

rolling powerhouse

Bluebonnet's newest mobile substation adds punch to co-op's energy-delivery arsenal



By Ed Crowell

Two of the most impressive tools in Bluebonnet Electric Cooperative's arsenal to keep electricity flowing into homes and businesses turn heads when they roll onto open roads.

They look like gargantuan transformers with 6-foot-tall coils angled and wired for action. The assemblies sit on long flatbed trailers pulled by truck cabs with the familiar Bluebonnet logo.

The newest of these rigs carries the most electrical punch, stretching 95 feet in length and weighing in at 169,000 pounds. The older unit is 94 feet and weighs 139,000 pounds. Each of the prizefighting units is literally an electrical substation on wheels.

Built in California, the \$2.4 million rig that arrived in August supplements the co-op's second decade-old mobile unit. Both are garaged in Giddings and serve as emergency back-up machines and substitutes for the co-op's 45 on-the-ground substations located throughout the co-op's 14-county service area.

Substations convert high-voltage power that comes in on transmission lines suspended from power poles to lower voltages that go out on Bluebonnet's distribution lines to homes and businesses.

Called mobile substations, the rigs primarily are used five or six times a year when a substation is

taken out of service for scheduled maintenance. Every few years, a mobile substation is rolled out because of equipment failure at a substation or damage from a storm.

Each substation operates around the clock. If a substation were to go offline and there was no mobile substation to take its place, thousands of members would be without power, potentially for long periods of time.

The number of members served by a substation varies. Some substations supply nearby retail or other high-usage commercial developments. Some reach long distances to scattered rural houses.

Bluebonnet serves more than 89,000 residential and commercial meters and that number is growing, with members spread across 3,800 square miles. To meet future demand, co-op officials decided last year that a second, more powerful mobile substation was needed.

"We now have a brand-spanking-new 30 MVA," said Phillip Ellis, manager of technical services for Bluebonnet.

The MVA measurement means the new mobile substation can handle 30 megavolt amperes of power. That is enough to power 17,000 to 19,000 homes — or 30 Walmarts, Ellis said.

Ellis traveled last year to San Carlos, Calif., to

BOTTOM: A new \$2.4 million mobile substation gives Bluebonnet an additional unit to supplement an older, less powerful one. Linemen install the substation on wheels when one of the 45 permanent substations that serve Bluebonnet's members is taken down for maintenance or has a problem.

FAR LEFT: In November, the new mobile substation was used for the first time at Max Zuehlke substation in Burton when the stationary substation was taken offline for scheduled maintenance.

LEFT: With work in Burton complete, employees Doug Schlemmer, left, Chase Wilson and Michael Gholson disconnect the mobile unit and prepare to return it to its home in Giddings.

Sarah Beal photos

check on the progress of the unit that was built by Delta Star Inc. The company also manufactured Bluebonnet's older mobile substation, a 23 MVA rig Bluebonnet put into service in 2004.

"We are excited to have the new one here so we have some redundancy in supporting our substations," Ellis said. "It is nice to have two units" available.

The investment in a new mobile substation was necessary, given the vital role substations play in delivering electricity.

To ensure the reliability of the co-op's stationary substations, they are taken offline every five years on staggered schedules for overhauls. That's when one of the mobile substations goes to work.

Five employees are trained to drive the rigs, which can be rolled out of Bluebonnet's Giddings service yard after 45 minutes of preparation.

Although nearly all the substation locations are on paved, wide roads, Ellis said that the rigs' "sheer length and weight make maneuvering difficult around turns and in tight spots." The new mobile substation has a 90-foot turning radius, about twice that of a Ford F-150 pickup.

Usually up to 10 employees are involved in rolling out the mobile unit and getting it operating on location. A typical "install" takes about 10 hours, Ellis said.

The mobile substation then operates in place 24/7 for up to two weeks while maintenance and/or upgrades continue. A complex job may require the mobile unit to remain in service for as long as two months, Ellis said.

The new mobile substation received its first workout in November when it was installed in Burton so routine maintenance could be done on a substation there. The plan is to use the mobile rigs on an alternating schedule, Ellis said.

"Every rollout is a unique ordeal because we are trying to get it there safely, get it set up and pick up (electric) load in the quickest time possible to mitigate the impact to the membership," he said.

"Most of the time, it goes really well — mainly because of our experience and the procedures we have in place to install and remove this thing. It is not by chance; it's very methodical." ■

