

Your Company Name / Logo	ESD VALVE PROOF TEST SOP	Doc no: SOP SIS 001	Rev: 0
Department: Instrumentation	Standard operating procedure	Date:	Page: see footer

1. Purpose

To reveal dangerous undetected failures of shutdown valves at the proof test interval assumed in the SIL verification.

2. Scope

On/off shutdown valves (ESD, SDV, XV) with solenoid valves and spring return actuators that form part of a SIF.

3. References

- IEC 61511 (proof testing of SIS)
- Safety requirements specification (SRS) of the SIF
- Valve and actuator manuals

4. Responsibilities

- Instrument technician: carries out the work and records results.
- Instrument engineer or supervisor: reviews and approves the records.
- Operations: grants the permit, isolates the process and returns the equipment to service.

5. Safety precautions

- Work only under a valid permit to work and follow the site isolation (lockout tagout) procedure.
- Wear the PPE required for the area: safety helmet, glasses, gloves and safety shoes as a minimum.
- In hazardous areas use certified or intrinsically safe test equipment, or obtain a gas free certificate and hot work permit.
- Inform the control room before starting, and before returning the instrument to service.
- Bypassing a SIF reduces protection: apply compensating measures and get written authorisation as per the bypass procedure.
- Only test with the process in a safe state or isolated.

6. Tools and equipment

- Stopwatch or SIS sequence of events records
- Communication with the control room (radio)
- Leak test equipment if seat tightness is part of the test

7. Prerequisites

- Proof test plan approved; required closing time from the SRS.
- Operations agreement and bypass authorisation where needed.

8. Procedure

8.1 Preparation

- 8.1.1 Review the previous proof test record and any open defects.
- 8.1.2 Confirm the required stroke times and fail action from the SRS.

8.2 Full stroke test

- 8.2.1 Initiate the trip from the SIS logic (through the solenoid valve) as the real demand would.
- 8.2.2 Time from the command to the closed limit switch.
- 8.2.3 Confirm the closed feedback in the SIS and DCS.
- 8.2.4 Reset and open the valve; time the opening stroke and confirm the open feedback.
- 8.2.5 Repeat as required by the test plan.

8.3 Additional checks

- 8.3.1 Check the solenoid valve vents freely and the actuator has no air leaks.
- 8.3.2 Perform a seat leak test if the SRS requires tight shut off.

8.4 Completion

- 8.4.1 Remove all bypasses with operations confirmation.
- 8.4.2 Record the results against the SIF and report any failure as a dangerous failure.

9. Acceptance criteria

- Closing time within the SRS requirement.
- Feedback correct; smooth travel without sticking.
- Seat leakage within the specified class (where tested).

10. Records

- ESD valve stroke test report (free template: instrumentationblog.in/downloads/templates/esd-valve-stroke-test-report/)
- Cause and effect matrix (free template: instrumentationblog.in/downloads/templates/cause-and-effect-matrix-template/)

11. Approval

	Prepared by	Reviewed by	Approved by
Name			
Signature			
Date			

This procedure is a generic template. Adapt it to your site permit system, the manufacturer instructions and your quality system before use.