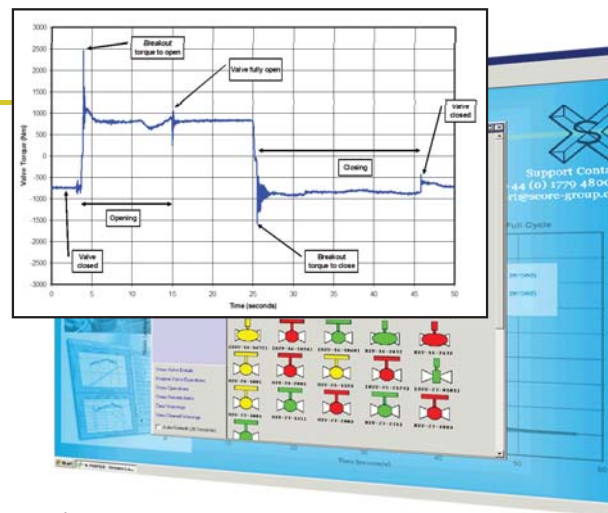


For the most critical process valves, such as Emergency Shutdown Valves (ESDVs), where other failure modes and effects are important to monitor and trend, Score have developed a fully integrated, permanently installed system known as V-MAP®.

Telemetry systems, comprising sensors, transducers and management / reporting software continuously monitor key indicators of valve and operator performance over time and report these in both statistical and graphical formats for further analysis.

Valve failures are very often the result of ageing. Indicators of ageing that can be detected and trended over time using the V-MAP® system include, but are not limited to :-



Main benefits of V-MAP®:-

- Increasing times to operate.
- Increasing valve operating force or torque.
- Increasing actuator pressure or current.
- Increasing through seat leakage.
- Need for maintenance or break down repair.
- Failure to meet acceptance criteria.
- Experience of problems of ageing with similar critical valves of similar materials and/or design on similar duties.
- V-MAP® is a passive, non-intrusive monitoring system that responds to every valve operation, planned or unplanned.
- It removes the need for operations personnel intervention, unless alerted.
- It provides reports and audit records including the trending and comparison with performance benchmarks and safety criteria.
- V-MAP® reporting and analysis provides identification of maintenance requirements and reliability data for confirmation of Safety Integrity Levels (SILs).
- Remote access is available for valve expert analysis and support.

Common approaches to Valve Management:-

- Maintain Just in Case
- Run to Failure
- Failure Response
- Replace like for like

**Expensive
High Risk
Inefficient**

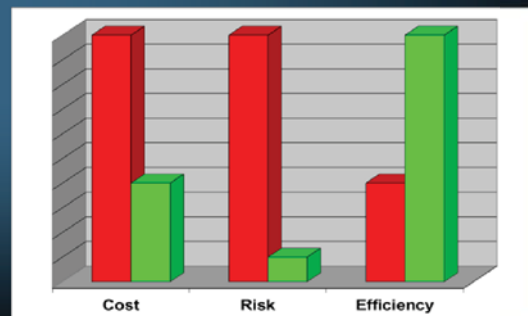
V's

Score Intelligent Valve Management:-

- Criticality Identification
- Condition Monitoring
- Trending over time
- Engineered Solutions

**Lower Cost
Low / No Risk
Max Efficiency**

**Positive changes
you can make by
implementing MIDAS®
Valve Diagnostics...**



MIDAS® Valve Diagnostics

Valve Condition and Performance
Monitoring Made Easy

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Contact us today for further information, or to
arrange a product demonstration, at :-



Improve your valve population performance by implementing

MIDAS® Valve Diagnostics

Valve Condition Monitoring is known to reduce risks, and maximise efficiency and reliability in all processes where it is deployed. It is increasingly being seen as the only safe way of managing valve populations.

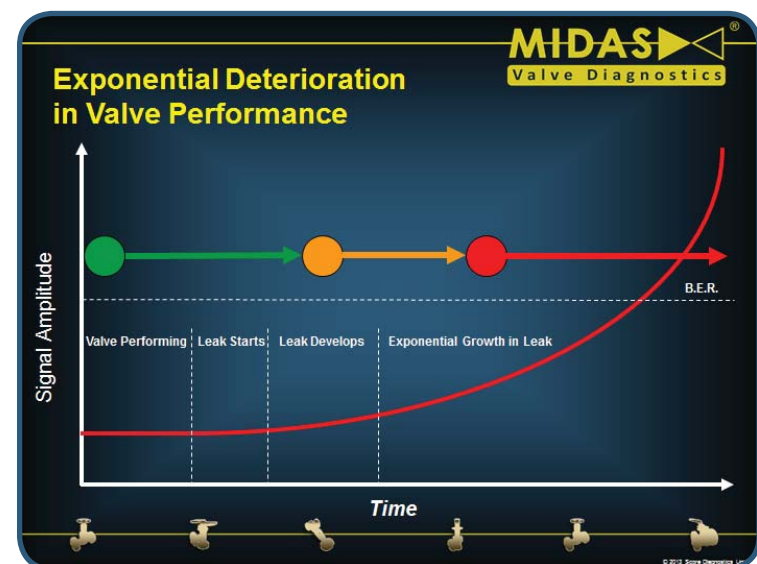
To ensure the on-going safety integrity, environmental protection and efficiency of your process is correctly maintained at all times, it is of critical importance that you know the condition of your process valves.

Put more simply, you need to know if your valves are leaking or not and if they are leaking, how bad is the leak? Additionally, on more critical valves you need to know if there is another “failure mode” developing in your valves or operators that will expose you to risks to people, process or plant (for example, in the event a valve fails to complete its design function such as closing or opening on demand).

Score’s 30+ years of experience of valve supply and Intelligent Valve Management™ tells us that all plant operators are facing the same recurring problems.

As a general rule, 90% of the problems experienced by process operators result from just 10% of the installed population of valves which are not performing to the required standard. The problem for operators is that it’s not always obvious which are the “culprit valves”.

It is also known that all valves follow the same exponential deterioration in performance over time.



Given that we know this, it is possible to use Acoustic Emissions (AE) technology, for example, for quick and easy leak detection.

So, the good news is that risk can easily be managed through the intelligent monitoring of valves, based on their criticality, over their entire life cycle (and any subsequent life cycles following maintenance interventions). All we need is the correct and reliable monitoring equipment, systems and techniques.

MIDAS® Valve Diagnostic products use proven acoustic emissions (AE) technology to identify through valve losses / leaks and then use proprietary algorithms to calculate and quantify any leaks found. Valve leakage represents major risks to plant operations.

These risks include:

- **Safety**
Loss of containment of process fluids presents a major risk to personnel working on the plant.
- **Environmental**
Leaking valves / loss of fluid containment represents a potentially major risk to the environment.
- **Efficiency**
Lost production due to leakage and / or downtime due to poorly performing valves affects both plant efficiency and availability, which can result in both product and / or profit losses.

Score Diagnostics Limited has developed a number of valve condition and performance monitoring products and services to address their existing customers’ and the wider market’s needs.

These products are now in wide-spread use throughout the Oil & Gas regions worldwide. The products offered are all intrinsically safe certified for use in explosive atmospheres.

The “entry level” product for through-valve loss / leak detection and quantification is the hand-held MIDAS Meter®.



The MIDAS Meter® uses an acoustic emissions (AE) sensor to detect the high frequency sound signals emitted by leaks across valve seat to seal interfaces. It is a non-invasive inspection technique which requires the operator to place the sensor directly onto the outside surface of the valve body. Once in position, it is possible to see within a few seconds if there is any leakage across the valve seat(s).

Furthermore, by completing a quick valve survey, where readings are sent from the handset, wirelessly by Bluetooth, to the Personal Digital Assistant (PDA) it is also possible to estimate the leak rate. This then allows the valve maintenance team to focus their efforts on addressing the worst performing valves first and to develop a preventative approach to valve maintenance.

Easy to understand output reports show valve condition and performance corresponding to it’s “allowable leak rate” in the form of a traffic light system.

MIDAS® Meter Installation Summary															
Installation 1 (Score Group plc) from 01/07/2011 to 15/07/2011															
Test Date	Tag Number	Valve Type	Fluid	Operating Conditions				Readings				Leakage			
				Fluid Density	Upstream Pressure	Downstream Pressure	Back Pressure	Far Upstream	Near Upstream	Valve	Near Downstream	Far Downstream	Estimated Leakage	Allowable Leakage	
08/07/2011	ESV-005	Ball	Gas	0.00g/m3	80.00Barg	80.00Barg	20	25	21	21	20	20	0.00mm3/min	100.00mm3/min	●
08/07/2011	XV-001	Ball	Liquid	0.00g/m3	80.00Barg	10.00Barg	21	26	26	26	28	25	0.50mm3/min	10.00mm3/min	●
08/07/2011	XV-002	Butterfly	Gas	0.00g/m3	80.00Barg	50.00Barg	20	23	27	48	28	28	83.10mm3/min	0.50mm3/min	●
08/07/2011	XVU-003	Ball	Gas	0.00g/m3	70.00Barg	50.00Barg	21	24	23	26	25	23	30.10mm3/min	100.00mm3/min	●
08/07/2011	XV-004	Ball	Gas	0.00g/m3	70.00Barg	10.00Barg	20	22	22	20	26	24	22.40mm3/min	0.50mm3/min	●
08/07/2011	XV-004	Ball	Gas	0.00g/m3	70.00Barg	10.00Barg	20	22	22	20	22	22	16.30mm3/min	20.00mm3/min	●
08/07/2011	XV-006	Ball	Gas	0.00g/m3	20.00Barg	10.00Barg	21	24	25	25	23	24	24.00mm3/min	0.50mm3/min	●
08/07/2011	XV-002	Butterfly	Gas	0.00g/m3	80.00Barg	50.00Barg	20	21	21	21	20	21	0.00mm3/min	0.50mm3/min	●
08/07/2011	XV-006	Ball	Gas	0.00g/m3	80.00Barg	30.00Barg	21	21	22	22	22	21	0.00mm3/min	0.50mm3/min	●
08/07/2011	XV-004	Ball	Gas	0.00g/m3	70.00Barg	10.00Barg	20	21	21	21	21	21	0.00mm3/min	0.50mm3/min	●
08/07/2011	XV-001	Ball	Liquid	0.00g/m3	80.00Barg	10.00Barg	21	21	24	25	23	23	0.10mm3/min	1.00mm3/min	●
08/07/2011	XV-001	Ball	Liquid	0.00g/m3	10.00Barg	2.00Barg	21	24	24	27	25	24	0.00mm3/min	1.00mm3/min	●

The easy to interpret visual indicators suggest the following logic :-

- Valve Performing, Leave Alone.
- Leakage Detected, Monitor Deterioration Closely.
- Leakage Detected, Maintenance Required, to avoid risks associated with in-service failure modes.

Score Diagnostics Limited’s range of market-leading valve condition and performance monitoring products help you to troubleshoot problem valves, monitor valves, trend failures and move towards pro-active maintenance.

For more critical process valves, the MIDAS® Sensor (patent pending) has been developed to be installed on the valve and adjoining pipework, to give a continuous and permanent feedback indication of valve sealing performance in line.

The sensor used is the same design as the MIDAS Meter® and the output from the unit’s acoustic emissions (AE) sensor (4-20mA electrical signal) is designed to tie in directly with all plant’s Digital Control Systems (DCS) or Supervisory Control And Data Acquisition (SCADA) Systems or Score’s own V-MAP® System. This makes the technology easy to install at the plant construction phase and also to retrofit to existing plants.

The MIDAS® Sensor’s output allows the operator back in the process control room to see the performance of the valve in real time. The software / graphic user interface (GUI) gives a visual indication of the condition of each valve being monitored for through-seat leakage.

