



VPAC™ Site Services for Through Valve Leak Detection

As we enter the era of net zero strategy planning by major energy companies worldwide, the ability to accurately quantify and trend through-valve leak detection is an attractive proposition. Not only do leaking valves have financial implications, the impact on CO₂ and methane emissions can be significant.

In addition to the net zero challenges faced by many operators, there is a need to confirm correct functionality of safety critical elements including emergency shutdown valves (ESDVs); the ability to efficiently perform integrity checks on ESDVs without extending shutdown durations is of huge benefit in challenging markets.

MISTRAS provides a valve assessment service using our proprietary Acoustic Emission VPAC™ technology. Our VPAC™ operators are located across the UK and are competent and certified to carry out testing services both onshore and offshore.

Benefits of VPAC™ testing include:

- ▶ Non-intrusive, lightweight and portable system
- ▶ Quantifies leak rate for valves in gas and liquid service
- ▶ Leak rates achieved even at low differential pressures (0.5 bar for gas, 3 bar for liquids)
- ▶ Insensitive to background process noise
- ▶ Efficient test method (18" ball valve can be tested in less than 5 minutes)
- ▶ Simple report interpretation
- ▶ Intrinsically safe system (ATEX Zone 0 classified)



Check on valves with portable system



Emergency Shutdown Valve



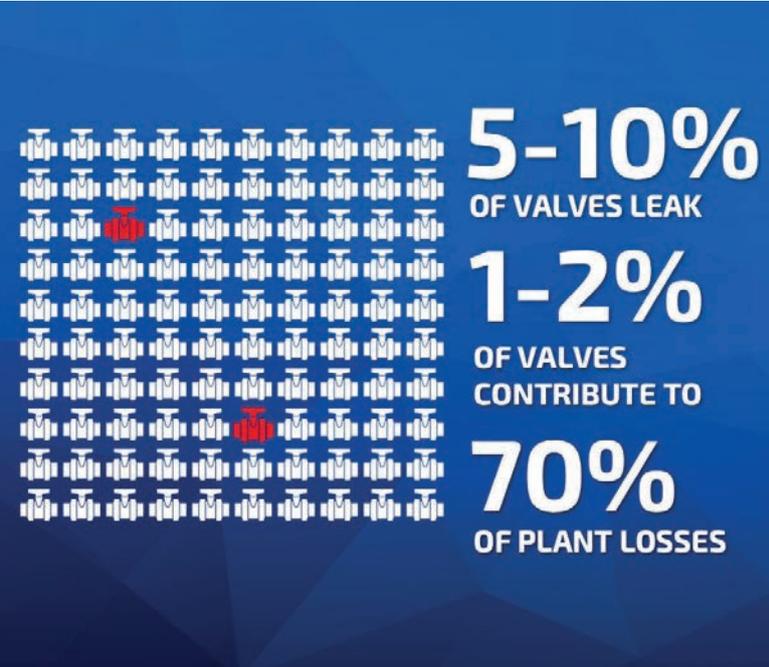
Inspection of leaking valve with VPAC II™

Monitoring for Safety and Control of Loss to Flare

Valves are an essential part of operating process plant, and represent a significant capital investment, statistically ten percent of valves leak when they should be closed, however only one percent of valves cause seventy percent of total through-valve leakage.

This leakage causes a significant loss of product where valves are normally closed and leading to flare, and represents a significant safety risk for normally open valves that are only closed in an emergency.

VPAC™ technology provides a means to estimate the leakage rate, using either a portable unit, or an on-line system, as appropriate for the application.



VPAC™II features and benefits:

- ▶ Cut sellable gas losses drastically
- ▶ Reduce shutdown time
- ▶ Transfers stored data to notebook or desktop PC with VPACwin™ software via a wireless Bluetooth interface
- ▶ Calculates Leak rates directly on the unit and accurately replace leaking valves
- ▶ Move towards zero flaring emissions
- ▶ Stores readings, as well as upstream and downstream readings, for up to 500 valves at a time
- ▶ Reduce valve maintenance costs
- ▶ Loads a complete testing route with valve names and physical properties from VPACwin™
- ▶ Accurately replace leaking valves

Savings in the Millions

Statistical experience has shown that in oil and gas plants 5-10% of valves leak, but 1-2% of valves are responsible for 70% of total loss.

Finding these valves and taking remedial action reduces annual losses by millions.

On plants with flare gas recovery systems the use of the system is even more important to avoid burning saleable product and hydrogen as fuel gas. Regular checking of product and hydrogen valves avoids this downgrading.

Identified Savings: € 400.894

Leak Rates			Fluid Density kg/m ³	Loss tons/yr	Cost Per Ton €	Total Loss Per Valve €/yr
l/min	ft ³ /hr	gal/hr				
199.0	421.6	3154.8	1.10	115.1	151.00	17,375
0.0	0.0	0.0	2.50	0.0	151.00	0
961.4	2036.7	15239.5	2.50	1263.2	151.00	190,747
299.2	634.0	4743.5	8.10	1274.0	151.00	192,367
0.0	0.0	0.0	8.10	0.0	151.00	0
2.0	4.3	32.4	2.50	2.7	151.00	405
0.0	0.0	0.0	1.10	0.0	151.00	0
0.0	0.0	0.0	1.10	0.0	151.00	0
0.0	0.0	0.0	1.10	0.0	151.00	0