.1.1.1 Employers shall provide a safe and industrious workplace, adequate training, and supervision.

9.1.1.2 Employees engaged in Forklift Training by local authority's approved third party training institute shall not be allowed to operate forklift at any circumstances with or without load.

9.1.1.3 Operating area of the forklift shall be provided with (i) appropriate traffic signs at strategic locations (ii) Mirrors and Visual Aids at suitable corners & the area where hidden hazards are likely exists (iii) adequate lighting facilities (iv) loading & unloading facility isolated from moderate/heavy traffic areas (v) speed Limitations not to exceed 8 km/hr (vi) flexible or transparent doors wherever required/practicable (vii) adequate parking facility.

9.1.2 Safe Operations of Forklift:

9.1.2.1 Employers shall ensure that forklifts are operated by a licensed holder & in-line with the instructions of the designers or manufacturer or of any competent person who frames instruction for safe operations of the forklift.

9.1.2.2 No Employees or training employees or any assistant to forklift or machinery/equipment operators shall be allowed to operate the forklift unless forklift operating license issued by local authority & appropriate training in materials handling operations is given.

9.1.2.3 Forklift Operators manuals & operating instruction of the forklift shall be kept readily available to all the forklift operators.

9.1.2.4 Forklifts shall be provided with reverse warning sound/buzzer. Rotating flashlight to be fitted while working in dark conditions or in crowded places.

9.1.2.5 No alteration of the forklift or its part of the mechanical or electrical system shall be carried out by any employees in the organization.

9.1.2.6 Forklift(s) shall be engaged for operations only after obtaining necessary test certificate issued by Trakhees' pre-qualified third party.

9.1.2.7 Validity of Load Test certificate issued by Trakhees' pre-qualified third party shall be maintained always without fail.

9.1.2.8 Copy of Load Test Certificate shall be kept on the forklift for ready reference by Authority having jurisdiction.

Regulation IO – 9.0: Equipment Operations & Machinery Installations

9.1.2.9 Repair, Maintenance of the forklift shall be done by the competent person and also within the approved facility as per the Manufactures or designers recommendations.

9.1.2.10 Forklift operations shall be withdrawn immediately where the condition of forklift presents an immediate risk to the safety or health of operators or others working around the forklift until it is repaired & certified with necessary load test certificate issued by Trakhees' pre-qualified third party.

9.1.2.11 Employer shall ensure that Operator protective devices including roll-over protective structures (ROPS), falling object protective structures (FOPS) are provided on each forklift engaged for operations in the facility & also in the area of forklift operations carried out by the employees of the company or contractors hired by the employers.

9.1.2.12 Falling object protective structures should not obstruct the vision of the forklift operators.

9.1.2.13 Forklifts hired by employer shall be fitted with Operator protective devices including roll-over protective structures (ROPS), falling object protective structures (FOPS) prior to engaging them for operations.

9.1.2.14 So far reasonably practicable, risks to operators of forklifts must be limited by the provision of an appropriate combination of operator protective devices, provided by Employer(s).

9.1.2.15 Every employer shall effectively carry out maintenance work on the operator protective devices for maintaining their safety & integrity.

9.1.2.16 The forklift shall be provided with data plate with the forklift's rated capacity as designated by the manufacturer, relevant information should also be displayed on a data plate.

9.1.2.17 Forklift operators shall be familiar with forklift operating symbols. Forklift controls shall also be displayed.

9.1.2.18 Every dangerous part of the forklift as far as reasonably practicable shall be fitted with protective guard and the guard shall be kept in position while the forklift is in operations.

9.1.2.19 Forklifts shall be tested/certified with a Load Certificate at suitable intervals **(See Table 3)** from Trakhees' Pre-qualified third party agency

9.1.2.20 Sign stating the maximum Safe Working Load capacity of the Lifting Equipment must be displayed on the Forklift.

9.1.2.21 Approval from the Competent Department is required for entry/use of Lifting Equipment into PCFC/EHS jurisdictional areas. EHS Procedure to obtain permit for Crane & Gas Cylinders" shall be referred to for submission of applicable/required documents to Trakhees – Inspection Department for initiation of approval process

9.1.2.22 Forklift Operators Vision shall not be obstructed by any means during operations of the forklift.

9.1.3 Ramps

Ramps shall be:

9.1.3.1 Wide and strong enough to take the maximum combined weight of dynamic forklift and its load.

9.1.3.2 Under regular maintenance to maintain in good conditions

9.1.3.3 In good traction even in wet weather

9.1.3.4 With side rails to prevent wheels slipping off

9.1.3.5 In a condition to allow smooth weight transfer on & off the ramp with a gradient that does not exceed the angle recommended for safe forklift operations

Where applicable the forklift operational area shall be provided with mobile ramps in position to prevent dislodgment.

9.1.4 Hazardous Area

Areas of Forklift operation may have potential to become hazardous due to:

9.1.4.1 Inadequate illuminations/poor visibility

9.1.4.2 Wet & slippery floors/ surface area;

9.1.4.3 Explosive atmospheres (dust or gas);

9.1.4.4 Toxic atmospheres;

9.1.4.5 Poor ventilation system.

Forklifts with internal combustion engines can expose workers to carbon monoxide and irritants such as oxides of nitrogen. Diesel forklifts produce less carbon monoxide than gas or petrol powered forklifts, but more irritants such as aldehydes and nitrogen dioxide. In confined spaces or poorly ventilated areas, such as cool rooms or small rooms, exposure to such gases can reach dangerous concentrations.

To reduce the risk of hazardous substances exceeding exposure standards in confined or poorly ventilated spaces, use:

- electric forklifts, or
- regularly tuned forklifts
- increased ventilation
- diesel forklifts to reduce carbon monoxide levels.

Forklifts used in hazardous areas such as flammable/explosive atmospheres or combustible dusts shall be fitted with spark proof device. Forklifts certified for use in hazardous areas should be labeled accordingly.

Regulation IO – 9.0: Equipment Operations & Machinery Installations

9.1.5 Pre-Operating Check

Forklift Operator, prior to operating the forklift shall:

- inspect lift and tilt mechanisms;
- inspect tires for inflation (where relevant) and wear;
- check its lifting capacity;
- Inspect liquid levels (battery, hydraulic oil, engine oil, transmission oil, brake fluid, cooling water and fuel); and ensure brakes, steering, controls, lights and warning devices operate effectively.

9.1.6 Accident & Maintenance

Any faults or safety problems must be reported to the supervisor immediately. Alterations or adjustments to the forklift should not be made unless by a company authorized to carry out with a license issued by respective Dubai world's business unit. Incidents or Accidents that occurred during the operation of forklift shall be reported by the forklift operator to the immediate supervisor.

9.1.6.1 Tip forward

The forklift will tip forward if overloaded with any objects/materials. In such case, the operator shall:

- check the load rated capacity of the forklift;
- check the load if facing uphill: reverse loaded forklifts down gradient;
- check it the load is back on the heel of the fork arms
- drive the forklift with the load as low as possible

9.1.6.2 Roll over

- ensure operators wear seat belt at all times during operation
- don't drive the forklift across an incline
- drive up and down gradients slowly
- at all times keep the load facing upwards
- extra care shall be taken with unloaded forklift operations as they are often more unstable than loaded forklifts
- keep the forklift level - avoid uneven driving surfaces, dips and pot-holes
- keep the load as low as possible when moving
- don't make sharp turns, or turns at high speeds

- if the forklift becomes unstable and begins to roll over, DO NOT ATTEMPT TO JUMP CLEAR. BRACE YOURSELF AND STAY WITH THE FORKLIFT.

9.1.6.3 Moving Loads

- loads must not be suspended, or travel, over a person
- ensure other people are clear when moving and loading objects on the fork
- secure the load to prevent it sliding or rolling off the fork arms if necessary
- avoid sudden stops and starts
- never exceed the recommended load mass.

9.1.6.4 Body Position

- do not place any part of the body outside the operator's compartment
- remain seated at all times during operation
- keep clear of the lifting mechanism at all times
- seat belt to be worn at all times during operation

9.1.6.5 Attachments

- make sure the attachment used is appropriate for the forklift truck and the job (e.g. fork arms, jib, clamp, platform)
- do not drag loads
- do not sling loads from the fork arms, unless using a proper lifting device secured to the forklift carriage to prevent displacement
- do not use damaged pallets, bins or containers as they may collapse
- do not modify any attachments without the agreement of the designer or of a competent person
- Alternative rated capacity in regards to specific attachment being used must be displayed on forklift.
- Never use a forklift for a job it is not designed to do.

9.1.6.6 People on forklifts

- Do not allow passengers on the forklift for any purpose.
- Never lift a person on the fork arms or a pallet.

9.1.6.7 Vision

- keep a careful watch on surroundings while working or driving, and reduce speed as appropriate

- be aware of doorways, passages or pathways where pedestrians or vehicles may suddenly appear
- if the load obscures forward vision, the forklift should be driven in reverse (except up ramps)
- keep warning lights flashing when using the forklift sound the warning device when going through doorways, around blind corners or when starting to reverse.

9.2 Mobile Crane

9.2.1 Crane Operations

9.2.1.1 The employer shall comply with the manufacturer's specifications and limitations applicable to the operation of any and all cranes and derricks. Where manufacturer's specifications are not available, the limitations assigned to the equipment shall be based on the determinations 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.

9.2.1.2 Rated load capacities, and recommended operating speeds, special hazard warnings, or instructions, shall be conspicuously posted on all equipment. Instructions or warnings shall be visible to the operator while he is at his control station.

9.2.1.3 Hand signals to crane and derrick operators shall be of acceptable international/local standard for the type of crane in use. An illustration of the signals shall be posted at the job site.

9.2.1.4 The employer shall designate a competent person who shall inspect equipment, cranes prior to each use, and during use, to make sure it is in safe operating condition. Any deficiencies shall be repaired, or defective parts replaced, before continued use.

9.2.1.5 A thorough, annual inspection of the hoisting machinery shall be made by a competent person, of the Trakhees' pre-qualified third party and also for issuance of necessary certificate. The employer shall maintain a record of the dates and results of inspections for each hoisting machine and piece of equipment.

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

9.2.1.6.1 In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay

9.2.1.6.2 Wear of one-third the original diameter of outside individual wires. Kinking, crushing, bird caging or any other damage resulting in distortion of the rope structure

9.2.1.6.3 Evidence of any heat damage from any cause.

9.2.1.6.4 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.

9.2.1.7 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.

9.2.1.8 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.

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

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

9.2.1.11 All windows in cabs shall be of safety glass, or equivalent, that introduces no visible distortion that will interfere with the safe operation of the machine.

9.2.1.12 Where necessary for rigging or service requirements, a ladder, or steps, shall be provided to give access to a cab roof.

9.2.1.13 Guardrails, handholds, and steps shall be provided on cranes for easy access to the car and cab.

9.2.1.14 Platforms and walkways shall have anti-skid surfaces.

9.2.1.15 Fuel tank filler pipe shall be located in such a position, or protected in such manner, as to not allow spill or overflow to run onto the engine, exhaust, or electrical equipment of any machine being fueled.

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

9.2.2. Electrical Safety in Crane Operations

9.2.2.1 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:-

(i) For lines rated 50 kV. or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet/3m.

(ii) For lines rated over 50 kV, minimum clearance between the lines and any part of the crane or load shall be 10 feet/3m plus 0.4 inch/1cm for each 1 kV. but never less than 10 feet/3m.(redundant)

(iii) In transit with no load and boom lowered, the equipment clearance shall be a minimum of 4 feet/1.20m for voltages less than 50 kV., and 10 feet/3m for voltages over 50 kV., up to and including 345 kV., and 16 feet/4.8m for voltages up to and including 750 kV.

(iv) 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.

(v) 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.

(vi) 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.

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

9.2.2.3 No modifications or additions which affect the capacity or safe operation of the equipment shall be made by the employer. If such modifications or changes are made by any competent person authorized by local authority or any governing body, 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.

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

9.3 Overhead & Gantry Crane

9.3.1 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 on its load block, and this marking shall be clearly legible from the ground or floor.

9.3.2 Except for floor-operated cranes, an effective audible warning signal shall be provided for each crane equipped with a power traveling mechanism.

9.3.3 As a general requirements. The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the 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.

9.3.4 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 in a stationary position.

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

9.4 Personnel Platform on crane operations

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

9.4.2 Cranes and derricks with variable angle booms shall be equipped with a boom angle indicator, readily visible to the operator.

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

9.4.4 The load line hoist drum 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 (controlled load lowering.) Free fall is prohibited.

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

Regulation IO – 9.0: Equipment Operations & Machinery Installations

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

9.4.7 The personnel platform itself, except the guardrail system and personnel fall arrest system anchorages, shall be capable of supporting, without failure, its own weight and at least five times the maximum intended load.

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

9.4.9 Access gates, if installed, shall not swing outward during hoisting.

9.4.10 Access gates, including sliding or folding gates, shall be equipped with a restraining device to prevent accidental opening.

9.4.11 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.

9.4.12 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.

9.4.13 The number of employees occupying the personnel platform shall not exceed the number required for the work being performed.

9.4.14 The personnel platform shall not be loaded in excess of its rated load capacity, When a personnel platform does not have a rated load capacity then the personnel platform shall not be loaded in excess of its maximum intended load.

9.4.15 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.

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

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

9.4.18 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.

9.5 Hand Tools & Portable Power Equipment

9.5.1 Checking of Tools.

Tools must be inspected prior to use to ensure that:

9.5.1.1 For tools with jaws, jaws are not sprung to the point of slippage.

9.5.1.2 For impact tools, they are free of mushroom heads.

9.5.1.3 For tools with wooden handles, the handles are free of splinters or cracks and are tight in the tool.

9.5.1.4 The tool is otherwise safe for use.

9.5.1.5 The supervisor is notified if tools are in need of repair.

9.5.2 Checking of Guards.

Tools with guards must meet these minimum general requirements:

9.5.2.1 Be secure - Removable guards are in place on the machine or equipment before use.

9.5.2.2 Prevent contact - Guards prevent any part of any employee's body and clothing from making contact with dangerous moving parts.

9.5.2.3 Protect from falling objects - Guards ensure that no objects can fall into moving parts.

9.5.2.4 Be in working order - If a guard is defective, damaged, or in any way does not meet the requirements of these procedures, employees should not use the tool and must immediately notify their supervisor.

9.5.3 PPE & Work Area Checks

9.5.3.1 Employees must locate and put on necessary and appropriate personal protective equipment (PPE) before using or operating tools.

9.5.3.2 Employees must change clothing or take off jewelry that could become entangled in the tools they are to use.

9.5.3.3 Employees must make sure that work areas are well lit, dry, and clean before beginning work.

9.5.4 Operational Safety

9.5.4.1 Employees must always use the proper tool for the job.

9.5.4.2 Employees may not remove a guard for any reason while operating tools.

9.5.4.3 Electric cables and cords must be kept clean and free from kinks.

9.5.4.4 Tools must not be carried by their cord.

9.5.4.5 All necessary personal protective equipment (PPE) is worn while using tools.

9.5.4.6 If an employee is distracted or unable to focus on the work involving tool use, they must stop work with that tool.

9.5.4.7 Upon finishing with a tool, basic maintenance must be performed, for example the tool should be kept sharp, oiled, and stored properly, as appropriate.

9.5.4.8 Problem tools must be immediately reported to the supervisor so they can be repaired or replaced.

9.6 Machinery & Racking System Installation

Installation of Racking/Shelving systems and / or machinery requires the approval from Trakhees to ensure that basic requirements of Environment, Health, Safety & Fire are met at the time of installation**.** DW clients intended to install any machinery and/or equipment within the client's leased facility as per the relevant business unit's approved scope of activity shall require to follow the Trakhees' “Procedure to obtain approval for Machinery or Racking System Installation". Machinery and Racking System shall be installed inside approved fabrication/warehouse facility only. Unauthorized installations of any machinery/equipment by the clients shall be liable for serious action, as per the environment, health & safety standards, to be taken by Trakhees without any reference.

9.7 Abrasive Wheel Grinder

9.7.1 Abrasive wheels used on bench and pedestal grinding machines must be equipped with safety guards.

9.7.2 The safety guard should enclose most of the wheel covering the flange, spindle end, and nut projection while allowing maximum exposure of the wheel periphery.

9.7.3 The exposure of the wheel should not exceed 90 degrees or one-fourth of the periphery.

9.7.4 This exposure begins at a point that shall not be more than 65 degrees above the horizontal plane of the wheel spindle

9.7.5 Wherever the nature of the work requires contact with the wheel below the horizontal plane of the spindle, the exposure must not exceed 125 degrees.

9.7.6 The safety guard shall be designed to restrain the pieces of a shattered grinding wheel, the distance between the safety guard and the top periphery of the wheel must not be more than 1⁄4-inch/6mm. If this distance is greater because of the decreased size of the abrasive wheel,

then a “tongue guard” must be installed to protect workers from flying fragments in case of wheel breakage.

9.7.7 The “tongue guard” should be adjustable to maintain the maximum 1⁄4-inch/6mm distance between it and the wheel.

9.7.8 An adjustable tool/work rest must also be installed and maintained at a maximum clearance of 1⁄8-inch/3mm between it and the face of the wheel. In addition to offering a stable working position, this clearance must be maintained to prevent the operator’s hands or the work from being jammed between the wheel and the rest, which may cause serious injury or wheel breakage.

9.7.9 All abrasive wheels must be closely inspected and ring-tested before mounting to ensure that they are free from cracks or other defects.

9.7.10 Wheels should be tapped gently with a light, nonmetallic instrument. A stable and undamaged wheel shall give a clear metallic tone or “ring.” If a wheel sounds cracked (dead), do not use it. (This is known as the “ring test.”)

9.7.11 The spindle speed of the machine must also be checked before mounting the wheel to be certain that it does not exceed the maximum operating speed marked on the wheel.

9.7.12 Always follow the manufacturer’s recommendations.

9.8 Band Saw

9.8.1 HORIZONTAL BAND SAW

9.8.1.1 Guard the entire blade except at the point of operation (the working portion of the blade between the two guides). Band saw wheels must be fully encased.

9.8.1.2 Make sure the saw includes a tension-control device to indicate proper blade tension.

9.8.2 VERTICAL BAND SAW

9.8.2.1 Use an adjustable guard for the portion of the blade above the sliding guide rolls so that it raises and lowers with the guide. Properly adjust the blade guide to fit the thickness of the stock and ensure the guard is as close as possible to the stock.

9.8.2.2 Band saw wheels must be fully enclosed.

9.8.2.3 Guard the entire blade except at the point of operation (the working portion of the blade between the bottom of the sliding guide rolls and the table).

Regulation IO – 9.0: Equipment Operations & Machinery Installations

9.9 CNC Machine

9.9.1 To prevent access into the point of operation area, ensure the CNC machine shall be fully enclosed and equipped with an interlocked guard (door).

9.9.2 The cutting tool(s) should not start unless the door is in position and should stop when the door is opened.

9.9.3 Many machines lock the guard in position during operation and can only be opened when the tooling stops.

9.9.4 If access into the point of operation is infrequent, install a fixed enclosure that can be removed only for maintenance activities.

9.9.5 Automatic loading and unloading methods and automatic tool changing shall be in place so as to further reduce the exposure to the point of operation.

9.9.6 To prevent injury from ejected parts, the polycarbonate vision panels shall be made strong enough to contain ejected parts.

9.9.7 The appropriate rotational speed shall be verified for the particular work piece and inspect the chuck jaw assemblies, work piece clamps, and all component parts of the turning fixtures.

9.10 Compacting & Bailing Machines

9.10.1 Access covers and point-of-operation guarding must be interlocked in such a manner that the compactor cannot be operated if the guard or loading door is removed or opened.

9.10.2 Compactors and balers shall be provided with means of adequate protection so as to prevent workers from reaching into the point of operation by configuration, cycling controls, and interlock guarding that interrupt or reverse the ram's motion if the compression chamber doors are opened.

9.10.3 Older equipment may not have these features and it is wise to consult with the manufacturer for possible retrofits or upgrades.

9.10.4 Whenever un-jamming, adjusting, cleaning, repairing, or performing other maintenance tasks, the machine must be isolated from all its energy sources and "locked out." If conveyors are used, they should be interconnected so that a single, lockable device can de-energize and isolate the power to both machines.

9.10.5 Follow permit-required confined space entry procedures whenever working inside these machines.

9.11 Cut-Off Saw

9.11.1 Over-table cut-off saws (miter, chop & overhead swing saws) must be provided with fixed hood guards that enclose the arbor and top half of the saw.

9.11.2 All Cut-Off saws also must be equipped with a self- adjusting blade guard

9.11.3 Adjusting lower blade guard of the saw shall have provisions to automatically adjust itself to the thickness of the material being cut and shall provide continuous protection from the blade.

9.11.4 Guards shall be designed to move out of the way as the blade nears the cut.

9.11.5 If a guard seems slow to return to its normal position, adjust or repair it immediately.

9.11.6 Overhead swing saws must be provided with a device (e.g. counterweight) to return the saw automatically to the back of the table when released at any point of its travel

9.11.7 Limit chains must also be pro-vided to keep the saw from swinging beyond the front or back edges of the table.

9.11.8 Cut saws must have a “nose guard ” affixed to the saw table in front of the hood guard (or another method providing equivalent protection) to prevent accidental entry of fingers or hands into the path of the saw blade from the front.

9.12 Drill Press

9.12.1 Jigs or fixtures shall be used to fasten the stock to the bed and stabilize the work piece in order to allow the stock to be secured for drilling & operator’s free hand to be positioned away from the rotating chuck & drill bit.

9.12.2 Drilling applications shall be equipped with specially designed guards or shields installed to protect the operator from the potential exposure to rotating drill chucks and drill bits.

9.12.3 A fixed universal-type shield must be used on larger gang drills.

9.12.4 The stock shall be adequately secured to the table to avoid spin.

9.13 Iron Worker

9.13.1 Fixed or adjustable guard shall be provided at all pinch and shear points.

9.13.2 Guards should be adjusted down to within 1/4th inch/6mm from the top of the material to the bottom of the guard (or stripper when punching).

9.13.3 Beware of machines with automatic urethane hold- downs.

9.13.4 Hold-downs shall be adjusted properly so as to avoid coming down with many tons of force and can be hazardous pinch points.

9.13.5 Proper alignment of the punch and dies shall be done without fail. Cover foot pedals shall be provided.

Regulation IO – 9.0: Equipment Operations & Machinery Installations

9.14 Metal Lathe

9.14.1 Wearing gloves, loose clothing, long hair, jewelry, or other dangling objects near lathe operations shall be avoided.

9.14.2 Close attention shall be paid to work pieces that have keyway slots or other surface profiles that may increase the risk of entanglement.

9.14.3 Assess the need to manually polishing (e.g. emery cloth) rotating material. If necessary, consider milling keyways or other profiles after polishing or use emery cloth with the aid of a tool.

9.14.4 Brush or tool shall be used always to remove chips.

9.14.5 Work-holding devices (chucks) and tool trapping space hazards (especially in automatic or semiautomatic modes) shall be covered with secured fixed or movable guards or shields.

9.14.6 Fixed or interlocked guarding shall be provided on lathes (wherever applicable) and controlled turning centers which prevents access during the automatic cycle.

9.14.7 All work pieces and work-holding devices shall be secured and free from defects.

9.14.8 Chuck key shall be removed from the chuck after securing the material.

9.14.9 Never take your hand off the chuck key until you set it back onto a table. Consider using a spring-loaded wrench.

9.14.10 Provide a chip/coolant shield unless another guard or shield already provides protection. This does not replace the need for eye and face protection.

9.15 Wood Lathe

9.15.1 All rotating parts and points of operation shall be covered with suitable guards & shields.

9.15.2 Cover lathes used for turning long stock with long curved guards that extend over the top of the lathe. These shields, or guards, must protect the operator if stock comes loose and is thrown from the machine.

9.15.3 Tool rest shall be secured and set close to the stock (1⁄8-inch/3mm).

9.15.4 The stock shall be rotated by hand to make sure it clears the tool rest before turning the lathe on. Guide the turning tool on the rest only — do not attempt to support the tool with hands.

9.15.5 The work piece must be secured and should be free of cracks, splits, knots, and other defects. Check for weak glue joints.

9.15.6 Remove chuck keys or adjusting wrenches. Consider using a spring-loaded chuck wrench.

9.15.7 Necessary check shall be performed to make sure that the chuck is secured before turning the lathe on.

9.15.8 Never permit operators to wear loose clothing, long hair, jewelry, dangling objects, or gloves.

9.16 Milling Machine

9.16.1 Secure the work piece either by clamping it onto the work table or by clamping it securely in a vise that is clamped tightly to the table.

9.16.2 Operators must always keep their hands away from the point of operation.

9.16.3 A guard, or shield, that encloses the cutter head or milling bed shall be considered to protect the operator from the cutting area, flying metal shavings, and lubricating or cooling fluids.

9.16.4 Make sure the tightening wrench is removed from the mill

9.17 Planer Machine

9.17.1 Machine guards shall be in place at all times.

9.17.2 Keep your hands out of the machine feeding area and allow the planer to pull the stock through.

9.17.3 Never lower the table during operation and never feed stacked boards.

9.17.4 Manufacturer’s recommendations shall be followed for allowable material dimensions.

9.17.5 Keep your body to the side of the stock.

9.18 Portable Abrasive Grinder

9.18.1 Manufacturer's safety guard shall be always in place as recommended.

9.18.2 Abrasive grinder exposure must not exceed a maximum angle of 180 degrees and the top half of the wheel must be enclosed at all times.

9.18.2 The guard must be mounted so it maintains proper alignment with the wheel.

9.18.3 Vertical “right angle” grinders must have a 180 degree guard between the operator and wheel. The guard must be adjusted so that pieces of a broken wheel will be deflected away from the operator.

9.18.4 Cup wheel grinders must be guarded as described above or be provided with special “revolving cup guards,” which mount behind the wheel and turn with it.

9.18.5 All abrasive wheels must be closely inspected and “ring-tested” before mounting to ensure that they are free from cracks or other defects.

9.18.9 The spindle speed of the machine also must be checked before mounting the wheel to be certain that it does not exceed the maximum operating speed marked on the wheel.

9.18.10 Operational safety as recommended by the manufacturer shall be followed always.

Regulation IO – 9.0: Equipment Operations & Machinery Installations

9.19 Portable Belt Sander

9.19.1 Both hands should be used to operate the portable belt sander, one on the trigger switch and the other on the front handle.

9.19.2 Guard the unused runs of the sanding belt and all in-running nip points. This is normally accomplished by the tool's casing, enclosing the top portion of the belt and much of the side.

9.19.3 The enclosure or guard, on the sides must prevent the operator from contacting the nip points.

9.20 Portable Circular Saw

9.20.1 All saws with a blade diameter greater than two inches must be equipped with guards above and below the base plate (shoe).

9.20.2 The upper guard must cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard must enclose the teeth as much as possible, and cover the unused portion of the blade when cutting.

9.20.3 When the tool is withdrawn from the work, the lower guard must automatically and instantly return to the covering position.

9.20.4 The lower guard must be equipped with a lug or lever, remote from the blade teeth, which will permit the operator to shift the guard safely for starting unusual cuts.

9.20.5 Never hold or force the retracting lower guard in the open position.

9.20.6 Kickbacks can be minimized by setting the proper blade depth so that the lowest tooth extends no more than 1⁄8-inch/3mm beyond the bottom of the material. This should limit the area of the blade in the kerf and also exposes less of the blade if the saw does kick back.

9.20.7 The saw kerf shall be kept open in order to reduce the chance for the saw to bind.

9.20.8 The board being cut should be positioned so that the weight of the cutoff keeps the saw kerf open as the cut is being made.

9.20.9 No uphill cutting operations shall be permitted (even the slightest incline can cause the saw to bind).

9.20.10 The saw must always move in a straight line.

9.20.11 If the saw has to be turned off in the middle of a cut, make sure the blade has stopped spinning before taking your hand off the saw.

9.20.12 Always keep your body out of the line of potential kickback

9.20.13 Use two hands whenever possible, one on the trigger switch and the other on a front knob handle. Secure work being cut to avoid movement.

Regulation IO – 9.0: Equipment Operations & Machinery Installations

9.21 Power Press

9.21.1 The point of operation of all power presses must be safeguarded.

9.21.2 Safeguarding shall be accomplished either by barrier guarding or the use of devices.

9.21.3 Barrier guarding shall prevent entry into the die area by physically enclosing the point of operation.

9.21.4 Guarding may not be required if the point of operation opening is 1⁄4-inch/6mm or less.

9.21.5 Safeguarding choices for mechanical power presses depend on the clutch systems and also subject to final decision of authority on the guarding requirements.

9.21.6 Feasible methods for full-revolution presses shall include fixed or adjustable barrier guarding, two-hand trips, pullbacks, restraints, or type “A” gates.

9.21.7 Part-revolution presses shall be equipped with barrier guarding, presence-sensing devices, two-hand controls or trips, type “A” or “B” gates, pullbacks, or restraints. The safeguarding options for a part-revolution press can also be installed on hydraulic presses.

9.21.8 Fixed, interlocked, or adjustable barrier guarding shall be installed where the operator does not need frequent access to the point of operation, for example, on a mechanical power press in continuous mode.

9.22 Power Roll Forming & Bending Machine

9.22.1 Installing fixed or adjustable barrier guarding at the point of operation is usually not practical, primarily due to the flexibility needed to bend various sizes of stock. Protection for the operator and anyone near the machine shall be provided by using devices such as safety trip cables (emergency stop) and hold-down controls; however, these safety devices do not directly prevent entanglement or entrapment.

9.22.2 Safety guards shall be designed in such a way that they are to help prevent or minimize injury by stopping the machine quickly.

9.22.3 Hold-down button or foot controls shall be designed to actuate roll movement only when held in the run position. The control should automatically return to the stop position when released.

9.22.4 A trip device (bar, tensioned wire/cable, or kick panel) shall be interlocked with the machine’s control circuit and positioned so that it may be easily actuated by any person caught or drawn toward the rolls and will stop the machine before serious injury can occur.

9.22.5 A trip device shall run the entire length of the machine at the front and in the back. Also, ensure the braking system is adequate, as the safety devices are only effective if the dangerous parts of the machine stop quickly.

9.22.6 An emergency stop button should be provided at the machine control console and at any remote work station. If more than one person is needed to operate the machine, controls should be furnished for each person.

9.23 Belt Sander

9.23.1 Suitable Guards shall be produced at unused runs of the sanding belt.

9.23.2 Do not sand the face of pieces that are less than 3⁄4-inch/20mm thick unless you use a push shoe or some other means of supporting the stock.

9.23.3 Guard all nip points. This can normally be accomplished by enclosing the edge of the sanding belt and the ends of the pulleys.

9.23.4 The work table shall be of as close as possible to the sanding belt.

9.24 Disk Sander

9.24.1 Keep hands away from the abrasive surface and use only the downward side of the disk so that the wood is driven onto the table by the machine's rotation.

9.24.2 Do not sand pieces that are of a shape or size that can become wedged between the disk and the work table. Hold small or thin pieces of stock in a jig or holding device to prevent abrasion to the fingers or hands.

9.24.3 Each disk sanding machine must have an exhaust hood (or other guard if no exhaust system is installed) that encloses the rotating disk, except for the portion of the disk above the table. This applies to drum (spindle) sanders also.

9.25 Shear Machine

9.25.1 The shear blades shall be guarded as per the manufacturer's recommendation. If not, a barrier guard, capable of adjusting to the thickness of the stock, must be installed in front of the shear blades.

9.25.2 An adjustable barrier guard must also be provided in front of the hold-down devices to protect the operator from the pinch point hazard.

9.25.3 Guards must meet the safe opening requirements as recommended by the manufacturer or reasonably practicable. They must be adjustable so that operators can feed the stock but cannot get their hands or fingers into the hazard area.

9.25.4 On mechanical shears equipped with a part-revolution clutch or for those that are hydraulically powered, light curtain presence-sensing devices or two-hand control devices shall be considered to be safeguarding options.

9.25.5 Wear gloves when handling the stock. In addition to gloves, appropriate mechanical devices or assistance should be used when removing, handling, and installing the blades.

9.25.6 Hand/foot controls should be enclosed or shrouded to eliminate accidental cycling.

9.25.7 The back of the shear, where sheared debris drops, should be barricaded.

9.26 Table Saw

9.26.1 The most common blade guard shall be of a self-adjusting guard that encloses the portion of the saw above the table, and above the stock being cut.

9.26.2 The guard shall be designed to automatically adjust to the thickness of the material being cut and remains in contact with it during the cut.

9.26.3 Fixed enclosures, fixed barrier guards, or manually adjusted guards (e.g. Brett-Guards) shall also be used as point of operation guarding provided its protection is equivalent to the protection of self-adjusting guards and it prevents employee exposure to the saw blade.

9.26.4 Guards must be used under sufficient supervision and in accordance with manufacturer's instructions.

9.26.5 Prevent exposure to the blade (and belt drive) located underneath and behind the table saw with a fixed guard.

9.26.6 Use a push stick for small pieces of wood and for pushing stock past the blade. Consider using large or well-designed push sticks that can not only provide a firm and stable grip of the stock but also effectively push the stock through while keeping your hand away from the blade. Combs (feather boards) or suitable jigs can be used when a standard guard cannot be used during grooving, jointing, molding.

9.26.7 Turn the power off, wait for the blade to stop, and lower the blade before removing scraps or finished pieces of stock from around the blade.

9.26.8 Use a spreader and anti-kickback fingers to prevent material from squeezing the saw or kicking back during ripping.

9.26.9 Enough clearance behind the blade shall be provided to allow the stock to completely pass through the cut. Also, provide support for material that will pass beyond the table.

9.27 Air Receiver Tank and Its Accessories

9.27.1 General Requirements

Regulation IO – 9.0: Equipment Operations & Machinery Installations

9.27.1.1 Air hoses shall be kept free from any lubricant in order to prevent the possibility of deterioration.

9.27.1.2 Air hoses shall not be laid down across the floors or aisles to avoid trip or fall of personnel. And, whenever necessary, air supply hoses should be elevated or otherwise positioned properly on the workplace to provide adequate access and protection against damage.

9.27.1.3 Air hose shall not be bended or twisted.

9.27.1.4 Air lines / hoses should be inspected frequently for defects, and any defective equipment repaired or replaced immediately.

9.27.1.5 Restraining devices such as keepers, chains, slings, proprietary special couplings and whip-checks should be installed on all pipe-diameters connected with high-pressure compressed air hoses to prevent them thrashing / whipping about in the event of a hose or coupling failure.

9.27.1.6 Trakhees approved Third Party inspection & certificate is required and shall be conducted annually (see Table 3). In addition to this, the occupier / contractor has to appoint qualified & trained personnel to carry out regular inspections & preventive maintenance of all parts of compressed air powered equipment including hoses, couplings, clamps and keepers in order to retain the operational integrity of this equipment and corrective action shall be taken subsequently where necessary.

9.27.1.7 Only qualified personnel should be allowed to carry out operation, maintenance and repair of this air receiver tank & its accessories. Upon Carrying out repair work on the tank, approved Third Party inspection and shall be conducted & necessary Test certificate for the tank & its system shall be obtained and submitted to Trakhees prior to resume its operations.

9.27.1.8 Face shields, goggles or other eye protection must be worn always whenever necessary by personnel performing cleaning operations on the air receiver.

9.27.1.9 Air compressor must be grounded or bonded while being used when fuel, flammable vapors or explosive atmospheres are present.

9.27.1.10 Effective safety guard shall be installed to all moving parts, such as compressor flywheels, pulleys, and / or belts etc.

9.27.1.11 Only tanks with "hydrostatic test & appropriate approvals from Competent Authorities" are allowed to be used in the premises. The maximum allowable

working pressures of air receivers should never be exceeded except when being tested & approved by Trakhees Third Party.

9.27.1.12 Receivers should be drained frequently to prevent accumulation of liquid inside the unit and the liquid waste shall be drained only to proper industrial drainage system.

9.27.1.13 A safety (spring loaded) relief valve shall be installed to prevent the receiver from exceeding the maximum allowable working pressure.

9.27.2 Pressure Devices:

9.27.2.1 Maintain valves, gauges and other regulating devices in good working condition.

9.27.2.2 Air tank safety valves should never be higher than the maximum allowable working pressure of the air receiver.

9.27.2.3 Case iron seat or disk safety valves shall be of ASME approved and stamped for intended service application.

9.27.2.4 Frozen safety valves must be defrost and drained before operating the compressor.

9.27.3 Compressed Air Equipment Maintenance:

9.27.3.1 Compressor shall not be lubricated with high flash point oil or grease.

9.27.3.2 Air compressor shall be frequently cleaned to maintain its workable condition.

9.27.3.3 The air systems should be fully purged every after cleaning.

9.27.3.4 Lock-Out & Tag-Out shall be applied during maintenance work of the compressor.

9.28 Dead Man's Switch

All equipment such as, but not limited to the, mentioned below table, are required to be provided with “Dead Man’s Switched or Dead Man’s Control” so that, in the event where the operator becomes incapacitated, the device will respond in a way that a particular equipment will stop safely and reduce the chances of harm to other person & result to at least minimum damage to properties.

Forklift	Stacker	Mobile Crane	Overhead & Gantry Crane
Blaster Gun	Power Press	Disk or Belt Sander	Compacting & Bailing Machine
Shear Machine	Lathe Machine	Drill Press	Power Roll forming & Bending Machine
Milling Machine	Abrasive Grinder	Portable Belt Sander	Portable Circular Saw
CNC Machine	Belt Sander	Portable Circular Saw	Abrasive Wheel Grinder

Regulation IO – 9.0: Equipment Operations & Machinery Installations

9.29 Portable Ladder / A Frame Ladder Or Step Ladder

7.29.1 Read and follow all labels/markings on the ladder.

7.29.2 Look for overhead power lines before handling a ladder. Avoid electrical hazards - avoid using a metal ladder near power lines or exposed energized electrical equipment.

7.29.3 Always inspect the ladder prior to use. If the ladder is damaged, it must be removed from service and tagged until repaired or discarded.

7.29.4 Do not use a self-supporting ladder (e.g., step ladder) as a single ladder or in a partially closed position.

Always maintain a 3-point (two hands and a foot, or two feet and a hand) contact on the ladder when climbing. Keep your body near the middle of the step and always face the ladder while climbing (see diagram).

7.29.5 Do not use the top 3 step/rung of a ladder as a step/rung unless it was designed for that purpose.

7.29.6 Only use ladders and appropriate accessories (ladder levelers, jacks or hooks) for their designed purposes.

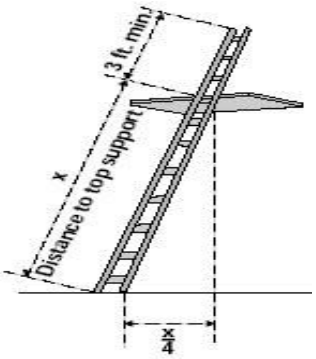
7.29.7 Ladders must be free of any slippery material on the rungs, steps or feet. While using a ladder use only shoes with non-slip soles.

7.29.8 Do not stand or sit on a step ladder top or pail shelf.

7.29.9 Use a ladder only on a stable and level surface, unless it has been secured (top or bottom) to prevent displacement.

7.29.10 Do not place a ladder on boxes, barrels or other unstable bases to obtain additional height.

Regulation IO – 9.0: Equipment Operations & Machinery Installations



7.29.11 Do not move or shift a ladder while a person or equipment is on the ladder.

7.29.12 An extension or straight ladder used to access an elevated surface must extend at least 3 feet above the point of support (see diagram). Do not stand on the three top rungs of a straight, single or extension ladder.

7.29.13 The proper angle for setting up a ladder is to place its base a quarter of the working length of the ladder from the wall or other vertical surface (see diagram).

7.29.14 A ladder placed in any location where it can be displaced by other work activities must be secured to prevent displacement or a barricade must be erected to keep traffic away from the ladder.

7.29.15 Be sure that all locks on an extension ladder are properly engaged.

7.29.16 Do not exceed the maximum load rating of a ladder. Be aware of the ladder's load rating and of the weight it is supporting, including the weight of any tools or equipment.

7.29.17 Move materials with extreme caution. Be careful pushing or pulling anything while on a ladder. You may lose your balance or tip the ladder.