HYDROBLASTING PROCEDURE

V:2023.1

Hydroblasting Procedure

January 2023

PURPOSE/ SCOPE

To establish a procedure for the safe operation of high-pressure water cleaning equipment.

RESPONSIBILITY

It is the responsibility of Operations personnel issuing permits to hydroblasting personnel to ensure the safeguards within this procedure have been met.

It is the responsibility of the IPS★ITCS Supervisor and personnel to comply with this procedure for hydroblast jobs.

GENERAL

High pressure water cleaning (hydroblasting) is an effective method for cleaning piping, heat exchangers, vessels, and numerous other kinds of equipment. The high velocity stream necessary to effectively clean the equipment can be very dangerous if the necessary precautions are not taken. This procedure outlines these precautions to ensure safe operation of hydroblasting equipment.

Please read and follow all these instructions, in addition to the guidelines in the WJTA Recommended Practices handbook – 2021 Edition (Orange Book). Deviating from safety instructions and recommended practices can lead to severe injury and/or death.

PROCEDURE

A routine inspection and maintenance schedule for all hydroblasting equipment should be maintained by IPS★ITCS Hydroblasting Supervisor and made available to client and IPS★ITCS Safety as needed. All pressure relief valves installed on the hydroblasting compressor unit must display a current inspection tag.

IPS★ITCS has designed and manufactured this equipment considering all hazards associated with its operation. IPS★ITCS assessed these risks and incorporated safety features in the design.

Only fully trained and qualified personnel are to operate hydroblasting equipment.

Prior to starting a job:

- The hydroblast operator and client operations together, should examine the equipment to be cleaned for any potential hazard to personnel from debris, corrosive or toxic substance or flammable liquids or vapors.
- Work Platforms: Any scaffolding or work platforms that may be required should be inspected for proper construction and placement and meet OSHA standards prior to use.
- Safe Work Permits must be completed by client operations and IPS★ITCS supervision prior to starting any cleaning.

- The hydroblast equipment operator should check out the operation and condition of all critical equipment, including the pump, filter, relief system, pressure gauge, hoses, hose connections, dead-man valve, lance, nozzle, and operating controls.
- A check-off list indicating this has been done must be filled out and attached with the work permit prior to work beginning.
- The Pre-Service Checklist is to be completed by the Hydroblasting Supervisor and the form reviewed and signed by the issuing operator.
- Do not exceed the maximum operating pressure specified for any component in a system.
- Always de-energize the system before opening a door to service or replace any parts. Failure to do so can result in severe injury and/or death.

NOTE: *Stingers and Back-Out Preventers are required for all hydroblasting unless approved by IPS★ITCS and Client Management.*

- Water hookup to the reservoir shall have operations approval to assure only service water is connected. Any water additives (chemicals, detergents, etc.) shall be used in accordance with the manufacture's recommendations and an SDS provided before may begin.

Barricade the area

1. Barricades must be installed to alert other personnel of the hydroblasting operation. A shield shall be placed over the end of the exchanger or piping to contain the ejection of water or scale.
2. All persons working in the barricaded area while the cleaning operation is in progress must wear personal protective equipment. The minimum protection will be hard hat, safety glasses, face shield, chemical or liquid proof splash suit, steel toed boots and if applicable, hearing protection and/or respiratory equipment.
3. The hydroblast equipment must be depressurized any time an unauthorized person enters the barricaded area.

No less than two qualified employees will be assigned to a hydroblasting job.

Hydroblast cleaning incorporates several different methods of cleaning. Each method requires its own procedures.

1. Lancing or Rodding operation - For cleaning of tube bundles or piping
   a. Requires one man to hold and guide the lance and one man to guide the tip or nozzle and operate the foot pedal or dump valve.
   b. When under manual operation, the nozzle shall be inserted into the tube prior to pressurizing. Conversely, the system shall be depressurized before removal of nozzle from tube.

c. At various times, certain tests may be conducted with personnel protection devices such as a shielding device (Articulated Flex Lance Safety Stop with Tube Sheet Mount or “Chicken Wing”) fitted on top to allow for stabbing under pressure. Tests such as these shall be conducted only with prior notification and authorization of the safety department.

- With safety as the primary consideration, the Flex Lance Safety Device was designed to protect the operator from a flex lance exiting a tube sheet during cleaning operations. It can easily be used for both vertical and horizontal applications and its wide range of adjustment will accommodate different sizes of tube sheets. Durable construction is of galvanized steel and anodized aluminum with a Lexan splash guard.
- **Safety Check:** Test to assure that the lance end fitting and nozzle cannot be pulled out of the Safety Device before applying pressure to the flex lance.
- Select the smallest diameter guide which allows the nozzle and lance to pass through freely.
- Check that the locking screw is sufficiently unscrewed to permit the lance guide to slide completely into the extension tube.
- Push the guide fully into the extension tube and secure it with the locking screw

2. Line Moiling – For cleaning of pipe or tubing, requires one man to handle moiling hose and one to operate the dump valve. The man operating the dump valve must have constant visual contact with the man controlling the hose.
3. Shot gunning – for cleaning vessel walls, flange faces, and other flat surfaces, consists of a handheld dump valve in combination with lance and tip that can be directed in virtually any plane of operation.
   a. Requires one man to handle the gun and one man for safety standby.
   b. The gun shall never be pointed at anyone, including the operator.
   c. Objects being cleaned shall not be handheld.
   d. No handgun with less than 48” overall length will be used in the plant without prior notification and authorization of the safety department.
   e. A maximum of 20,000psi water pressure will be used while working inside a vessel.

NOTE: *High pressure equipment must not be directed at other people, animals or live electrical equipment.*

At no time will the foot pedal or dump valve be locked down or jammed in the pressurized position.

The complete hydroblasting system must be shut down before cleaning or changing IPS★ITCS or hoses or performing maintenance on any of the other components of the system.

PERSONAL PROTECTIVE EQUIPMENT

Use of Personal Protective Equipment (PPE) is dependent on the working pressure of water and the cleaning application. Managers, Supervisors, and Operators MUST carry out a job specific risk assessment to define the exact requirements for PPE.

- Hygiene: Operators are advised to wash thoroughly after all water-jetting operations to remove any waterblast residue which may contain traces of harmful substances.
- First aid provision: users MUST be provided with suitable first aid facilities at the operation site.

PPE May Include:

- Eye protection: Full-face visor
- Foot protection: Kevlar® brand or steel toe capped, waterproof, non-slip safety boots
- Hand protection: Waterproof gloves
- Ear protection: Ear protection for a minimum of 85 dBA
- Head protection: Hard hat that accepts a full-face visor and ear protection
- Body protection: multi-layer waterproof clothing approved for water jetting
- Hose protection: Hose shroud
- Respiratory protection: May be required; refer to job specific risk assessment

RECORDS

Upon request, Hydroblasting supervisor shall make available to client routine inspection and maintenance schedules for all hydroblasting equipment brought on site to perform work.

Revision History

Rev	Rev Date	Rev By	Approved By	Description
1.0	1/3/2022	Shayne Torrans	Shayne Torrans	Initial Procedure
1.1	11/23/2022	Shayne Torrans	Shayne Torrans	Format Revision

Approvals:

Procedure Owner

_____ _____
Print Name Date

_____
Signature

Competency Assessment

No.	Questionnaire	C/NYC
Q1		
A1		
Q2		
A2		
Q3		
A3		
Q4		
A4		
Q5		
A5		

Enclosed Attachments	
Risk Assessment	☑
Environmental Aspect and Impact	☑
Training and Competency	☑
Measure and Evaluation Tools	☑

Competency Checklist

To be filled out by Trainer and signed by Employee, Assessor and Supervisor before being returned to the HSEQT Co-ordinator for recording purposes.

Procedure	Competency	Date	Competent YES / NO	Employee Signature

(Please tick appropriate box)

This employee is competent in performing the job. ☐

This employee has not attained the competency level. ☐ *

* *If the employee has not attained all competency levels, the Regional Manager must assess the action to be taken, provide an extension of training or alternative action as listed below.*

Alternate action to be taken: _____

Signed By

Employee: _____ Date: _____

Trainer: _____ Date: _____

Assessor: _____ Date: _____

Regional Manager: _____ Date: _____

Environmental Aspects and Impacts

Identified Environmental Aspects and Impacts

The following table is a summary of the likely environmental aspects and impacts that may be identified during site inspections. The significance of each impact needs to be assessed using the Risk Assessment Model.

Activity	Aspect	Impact
Purchasing & Administrative Work	Consumption of goods	Conservation of natural resources
	Consumption of energy (eg. Electrical equipment and facilities)	Release of greenhouse gases and atmospheric pollution; Consumption of natural resources; Habitat loss
	Generation of waste (eg. Paper)	Consumption of space for waste disposal; Habitat loss
Climate Control	Consumption of energy	Release of greenhouse gases and atmospheric pollution; Consumption of natural resources; Habitat loss
	Generation of noise	Disturbance to community; Habitat loss
Cleaning of – offices / vehicles	Storage, use and release of chemicals	Contamination of air, water or soil; Risk to human health
Transport (Fleet vehicles / staff travel)	Consumption of energy	Release of greenhouse gases and atmospheric pollution; Consumption of natural resources; Loss of habitat at all stages of generation; Light pollution
	Consumption of goods (eg. Oil)	Consumption of natural resources; Generation of waste; Habitat loss; Biodiversity impacts
	Generation of waste (eg. Oil)	Consumption of space for waste disposal; Potential contamination of water or soil; Habitat loss
	Exhaust emission	Release of greenhouse gases and atmospheric pollution
	Use of dangerous goods (eg. Batteries)	Potential contamination of air, water or soil; Risk to human health
	Generation of noise	Disturbance to community; Habitat degradation
Operations		

Risk Assessment

Risk Assessment // insert name here					
Step No: Logical sequence	**Sequence of Basic Job Steps documented in the Procedure, Work Instruction and project plans. Break down Job into steps.** Each step should be logical and accomplish a major task.	**Potential Safety & Environmental Hazards/Impacts at the site of the Job** Identify the actual and potential health and safety hazards and the environmental impacts associated with each step of the job.	**Risk Rating** Refer to the risk matrix or HSEQT.PRO. Risk Mgt	**Recommended Corrective Action or Procedure** ***Determine the corrective actions necessary to reduce the risk to as low as reasonably practical (ALARP) refer to HSEQ.PRO.Risk Mgt. The risk must be rediced or controlled to ALARP before work commences.*** Document who is responsible for implementing the controls to manage each hazard identified.	**Risk Rating** refer to the risk matrix or HSEQT.PRO.Risk Mgt
1.					
2.					
3.					
4.					
5.					

Audit

Process: insert// **Procedure**: Insert //	Date:	Audited by:
	Location of Audit:	Area Mgr/Supervisor:

Item	Question	Evidence Sited	Comments	Conformance Score 0,3,5
1.				
2.				
3.				
4.				
5.				
6.				
7.				

AUDITOR'S SIGNATURE: SAFETY REP'S SIGNATURE:	CONFORMANCE SCORE: / 25 CONFORMANCE %:	0 – Non-Conformance 3 – Continuous Improvement Opportunity 5 – Total Conformance