




Piping Modification in Pre-existing UPP Sites

This section is designed as an advisory guideline on the how to modify an existing UPP site.

Prepare the site in advance to either close or restrict access to the work area, and check all equipment to ensure that it is in operational condition.

Warning  You will be working in an area that may be considered a confined space. Follow all regulations for working in a confined space. Pipe will be cut and may have explosive vapors present. Purge the pipe and work area with inert gas before connecting the welder to the fittings to be welded.

Warning  During any modification to UPP pipework, the safety of on-site personnel is most important. Follow all national, regional and local health and safety legislation.

The following guide provides steps to make UPP pipe modifications in the safest possible manner.

However relevant local health and safety regulations should take precedence over the advice given here.

NOTE: Use these instructions for piping repair also.

Equipment List:

- Fittings and lengths of pipe required for modification
- UPP pipe cutter
- UPP Welder
- Clamping method for welding
- Inert gas (i.e. Nitrogen)
- Consumable kit with scrapers, acetone, lint-free cloth, marker
- Approved sealable container
- Appropriate wrenches or spanners

Method

1. Switch off: Shut down the submersible pump and dispensers in works area.
2. Tag out: Remove fuses or isolating breaker to pumps and dispensers.
3. **Purge the pipeline of product:**

Verify the tanks are vented to accommodate the flow of fuel back into the tank.

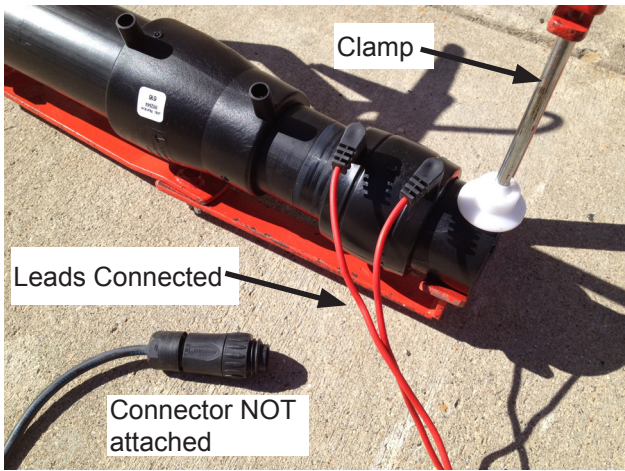
- Suction systems: go to step 4.
- Pressure systems:
 - Relieve line pressure by an appropriate means.
 - a. Open the line drain valve on discharge elbow if one is fitted or:
 - b. Remove cover to check valve and take out the check valve.
 - c. Reinstall check valve cover.

Go to step 4

Note: For FEPetro submersible turbine pumps, open the manual pressure relief valve instead of removing the check valve.

4. Open the shear valve access port at the highest point in the piping system, typically this is the dispenser farthest away from the tank. This allows the petroleum liquid in the lines to drain down to the tank.

5. For suction systems, open the check valve under the dispenser to allow flow back to the tank.
6. Introduce inert gas to the open shear valve port or disconnected pipe, to push product in the pipeline back to the tank.
7. Check the containment where the modification is to be made with an O_2 meter and record the presence of sufficient oxygen ($\sim 21\% O_2$) before any personnel enter the sump. Air exchange if necessary.
8. When pipeline is cleared of product isolate the pipeline by closing the isolation valve (ball valve).
9. Shut (close) all the shear valve access ports or check valve, when no more fuel flows out of the product line.
10. All secondary containment lines will need to have their test boots removed, when applicable.
11. The air supply in containment area where the repair or modification is to be carried out should be exchanged until the O_2 meter records the presence of sufficient oxygen ($\sim 21\% O_2$) before any personnel reenter the containment.
12. Follow UPP installation instructions and complete the modifications up to the point of welding.
13. The new assembly of UPP pipework and fitting(s) must be clamped or supported and not subject to strain during welding and cooling periods.
14. The pipe should be open to the sump to allow the Inert gas purge to inert the sump as well as the line.



- The welding lead should be attached to the welding coupler/fitting in preparation for electrofusion.
- The welding lead should NOT be connected to the welding machine at this stage.

- The atmosphere of the sump is to be continually monitored with the O_2 meter for the presence of sufficient oxygen ($\sim 21\% O_2$) during pipe modification whilst personnel are within the sump.
- Connect the inert gas supply to a shear valve access port and flood the product line and sump, the O_2 meter should record the presence of no oxygen in the sump.
- Once no oxygen is recorded on the O_2 meter, the welding machine and power supply can be located above ground at the furthest point at which the welding lead will reach the welding machine without any tension on the lead.
- On completion of welding cycle, isolate the welder from the power supply and continue the inert gas purge for a period no less than 15 minutes.
- During this time period no personnel should enter the tank sump to remove the welding leads.

- The sump air supply should be exchanged until the O_2 meter records the presence of sufficient oxygen ($\sim 21\% O_2$) before any personnel enter the sump.
- Before undertaking any additional work on any of the other sections of pipe, the atmosphere should be checked with the O_2 meter and records the presence of sufficient oxygen ($\sim 21\% O_2$), initiate air exchange if in any doubt.
- All the affected shear valves and check valves should have the access port re-sealed ready for the product line to be pressure tested. The submersible pump should have its check valve reinstalled, if it was removed.
- Allow sufficient cooling time (minimum 3 hours). The product line should be pressure tested with inert gas to the UPP guidelines (60 psi/4.2 bar) for 1 hour. The new welded joint should be wiped with soapy water to make it easier to check for signs of leakage.
- Perform any regulatory testing required and sign off as required.
- On completion of a successful pressure test, the submersible pump can be re-connected and the dispensers re-commissioned.



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