

Natural Gas Compressor Stations

Air Pollution, Explosions and Fires

Pipelines transporting natural gas require pressure to keep the gas moving. The pressure is provided by compressors. The power to move the gas is normally provided by gas-powered turbines or reciprocating engines. The pipeline company selects the type of compressor to install. The selection is based on local conditions, regulations and cost.

Pipeline compressors are installed at intervals of about 40 to 100 miles. So a 500 mile pipeline could have as few as 5 or as many as 12 compressors.

Air Pollution 24/7

Compressors operate around the clock, and they emit air pollution 24 hours a day, seven days a week. The pollution comes from large engines needed to drive the compressors. Of course, the cheapest fuel available on a pipeline is natural gas.



Pollution is no accident

Compressors normally have no pollution control devices. Air quality agencies may require performance or operating standards, but pollution is emitted in one form or another, including nitrogen oxides, carbon monoxide, volatile organic compounds and greenhouse gas. For example, lean-burn engines can reduce nitrogen oxides but increase carbon monoxide emissions. Catalytic oxidizers reduce carbon monoxide by converting it to carbon dioxide. In addition to intentional smokestack emissions, air pollution is caused by venting to prevent blowouts, flaring of unwanted gas, and fugitive emissions. Toxic air emissions include formaldehyde, benzene, toluene, ethylbenzene, xylene, hydrogen disulfide, methane and other pollutants.

Negative Health Impacts

Nitrogen oxide emissions cause red and purple ozone alerts, aggravating asthma and COPD. Many of the air toxics emitted are carcinogenic or neurotoxic, such as benzene and hydrogen sulfide. Other negative impacts on public health include respiratory problems, early mortality and childhood learning defects.

A recent 21-county study in the Barnett Shale region in Texas revealed that the air pollution emissions from natural gas production were greater than that emitted from all on-road cars and trucks in the Dallas-Fort Worth metropolitan region, an area with a population of 6.5 million.

Safety Hazards

Risks to health and safety and environmental contamination come with natural gas compressor stations. Compressors operate under high risk conditions, created by the high pressures and reduced temperatures of operation. These conditions cause vibrations, cracks and corrosion leading to failure of mechanical components, explosions and fires.

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Recent Natural Gas Compressor Fires and Explosions

- Crosstex Pipeline, Godley, TX, Nov 18, 2008
- Artesas Compressor Station, Mann Township, Bedford County, PA, Houston-based Columbia Gas Transmission, Nov 3, 2011
- Falcon natural gas compressor station, Jonah Field, WY, Dec 7, 2011
- Williams Energy, Lanthrop, PA March 29, 2012
- Pinon Compression Station (BP), Durango, CO June 25, 2012 - 1 killed, 2 injured
- Copano Energy in Jim Wells County, TX, September 6, 2012
- Bill Barrett Corporation, Carbon County, UT, Nov. 22, 2012 - Two injured (severe burns)
- Energy Transfer Partners, Madison County, TX, Jan 17, 2013

◊An explosion at a natural gas compressor station in Susquehanna County on Thursday morning blew a hole in the roof of the complex holding the engines, shaking homes as far as a half-mile away and drawing emergency responders from nearby counties.◊ Scranton Times-Tribune 2012

The Pinon Compression Station blast occurred during a routine maintenance operation when a data collecting device was sent through the system. The Copano explosion and fire caused 100-foot high flames. The Carbon County fire was caused by a compression tank. In Madison County, Texas a compressor malfunction caused an explosion and fire which destroyed the unit.

◊In Iowa in the past decade, pipeline accidents have resulted in nearly \$20 million in property damage, spilling a total of 10,712 gross barrels of hazardous liquids onto Iowa property, according to the federal Pipeline and Hazardous Materials Safety Administration.◊

The Des Moines Register

A Single Compressor Can Emit Huge Amounts of Air Pollution

A compressor station investigated by Blue Ridge Environmental Defense League was permitted to emit the following amounts of pollution into the air annually:

Pollutant	Emissions, pounds/year
Particulates (2.5, 10 and total)	25,000
Sulfur dioxide, SO ₂	1,400
Nitrogen oxides, NO _x	360,000
Volatile organic compounds, VOC	70,000
Carbon monoxide, CO	44,000
Carbon dioxide equivalent, CO _{2e}	407,000,000
Hazardous air pollutants, HAP	25,000
Formaldehyde	17,000

These are routine emissions released under normal operation. The plant was issued a permit to operate by the North Carolina Division of Air Quality. Power for the compressors is provided by eight reciprocating engines, each rated at 4,735 horsepower and equipped with catalytic oxidizers. Pollutant emissions vary with load conditions; engine efficiency is less when the engine is operating at full throttle. Products of incomplete combustion (PICs) caused by rich-burning or lean-burning engines are known to increase carbon monoxide and formaldehyde.

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