



SAFETY ALERT

DATE: 31st January 2023

SA: 0001

TITLE:

Incorrect fitment of HP water jetting hoses

INDUSTRY SECTOR:

All water jetting sectors

TARGET AUDIENCE:

Contractors, hire companies, operatives

ORIGINAL SAFETY ALERT ISSUED BY

HSE

WHAT HAPPENED

As a result of a serious incident to an operator, WJA have identified that when assembling a foot control valve (FCV) of a HP water jetting assembly, the LP dump outlet port coupling can inadvertently be configured to be subject to HP water pressure. FCVs are not clearly marked, and action should be taken to prevent incorrect assembly.

- It is foreseeable that the LP dump outlet port's male-male adaptor enables the incorrect fitment of an HP water jetting hose having a female fitting of a compatible or incompatible thread form.
- The incorrect fitting of the HP water jetting hose to the FCV's LP dump outlet port has potential to directly pressurise the LP dump outlet port fittings.
- The fitting of whip-check style hose restraints is a mechanical protection that assist against hose/fitting ejection or whiplash occurrence. However, whip-check style hose restraints do not prevent the incorrect fitting of the HP water jetting hose to a male adaptor fitting of the LP Dump outlet port.

ACTION TAKEN

Due to the removal of the LP dump hose from the male-male type adaptor of the LP dump outlet port coupling, it is foreseeable that the HP water jetting hose can be incorrectly fitted to the LP dump outlet port adaptor, whereby the HP pump pressure will exceed the pressure rating of the LP dump outlet port fittings. This can result in the sudden disconnection, ejection, or uncontrolled whiplash of the HP water jetting hose and male-male adaptor from the FCV's LP dump outlet port coupling.

Duty holders should apply engineering controls to ensure that only suitable and compatible pressure rated fittings and hoses are fitted together and that the inadvertent and incorrect fitment of dissimilar pressure rated components and fittings i.e., HP to LP fittings on a dump-style FCV, are mechanically prevented.

As part of a regular inspection regime for pre-hire and pre-use, threaded fittings and adaptors should be checked and formally recorded by a competent person using a thread gauge to establish thread deterioration, fatigue, wear, and remaining integrity.



The WJA Code of Practice for high and ultra-high water jetting provides clear safety guidelines and recommendations relating to water jetting processes.

A written pre-start checklist as detailed in Appendix No 1 of the WJA CoP [2] should be completed by the competent person to ensure the water jetting system and its components have been installed correctly, all whip-check style hose restraints are in place and are effective, and that the system is safe before the system is pressurised. Duty holders are reminded that all persons involved with water jetting activities should be suitably trained and competent for the roles tasked and undertaken.

Duty holders are also reminded that appropriate PPE required for the safe system of work should be identified within the water jetting activity Risk Assessment. The appropriate PPE should also be worn accordingly during pre-start checks, system pressurisation and water jetting activities.

KEY LEARNING POINTS

Control of Risk

HSE reminds Duty holders that risks should be reduced to the lowest reasonably practicable level by taking preventative measures, in order of priority.

Management of risk when planning work sets out an ideal order to follow to reduce risk from workplace activities. When completing your risk assessment for each HP water jetting activity, consider the hierarchy order below in all circumstances:

1. *Elimination*
2. *Substitution*
3. *Engineering controls*
4. *Administrative controls*
5. *Personal Protective Equipment.*

Training

As identified within the WJA CoP [2], *any person involved in the use of water jetting must have received training to a standard which as a minimum complies with that provided by the WJA courses and is appropriate to the type of jetting operations undertaken.*

Competence

As identified within the WJA CoP [2], *personnel must have received sufficient skills, knowledge, and experience (including training that is approved by the WJA) and be able to demonstrate relevant experience and a competency assessment undertaken by a competent person(s).*

In any team at least half (50%) of the operatives shall be competent. In the case of an odd numbered team the number of competent operatives shall be rounded up e.g., in a three person team, two shall be competent.



Personal Protective Equipment

The WJA CoP [2] identified PPE as the 'last resort' because it is the last line of defence and only protects the wearer without changing the level of hazard present. Other control measures may be needed in addition to PPE and may reduce the level of protection needed from the PPE.

As recommended within the WJA CoP [2], appropriate PPE as identified within the Risk Assessment should be worn at all times during the water jetting activity including during the start-up and pressurisation of the system.

Component or Fitting Failure and Compatibility

The HSE guidance GS4 [1] provides information to address your physical safeguarding, safe systems of work and maintenance associated with pressure testing an assembly of parts, verifying their strength, integrity and/or functionality.

The water jetting apparatus would require a functional pressure test following each assembly and disassembly of the equipment, to confirm the integrity of fit. GS4 [1] also identifies such things as deterioration of fitting threads, cyclic loading of fittings, fitting deterioration resulting in sudden disconnection of the hose and consequential hose whip, restraining, or shielding of flexible hoses to restrict whiplash hazard and that hose-fitting components from one manufacturer are not usually compatible with those from another manufacturer. You should ensure that only compatible components are assembled together.

RELEVANT DOCUMENTS

References

[1] HSE GS4 – Safety requirements for pressure testing, 4th edition

[2] Water Jetting Association Code of Practice for the Use of High Pressure and Ultra-high Pressure Water Jetting Equipment 2021