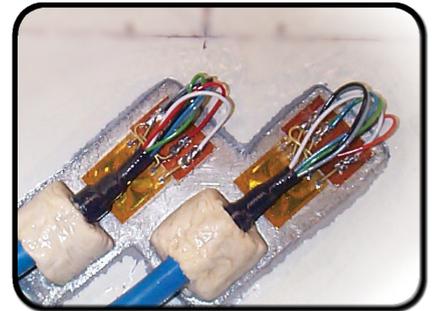




V-Map: Valve Monitoring for Analysis and Performance

V-MAP continuously monitors, alerts and reports on valve and actuator performance. It is a passive, non-intrusive monitoring system that responds to every valve operation, planned or unplanned, partial or full, that:

- Issues warning of performance deterioration before unacceptable levels are reached
- Eliminates the need for personnel at the valve's location
- Provides trending, benchmark comparison, reports, and audit records
- Provides analysis that will identify maintenance requirements and provide reliability data for confirmation of Safety Integrity Levels (SILs)
- Gives remote access availability for valve expert analysis and support



The Need

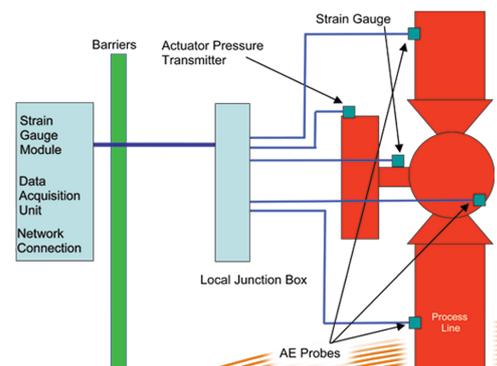
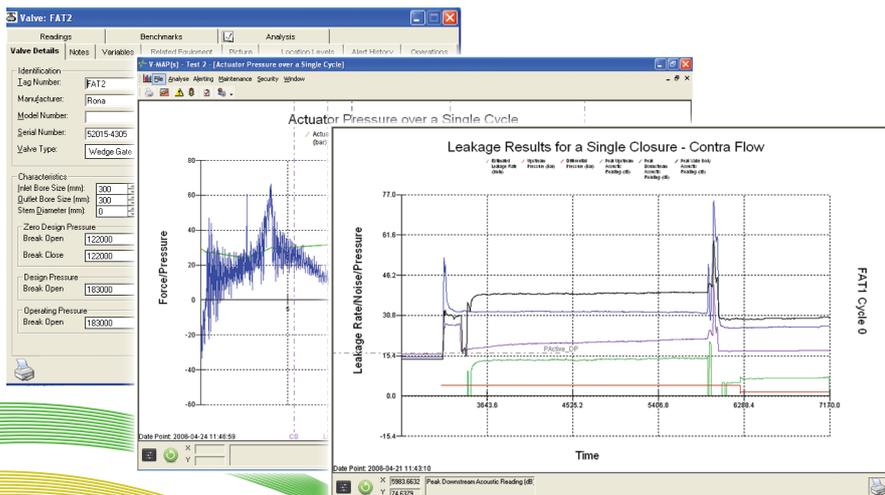
The monitoring of the condition of Emergency Shutdown Valves (ESDVs), on both onshore and offshore Oil and Gas installations, is an essential part of ensuring the safety of personnel, protection of the environment and capital assets. The failure of an ESDV to operate on demand, or fail to provide a shut off will have major impact.

To demonstrate that an ESDV's performance meets the installation's safety criteria, it is normally subjected to routines involving inspection, partial closure, full closure, and leakage tests. These routines often require special test equipment and trained personnel, and will involve a planned shutdown thereby interrupting production.

Hence, there is need for a system that automatically reports valve performance and addresses the safety and personnel issues. This need to continuously demonstrate performance is met by Score's V-MAP development. Data is acquired remotely without the need for personnel to be in attendance. V-MAP will also acquire data for every valve operation, including spurious ESDVs, so building up a history of performance that can be used in-lieu of a planned shutdown test.

The Development

V-MAP has been developed based on Score's long term experience in valve and actuator design, diagnostics, data acquisition, and system design and construction. The basic monitoring techniques and principles have been well developed in the past. It is the hardware and software developments of recent years that have enabled those techniques and principles to be implemented in a cost effective modular system design. One that can be tailored to the specific monitoring requirements, communications and protocols of the installation's automation system.



The System

V-MAP dedicated sensors are located on the valve and actuator and on the adjacent piping. The sensor types typically selected are:

- Acoustic Emission leak detection sensors
- Strain gauges to measure the torque or force required by the valve
- Pressure transmitters to monitor the actuator fluid power requirement
- Position transmitter to measure the valve stroke

The V-MAP sensors are continuously logged by dedicated data acquisition units (DAUs). On detection of a valve operation the V-MAP server downloads the information from the DAUs and typically requests the following input from the installation's automation databases:

- Pipeline pressures and temperatures
- Actuator limit switch and solenoid status and timestamps
- ESDV event timestamps

Once the server has collected the raw data from the various sources, it is stored and the following functions performed to transform the data in to information:

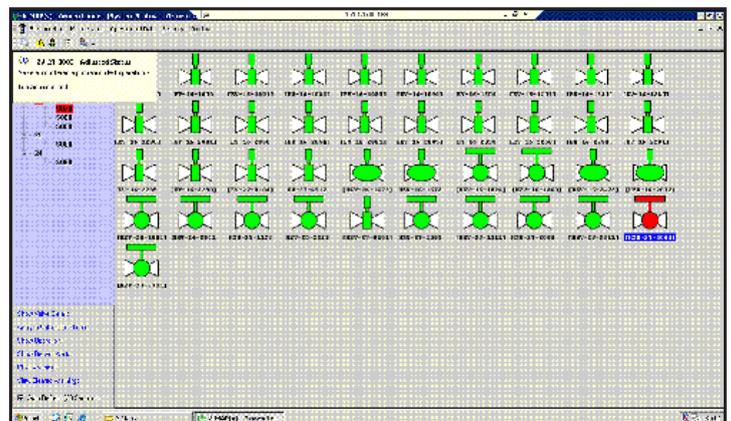
- Manipulation to obtain derived data
- The derived data is then analysed by use of proprietary algorithms for:
 - Raising of alerts if performance characteristics exceed preset alarm or notification levels
 - Comparison and trending with previous readings, benchmarks and design calculations
 - Comparison of sensor outputs to detect sensor drift or malfunction
- Provision of summary reports

The Benefits of Using Score

- Over 25 years experience in valve and actuator technology, design, repair, and problem solving
- Extensive experience in valve testing and monitoring techniques
- V-MAP has been supplied to two major North Sea Projects, both on and offshore, each with over 40 critical ESDVs
- Specialist engineers available worldwide with the backing of an over 1,400 employee Organisation
- Independent privately owned company

The Benefits of Using V-Map

- Remote monitoring of all valve operations
- Reduces site exposure for personnel
- Automatic alerts and warnings of deterioration
- Measures compliance with acceptance criteria
- Focuses maintenance activity
- Thereby maximises plant safety and availability and reduces costs



 **Score Group plc**
Intelligent Valve and Gas Turbine Solutions™
www.score-group.com

For Further information contact:

V-Map Team,
Glenugie Engineering Works, Peterhead, AB42 0YX
V-MAPinfo@score-group.com

Tel: +44 (0) 1779 480000