

## **Infrared Helps Uncover Hot Spots**

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Electric systems are designed to harness powerful forces—to control the same kind of uncontrollable energy found in lightning.

We have come a long way in that pursuit, but electricity continually tries to escape the bounds we place on it. An ongoing effort is required to make sure that the weakest individual parts of our transmission system do not create problems for the system overall.

Any buildup of heat in an electric system is a sign of a developing problem. Increasing temperatures can ultimately cause equipment to melt or fail, causing an unplanned and expensive outage. South Mississippi Electric has been using infrared technology to help identify “hot spots” throughout our system and those of our Members.

Infrared is an energy similar to visible light but with a longer wavelength. All objects emit a certain amount of radiation relative to their temperatures. Generally speaking, the higher an object’s temperature, the more infrared radiation it emits. Infrared energy is invisible to the human eye but can be detected by cameras that form images using infrared radiation, similar to the way common cameras form images using visible light. Infrared even works in total darkness because ambient light levels do not matter.

“We use an infrared camera to measure temperatures on transmission and distribution line equipment and in substations,” said John Gilbertson, substation and communications manager. “The infrared surveys detect hot spots that are indications of bad connections, high impedance connections or equipment which is approaching failure.”

For several years, South Mississippi Electric hired outside consultants to conduct infrared surveys, which were also available to each of our Member systems. In 2006, SME purchased its own infrared camera and three employees—substation maintenance technicians Josh Beech and Todd Fortenberry and metering technician Dusty Sledge—were trained to use the device.

“Having our own camera now allows us to be more flexible and thorough in scheduling surveys of our substations and lines, as well as those of our Members,” Gilbertson said. “This year, ten of the Members requested the service. It has become one of the top services we can offer to our Members, and it has enhanced the relationships we have with their employees involved in the process.”

The new cameras are easy to use and provide quick results. The technicians bring back digital images of equipment and connections where likely problem areas exist, such as bushings, switches and lightning arrestors. The images and the information they provide are then turned into reports by Ted Bower and Tammy Haas, technical support staff members, and forwarded to Member contacts.

“The nice thing about owning our own camera is that now we can return to the location after corrections are made to ensure that the repaired or replaced components are working properly,” Gilbertson noted. “Before, we had to wait until the next year’s survey.”

This year’s surveys were conducted over the past two months, during times when system load was at its highest. The usefulness of the surveys was seen firsthand on September 16 when testing at Gwinville Junction showed signs of potential failure looming in a lightning arrestor.

“We were able to take a quick maintenance outage to replace the equipment, rather than risking a failure that would have caused an extended outage,” Gilbertson said. “The camera has more than paid for itself many times over.”