Pressure Safety

1.1 PURPOSE

1.1.1 The purpose of this policy is to ensure that risks associated with pressure applications are adequately managed in order to minimize the risk of injury or harm to TERRY R PITT CONSTRUCTION's workers.

1.2 RESPONSIBILITIES

1.2.1 Senior management

1.2.1.1 Oversee and ensure the implementation of the requirements of this policy and related procedures within their respective functional areas.

1.2.1.2 Ensure all sites are suitably risk assessed and have appropriate facilities, services, and resources to ensure that risks associated with pressure applications are adequately managed to minimize the risk of injury or harm to workers.

1.2.2 Supervisors

1.2.2.1 Provision of appropriate resources so that the design and operation requirements for pressure vessels are appropriate

1.2.2.2 Provision of appropriate resources to deliver training to workers who are involved in pressure related tasks

1.2.2.3 Completion and currency of pressure vessel risk assessments

1.2.2.4 Ensure alterations are conducted by competent persons

1.2.2.5 Maintain the pressure vessel register

1.2.2.6 Ensure that pressure vessel storage areas are kept free of ignition sources

1.2.2.7 Ensure that pressure vessel equipment is appropriately labeled

1.2.2.8 Ensure pre-start checks are completed by operators, where required

1.2.2.9 Ensure workers who undertake pressure applications are trained and use required PPE

1.2.3 Safety department

1.2.3.1 Register pressure vessels (where required) with relevant statutory authority

1.2.3.2 Ensure the design and operation requirements for pressure vessels are appropriate

1.2.3.3 Maintain pressure vessel maintenance plans and inspection, testing, and maintenance records

1.2.3.4 Complete and store records and registers of pressure vessel licenses

1.2.4 Workers

1.2.4.1 Follow guidelines in this policy and comply with manufacturers' recommended procedures for use and storage of pressure equipment

1.2.4.2 Only use equipment for the purposes for which it was designed

1.2.4.3 Do not interfere with or misuse equipment and do not remove safety mechanisms

1.2.4.4 Report all incidents to supervisor

1.2.4.5 Wear appropriate PPE

1.3 RISK ASSESSMENT

1.3.1 TERRY R PITT CONSTRUCTION will take action to manage facilities, work environment, and tasks as to eliminate risks associated with pressure applications and if that is not possible, TERRY R PITT CONSTRUCTION will minimize risks so far as is reasonably practicable.

1.3.2 Examples of pressure applications at controlled worksites include:

1.3.2.1 Water jetting/blasting

1.3.2.2 Steam cleaning

1.3.2.3 Working with pressurized vessels

1.3.2.4 Working with compressed gas cylinders

1.3.2.5 Working with pressurized water mains

1.3.2.6 Working with hydraulic pressure

1.3.3 To manage the risks associated with pressure applications TERRY R PITT CONSTRUCTION will:

1.3.3.1 Identify and assess the risk for all pressure applications that could cause injury or damage.

1.3.3.2 Supply and maintain suitable equipment for workers to reduce the likelihood of an incident occurring as a result of a pressure application.

1.3.3.3 Provide instruction in safe pressure applications to workers.

1.3.3.4 Develop and test emergency response, rescue, and first aid plans.

1.3.4 Pressure applications will vary at each worksite. TERRY R PITT CONSTRUCTION will determine requirements related to pressure applications (such as equipment, facilities, and personnel) through a risk management approach. This may include one or more of the following:

1.3.4.1 Identifying hazards that could result in work-related injury, illness, or damage

1.3.4.2 Assessing the type, severity, and likelihood of injuries and illnesses

1.3.4.3 Providing appropriate equipment, facilities, first aid, and training

1.3.4.4 Reviewing requirements of pressure applications on a regular basis or as circumstances change.

1.4 SAFETY REQUIREMENTS

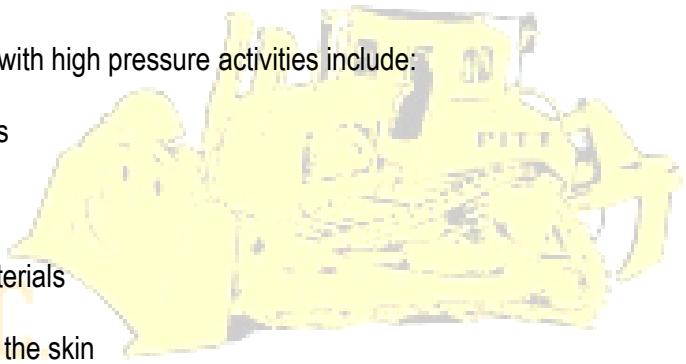
1.4.1 Common hazards and risks associated with high pressure activities include:

1.4.1.1 Being struck by flying debris

1.4.1.2 Exposure to noise

1.4.1.3 Exposure to hazardous materials

1.4.1.4 Water/air pressure piercing the skin



1.4.2 Adequate control measures must be put in place to protect the worker and include:

1.4.2.1 Operator isolation

1.4.2.2 Multiple operators

1.4.2.3 Short working periods

1.4.2.4 The use of minimum pressure

1.4.2.5 Manual removal of heavy/biological matter prior to carrying out the task

1.4.2.6 The use of suitable PPE

1.4.3 Before any job can commence, a JSA must be completed.

1.4.4 All equipment and attachments must only be used in accordance with the manufacturer recommendations.

1.5 GENERAL PRECAUTIONS

1.5.1 Equipment and attachments must not be modified in any way.

1.5.2 Equipment must not be used unless it:

1.5.2.1 Has a logbook/maintenance service history which defines past and future maintenance requirements.

1.5.2.2 Has an original equipment manufacturer's manual and is available to personnel operating the equipment.

1.5.2.3 Has been inspected/serviced in accordance with the manufacturer recommendations.

1.5.2.4 Is free from any fault that may adversely affect its performance and safe operation.

1.5.3 All equipment near operations must be shielded/protected from debris and water.

1.5.4 All electrical components must meet the required protection levels against water vapor and overspray.

1.5.5 No persons other than the operating team are permitted within the barricaded work areas.

1.5.6 Safe access to the equipment and item/surface being cleaned must be provided at all times.

1.5.7 Overhead work must be avoided where possible.

1.5.8 Before starting cleaning activities, operators must be in a safe and well-balanced position.

1.5.9 Activities must not be performed:

1.5.9.1 From ladders or other surfaces not intended for use by workers

1.5.9.2 On asbestos-containing material

1.5.10 Before starting the job, the operator must check that there is no interruption or interference to the release mechanism of any hand/foot controls that are used to safely stop the equipment operating.

1.5.11 Operations must stop when:

1.5.11.1 Conditions change or new hazards are introduced

1.5.11.2 Unauthorized people enter the barricaded area

1.5.11.3 Recommended safe work practices are not being followed

1.5.11.4 A malfunction occurs

1.5.12 Cleaning machines should be depressurized and secured when:

1.5.12.1 Not in use or left unattended

1.5.12.2 Components are being replaced or repairs are being made to the system

1.5.13 Operators must never direct the water/steam flow toward any other person.

1.5.14 Pressurized equipment must never be left unattended.

1.5.15 After activities have been completed, operators must undertake full hygiene practices (ex. change clothes, have shower, etc.) as necessary for the task.

1.6 PUMP UNITS

1.6.1 The pump unit must be maintained in accordance with the manufacturer's instructions.

1.6.2 The entire pump unit must be checked as part of the daily pre-start check, including:

1.6.2.1 Engine and drive unit (lubricating oil, water, hydraulic fluid, and fuel levels)

1.6.2.2 Pump unit (lubricating oil, water filters, drive belts, gauges, and gearbox oil levels)

1.6.2.3 Hydraulic hose reel (lubricating oil and fluid levels)

1.6.2.4 Condition of guards, shields, and safety interlocks

1.6.2.5 Electrical leads and connectors

1.7 FILTERS

1.7.1 Water filters must be checked regularly in accordance with the manufacturer recommendations.

1.7.2 Water must be cleaned through filters that meet the manufacturer recommendations.

1.8 HOSES

1.8.1 Hoses, couplings, connections, and end fittings that are suitable for the activity must only be used.

1.8.2 Before each use, hose assemblies must be visually inspected by a competent person to ensure:

1.8.2.1 Correct pressure rating and size is selected

1.8.2.2 There is no apparent damage (ex. corroded/broken wires, bulging, kinking, or cuts)

1.8.2.3 End fittings are in good condition and are the correct pressure rating for the unit

1.8.2.4 Hose connections to equipment/other hoses are restrained (ex. with braided stockings) to stop their movement if the hose end fails

1.8.3 When water supply and jetting hoses are laid across thoroughfares, walkways, or roads, vehicle cable protectors must be used.

1.8.4 Where hoses need to be hung vertically, they must be supported by a wire stocking. Where multiple lengths of hose are used this way, they must be supported at points below each coupling.

1.8.5 To ensure that hose assemblies are kept in a safe condition, they:

1.8.5.1 Must not be unnecessarily subjected to frequent and prolonged periods of high pressure

1.8.5.2 Must not be used in temperatures higher than the stated rating

1.8.5.3 Must not be unnecessarily exposed to chemicals/corrosive substances

1.8.5.4 Must not be used in functions that require repetitive/prolonged use (ex. long-line drain cleaning)

1.8.5.5 Must not be exposed to sharp, protruding, or abrasive surfaces

1.8.6 If the following faults are identified, the equipment must not be used and must be immediately taken out of service in accordance with TERRY R PITT CONSTRUCTION's *Lockout/Tagout* policy.

1.8.6.1 Hoses with broken wires, deep abrasions, kinking, blisters, or bubbles in the outer covering

1.8.6.2 End fittings/crimping with cracks, corrosion, damaged threads, or other evidence that they may not be safe

1.8.7 Hoses must be tested when they are new, have been damaged, have been re-ended or repaired, and have been exposed to adverse conditions which may have affected their integrity.

1.8.8 Where hoses are exposed to external mechanical damage, such as the hose being kinked or crushed, all attempts should be made to protect the hose by manufacturer approved means.

1.8.9 Where known activities are likely to expose hoses to frequent wear such as jet rodding and pressure washing activities, consideration should be made for preventive maintenance and additional inspections completed by competent personnel.

1.9 NOZZLES

1.9.1 As part of the pre-start check, nozzles must be inspected before each use for:

1.9.1.1 Blocked/damaged holes

1.9.1.2 Damage to threads

1.9.1.3 Cracks

1.9.1.4 Other structural damage that could affect their safe operation

1.9.2 Nozzles that have been identified as defective must not be used. They must be removed from service immediately and repaired or destroyed.

1.9.3 Nozzles must be kept clean and stored safely when not in use.

1.10 ELECTRICAL EQUIPMENT

1.10.1 Cables, plugs, connections, and control devices must be checked before any works commence.

1.10.2 When a job is to be carried out within a potentially explosive atmosphere, the pump equipment must meet electrical equipment for explosive atmosphere regulatory requirements.

1.11 HAZARDOUS MATERIALS

1.11.1 Product safety data sheets (SDSs) must be obtained before activities if hazardous materials are present or suspected to be present in the material/coating.

1.11.2 Appropriate controls must be put in place to eliminate or minimize exposure to any hazardous materials identified in the risk assessment process. This may include controls that are suitable for the hazardous materials identified/suspected.

1.12 PERSONAL PROTECTIVE EQUIPMENT

1.12.1 Appropriate PPE must always be worn, regardless of the other control measures that are in place. Selection of PPE must be based on risk assessment, which may include:

1.12.1.1 Waterproof suit/overalls

1.12.1.2 Face shield, goggles, or blast mask

1.12.1.3 Waterproof boots

1.12.1.4 PVC gauntlet gloves

1.12.1.5 Heat-resistant clothing (for steam cleaning only)

1.12.1.6 Hearing protection

1.12.1.7 Breathing equipment or respirators

1.12.2 Additional PPE may be required for certain activities, as determined by risk assessment. This may include liquid/chemical-resistant suits, leg guards, or head protection.

1.12.3 PPE selected for high pressure activities must be suitable for the activity and comply with OSHA/ANSI standards.

1.13 PRESSURE VESSELS

1.13.1 Pressure vessels represent a risk for explosion and physical injury if not properly maintained.

1.13.2 Pressure vessels are classified according to their maximum volume, operating pressure, type of fluid/gas, and type of door closure. The regulatory requirements for each pressure vessel depend on the hazard level classification.

1.13.3 Hazard identification and risk assessment must be undertaken for all pressure vessels onsite.

1.13.4 Pressure vessels must be installed and stored in compliance with appropriate regulations and standards.

1.13.5 Pressure vessels must be maintained in accordance with the manufacturer instructions.

1.13.6 Pressure vessels must be maintained and repaired by qualified persons.

1.13.7 All workers required to work with pressurized vessels must be trained in safe use/operation.

1.13.8 Where necessary, workers must have appropriate certificates of competency. Training records must be retained.

1.13.9 All pressure equipment, including piping, must be appropriately labeled.

1.13.10 Pressure vessels must not be operated without an appropriate and properly functioning pressure gauge and safety relief valve.

1.13.11 Safety relief valves must not be removed or obstructed/restricted by any means (ex. tie downs, paint, caps, blocks, etc.).

1.13.12 Only pipes, tubing, fittings, and valves appropriate to the pressure vessel's fluid and maximum allowable working pressure must be used.

1.13.13 Pressure vessels must be kept level at all times. If the pressure vessel is mounted, appropriate vibration protection must be in place.

1.13.14 Pressure vessels must be protected from damage caused by vehicle traffic or general work operations.

1.13.15 Materials, supplies, or stock must not be piled up against any pressure vessel.

1.13.16 Before operating a pressure vessel, it must be inspected by the operator for corrosion, fatigue, or build-up of deposits. If any faults are identified, the equipment must be immediately removed from service and promptly reported to a supervisor.

1.13.17 Workers must not operate a pressure vessel at a pressure higher than its maximum allowable working pressure.

1.13.18 If a worker is required to enter a pressure vessel for maintenance or repairs, they must have received confined space training and comply with TERRY R PITT CONSTRUCTION policy.

1.13.19 Pressure vessels must be inspected by a competent person after installation, at prescribed frequencies, and after any welding, alterations, repair, or relocation.

1.13.20 All pressure vessels must be maintained in accordance with the relevant standards.

1.13.21 All records of maintenance/repair must be retained and kept with the pressured vessel.

1.13.22 All registration certificates must be kept with the pressure vessel.

1.14 COMPRESSED/LIQUEFIED GAS CYLINDERS

1.14.1 Compressed/liquefied gas cylinders contain large volumes of gas under high pressure and precautions need to be taken when storing, handling, and using cylinders.

1.14.2 Hazards associated with compressed and liquefied gases include fire, explosion, toxicity, asphyxiation, oxidization, and uncontrolled release of pressure. Gas leakage is a particular hazard, especially with oxygen leaks, as they cannot be recognized by odor (unlike fuel gas leaks) and are harder to detect.

1.14.3 Gas cylinders must be stored and handled appropriately at all times.

1.14.4 Cylinders must be restrained and secured against movement with chain or strap (not rope) at all times during storage, transport, and use.

1.14.5 Cylinders must be stored and transported in an upright position.

1.14.6 Cylinders must be stored in a clean area free from oil and grease.

1.14.7 Cylinders must be sheltered from weather conditions, such as sunlight.

1.14.8 Cylinders must be clearly labeled with their content.

1.14.9 Cylinders must be stored away from doorways, stairs, and aisles, and must not be positioned in an access way or traffic area.

1.14.10 Cylinders must be stored at least 35 feet away from flammable materials.

1.14.11 Cylinders must be maintained free from leaks and dents.

1.14.12 Cylinders must not be dropped.

1.14.13 Cylinder storage areas must be designated and designed appropriately.

1.14.14 All sources of heat and ignition must be kept away from cylinders, even if the cylinders do not contain flammable material.

1.14.15 To ensure the controlled release in an emergency situation:

1.14.15.1 Oxygen, hydrogen, carbon dioxide, and inert gas cylinders must be fitted with a bursting disc safety device

1.14.15.2 LPG cylinders must have an operation spring-loaded pressure release valve

1.14.15.3 Acetylene cylinders must be fitted with a fusible plug in the neck of the cylinder and must always be stored and used in an upright position

1.14.16 Flashback arrestors must be fitted at the blow pipe and to the oxygen and fuel gas regulators.

1.14.17 Before commencing any activity, workers must check all cylinder fittings to ensure they are not damaged or in poor condition, and that they are ready for safe use.

1.14.18 If a cylinder has a valve tool, this must not be tampered with in any way. The cylinder valve must be kept closed at all times apart from during welding operation.

1.14.19 When opening cylinder valves, workers must stand to the side of the regulator and never in front of it.

1.14.20 If a small leak occurs, the cylinder valve must be closed (if possible). The area must be well-ventilated and any air conditioning systems must be turned off to avoid the spread of gas. In the

event of a large amount of gas escaping, emergency procedures must be implemented immediately.

1.14.21 Oxygen cylinders and fittings must not be lubricated with grease or oils or stored with grease or oils.

1.14.22 When transporting gas cylinders, they must be contained within an approved caged safety device. If this is not practicable, all attachments must be removed from the gas cylinders.

1.14.23 Gas cylinders (excluding breathing apparatus) must not be taken into any confined spaces.

1.14.24 For further information regarding the use of cylinders for welding, refer to TERRY R PITT CONSTRUCTION's *Hot Work Program*.

1.15 MAINS UNDER PRESSURE

1.15.1 There are some activities at TERRY R PITT CONSTRUCTION that may require mains to be pressurized for decontamination purposes.

1.15.2 Where mains need to be pressurized, the pressure must be released before any work on the main commences.

1.16 HYDRAULIC PRESSURE

1.16.1 TERRY R PITT CONSTRUCTION's activities that involve hydraulic pressure:

1.16.1.1 Hydraulic hand tools (ex. jacks)

1.16.1.2 Earth moving equipment

1.16.1.3 Cutting devices

1.16.1.4 Fixed hydraulic assets (ex. floor sludge doors)

1.16.2 A facility risk assessment must be undertaken in relation to hydraulic pressure activities.

1.16.3 Before any hydraulic pressure activities are carried out, the equipment must be visually inspected to ensure that it is in good working condition and there is no apparent damage. If a fault is identified, the equipment must be immediately tagged out for repair.

1.16.4 For further information on safety precautions for hydraulic hose use, refer to relevant section.

1.17 INSPECTION AND MAINTENANCE

1.17.1 A review of the implementation of this procedure will be undertaken through periodic inspections carried out in accordance with company policy.

1.17.2 The safety department will undertake periodic inspection of selected projects to validate, where design is required by the project, that these rules are applied and complied with.

1.17.3 This policy will be reviewed every 2 years or earlier if:

1.17.3.1 There is an identified risk to the business

1.17.3.2 A significant incident or unplanned event occurs

1.17.3.3 There is evidence safety is not effectively being considered in design at the facility

1.17.3.4 Incident investigation or audit results demonstrate that the procedure is failing to deliver the required outcomes

1.17.3.5 There are changes in associated legislation

1.17.4 Operators must not carry out repairs, other than simple adjustments to or replacements of parts which are listed in the manufacturer instructions for use/periodic service.

1.17.5 Other repairs, maintenance, and servicing operations must be carried out by the manufacturer or other suitably qualified people.

1.17.6 Maintenance records must be kept for each major piece of equipment.

1.17.7 Parts or assemblies that need to be identified for service, maintenance, or application must be permanently marked with enough information to identify the part, its use, and performance in a way that is easy to read.

1.17.8 Whenever placed out of service or defects and noticeable hazards/risks are identified with high pressure equipment, a report must be documented.

1.18 TRAINING

1.18.1 Training will include the risks associated with pressure applications, related chemical hazards, emergency procedures, and personal protective equipment requirements.

1.18.2 All workers involved in any pressure applications must be trained and have the appropriate skills to carry out the task safely.

1.18.3 If a pressure related task requires competency certification (ex. working in boilers), all workers carrying out that task must have appropriate certificates of competency.

1.18.4 TERRY R PITT CONSTRUCTION will provide instruction to workers on:

1.18.4.1 Hazards associated with pressure applications

1.18.4.2 Safe use of pressure equipment

1.18.4.3 Manufacturer's requirements for pressure equipment

1.18.4.4 Safety Data Sheets (SDSs)

1.18.4.5 Emergency procedures related to pressure applications.