

PUBLIC COMPANY ORLEN LIETUVA

APPROVED BY:
Director of Quality, Labour Safety
and Environmental Control

16 April 2025
Order No TV1(1.2-1)-2025-0176

OCCUPATIONAL HEALTH AND SAFETY PROCEDURE BDS-21 OPERATION OF HIGH PRESSURE JET CLEANERS

I. GENERAL

Purpose and Scope of Application

1. Occupational Health and Safety Procedure BDS-21/1 'Operation of High Pressure Jet Cleaners' (hereinafter, the Procedure) defines occupational health and safety (hereinafter, OHS) requirements applicable to cleaning of equipment and pipelines with high pressure water jets at Public Company ORLEN Lietuva (hereinafter, the Company).

2. This Procedure shall apply to employees of the Company who organize works that involve the use of high pressure jet cleaners, as well as to employees of contractors who under contracts concluded between the contractor and the Company clean equipment and pipelines with high pressure water jet cleaners at the Company.

II. REFERENCES

3. This Procedure has been developed in line with the effective revisions of the following documents:

3.1. ORLEN S.A. Technical Standard ST S7 T12 'Preparation and safe execution of work with pressure on vessels, their components and pipelines';

3.2. General Rules for Installation of Electrical Equipment approved by the Minister of Energy of the Republic of Lithuania.

III. TERMS AND DEFINITIONS

4. Terms and definitions used herein:

High pressure jet cleaner – device which consists of power source (electrical motor or internal combustion engine), pump, spray gun, hoses, pipes, nozzles and other components required for the cleaner to operate as a system.

High pressure water jet – water jet that travels at speeds over 3300 km/h. It has the power to cut through solid materials and may cause serious injury. Even relatively minor injuries can be fatal, as micro-organisms may be injected together with air, water and debris.

Work Coordinator – Company's employee who organizes and/or coordinates high pressure water jet cleaning of equipment and pipelines with high pressure jet cleaners at the Company.

Work Manager – Contractor's employee who passed the test for Work Managers as prescribed by the Company and is in charge for high pressure water jet cleaning of equipment and pipelines with high pressure jet cleaners at the Company.

Work Executors – employees who perform high pressure water jet cleaning of equipment and pipelines with high pressure jet cleaners at the Company.

Last Minute Risk Analysis (LMRA) – analysis conducted before the start of jet cleaning of equipment and pipelines in order to make sure the Work Executors understand the assigned work, know potential hazards and have all mandatory personal protective equipment (PPE) and other required means of work.

IV. DUTIES OF EMPLOYEES

5. **Work Coordinator must** provide the following information to Work Manager: location of equipment or pipeline to be cleaned (name of process unit, subdivision, etc.), name and tag number of equipment or pipeline to be cleaned, hazardous substance(s) the equipment or pipeline to be cleaned contains or contained, diameter of pipeline and other data as requested by Work Manager.

6. **Work Manager must:**

6.1. Ensure proper preparation of high pressure jet cleaner for high pressure water jet cleaning of equipment and pipelines according to requirements established by the manufacturer of jet cleaner;

6.2. Ensure that mobile high pressure jet cleaner has inspection documents;

6.3. Familiarize Work Executors with the characteristics of hazardous substances that are present or were present in equipment or pipeline to be cleaned;

6.4. Ensure that Work Executors have all required personal protection equipment and other means required for safe work;

6.5. Assign high pressure jet cleaning work to Work Executors who are trained and qualified to operate high pressure jet cleaners and are familiar with high pressure jet cleaner operation and maintenance manual provided by the manufacturer;

6.6. Perform Last Minute Risk Analysis (LMRA) according to example provided in Attachment 1 hereto and make sure the Work Executors have understood that all work-site risks are controlled and the required preventive measures for safe work have been implemented and request them to confirm this by signing the form of LMRA.

6.7. Ensure that the work is not commenced unless a Hazardous Work Permit has been issued in accordance with the Company's procedures, the Work Executors have been inducted, LMRA has been carried out, and the Work Executors have signed the Hazardous Work Permit and the Risk Identification Card for the work to be performed.

7. **Work Executors must:**

7.1. Operate high pressure jet cleaners according to requirements established in high pressure jet cleaner operation and maintenance manual provided by the manufacturer;

7.2. Maintain the work site in proper order, i.e. keep it free from any irrelevant objects, store/keep materials required for work properly, etc.;

7.3. Discontinue the work immediately in case of any signs of potential danger or conditions which do not allow to work, in case of emergency alarm or activation of gas analyzer, and/or if so instructed by the Attendant/Watcher or employee of organizational unit where the works are performed.

V. MAIN HAZARDS

8. **Main hazards of work with high pressure jet cleaners:**

8.1. Exposure to high-pressure water jet;

8.2. Dislodgement of the head of high pressure jet cleaner and escape from the pipeline being cleaned;

8.3. Thermal burns due to high temperature of water used for cleaning, hot elements of the cleaner;

8.4. Chemical burns due to exposure to corrosive substances;

8.5. Musculoskeletal disorders due to unnatural posture and static bodily load;

8.6. Noise generated by the cleaner;

8.7. Excessive load on musculoskeletal system from manual lifting and carrying of hoses, materials, etc.;

8.8. Fall from height (e.g. platform, scaffolding);

8.9. Slipping, tripping and falling;

8.10. Poisoning with vapors or aerosols of substances emitted to work atmosphere during cleaning work;

8.11. Fire or explosion;

8.12. Exposure to electric current;

8.13. Insufficient lighting at workplace.

VI. REQUIREMENTS FOR PERSONAL PROTECTIVE EQUIPMENT

9. For work with high pressure jet cleaner employee must wear the following PPE (Fig. 1):
- Work clothing together with water-jet protection for legs and hands;
 - Safety helmet with a chin strap and face shield;
 - Safety earmuffs;
 - Respiratory protection in case of risk of poisoning.



Fig. 1. PPE for work with high pressure jet cleaners

VII. REQUIREMENTS FOR HIGH PRESSURE JET CLEANERS

10. High pressure jet cleaner must have EU declaration of conformity, CE marking as well as operation and maintenance manual.

11. Hoses and other accessories of high pressure jet cleaner must be in good technical condition and compliant with applicable safety requirements (made of materials preventing the build-up of static electricity, etc.).

12. Any modifications of high pressure jet are forbidden unless approved by the manufacturer in writing. Any modification must be approved by the manufacturer and the appropriate certification or inspection body in accordance with applicable legal procedures.

13. High pressure jet must be periodically maintained and inspected.

VIII. GENERAL REQUIREMENTS FOR HIGH PRESSURE JETTING WORKS ON PIPELINES AND EQUIPMENT

14. Before any jetting work, equipment or pipeline to be jet-cleaned must be isolated with energy isolating devices (EID) from the existing or potential hazardous energy as required by OHS Procedure BDS-29 'Equipment Isolation'.

15. Before jetting work, perform on-site assessment of hazards, define exclusion zone and fence off the workplace against unauthorized access as prescribed by the Company's OHS Procedure BDS-20 'Barriers'.

16. Electrical equipment, installations and cables within exclusion zone must be protected against exposure to water splashes.

17. For pipeline cleaning, it is required to select a protective bonnet of required diameter. Through an opening in protective bonnet, a high-pressure hose with protective lance is inserted. Protective lance must be 1.5 times longer than the diameter of pipeline to be cleaned. Further, cleaning head is attached and the bonnet is securely fixed to the flange of pipeline to be cleaned.

18. For pipelines of big diameter where the hose with cleaning head may be dislodged and escape from the pipeline, the hose must have rigid lance with cleaning head (Fig. 2). The length of rigid lance must be not less than the diameter of piping to be cleaned.

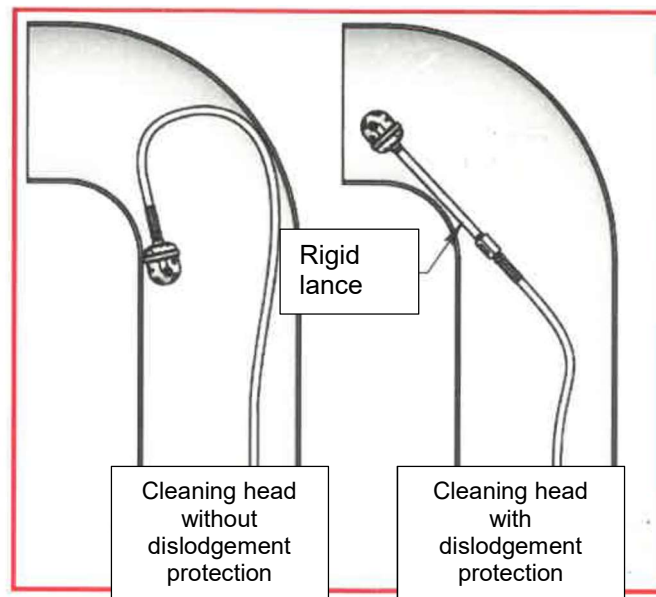


Fig. 2. Rigid lance of hose protecting against dislodgement

19. High pressure jet cleaner must be connected to the grounding system using grounding conductors in accordance with the General Rules on Installation of Electrical Equipment [3.2]. The Rules stipulate that natural grounding objects (metallic and reinforced concrete structures of buildings with adequate contact with the ground, metallic structures of hydraulic structures and installations, water supply and other metallic pipelines laid in the ground, except for pipelines for flammable liquids and gases) may be used for grounding.

20. Should it be necessary for Work Executors to enter the confined space, the requirements of the Company's OHS Procedure BDS-6/2 'Work in Confined Spaces' shall be followed.

21. High pressure jetting work must be executed by two Work Executors at least – one performing jet cleaning operations, and the other operating high pressure jet cleaner on/off switches.

22. Spray gun must be held firmly with two hands and a sturdy stance because the gun may kick back when triggered.

23. The use of cleaning agents for cleaning equipment and pipelines may produce aerosols. Inhalation of aerosols can be hazardous to health. In such cases, Work Executors must wear appropriate respiratory protection selected according to the character of work.

24. It is allowed to carry, clean, maintain, etc. high pressure jet cleaner only when it is switched off and pressure in the hoses is relieved to atmospheric.

25. During work with high pressure jet cleaners it is not allowed:

25.1. To use any hoses with visible defects (cuts, blisters, deformations, etc.);

25.2. To direct discharge stream at or near any person, including self;

25.3. To leave high pressure jet cleaner unattended;

25.4. To use high pressure jet cleaner of improper technical condition, without periodic maintenance or inspection;

25.5. To clean high pressure jet cleaner with hoses pressurized or motor/engine of the cleaner running;

25.6. To use cleaning agents of unknown application as well as flammable, combustible, corrosive or irritating substances;

25.7. To kink, twist or press the hoses during cleaning operations.

26. Work must be discontinued immediately in case of any signs of potential danger or conditions which do not allow to work, any failure of high pressure jet cleaner noticed, in case of emergency alarm or activation of gas analyzer, and/or if so instructed by the Attendant/Watcher or employee of organizational unit where the works are performed.

IX. EMPLOYEE TRAINING

27. Employees operating high pressure jet cleaners must be familiarized with operation and maintenance manual of each type of high pressure jet cleaner provided by the manufacturer, the present Procedure and trained as prescribed by the legal regulations of the Republic of Lithuania and procedure established by the Contractor.

X. FINAL PROVISIONS

28. Responsibility for periodic review and updating, if needed, of this Procedure shall lie with the Director of Quality, Labour Safety and Environmental Control of the Company.

XI. ATTACHMENTS

Attachment 1 – Last Minute Risk Analysis (example).

Prepared by:
Occupational Safety Regulation Manager
Egidijus Luomanas

