



Northeast Supply Enhancement

WHAT IS A COMPRESSOR STATION?

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Compressor stations, sometimes called pumping stations, are the “engines” that power an interstate natural gas pipeline. As the name implies, the compressor station compresses the natural gas, to push the gas through the pipeline.



Pipeline companies install compressor stations along their pipelines, typically one every 40 to 100 miles. The size and the number of compressors varies, based on the diameter of the pipe and the volume of gas to be moved. Nevertheless, the basic components of a station are similar.

SEPARATING THE GAS

When the natural gas enters the compressor station, it flows through separators used to remove solids and liquids from the natural gas in the pipeline. These separators are provided mainly to protect the compressor from any small debris that has entered the pipeline during construction and water from integrity testing. It should be noted that except for the small amount of debris and liquids captured to protect the compressors, and the natural gas needed to run the compressor station, all the natural gas that enters a compressor station leaves it again through the pipeline.

After going through the separators, the natural gas is then compressed by a centrifugal or reciprocating compressor.

TYPE OF COMPRESSORS

Simplistically, a centrifugal compressor works like a fan; each fan is called an impeller, and there may be one, or several, impellers in a series, depending on how much pressure is needed.

A reciprocating compressor, on the other hand, is made up of one or several pistons configured much like an engine block. Deciding between which type of compressor to use is based on the flowrate through the compressor, as well as the amount of pressure needed.

The compressor is driven by a gas turbine, electric motor or reciprocating engine.

A gas turbine is very similar to a jet engine found on an airplane except that instead of using the thrust to push the airplane, the jet turns a large fan to spin or rotate the compressor. An electric motor is a larger version of the electric motors you see every day, just as the reciprocating engine is similar to your car engine, just larger. The gas turbine and reciprocating

engines typically use natural gas from the pipeline, where the electric motor uses power from an electric transmission line.

Selection of this piece of equipment is based on air quality, available power and the type of compressor selected. Typically, electric motors are used when air quality is an issue. Gas turbines are used when electric power is not readily available. Reciprocating engines are used when smaller compressors are needed.

THE AUTOMATION SYSTEM

Most compressor stations are automated so that the compressors can be started, controlled and stopped from a central control location regardless of the weather conditions, time of day, or day of the week. The automation system also acts to protect the equipment, facility, and surrounding area in the event that the equipment is not operating as it was intended. The operators of the system continuously monitor and adjust the mix of compressors that are running to maximize efficiency, as well as keep detailed operating data on each compressor station. The control center also can remotely operate shut-off valves along the pipeline system.



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