



Operator using a VPACII™ system

DISCOVER HOW A PETROCHEMICAL PLANT SAVES \$4.7 MILLION PER YEAR

Benefits of Detecting Valve Leaks with VPAC™ Systems

For decades, VPAC™, the Through-Valve Leak Quantification system from MISTRAS and a licensed British Petroleum (BP) joint venture, has been widely used in refineries, chemical plants, and offshore platforms to estimate through-valve gas leakage. The VPAC™ family of products realizes savings up to \$5 million per annum per site, as a result of rapidly identifying and estimating losses to the flare.

It's estimated that 5-10 percent of valves leak, and 1-2 percent of those valves account for 70 percent of total loss. Therefore, multimillion dollar savings per facility could easily be achieved with proper detection and quantification of through-valve leakage with the VPAC™ and its family of products.

To date, MISTRAS has sold more than 600 VPAC™ systems to refineries and offshore platforms. Measurement takes a matter of seconds using the portable VPAC™ or new, handheld VPAC™II, which is intrinsically safe and designed specifically for use in hazardous environments such as the oil, gas and petrochemical industries.

The newest system, VPAC™II, utilizes the latest technology to miniaturize and automate valve leak detection while increasing portability with handheld, battery-operated capabilities.

The database that supports the estimation formula was developed during a ten-year span on 800 leaking valves examined by BP. In 1996, the scope of application was widened by a joint BP-Shell program of measurements on large valves in both gas and liquid service, offshore, and in the laboratory.

Work on valves up to 36", was conducted to allow VPAC's™ use on ESDV ball valves (emergency shutdown), and consists of a database extension and revised procedure together with revised calculation spreadsheets, eliminating time-consuming riser ESDV tests per OSHA 1910.119 j (iv) 4, and saving \$400,000/year. A single valve can lose more than \$300,000 per annum. VPAC™ has been documented to save \$1 million - \$4 million per year per refinery by isolating valve leaking. So, instant payback is virtually guaranteed.

See what some of our customers are doing with VPAC™...

VPAC™ KEY FEATURES

- Cut sellable gas losses drastically
- Reduce shutdown time
- Ensure plant integrity and safety
- Accurately replace the bad valves
- Improve maintenance reduce costs
- Move towards zero flaring emissions
- Helps adherence with federal Greenhouse Gas (GHG) reporting and monitoring regulations



VPACII™
Handheld through-valve loss control instrument



VPAC™ Services
Leak Detection and Quantification Services



VPACwin™
Trending software projects valve's future behavior



VPAC-1278
On-line valve monitoring subsystem for Oil & Gas



Valve-Squeak™
Leak detection capability that fits in your pocket

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SAUDI ARAMCO'S VPAC™ EXPERIENCE

ARAMCO uses the VPAC™ on a valve leak program designed to minimize product losses and contamination and to improve maintenance planning. The program was initially implemented on valves in piping systems to flare headers in similar plants.

A total of \$1.2 million dollars was saved in lost products alone, by inspecting more than 550 valves at 24 sites and pinpointing the worst leaking valves for subsequent tear down and inspection.

** Report Presented at European Conference On NDT, Copenhagen, Denmark, May 1998.*



PUT A SMART FACE ON ASSET MANAGEMENT

Many companies routinely pull and rebuild equipment in critical service every year – a waste of time and resources. BP has reported that valve diagnostics helped to reduce valve maintenance costs by 50 percent and spare parts costs by 75 percent because technicians were able to limit service to only devices identified as needing immediate attention. Others were left alone until the next turnaround. A similar predictive-maintenance program to eliminate pulling valves unnecessarily resulted in estimated annual savings of \$617 per valve at a Dupont plant in Orange, Texas in 1996.

** Excerpts from a Chemical Engineering Article, Feb. 1999*



PROFITABLE & ENVIRONMENTALLY FRIENDLY

In 1999, Mobil helped reduce emissions and saved substantial amounts of money. This is an example of a major oil company with eight facilities in the U.S. that are using the VPAC™/5131 system.

Three Facility Examples:

- Joliet: \$1.2 million/year savings
- Houston: \$490,000/year savings
- Beaumont: \$4.7 million/year savings
- One H2 valve leaked \$900,000/year
- Total Savings for eight plants: \$10.2 million/year



SHELL'S VPAC™ SUMMARY

- Gives good answers
- Immediate usefulness
- Quickly paid for itself
- It's great!
- Even small leaks are expensive

** An excerpt from Underhall Magazine*



HE'S THE \$8 MILLION MAN!

David Arney's supervisor knows he is worth more than \$8 million to the company. In February and March of 2001, the Paulsboro, N.J. refinery initiated a program to identify and stop unwanted hydrocarbons from getting into the flare system. Arney was handed a VPAC™, given instructions on how to use the meter and then set free. He checked 630 valves at the facility and found that 36 of these valves were leaking. The value of the product lost to the flare was estimated at \$2.1 million a year. We estimate that corporate-wide, this program's savings could be worth more than \$8 million.

** An excerpt from Valero Newsletter, 2001*

GREEN OPERATIONS NEWSLETTER

Acoustic Technology Sounds Good

By using the Acoustic Emission monitoring equipment, Anschutz Ranch and Whitney Canyon gas processing plants in Wyoming have identified leakage equivalent to \$600,000 and \$750,000/annum, respectively. High-pressure control valves have been found to be a major source of the leaks. A third plant intends to utilize the technology in the very near future as well. Local management has fully endorsed the use of this technology, which through the calculation of an approximate leak rate results in significant dollar savings and environmental benefits as well as increased asset integrity.

This is a good example of best practice sharing across streams and shows that these gas production sites have now fully integrated the technology into their work practices. "Often a site visit will result in an immediate impact, which is then lost over time due to the site not embracing these new work practices. This is obviously not the case here and management at these sites should be commended for their approach," said BP's Steve Carter.



VPAC™II LEADS TO MILLIONS SAVED

An ethylene plant (Borealis AB) located in Stenungsund, Sweden has saved more than €2 million Euros (about \$2.5 million) in reduced losses per year after they started to use VPAC™II.

The company is part of the international Borealis Group and is excited about the potential for further use of the VPAC™II.

**Testimonies and/or statements mentioned are excerpts or customer accounts that have been supplied to MISTRAS and its subsidiaries and represent the views and results of their authors.*

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