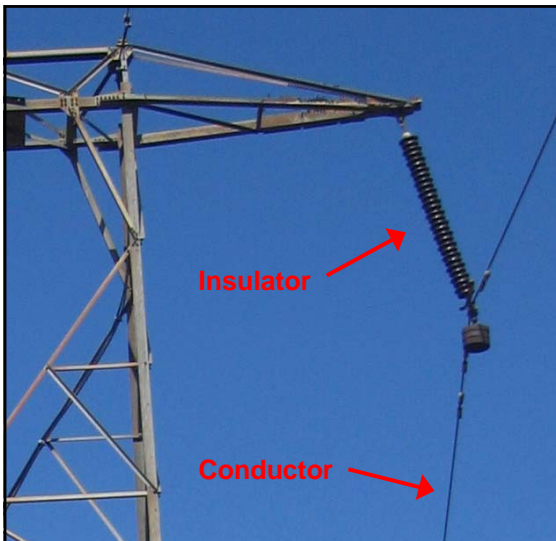


# Transmission Line Noise

Three types of noise are often associated with transmission lines once operational, including noise from the transmission lines and towers (corona, insulator, or Aeolian noise), noise from activities for routine inspection and maintenance of the new facilities, and noise from new substation facilities. The noise generated by routine maintenance is generally negligible, while the noise generated by a substation may affect the area immediately adjacent to the substation.

Transmission line noise, which includes corona, insulator, and Aeolian noise, can be generated throughout the transmission line route and is therefore more likely to affect sensitive receptors than the other two noise types.



Top of lattice steel tower illustrating insulator and conductor.

steadily and perpendicular to the lines to set up an Aeolian vibration, which can produce resonance if the frequency of the vibration matches the natural frequency of the line. Dampeners can be attached to the lines to minimize Aeolian noise.

## Types of Transmission Line Noise

**Corona noise** is the most common noise associated with transmission lines and is heard as a crackling or hissing sound. Corona is the breakdown of air into charged particles caused by the electrical field at the surface of conductors. This type of noise varies with both weather and voltage of the line, and most often occurs in conditions of heavy rain and high humidity (typically >80%). An electric field surrounds power lines and causes implosion of ionized water droplets in the air, which produces the sound.

**Insulator noise** is similar to corona noise but it is not dependent on weather. It is caused by dirty, nicked, or cracked insulators, and is mainly a problem with older ceramic or glass insulators. New polymer insulators minimize this type of noise.

**Aeolian noise** is caused by wind blowing through the conductors and/or structures. This type of noise is usually infrequent and depends on wind velocity and direction. Wind must blow

## Corona Noise Levels

Corona noise levels for transmission lines vary depending on weather conditions and the amount of power being carried by the line at any given time. During relatively dry conditions, corona noise typically results in continuous noise levels of 40 to 50 dBA in close proximity to the transmission line, such as at the edge of the right-of-way. In many locations, this noise level is similar to ambient noise conditions in the environment. During wet or high humidity conditions, corona noise levels typically increase. Depending on conditions, wet weather corona noise levels could increase to 50 to 60 dBA and could even increase to over 60 dBA under some conditions. Corona noise levels are not consistent from location to location because conductor surface defects, damage, dust, and other inconsistencies can influence the corona effect.

For comparison purposes, noise levels for other common sounds are presented in the table below.

## Common Sounds and Their Associated Noise Levels

Source	Level
Normal breathing	10 dBA
Rustling leaves	20 dBA
Whisper	20-30 dBA
Ambient noise in an average home	50 dBA
Normal conversation at 3 feet	60-65 dBA
Vacuum cleaner	60-82 dBA
Freeway traffic at 165 feet	70 dBA
Garbage disposal at 3 feet	80 dBA
Rock concert	90-115 dBA
Jet flyover at 1,000 feet	110 dBA
Apollo liftoff	188 dBA