Automating utility pole inspection

Orangeburg DPU will realize quick return on RFID investment

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THE ORANGEBURG, S.C., DEPARTMENT OF PUBLIC UTILITIES used to have one of the simplest utility pole inspection programs in the industry.

"Our policy was basically that when the pole falls down, we put one back up," acknowledged John Bagwell, director of the Electric Division at Orangeburg DPU, located about 40 miles southeast of Columbia, S.C. "We never really used to inspect poles."

That was before the utility discovered the benefits of radio frequency identification (RFID) technology. The Orangeburg DPU, the largest municipal electric utility in South Carolina, began affixing RFID tags to its wooden utility poles last year. The utility has tagged 4,000 poles to date, and hopes to tag an additional 5,000 poles this summer.

Bagwell said that the utility turned to RFID to help it "to monitor, service and maintain its entire pole distribution network." He hopes to tag all 33,000 poles owned by the utility within two to three years.

Pole data helps emergency response

RFID technology involves placing tiny chips onto objects that can then be tracked by accessing the information with portable handheld or fixed RFID readers. While many utilities still rely on bar codes, RFID tags do not require a line of sight for scanning that bar codes require, meaning that utility poles and other assets can be scanned from greater distances and through obstacles such as fences or vines that grow on some poles and make it impossible to read bar codes.

Aside from allowing greater visibility into a utility pole's maintenance history, having the data readily available from each pole can help Orangeburg and other utilities to be better prepared to respond to emergencies, such as power outages following severe storms.

"We'll know much more quickly what our asset needs are for a particular pole, and that will also help us to disperse our manpower in a more efficient manner, ensuring a quicker response rate," said Bagwell.

The visibility provided by RFID can also help utilities when it comes to generating claims from storm losses. In many cases, utilities recover a portion of their labor and parts losses from the federal government after a major storm or disaster. However, utilities often have very little visibility into the unmanned storage yards where poles and other assets are stored. Oftentimes, they are providing only estimates to the government when it comes to recovering losses for assets used during a power restoration project. RFID can provide highly detailed information about those assets, allowing the utility to recover a greater amount of capital.

Labor savings in automation

Bagwell said that the utility has spent about $100,000 on hardware and software costs, and about $50,000 in labor costs to get the system up and running and to tag each pole and enter vital equipment information about each asset. Based on labor savings alone, the utility expects to pay off its investment in less than three years by automating the inspection process.

To keep project costs as low as possible, the company has hired college interns to tag the next set of 5,000 poles this summer. Because of the asset tracking and maintenance capabilities that RFID offers, Bagwell said the utility is considering tagging all assets at its 22 substations as well.

 "I can see us someday certainly tagging every asset we have here with some kind of RFID chip," he said.

Simple scans can generate work orders

The RFID system allows DPU's inspection and maintenance teams to capture pole-specific information with a simple reader scan, providing the utility with a thorough inspection record for poles and the assets that reside on them.

Armed with handheld RFID scanners and mobile computers, DPU inspectors record a variety of data about the tagged poles into their system, such as the condition of the pole and its cross arm, transformers, wiring and overall upkeep. The inspector is prompted by his handheld to answer a series of pre-formulated questions for each pole. The technicians then enter a priority level for any maintenance needed, and can send an immediate alert if the request is high priority, such as a leaning transformer or a severely damaged pole.

Upon returning to the office, the inspector syncs his computer system with DPU's software system, generating a work order that maintenance crews follow up on the next day.

The RFID process allows for the Orangeburg DPU to fully integrate its inspection process with its field maintenance teams, ultimately improving workforce productivity.

In addition, Bagwell said that the utility can now quickly capture and determine pole event data related to storms and other natural disasters, while monitoring-and often improving-the productivity of inspectors and maintenance personnel.

Tagging utility poles also enables utilities to track the complete life cycle of the unit and all the assets located on the pole. The data can also help utilities to comply with regulatory requirements regarding asset management and asset tracking.

Speeding up return on investment
Bagwell says that eventually poles will likely arrive at his facility pre-tagged, once RFID is embraced by more utilities. In fact, Orangeburg DPU's pole supplier recently installed an RFID-based yard management system. The supplier is also tracking poles for its own inventory management needs by tacking inexpensive UHF tags on the butt end of poles so it can track when an asset leaves the facility. However, that tag is useless once it arrives at the utility, as the butt end is buried underground during installation. Eventually, the supplier says it will tag poles on the side of the unit, allowing utilities to electronically verify receipt of the product and avoid the labor costs of tagging their own poles.

One of the biggest advantages to deploying RFID is that the utility can deploy faster reporting and recovery of joint use revenues related to third-party agreements with cable providers and cell phone companies. In many cases, utilities are unaware that a third party has placed equipment on its poles, and even when they are aware the billing process can often be slow. The RFID-generated information can help to automate that billing process, resulting in better cash flow, and can greatly speed up the return on investment for installing an RFID system.

"RFID has actually allowed us to develop a pole maintenance program, which has been our biggest benefit from the technology," Bagwell said. "Before we instituted this, we didn't have a maintenance program. Now, instead of being reactive to potential maintenance issues, we are proactive, and that has helped to increase our reliability numbers."