Natural Gas Compressors - Controlling Sound

Five Things You Need to Know

- A natural gas compressor increases the pressure of the gas so it can be transported through a pipeline and ultimately used by consumers. Depending on the volume and flow of wells within a natural gas producing area, a compressor station may have one or more compressor units.
- Southwestern Energy (SWN) locates our compressor units away from residential populations as much as possible. The location of a compressor station depends on the quantity and location of wells in relation to the pipeline system.
- Compressor station facility maintenance activity or other variables may cause a short-term increase in sound level.
- SWN reduces the sound generated from compressor facilities through station design, equipment and sound absorbing systems that lower sound levels.
- At minimum, SWN achieves sound levels below 55 decibels (dB) at the nearest residence, which is slightly quieter than the sound level of an average conversation.

Facts About Compressors and Sound

SWN currently operates more than 300 compressor units at 65 stations. We use a variety of methods to control sound levels. In 2011, the Arkansas Oil and Gas Commission (AOGC) passed a new rule, requiring a sound level of 55 dB at all “Noise Sensitive Areas” (NSA) in proximity to natural gas compressors. However, SWN already achieved that level of sound control at many of our existing stations.

Finding the Right Location

One of the best ways to reduce sound is distance. SWN works to select sites for compressor stations that are located away from residences and other occupied areas. Certain terrains and cultural features such as parks, historic sites and wetlands are not considered for locations.

Conducting the Right Testing

SWN conducts sound surveys before and after installation of a compressor station. We also take readings at nearby residences to determine sound levels. In situations where sound levels exceed the 55 dB design goal, SWN has taken corrective action to reduce sound exposure.

Well-insulated

The insulation layers used in compressor-station buildings provide a solid surface to contain noise and materials to reduce sound energy or “dampen” sound before it can escape. By varying the types of sound-dampening material, sound levels are exponentially decreased because one material can “catch” sound the other material allows to escape.

- Perforated aluminum panel – holes provide space for sound to travel through and be “caught” in sound-dampening material.
- Mineral Wool – insulation material, dampens sound.
- Fiberglass Insulation – same insulation used in homes, dampens sound.
Controlling Sound (continued)

Using the Right Equipment

SWN purchases special or non-standard compressor units with extra silencers and the highest level of sound reduction available related to exhaust systems. We have worked to reduce the four main sources of constant sound from our compressor stations.

1. Engine exhaust and air intake systems are equipped with silencers to reduce sound by 50 and 60 dB.

2. Natural gas and water-cooling equipment have high efficiency fans to prevent turbulence and reduce sound by 2 to 3 dB. These high efficiency fans have a greater number of blades, which also contributes to producing less noise.

3. Larger piping than typically used in compressor stations is installed to keep the gas velocity low. This reduces continuous high-frequency (high-pitched) sounds.

4. If sound levels are above 55 dB at a Noise Sensitive Area, SWN constructs buildings over mechanical equipment to reduce sound levels. SWN spends between $145,000 and $200,000 per compressor to enclose them and currently has 42 stations with buildings. Each station contains one or more compressor.

How Loud is it Really?

Sound pressure is measured in decibels (dB). When SWN takes a reading, we test and report sound in levels of the A scale, which is the scale associated with human hearing and most regulations.

Decibel Level | Sound Comparison
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0 | Lowest sound audible to the human ear
10 | Crickets, distant frogs, whisper
20 | Kitten meowing, songbirds, distant dog bark
30 | Refrigerator running, babbling stream
40 | Average conversation level
50 | Busy restaurant
60 | Tractor idling, barn cleaner, conveyors, elevators
70 | Tractor at 50 percent load, leaf blower, home air compressor, combine
80 | Tractor at 60 percent load, power tools
90 | Tractor at full load, bad muffler, old chain saw
100 | Gunshot, backfire, dynamite blast

Data courtesy of the Texas Cooperative Extension, Texas A&M University.

The Environmental Protection Agency (EPA) recommends a maximum 24-hour continuous sound-level exposure of 70 dB. The Occupational Health and Safety Administration (OSHA) has mandated a maximum limit of 90 dB for eight hours of continuous sound exposure without hearing protection.

Doing the Right Thing

If a resident has a concern related to sound level or other issues concerning SWN, residents may contact (866) 322-0801.

SWN CONSTRUCTS BUILDINGS around compressor equipment to lower sound levels. Forty-two of our 65 compressors currently have buildings around them. Many of the uncovered compressors are remotely or commercially located.