



TRI-STATE G&T

Tri-State G&T is located across sections of the states of Colorado, New Mexico, Wyoming and Nebraska. Their present method of gathering substation data is through a network of radios. Many of these sites are located in remote areas where the terrain/environment presents many challenges to establishing reliable communications to these substations.

Tri-State G&T decided to look into establishing a satellite based network to reach these locations. They choose the RFL TSAT satellite system to provide these services. The TSAT is a completely operator owned system designed specifically for remote SCADA communications. No third party satellite operators are required to act as the master HUB. Only satellite bandwidth leasing is required from a satellite provider, similar to leasing a phone line. The TSAT operates in a narrow bandwidth, which makes it ideal for 9600 bps SCADA communications.

Initially a test link was set up by locating both the HUB MTU antenna and a test RTU antenna at their headquarters building in Westminster, Colorado. Tests were run over an extended period of time to establish confidence in the systems ability to operate through various environmental conditions. After this successful test, antennas were installed at various remote substation locations over the course of several months. Tri-State installed the TSAT RT's at locations that had given them the highest communications problems. They have reported great success with the communications to these locations using the RFL TSAT system.

EASILY EXPANDABLE

After the initial system is installed, adding RT's is simply a matter of installing the new antenna and adding the new RT site to the HUB TSAT data base. The TSAT SCADA communications system requires a bandwidth of 100KHZ, regardless of how many RT's are operating over the system. This results in a low ongoing lease cost (estimated at \$650/Month) which remains the same regardless of the number of RT's. The more RT's operating over the TSAT system, the more cost effective the system becomes.

TSAT Tri-State G&T System

BLOCK DIAGRAM

- 100 KHz Total BW
- Field sites added as required with no additional bandwidth

FULL DUPLEX
PT TO PT
9600 bps

