



**Facts not widely understood about
surge pressure**

Introduction

Uncontrolled pressure surges in pipelines costs the water industry millions of pounds every year, causing burst pipes, structural damage, negative pressures and colossal water wastage.

Negative pressure, directly contravene Drinking Water Inspectorate (DWI) legislation due to the risks of contamination. QED are specialists in controlling pressure surges, providing cost effective solutions.

Some valuable surge pressure facts:

- A current hydraulic study is the key element of a risk assessment for whole-life cost management of a pipeline and water quality compliance, and where the magnitude of risk is defined.
- The surge vessel volume identified in the hydraulic study does not include the many other vital site-specific factors necessary for calculating final vessel volume.
- For surge vessels to comply with the Pressure Equipment Directive, fatigue loading must be included as part of the design specification. This is a result of pressure variations within the pumping main.
- Negative pressures in a portable water main directly contravene the Drinking Water Inspectorate requirement of maintaining a positive pressure at all times.
- Transient vacuum conditions in a pipeline will potentially lead to fatigue and failure of the pipe, not because of the vacuum, but from the pressure spike resulting from the vacuum collapsing.
- PVCu mains are very prone to fatigue failure from pump stops and starts. Transient pressure excursions should be limited to 50% of the operating gauge pressure.
- A correctly controlled surge vessel protects the whole of the pumping main from positive and negative pressures
- If the initial Air Volume (IAV) is allowed to “drift” then the level of surge protection being provided also “drifts”.
- The air compressor has no effect on the pressure in a surge vessel when open to the pumping main.
- An air/water interface surge system has considerable cost saving benefits when considering total capital and operating expenditure (TOTEX) compared to the alternative “bladder” type of vessels.
- Installing variable speed drives on pump motors DOES NOT remove the risk of surge related bursts or pipe joint leaks.
- The most common source of surge problems identified by hydraulic modellers in pumping mains is NEGATIVE, not POSITIVE pressures.
- Whenever a surge control system is incorporated within a pump station, rapid-acting non-return valves will be needed for each pump.
- If the hydraulic study specifies a check valve and bypass is required, a rapid acting non-return valve is not necessary for this duty.