

Safe Harbour - Replacing Corroded Steel

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Project Profile:

Harbour refuelling installation

The Galician ports of Burela and Celeiro are among the main centres for the Spanish deep-sea fishing fleet. Steaming far out into the Atlantic with voyages of 2 weeks being quite common, larger trawlers can require 50 tonnes of marine diesel to run their engines and refrigeration plant. A fast fuelling turn-around is imperative to avoid lengthy queues at the 2 quay-side hose reels, so when the Port of Burela discovered that its 5 year old steel fuel pipeline was leaking they decided on a complete review of the installation, including adding an extra refuelling point.

Each trawler could take the whole contents of one road tanker so it was decided to have the fuel delivered by sea-going barge from a nearby coastal refinery and storage depôt. This move would considerably reduce Dangerous Goods road traffic within the port area. Also a new 400 m³ (105,000 US Gal.) above-ground bunded tank should replace the existing underground tanks to allow the old tank farm area to be used for an extension to the fish preparation and freezing halls.

Location	Galicia, Northern Spain
Application	Harbour refuelling installation
Installation Year	2000

High density, non-corroding UPP pipework was specified for the installations because the existing steel pipe, which had been wrapped and sleeved in PVC, had suffered salt water corrosion and had leaked after only 5 years' service. Installation had to take place in ground with salt water present at all times. A guarantee of fuel tightness and zero environmental impact was demanded since the fuel is pumped.

The projects had to be completed speedily and economically to fit in with the other construction operations on site. A UPP trained technical team handled the installation of the three different diameters of UPP pipework required:

- 160mm (6") to run from quayside discharge point to the 400m³ marine diesel storage tank. This large diameter will handle the high flows and the smooth bore gives excellent flow characteristics.
- 110mm (4") pipe to serve the two furthest trawler refuelling points with a high flow.
- 90mm (3") pipe for the closest refuelling point for the smaller boats at a lower flow rate.



Burela harbour



Trawler refuelling



Corroded steel pipe



Diesel tank bund

Problems with steel

Existing steel pipe had leaked after only 5 years. When a single wall steel or galvanised pipework system leaks hydrocarbons into the ground it may take months or years for such a leak to be revealed. During this time many thousands of litres of fuel may have escaped into the ground.

Specially produced for this contract, the 160mm (6") pipe was delivered in 12 metre (40') lengths. The 110mm (4") and 90mm (3") sizes of UPP were extruded in 6 metre (20') lengths and delivered from our warehouse stocks. In all cases, polyethylene is around five times lighter in weight than the equivalent diameter of steel pipe.

Where obstacles are found during the pipe laying, the natural flexibility of UPP allows the pipe to be easily adapted to the site's circumstances. These long pipe runs are also snaked into curves to compensate for the thermal expansion or possible ground movement. Once positioned, backfill material is used to fully support the pipe. Prior to final backfilling, the pipeline is pressure tested for tightness. This test can be carried out hydrostatically or with air or an inert gas.

Where the UPP pipework has to pass through walls, such as into the tank bund area, protective sleeves are used. Fuel resistant mastic will provided a liquid-tight seal around the pipe. This installation no longer depends on fuel deliveries by road. Bulk fuel now arrives by sea, the same way it leaves.

So, what has UPP pipework contributed, especially here when the ground is saturated with salt water?

- The FFS installation is safe, easy and practical.
- Time and cost were saved by the lightweight construction.
- Fully welded sections provided direct burial pipework with no joints and no risk of leakage.

Here Franklin Fueling Systems have provided a long term corrosion free solution; this whole project was designed, made and installed to the highest standards, protecting people and the environment.

Pipe lengths supplied:

160mm (6") Single wall UPP Extra pipe for 2,000 lpm	1,008 metres
110mm (4") Single wall UPP Extra pipe for 1,000 lpm	474 metres
90mm (3") Single wall UPP Extra pipe for 250 lpm	1,062 metres



Efficient Preparation & installation

Electrofusion is reliable and leak free and HDPE is lighter and easier to handle, being typically 20% the weight of steel.



Rapid electrofusion

Pipework is installed through an electrofusion process, which welds the pipe and eliminates any leak paths, providing one homogeneous construction. This ensures full protection from ingress of ground water and eliminates any chance of a spill to the environment.



Flexibility

Simple changes of direction can be achieved without the need for elbows thanks to a typical bend radius of 30 times pipe diameter. The natural flexibility of UPP allows the pipe to be easily adapted to the site's circumstances.