

## **Hot Work on Alcorn Line Only a Part of Continuous Effort**

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Line crew employees spent three difficult weeks in July and August near Lorman replacing eleven structures on Line 515, which serves Alcorn State University in Southwest Mississippi EPA's service area.

The terrain in the area, which includes numerous hills and steep dropoffs, made the work laborious. The crew also worked the line while it was energized, so had to use extra care and precautions.

"That line is the only source of power for the Alcorn substation, and the project was expected to take at least three weeks to complete," said Brad Wolfe, chief of transmission and support services. "It was not practical to take numerous sustained outages, so the work was done with the line 'hot.' It is more dangerous that way, but our crews do this kind of work regularly and know how to do it safely."

The 7.8-mile, 115-KV line was built more than a decade ago. Recent inspections had revealed that numerous poles scattered among the line's 73 H-frame structures had deteriorated and needed to be replaced.

South Mississippi Electric's line inspection and maintenance plan is a significant part of ensuring reliable service. The plan involves aerial inspections of the entire system every three months. In addition, crews inspect 25% of the system each year—one third of that visually from the ground and two thirds by climbing. It has gotten to be a huge job—overall, the system has more than 22,500 poles. Of that total, about 15% are concrete or steel and the rest are wood.

"From the air, we look for broken poles, crossarms or other damaged hardware which could cause problems, as well as danger trees," said Jim Evans, transmission maintenance manager. "On the ground, the visual inspections normally involve riding four-wheelers the length of the rights-of-way to take a good look at the poles and lines, where we can see deterioration or other problems. During the climbing inspections, we climb each pole and make sure everything is tight and up to code."

Work required to correct any problems revealed by the inspections is scheduled as needed, depending on the severity of the problem or the potential for affecting the reliability of the system. Evans' crews work closely with the engineering department to determine the best solutions.

"Under normal circumstances, we can change out poles as we make our inspections," Evans said. "We contact engineering to have them evaluate whether anything needs to be different. Sometimes they may be planning to up-rate a line, which would eventually call for taller poles to fit into the new design. Otherwise we use the same specifications of the existing pole."

The Lorman job was not normal. Because of the terrain, getting to the structures was half the job. In many cases, existing roads had become overgrown or had washed out. Limited access to the right-of-way required building new routes through the heavy brush that could accommodate 35-foot-long

bucket trucks, as well as the long pole sections. The crew's bulldozer was essential to accomplish the task.

The replacement structures were two-piece, pre-fabricated steel poles (ranging in height from 60 to 95 feet) and steel crossarms. The crews have adapted old conveyor belts from Plant Morrow to use as skids, allowing the poles to be pulled and, at the same time, protecting them from damage.

Once the crew reached the location of a structure to be replaced, the bulldozer was used to level off portions of the right-of-way to create enough space for two bucket trucks, the digger derrick, and the crews to work safely.

"In most cases it took more time to cut our way in along the line and prepare the site than to replace the structure," said Evans. "It is tough, hard work. Once we got to one site and were able to get to the line work, we could send the dozer ahead to start preparing the next site. This is probably one of the roughest areas in any part of our system."

Attention to safety, as always, was key to the success of the project, as much for creating access as replacing the poles with energized lines above. Crew members had to constantly watch for drop-offs as the heavy equipment and materials were moved into place. It also rained during the project, which created slippery conditions.

Safety and planning meetings were held several times each day in order to ensure that every member of the crew knew how tasks would be addressed and what their assigned roles were. For such projects, it is imperative that everyone understands the big picture as well as individual expectations. Strict safety guidelines govern all of the crew's efforts.

"Even though many of our guys have worked on these kinds of projects for years, each one is different and presents its own challenges," Evans said. "It is an opportunity for the younger guys to learn, but everyone looks out for each other. Each man has to watch what is going on. The learning curve never stops.

"In this instance—working hot lines in difficult physical locations— everything has to be right. If it is not, we stop and make it so. It is important that the trucks are stable and that we can maintain our proper clearances. I am proud of the way the crew worked this job during some long days—there were no injuries and no accidents."

The poles had to be carefully raised between the energized conductors and set in place; then the crossarms and hardware were installed before two 2-man teams in bucket trucks transferred the conductor to the new H-frames. After the transfer, the old wood poles were cut down in sections.

A new model of suspension shoes was used on this job for the first time, which proved to save a considerable amount of time. The new shoes, which attach to the bottom of the insulators to hold the

conductor, have rubber linings to protect the conductor as it expands and contracts. With the old shoes, pre-formed armor rods had to be wrapped around the conductor to prevent it from rubbing inside the shoe and possibly weakening. Installing the older model normally took two to three hours of hot stick work, compared to only ten minutes or so to complete the process with the new shoes.

“We are constantly looking for new technology to help make the lines safer and easier to work,” said Evans. “This project was a big success.”