Pole Inspections go Digital

By Earle Jenkins

During a pole inspection request for proposal (RFP) meeting between Alamon Telco Inc.—a business that provides skilled contract personnel to the electric and telecommunications industry—and a client, a discussion concerning inspection methodologies revealed that the majority of telephone companies and electric utilities utilize four basic "approved" inspection methods that have existed for many years.

Given the dates of the research publications, it seemed reasonable to expect that advancements in methods and technologies must have evolved that would be classified as "approved" and provide improved accuracy, effectiveness and reduced cost. Rather than bid on the project utilizing the "old" methods, Alamon decided to conduct an investigation to determine the "best in class" methodology.

Best Practice Research

The company began its research by looking at the most common types of wood poles used in this country and their deterioration characteristics. Over 80 percent of the poles in North America are southern yellow pine. Decay normally begins on the outside shell below ground and moves inward and then upward to sections above ground. Douglas fir and western red cedar are the next most common. Decay on these poles is likely to begin internally near the ground line. Armed with this information, the company next looked at the effectiveness of the four methods outlined in Rural Utilities Service (RUS) guidelines as well as ATT and former Bell System practices.

Visual inspection and the sound and prod test are truly an institutionalized utility industry process as well as a current OSHA standard. OSHA details the following test sequence to be performed as a standard work process for technicians prior to working on any pole: "Sound the pole with a hammer and probe it with a screwdriver to determine if it is safe to climb. Poles or structures determined to be unsafe by test or observation may not be climbed until made safe by guying, bracing or other adequate means. Poles determined to be unsafe to climb shall, until they are made safe, be tagged in a conspicuous place to alert and warn all employees of the unsafe condition."

These time tested methods, as well as aboveground boring with a drilling device, are proven methods of identifying aboveground defects—however, given the belowground deterioration characteristics of most poles, an effective inspection process should also include belowground testing.

An inspection cycle for all poles at or over the age of 20 years, utilizing a visual aboveground and belowground inspection

(Continued on page 20)

YOU NEED TO PROVIDE DEPENDABLE ENERGY, YOU NEED A DEPENDABLE SOURCE FOR TOOLS.

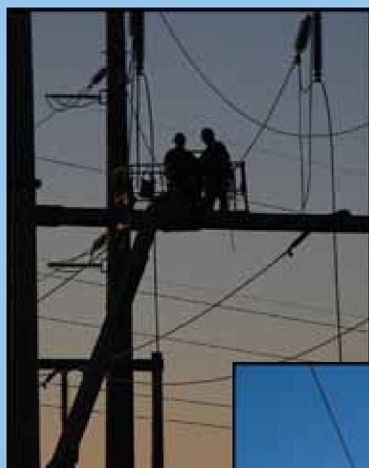
WWW.TALLMANEQUIPMENT.COM
TALLMAN
EQUIPMENT CO., INC.
877.860.5666

FOR OVER 50 YEARS....

Tallman Equipment has provided the tools and equipment most commonly used in the construction & maintenance of electrical distribution and transmission systems.

- **Stringing & Sagging**
- **Compression & Cutting**
- **Pole Setting & Climbing**
- **Grounding & Jumpering**
- **Overhead & Underground**

You can count on Tallman to deliver what you need, when you need it!



SALES

RENTAL

REPAIR

CALL FOR A FREE COPY OF OUR 2010 UTILITY TOOL & EQUIPMENT CATALOG

Over 200 Pages & 100 Manufacturers!

TOLL FREE 877-860-5666

WWW.TALLMANEQUIPMENT.COM

process designed to determine the serviceability of poles, is not only a long standing industry practice but a National Electrical Safety Code (NESC) requirement to establish an inspection process that will determine if a pole is "serviceable" or a "reject."

This is an area where Alamon's "best practice" research uncovered the introduction of technology-based methodologies that were not available when current industry guidelines were issued. The company found that a number of electric utilities have migrated to more advanced and accurate technological approaches to pole inspections. The company conducted field trials utilizing the most promising methods and spent time with the vendors and companies that distribute and use these technologies to discuss their experience. The investigation revealed:

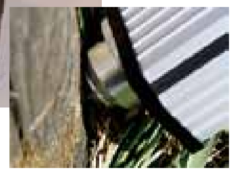
1. Field tests confirmed that aboveground testing alone would not adequately identify poles that are below "serviceability" standards (especially southern pine).
2. Depending on the inspector to notice a change in resistance against the drill when it contacts decayed wood, the condition of the shavings or the use of a "feeler" type of void or shell thickness indicator is very subjective compared to the accuracy of electronic devices available today.
3. Physically excavating around a pole and drilling large diameter holes that require plugging are not required in order to assess the below ground condition of a pole.

The need for excavation was the most controversial topic that Alamon encountered during its research. Is it necessary to dig around a pole in order to effectively check the condition below ground? Research revealed that current technological advances have eliminated the need to excavate around nearly all Class C poles (normal distribution line grade of construction). The limiting factor is the length of the drill bit. It all gets down to basic right angle trigonometry.

Once people become comfortable with the math, the next question is: How does the person know when he or she is exiting the pole below ground? Perhaps he or she may be drilling in hard packed soil that appears to be the pole. The answer is based on the material composition of poles versus soil. Advanced technology couples basic drilling with the ability to measure the resistance the bit encounters while drilling, producing a digital display that shows amplitude spikes associated with the resistance encountered while drilling through the growth rings of the pole. When the bit exits the pole the amplitude resistance immediately drops to zero or a flat line indicating hard packed soil.

The results of the research clearly indicated that testing utilizing one company's resistograph, the IML Resistograph device, is superior to a manual excavation and bore method from an accuracy, time and cost perspective. The strength of Alamon's conclusions is also supported by the fact that major utilities have migrated to this approach.

For Verizon and Embarq, the chronology of the adoption of this methodology began in 2006 following the severe hurricane season and related damage in Florida.



The Florida Public Service Commission (PSC) opened Docket No. 060077-TL to investigate the pole inspection programs utilized by utilities. The PSC-06-0 168-PAA-TL order issued in March of 2006 "ORDERED that all wood pole inspections required herein shall be based on the sound and bore technique for all poles. The sound and bore technique shall include excavation for all southern pine poles and other pole types as appropriate, in accordance with the recommendations of the United States Department of Agriculture's Rural Utilities service for Florida's rural electric utilities."

Subsequently, Verizon and Embarq filed protests and requested hearings to review a revised inspection process utilizing the technologically superior IML Resistograph in place of the PSC's excavate and bore directive. The IML Resistograph methodology was approved by the Florida PSC in August of 2006. Discussions with Verizon confirmed that this methodology has been in use since 2006 and is working well.

Alamon also contacted QWEST, when in the course of its research, discovered that QWEST conducted extensive research of pole and inspection methodologies with the assistance of Telcordia Technologies—resulting in a reengineered pole inspection program similar to the Verizon program. The IML Resistograph unit was piloted in September of 2007 and adopted for use in March of 2008—replacing the obsolete manually intensive below ground excavation inspection and treatment process.

The IML Resistograph

The IML Resistograph provides an exact measurement of the current condition of the

inspected utility pole without the need for excavation. The instrument is positioned at the base to measure wood decay at ground level. The inspector then attaches the 45-degree adapter to measure and record the wood density below ground level. The small drilling needle (less than 1/8 inch) extends as it penetrates the wood, measuring the resistance of the wood to reveal the relative density distribution. The density measurements, at a scale of 1:1, are graphed and stored in an electronic unit associated with the unit. The measurement profiles can be downloaded via the integrated Bluetooth functionality—creating a means of documenting and storing the precise condition of every pole inspected.

In addition, the Bluetooth capability facilitates the ability to download and couple the measurement profiles with inspection data collected in a handheld unit. There are a number of handheld units on the market with the ability to take field notes, mark GPS locations and store photos. Alamon combined this technology with an internally developed Web interface and software platform that contains a mechanized serviceability analysis algorithm that is adjusted to meet customer specific measurement criteria.

The drill graph profiles, serviceability rating and visual inspection results are uploaded into a database that provides a permanent digital record of the condition of each pole.

Alamon's research concluded that the IML Resistograph test unit, coupled with its internal Web interface and software analysis applications, met customer requirements as well as industry standards. To date Alamon has inspected over 50,000 poles utilizing this process; it continues to assess other methodologies but believe that this remains the best practice approach to pole inspections. ❏

About the Author:
Earle Jenkins is the North East regional director for Alamon Telco Inc. He can be reached at (603) 968-3829 or earle@alamon.com. Alamon Telco is a nationally certified business established in 1975 with headquarters located in Kalispell, Mont. The primary and dominant focus of the business is to provide skilled contract personnel to the electric and telecommunications industry. If you have questions or want more information about the IML Resistograph, please call 678-905-6318 or 800-815-2389, or go to www.imlusa.com.