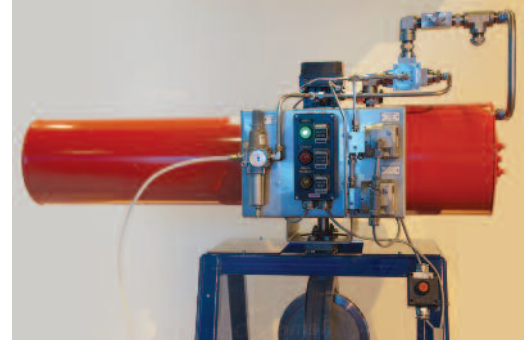


# Emerson provides advanced diagnostics to increase reliability on fast-acting Emergency Shutdown (ESD) Valve Systems

*A large proportion of undetected failures on Final Elements can be directly linked with untested pilot-operated systems.*

### Offshore Reliability Data

Critical, high-pressure quarter-turn valves are required to close very fast, often within 2-3 seconds, in the event of an operational emergency on offshore platforms and process facilities. Without this capability, gas overpressure buildup or leaks can lead to catastrophic events causing injury, loss of life and loss of assets. To counteract this risk, Safety Instrumented Systems (SIS) has been created to take a process or operation to a safe state. The SIS relies on integral components that include a sensor, logic solver and final element (FE) – actuator, controls, pressure relief components and quarter-turn valve performing a Safety Instrumented Function (SIF). To ensure system reliability, industry standards, most notably IEC 61508 and 61511, have been implemented to manage the veracity of the system.



### What if...

- You could increase diagnostics coverage on fast closing ESD valves with the system remaining in operation
- You could perform accurate in-line testing of ALL control components in the shut down circuit
- You could reduce the cost of a scheduled Partial Stroke Test (PST)

### INABILITY TO TEST ALL SYSTEMS COMPONENTS

The inability to fully test all components on a conventional pilot-operated shutdown system has required end users to obtain far more reliability to be certain that their critical ESD systems will work when called upon.

Periodic testing of each of the integral components while in service will diagnose, uncover and capture dangerous failures, so that operators can completely rely on their performance if needed.

### PARTIAL STROKE TESTS COULD INADVERTENTLY SHUT DOWN THE SYSTEM

Solenoid and pilot valve testing in the fast closing system is problematic and difficult to precisely regulate without losing control and prematurely closing the valve. Partial valve stroke testing on a fast closing FE could result in an unplanned and costly shutdown and re-startup of an operation.

## DIAGNOSTIC ON FAST-ACTING ESD SYSTEMS

### EMERSON PROVIDES PROVEN DIAGNOSTIC METHODS

Emerson's continual SIS development program has produced diagnostic methods to verify operability of fast closing ESD valves without losing control of valve functionality, inadvertently shutting down the operation. The technology, with milli-second precision, verifies functionality of all critical control components in the shutdown circuit, while the safety valve remains in operation. Emerson's lab tests have 'pushed' the system and identified outer boundaries.

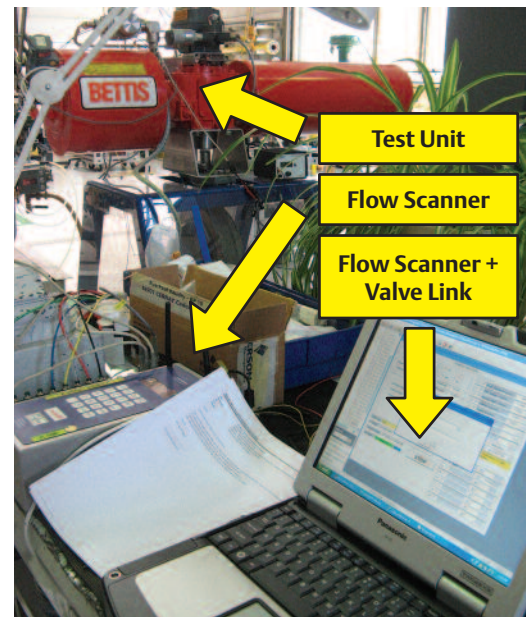
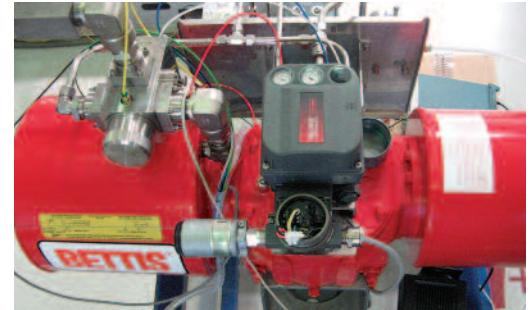
### ALL CRITICAL SYSTEM COMPONENTS CAN BE DIAGNOSED

Utilizing the Emerson solution, every vital component and the entire system can be tested and verified with third party documentation certifying complete suitability from a Safety Integrity Level (SIL) 1 to HIPPS, or SIL3, as required.

### EMERSON OFFERS A COMPLETE SOLUTION

Emerson offers a unique expertise in the field of safety systems, including resident certified safety personnel and all required system software and hardware in a single package. We provide a complete solution for testing and certification of fast closing ESD systems to meet IEC61508/61511 standards with all the needed components, documentation, continued lifecycle operation and maintenance support. We can supply an integrated Emerson package including Fisher Fieldvue DVC controllers, Asco solenoids, Bettis quarter-turn pneumatic actuators and approved volume boosters, reporting to a Delta V digital automation system for process control.

The results of Emerson's integrated diagnostic efforts have been very positive as a proven, cost-effective way to provide increased reliability on large emergency shutdown valves (ESDV) and high integrity pressure protection systems (HIPPS), required for applications up to a SIL level of 3.



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