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Compressor Facility

What is a compressor station?



Compressor stations, sometimes called pumping stations, are the "engine" that powers an interstate natural gas pipeline. As the name implies, the compressor station compresses the natural gas, (increasing its pressure) 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.

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 gotten into 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.



Simplistically a centrifugal compressor works like a fan, each fan is called an impeller and there may be one or several impellers in 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 that is needed.

The compressor is driven by either 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.

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 keeping detailed operating data on each compressor station. The control center also can remotely operate shut-off valves along the pipeline system.

Project Overview

Williams initially identified seven potential compressor station sites in Middlesex County, N.J., which met most, or all, of the requirements necessary for sitting a natural gas pipeline compressor station. Some of the factors considered included local zoning restrictions and physical constraints such as:

- . Proximity to the existing pipeline
- . Access to electric power (230Kv)
- . Pipeline hydraulics
- . Compatible with zoning, land use and land development
- . Site terrain
- . Water table and storm water management
- . Site accessibility


The pipeline company also evaluated a number of environmental factors, including potential

impacts on:

- . Residents
- . Threatened & endangered species
- . Wetlands, water bodies & groundwater
- . Fish, vegetation and other wildlife
- . Cultural resources
- . Geology
- . Soils
- . Land use
- . Air and noise quality

The site Williams identified with FERC as its preferred site is located approximately 800 feet north of Waterworks Road and 800 to 1,200 feet east of Bordentown Avenue. The site is located in an industrially zoned area, more than 1,600 feet from the nearest noise sensitive area. Williams anticipates that approximately 10 acres of the site will be used for construction and 6 acres will be retained for operation of the compressor facility. The remainder of the site will be left undisturbed.



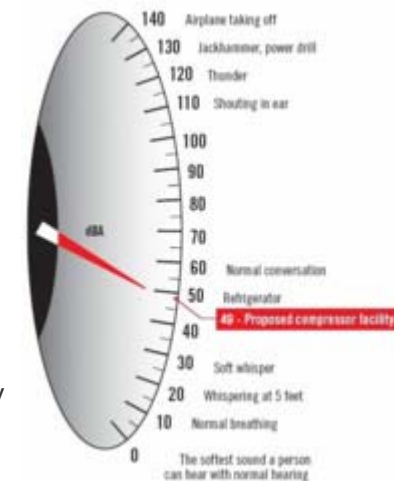
Click map to enlarge 

Facility Design


Four main buildings are proposed as part of the new facility:

- . A compressor building to house the compressors. The compressor drive package will consist of two 5,000 horsepower electric motors each driving a reciprocating compressor.
- . A one-story switchgear building for electric power
- . A two-story auxiliary/office building
- . A one-story control building

The project has been designed to minimize any adverse impact to surrounding communities. The facility will be powered by quiet, non-polluting electric motors. The company has attempted to ensure as much distance as possible is placed between the facility and the nearest residence. The proposed facility will include control and safety features with redundant backups. The station will be operated in accordance with all applicable safety standards established by the U.S. Department of Transportation's Office of Pipeline Safety.



Typical Sound Levels in dBA or decibels (click to enlarge)

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