



**P-192.731(a)(b)(c)
Compressor Relief Devices
Remote Control Shutdown Devices
Compressor Station Emergency
Shutdown System**

Description This procedure was designed to ensure proper inspection and testing of each pressure relieving and remote control shutdown device in a compressor station. Plus establishing a method for completing and documenting a Station Emergency Shutdown Devices (ESDs) are properly maintained and are functioning correctly.

Regulatory Applicability Pressure relieving devices (except rupture discs) in a DOT regulated compressor station.

- Regulated Transmission Pipelines
- Regulated Gathering Pipelines (Type A)
- Regulated Gathering Pipelines (Type B)
- Regulated Distribution Pipelines

Frequency Once per calendar year, at intervals not to exceed 15 months.

Reference

49 CFR 192.163	<i>Compressor Stations: Design and Construction</i>
49 CFR 192.167	<i>Compressor Stations: Emergency Shutdown</i>
49 CFR 192.171	<i>Compressor Stations: Additional Safety Equipment</i>
49 CFR 192.173	<i>Compressor Stations: Ventilation</i>
49 CFR 192.615	<i>Emergency Plans</i>
49 CFR 192.731	<i>Compressor Stations: Inspection and Testing of Relief Devices</i>

Forms / Record Retention

F-192.731 (a)	Compressor Station Relief Device / 5 Years
WTG-Attendance Form	Attendance Form / 5 Years
F-192.731 (c)	Compressor Station ESD Test / 5 Years

Related Specifications None



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OQ Covered Task	0411	<i>Spring – Loaded Pressure Limiting and Relief Device – Inspection, Testing, Preventative and Corrective Maintenance</i>
	0421	<i>Pilot Operated Pressure Limiting and Relief Device – Inspection, Testing, Preventative and Corrective Maintenance</i>
	0431	<i>Pneumatic Loaded Pressure Limiting and Relief Device – Inspection, Testing, Preventative and Corrective Maintenance</i>
	1361	<i>Station Emergency Shutdown System – Inspection, Testing and Corrective Maintenance</i>

(In order to perform the tasks listed above; personnel must be qualified in accordance with West Texas Gas's Operator Qualification program or directly supervised by a qualified individual.)



Procedure Steps

General

1. All remote control shutdown devices operated and maintained by West Texas Gas, capable of shutting down a compressor station, compressor units, gas fires, or electrical facilities as referenced in DOT regulations 192.167 shall be subjected to the requirements of this procedure.
2. Gas Areas as used in this procedure are areas within a compressor station that contain major gas containment facilities and include the compressor building, adjacent gas headers, and other concentrations of gas piping or other facilities.
3. Gas fires as used in this procedure are the flames in combustion chambers open to the atmosphere on equipment such as air, gas or water heaters, or re-boilers.
4. A remote control shutdown device is a device (e.g. fuel gas valve, engine ignition switch, or motor control center shunt trip) that is intended to react when an Emergency Shutdown station outside a gas area is tripped to deactivate or shutdown a compressor unit or units and/or gas fires and/or electrical facilities.
5. A test of a remote control shutdown device, accomplished during an Emergency Shutdown System test, that satisfies requirements of P-192.605(c), will satisfy the requirements of this procedure provided time interval requirements are met. Inspection and calibration, where applicable, must still be performed per this procedure.
6. If piping or equipment modifications or additions are made to the facilities protected by the Emergency Shutdown (ESD) system such that the complete blow-down test may no longer be valid, then a full-blow down ESD test must be performed upon completion of work.
7. If an Emergency shutdown system has been activated, intentionally or otherwise, within the calendar year and it can be determined that all items functioned as intended, the annual test requirement has been satisfied.

Pressure Relief Valve (PRV) Inspection and Testing

1. Each pressure relieving device in a compressor station must be inspected and tested at intervals not exceeding 15 months but at least once each calendar year and recorded. Inspections and tests will determine that each device:
 - a) is in good mechanical condition, (refer to manufacture recommendations)
 - b) is adequate from the standpoint of capacity and reliability of operation for the intended service,
 - c) is set to function at the correct pressure,



- d) tested and set for correct pressure rating based on original packagers design ratings,
 - e) vent stacks are properly installed.
 - i) Vent stacks are installed to prevent accumulation of moisture.
 - ii) Vent stacks are properly installed to prevent hammering and vented to a safe place.
 - f) Is properly installed and protected from dirt, liquids, or other conditions that might prevent proper operation
 - g) Determine that they have enough capacity to limit the pressure on the facilities to which they are connected to the desired maximum pressure
 - h) If a test is not feasible, review the calculation of the required capacity of the relieving device at each station and compare these required capacities with the rated or experimentally determined relieving capacity device for the operating conditions under which it works. After the initial calculations, subsequent calculations are not required if the review documents that parameters have not changed in a manner that would cause the capacity to be less than required.
 - i) If the relieving device is of insufficient capacity, a new or additional device must be installed to provide the additional capacity required.
2. Any defective or inadequate equipment must be promptly repaired or replaced.
3. Retain records for at least five (5) years.

Remote Control Shutdown Device Testing

1. Each remote control shutdown device in a compressor station must be inspected and tested at intervals not exceeding 15 months but at least once each calendar year and recorded. Inspections and tests will determine that each device:
- a) If an inspection is intended, visually inspect the device for corrosion, moisture, loose connections, or foreign material that might interfere with its operation.
 - b) If a test is intended, isolate items such as dump valves, which, if operated, will cause an unnecessary waste of gas, chemicals, or might cause an unwanted shutdown of equipment.
 - c) Test the device by introducing an input signal or simulate a condition with the use of an inert gas that causes the device to activate, producing an output response that will shut down or isolate equipment or cause operation of valves or equipment. Actual equipment shutdown or activation by the device is not a requirements it the device can be proven to function properly.
 - d) Clean, repair, or replace parts are required.



- e) If calibration is intended, calibrate by adjusting the mechanism to ensure that an output response or operation always corresponds to an input signal or condition within the manufacturer's prescribed operational tolerance.
2. Retain records for at least five (5) years. The use of an electronic scheduler will be used to ensure the test and calibration of the system is completed within the time frame set forth.

Compressor Station Emergency Shutdown System Testing

1. Maintain the following information on the ESD system:
 - a) Schematics, drawings, and/or pictures identifying major components of the Shutdown system.
 - b) A written description of how the Shutdown system operates.
 - c) A list of the components that require maintenance and the maintenance tasks involved. Include valves, valve operators, sensor heads, controllers, engine panels, process equipment, and other devices that need to be shut down during and ESD/BSD.
2. Train appropriate company and contractor personnel so they have a thorough knowledge of how each Emergency Shutdown system operates and to recognize situations and events when they are expected to actuate the system, when conducting work activities within the facility. For contractor personnel, utilize sections 2b through 2(b)(iv), to conduct training and ensure appropriate documentation during the contractor safety orientation process.
 - a) Train new personnel to adequately operate, inspect, and test each Emergency Shutdown system within a reasonable time after they begin work. Retrain all personnel annually.
 - b) Prepare written documentation of the content of the above required training, and include the following items:
 - i. Operation and purpose of the ESD/BSD system
 - ii. Explain the following basic system components using schematics and/or pictures:
 - Gas detector head locations
 - Fire detector head locations
 - ESD/BSD manual activation
 - Controller equipment



- ESD/BSD valve location
 - Critical test monitoring locations
 - Pilot gas regulator station
- iii. When a manual ESD/BSD should be activated
 - iv. What to expect when the ESD/BSD systems are activated.
 - v. Purging procedures and “return to normal” verification
 - vi. Update ESD manual as changes are made. *Review* ESD manual annually to assure accurate content of schematics, drawings, and components.
3. Test each Emergency Shutdown system at least once each calendar year. Consider at least the following steps for each Emergency shutdown test:
- a) Schedule an outage with management, and DOT if required by location.
 - b) Prior to each test, review previous tests records to ensure all valves functioned as designed
 - c) Notify neighbors and the fire and/or police department, as required by the location Emergency Plan.
 - d) A successful full blow down of systems or subsystems where all applicable components operate properly is required at least once every five (5) years. Determine if a full plant blow-down, partial plant blow-down, or some other lesser method (blind flange blowdowns) is to be used, on a location-by-location basis. For facilities that has 100% spring operated isolation and blowdown valves installed, total blowdown is not required unless a piping modification has occurred.
 - e) Review the written plan for the operation of the Emergency Shutdown system with applicable employees before each test. Include items such as personnel responsibilities, purging methods, and order of equipment restart.
 - f) Place employees at critical points of shutdown to observe and record Emergency Shutdown system performance.
 - g) Actuate the system utilizing a different Emergency shutdown station each year. Consider performing BSD first.
 - h) Observe and record the timing and function of all major components.
 - i) Any malfunctioning components should be repaired and retested. If the same component fails on subsequent tests consider a new, replacement, or is possible, removal of the component..



- j) Purge piping and reset ESD system.
 - k) Return ESD system to automatic.
 - l) Review the system test to determine whether the test criteria were met.
 - m) All unit ESD control systems should be verified and documented as operating properly. If possible, all available units should be running upon the actuation of the ESD test. If a unit is unavailable or it is not feasible to start a unit at the time of the annual test, the ESD components test should be accomplished by starting the unit when it becomes available or by simulation; before it exceeds the 15-month component test time limit.
4. A successful ESD test means that the entire station blew down (or would have in a situation) in the required time, in the correct order, employees could reasonably be expected to escape, and property damage would be minimized. If there is a component failure, but the ESD blows down successfully; then the component may be tested individually after repairs are made. If there is a component failure and the ESD does NOT blow down successfully, then the entire ESD system must be tested after repairs are made. If the initial ESD test was not successful, the next ESD test will be performed in two months. If the two-month test fails, ESD testing will continue to be performed at one-month intervals. Upon completion of a successful test, the original 12-month scheduled testing date and frequency will continue to ensure that the ESD system is tested each calendar year.
5. Retain records for at least five (5) years.
- a) Complete the Emergency Shutdown Test Report for each ESD test and submit to Admin.
 - b) The use of an electronic scheduler will be used to ensure the test and calibration of the system is completed within the time frame set forth to complete the ESD manual review. Retain documentation for 5 years.
 - c) For all training, complete the training attendance form with all requirements