## **Hydro-Blasting**

1. **Purpose**

The purpose of this program is to provide safe guidelines for hydro-blasting operations and maintenance of hydro-blasting equipment and components.

1. **Key Responsibilities**

Management

* Provide appropriate equipment, safety training, and procedures for safe hydro-blasting operations.
* Conduct periodic inspections and audits to ensure compliance and effectiveness of the hydro-blasting program.

Supervisors

* Identify potentially hazardous conditions prior to starting a hydro-blasting job and take measures to protect employees.
* Verify proof of training prior to permit issuance.
* Only permit qualified personnel to operate equipment.
* Ensure employees comply with all hydro-blasting policies and procedures.

Employees

* Have knowledge of hazards associated with hydro-blasting and safe operation functions of hydro-blasting equipment.
* Comply with all hydro-blasting policies and procedures.

1. **Safe Work Procedures**

* A Job Hazard Analysis (JHA) identifying hazards associated with the setup and operations of hydro-blasting shall be performed by the entire work crew before equipment is setup.
* At minimum, the hydro-blasting team must consist of a pump operator and a nozzle operator.
* The operator shall inspect the high pressure unit and hoses for defects, proper fluid levels and filters, and properly sized/rated end fittings.
* Defective equipment shall be taken out of service immediately.
* Objects to be cleaned shall never be held manually.
* Dead man switches/triggers must never be taped, tied, or otherwise altered so the equipment stays in the "on" position.
* Horseplay with hydro-blasting equipment is prohibited. Never point a lance at other employees.
* Periodic checks should be made of work area to ensure all barricades and signs are up and visible, all safety equipment is in place, and all persons in the area are wearing the required personal protective equipment.
* The system shall be shut down and depressurized any time the barricade is violated, the equipment malfunctions (special attention should be given to the dump control valve), repairs need to be made or the system is left unattended.
* Worker's fatigue level must be minimized by rotating fresh workers into the job or by taking adequate breaks.
* All hydro-blasting operations in enclosed spaces (i.e., towers, drums, etc.) requires a specific safety plan to address unique hazards associated with this activity (i.e., consideration for fall potential, how many persons allowed in vessel, additional PPE required, rescue plan, etc.).

1. **Permitting Requirements**

* A pre-operational, operational, and post-operational hydro-blasting permit must be developed by the site or contractor performing the work.
* At minimum, the permit shall include:
  + Job description and equipment being cleaned.
  + Precautions taken to protect electrical equipment.
  + Maximum operating pressure.
  + List of qualified personnel.

1. **Equipment Requirements**

* Follow all manufactures instructions and rules while operating hydro-blasting equipment.
* Properly sized anti-reversal device (stinger assembly attached to a nozzle to prevent it from turning around inside a pipe or large tube) shall be used throughout the task.
* The combined length of the hose connection, stinger, and nozzle shall be a minimum of 1.5 times the diameter of the pipe being cleaned unless the pipe being cleaned has a "T" then the combined length shall be 3 times the diameter of the largest pipe.
* The minimum total length of a hydro-blasting gun (hand-operated control valve, lance and nozzle resembling a gun layout) shall be 66 inches from the shoulder pad to the nozzle.
* The blast cleaning nozzles shall be equipped with an operating valve (on the gun or foot pedal) which must be held open manually and always under the control of the operator.
* Moleing device or lance shall require a minimum 2 feet end identification when a pipe flange is available. If no flange or other means to secure anti-reversal device is used, the hose/lance shall require a 2 feet end identification marking and a 4 feet end identification marking of a different color or different pattern.
* A hydro-blasting system must not be operated above the lowest working pressure (40% of the burst pressure) of any of its components.
* The hose should be securely tied off to a rigid support to limit the pull due to hose weight when the hose drop exceeds 10 feet.

1. **Barricades**

* Adequate barricades and signs should be in place to protect personnel when approaching all ends of the surface being cleaned.
* The area around the job, pumps, hoses, and pipe openings will be barricaded with a sign to indicate “Danger High Pressure Water Cleaning”.

1. **Housekeeping**

* Good housekeeping practices should be maintained during and upon completion of the job to include:
  + The elimination of slip, trip and fall hazards.
  + The proper disposal of trash, contaminated PPE and wastes generated from the cleaning service.
  + The removal of accumulated debris from working surfaces.
* All high pressure hoses should be routed and protected in a manner that prevents vehicular damage and personnel exposure to the hoses.
* When hazardous waste is generated, proper containment and disposal must be addressed.

1. **Working Surfaces**

* All hydro-blasting must be completed from a stable work surface.
* Ladders, step stools, benches, etc., shall not be used when operating hydro-blasting equipment.
* Use only approved scaffolding or platforms that are job specific.

1. **Personal Protective Equipment**

* Employees performing hydro-blasting work should, at a minimum, wear:
  + Waterproof body protection.
  + Eye protection.
  + Head protection including a full face shield.
  + Waterproof foot protection with steel toe caps.
  + Appropriate hand protection.
  + Hearing protection.
* Personnel working in the immediate vicinity who could be exposed to related hazards must also wear appropriate personal protection equipment.

1. **Training**

* Employees must be trained on the hazards (including penetration of the skin by high pressure water), operating procedures, and maintenance of hydro-blasters prior to performing hydro-blasting work.
* Training should include personnel working in the immediate vicinity of the equipment that have the same exposure.
* Training includes a demonstration of the cutting action of the high pressure water and an explanation of the effects of high-pressure water penetrating the skin.
* The training must address the potential hazard to the human body by cutting through a piece of lumber, concrete block or rubber boot. If an accident should occur and high pressure water penetrates skin, medical attention must be given immediately.
* The trainer shall be a competent operator of the type of equipment being demonstrated and be knowledgeable in all safety procedures for hydro-blasting equipment.
* All training shall be documented.