



Compressor stations: Keeping natural gas flowing

The Westcoast pipeline system has been transporting natural gas to markets across British Columbia (BC), Alberta and the U.S. Pacific Northwest for almost 70 years. This natural gas heats homes, generates electricity and produces hundreds of products that improve our lives.

The Westcoast system is over 2,900 kilometres (km) long, stretching from Fort Nelson in northeast BC and from Gordondale near the BC-Alberta border, south to the Canada-U.S. border at Huntington/Sumas.

Compressor stations

As natural gas travels through pipelines over long distances, it gradually loses speed and pressure due to factors such as friction and changes in elevation. To keep the gas moving along the pipeline, compressor stations are needed.

Strategically placed along the pipeline system, these facilities boost the pressure of the gas, helping it flow to the next station and ultimately reach its destination.

Along the Westcoast system, 20 compressor stations are located at critical intervals, typically 80 km apart, to compress and push the natural gas along the pipeline to reach its destination.

Natural gas and electric-powered compressors

Inside a compressor station, a huge machine called a compressor unit pressurizes and pushes the natural gas through the pipeline. This unit can be powered by either natural gas or electricity.

Driven by gas turbines or reciprocating engines, a natural gas compressor unit uses a portion of the transported natural gas as fuel.

An electric powered compressor unit relies on electricity from the power grid to power the motors used in the compression process. These units are typically quieter and do not produce greenhouse gas emissions. In some instances, they require the construction of additional powerlines to ensure an adequate supply of electricity.

When there is an increase in natural gas demand, additional compressor units may be installed at existing or new compressor stations to help push the added capacity. This allows the system to safely transport a larger volume of natural gas.

Noise and safety measures

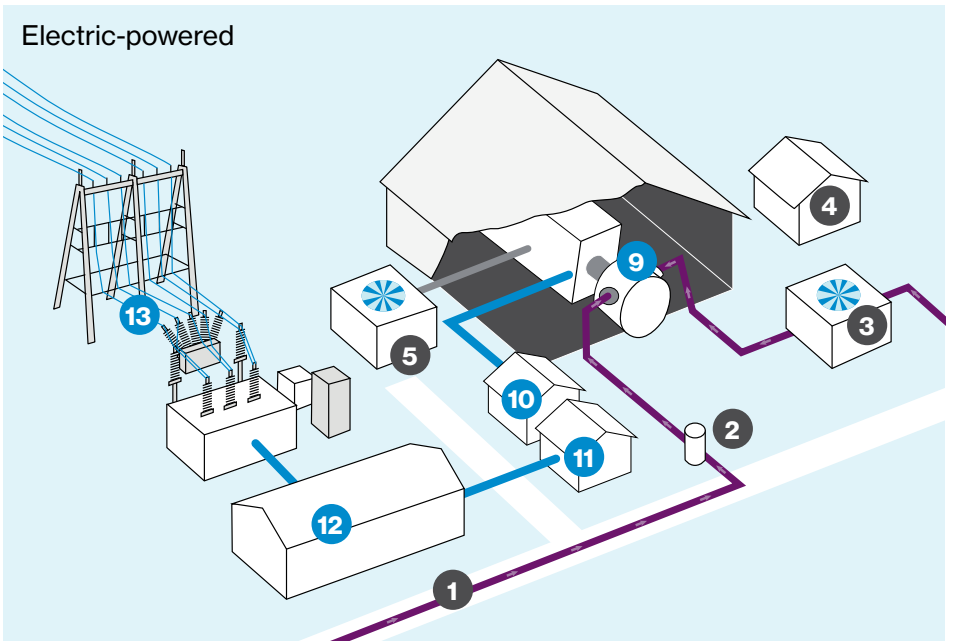
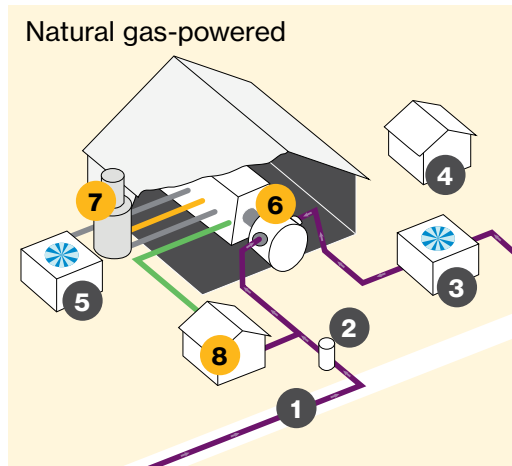
Compressor stations are designed with advanced features to minimize the impact on surrounding communities. This includes noise-reduction features, such as soundproofing materials, mufflers, and silencers. Under normal operating conditions, the noise levels are comparable to a quiet office or living room, ensuring minimal disruption to nearby residents.

Safety is a top priority in the design and operation of compressor stations. These facilities are equipped with advanced emergency shutdown systems that can automatically halt operations in case of emergency. Gas detection systems monitor for leaks, activating alarms if issues are detected. In addition, fire suppression systems are installed to quickly manage and extinguish fires should they occur. Regular maintenance and inspections are also conducted to ensure that all equipment continues to function properly.

Additionally, fencing and restricted access protocols help secure the station from unauthorized entry and potential security threats.

These safety protocols, along with trained personnel, help to ensure that compressor stations operate safely and reliably.

Key components of compressor stations



- 1 Station yard piping:** Station yard piping moves natural gas between the pipeline and compressor station.
- 2 Filter separators/scrubbers:** Filter separators or scrubbers remove any solids or liquids from the natural gas that enters the compressor station.
- 3 Gas cooling system:** When natural gas is compressed, its pressure and temperature increase. The gas may be cooled before its return to the pipeline to protect the pipeline's inner coating and increase its transmission efficiency.
- 4 Backup generators:** Backup generators stand ready in case of an electrical outage.
- 5 Lube oil system:** Compressor units have lube oil systems to lubricate, cool and protect the moving parts.
- 6 Natural gas-powered compressor unit:** This compressor unit is driven by a natural gas-powered jet engines. The compressor unit compresses the natural gas to keep the gas flowing through the pipeline.
- 7 Mufflers (exhaust silencers):** Mufflers decrease the volume level of compressor units to meet federal standards.
- 8 Fuel gas system:** At most stations, compressor units are fueled by natural gas from the pipeline.
- 9 Electric-powered compressor unit:** Also known as an electric motor driven (EMD) compressor unit, this compressor unit is powered by electricity. The compressor unit compresses the natural gas to keep the gas flowing through the pipeline.
- 10 Variable frequency drive (VFD):** A VFD controls the speed and power of the electric motor driven compressor unit.
- 11 Motor control centre (MCC):** An MCC houses the motor control units, such as starters, circuit breakers, and other equipment, used to control and protect the electric motor driven compressor unit.
- 12 Substation:** A substation transforms high voltage electricity to a lower level voltage, for safe and efficient use.
- 13 Transmission powerline:** High-voltage electricity is carried via a transmission line to power the EMD compressor unit.

