

# PTARMIGAN SUBSTATION

## PURPOSE AND NEED

Construction of new businesses and homes increases the need for electricity. Advancing technologies also drive new power requirements. For example, most new customers working in high tech industries and those using high tech equipment require not only more power per square foot of space, but a higher quality of power. These energy users rely on sensitive equipment and require a power supply that is free from voltage fluctuations, flicker, interruptions and outages. Power consumption trends and requirements also have changed for residential customers who use personal computers and electronics in home offices. Substations play a key role in helping deliver a high quality power supply for these existing and future customers.

Every substation has a “maximum capacity” which depends on the size and number of transformers in the substation, which typically ranges from one to three. Also, transmission lines feeding the substation have a thermal capacity limit. The type and amount of equipment in the substation, distance between substations, and demand for electricity all become components of the substation capacity calculation.

As a part of its planning process, Public Service Company of Colorado (PSCo), an Xcel Energy company, calculates a “reliable substation capacity” for each distribution substation on its system. The concept is to ensure reliable service can be provided, should one distribution transformer fail. The system should be capable of picking up all of the load through distribution feeder field switching or by transferring a portion of the load to the remaining transformers in a substation. This practice ensures a reliable distribution system.

Currently, PSCo’s Dillon and Summit Substations serve the Frisco, Silverthorne, Dillon and Keystone areas. These areas have experienced steady electrical load growth and are expected to continue a two to three percent annual growth rate into the future.

The distribution feeders emanating from these existing substations to the Silverthorne area are greater than four miles long, which is not desirable. These long distances, combined with the increasing electric demand, already cause an above-average number of electrical outages and increase the potential for further interruptions to service. Under some circumstances, repair times can be lengthy. For example, it can take 12 hours to repair a cable failure and up to three days to install a mobile transformer if there is a problem at one of the existing substations. Based on the projected load growth, the Dillon and Summit Substations will reach their capacity to reliably serve the Silverthorne area by Fall 2012. Thus, it is important to have a new electric distribution substation approved, constructed and operational by that time.

In an effort to maintain reliable electric service to the area, PSCo constructed and operated a temporary substation from 2001 to 2003 and also installed a new distribution feeder from the Dillon Substation to the Silverthorne area in 2002. Though these efforts have been beneficial to the area’s electric service reliability, they are only temporary solutions.

## QUESTIONS?

**If you have any questions  
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