

Compressor Stations

The Heart of Pipeline Systems

Compressor stations pump gas through a pipeline by compressing the gas at intervals along the system. Gas flows by expanding in the pipe from the discharge side (high pressure point) of one station to the suction side (low pressure point) of the next. An average station may pump as much as 830 million cubic feet of gas per day. Under normal operating conditions, compressor station engines run 24 hours a day, seven days a week, 365 days a year. The El Paso Pipeline Group's compressor stations are monitored at all times from the company's gas control centers. While stations vary according to the number and types of engines they use, most compressor stations consist of piping, engines, compressors, fuel gas systems, lube oil systems, engine jacket water systems, electrical generators, safety systems, and personnel to maintain and operate these elements. (See attached diagram.)

1. Station Yard Piping

Natural gas enters and exits the compressor station through station yard piping. Gas enters the station at the suction header. From there, gas passes through the scrubbers, which remove any solids and most liquids from the gas. Because the temperature of natural gas rises when it is compressed, high-pressure gas coolers may be used to lower the temperature of the gas before it is discharged into the main pipeline. Cooling helps preserve the pipe's anti-corrosion coating and allows for the transportation of greater volumes, for gas is denser at lower temperatures. From the cooling system, gas flows to the station discharge point, and enters the main line.

2. Engine and Compressor Sets

The engine and compressor are the heart of the station. As gas travels through the pipeline, its pressure drops. The compressor increases the pressure of the gas as it moves to the discharge side of the station, enabling the gas to continue its journey. Coordinating with gas control, a station will run only those engine-compressor sets needed to handle the volume of gas currently flowing through the pipeline.

3. Fuel Gas System

Most compressor station engines are fueled by natural gas from the pipeline; however, many are run by electric engines.

4. Lube Oil System

The lube oil system lubricates and protects all moving and rotating parts in the engine and compressor set. Each engine has its own lube oil system that maintains specific oil levels and temperatures in each engine crankcase. This oil also helps cool the engines. When an engine's oil is changed, the old oil is removed and sold to a vendor for reprocessing.

5. Jacket Water System

Water circulated through the engines as a coolant is called jacket water. After the water picks up heat from the engine, it runs through an atmospheric cooler where the heat is removed. The jacket water is then circulated back through the compressor engine. Additives in the water prevent corrosion inside the engine and piping.

6. Electrical Generators

Electrical Generators are used to fuel jacket water and cooling systems and perform as either the primary or backup energy source for a compressor station.

7. Safety Systems

To protect the public, company personnel, and property, all compressor stations are equipped with several safety devices. One of these safety systems, common to all compressor stations, is an Emergency Shutdown System. When activated, the Emergency Shutdown System stops the engines, isolates and vents the compressor piping, and routes the gas away from the station. During the venting process, natural gas is released through a stack in a remote area of the plant yard. Because of the required venting, some noise can result from compressor maintenance, activation, or Emergency Shutdown System testing.

8. Personnel

The El Paso Pipeline Group's pipeline systems are made up of a number of operating areas, each of which is overseen by an area manager who is responsible for the facilities in that region. These operation supervisors work directly with the local technicians who operate and maintain the equipment at the compressor stations and on the pipeline. At some stations, certain engine functions are completely automated and run by computers that are monitored from the company's gas control centers. Trained engineers support the operating areas to keep all systems in top condition.

With this complex and highly specialized system, the El Paso Pipeline Group moves natural gas safely and reliably from producers to customers.

