



Sulphur Springs Valley Electric Cooperative, Inc.

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Special Insert

Electricity “traffic cops”

Three operators control where electricity flows on the grid

Hidden behind the main office at the Sulphur Springs Valley Electric Cooperative building in Willcox is a room full of computers with a wall completely covered by large display monitors.

It’s where the magic happens.

Three SSVEC operators control and switch the flow of electricity around a 400-mile “Smart Grid,” opening and closing breakers to switch “loads” from one source to another. They are the traffic cops of electricity, moving current from one substation to another so that repairs or maintenance can be completed on the SSVEC grid.

“For the member, switching is seamless,” said Thomas Riggs, who is a member of the Supervisory Control and Data Acquisition (SCADA) system. “Think of it like this, you can turn on and off a light switch in your house. However, SCADA operates breakers remotely from the SCADA office. So, now think of it like you being able to control your lights at your house from your phone.”

Implementing SCADA required strict precautions to assure the safety of linemen in the field, Riggs said.

“A lineman may be working

someplace 70 miles away from the SCADA office, so clear communication and safety procedures are absolutely vital,” he said. “We go step-by-step and each step is verified by a three-part communication method.”

Most load switching is planned. However, during stormy seasons, members may experience an outage. When that happens, SCADA goes to work with linemen to complete a switch in an emergency situation to restore power and reduce the time of the outage. Although switching is not an everyday task, SCADA does help SSVEC crews daily by providing other control capabilities, such as applying a “Hot Line Tag.”

“A Hot Line Tag or HLT is one way SSVEC applies the ‘Lock Out, Tag Out’ procedures to safely allow crews to work on the various devices that can be found in our electric network,” Riggs said.

SCADA monitors SSVEC’s entire electric network, from McNeal to Patagonia to Bonita to San Simon to Mescal and all the locations in between. A substation reports back to the central office lots of data including watts, amps, and volts. There are more than 30 substations providing electricity to SSVEC members and



Thomas Riggs

each location reports this information.

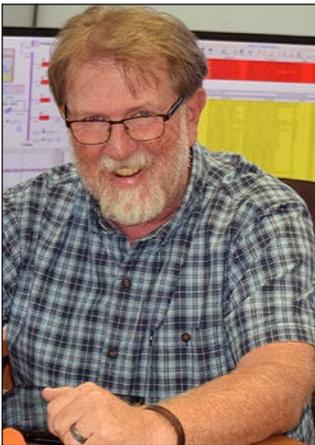
“All of this data is received and stored within a few seconds,” Riggs said.

This represents the “Data Acquisition” in SCADA. SSVEC has two operators in SCADA, Nick Barncastle and Earnie Batten, who rotate shifts to continually monitor this data for anomalies. Anomalies, or problems, can include alarming on faults or during a low or high voltage occurrence.

Once a problem is found, the SCADA operator will notify the linemen



Nick Barncastle



Ernie Battlen



Thomas Riggs, standing, oversees an operation by Earnie Battlen, left, while Nick Barncastle looks on.

and they will begin the process of troubleshooting to resolve the issue in a timely manner. The system allows SSVEC to use fewer crews and reduces drive time between switching locations, ultimately saving members' money by realizing efficiencies.

"With SCADA, the time to fix issues is greatly reduced," Riggs said.

SCADA also performs Load Control. Members can appreciate this feature by taking a look at their monthly electricity bill. SSVEC bills a member once a month for the electricity consumed. Likewise, SSVEC gets a bill once a month from its Generation and Transmission (G&T) provider -- Arizona G&T Cooperatives or AEPSCO -- for the total electricity consumed by all of our members.

By performing Load Control, SCADA can effectively reduce the SSVEC bill from AEPSCO, which in turn reduces

each member's bill. Implemented in 1995 and '96, the system for load control immediately helped SSVEC reduce its power consumption and has resulted in a \$24.8million savings.

There are two main ways to perform load control. First, SSVEC has negotiated a special rate with members operating a farm that allows SSVEC to stop and start the farmer's pump once a week, twice a week, or once a day as agreed upon with each farmer. The farmer gets a lower bill and in return, SSVEC can lower its overall bill. SSVEC calls this irrigation control.

SCADA's part in this process seems fairly straight forward, but gets complex quickly. From the SCADA office, the SCADA operators can stop and start the farmer's pump. However, there are more advantageous times during a monthly cycle to reduce SSVEC's load. SCADA

operators use lots of weather information to determine these times. Irrigation control can save from 3MWs (megawatts) to 10MWs depending on the season. In this case, winter versus summer.

As everyone knows, weather can be difficult to forecast making this seemingly simple task become more difficult.

The second way to perform load control is by having the SCADA operators activate something called VRC, or Voltage Reduction Control. Simply stated, this reduces voltage very slightly and thus reduces the total amount of watts very slightly over the full, SSVEC electric grid. VRC can save between 1MW and 2MWs.

With the combination of irrigation control and VRC, SSVEC can save thousands of dollars on its electric bill from AEPSCO and again, that saves dollars for our members.