

CASE STUDY



200 millisecond quick
closing of gas line



GAS
DISTRIBUTION

Inspired By Challenge

200 millisecond quick closing of gas line

Most Emergency Shutoff Devices (ESD) have closing speeds of 1-2 seconds. The Habonim engineering team was asked by a global turbine manufacture to meet the challenge of closing a 3" gas line pressurized to 500 psi in less than 200 milliseconds.

A rapid stroking time was a mandatory requirement dictated by the power turbine engineers. Based on system calculations and tests it was concluded that tight shut-off in a stroking time of less than 200 milliseconds would ensure that in the case of ignition malfunction, the amount of unburned gas that flowed into the turbine would be small enough to avoid an internal explosion, solenoid.

It was essential that the 200 millisecond closing time include all mechanical and electrical delays of the valve, actuator and solenoid making the challenge even more extreme.

The solution

Two types of valves were examined: Habonim's three-piece F47W series and the one-piece flanged class 300, F32W series. Given the flammable gas application, only a fire-safe valve certified to API 607 and ISO 10497 standards could be used. Both valve series use the unique and durable HermetiX™ fire safe stem seal, certified to the ISO 15848-1 and API 641 standards for fugitive emission.



Both lines of valves were automated with the COMPACT™ 4-piston spring return pneumatic actuator. The COMPACT™ is the FASTEST, off-the-shelf, rack & pinion actuator on the market. Its unique four-piston design allows for a smaller diameter pinion, which significantly shortens piston travel and reducing response time.

Initial tests of a standard COMPACT™ actuator on the fire safe valve resulted in a stroking time of 230-300 milliseconds from electric command to limit switch closing signal.

Responding to the customer's requirement to achieve a closing time of 120 milliseconds, the Habonim team adjusted the actuators characteristics offering the customer a custom made solution with a high degree of repeatability, curtail for the customers mission-critical application. The valves were cycled thousands of times at very short, rapid intervals at both Habonim's facility and at the customer's site, achieving a high degree of repeatability. Both Emergency Shut-off Devices were then validated by the customer to be used for this mission-critical application.

The key to this breakthrough was the out-of-the-box thinking of Habonim's engineers, who modified the fastest actuator in the market the COMPACT 4-piston actuator, and achieved a truly remarkable closing time of 120 milliseconds.



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