



STEEL DISTRIBUTION POLE CASE STUDY

Middle Tennessee Electric Membership Corporation

Steel Distribution Poles Deliver Reliability, Longevity and Labor Cost Savings to Tennessee Coop

New substations, continuous and comprehensive system management and steel poles are all critical components of the Middle Tennessee Electric Membership Corporation's (MTEMC) expansive and ever growing power distribution system. The utility's distribution system spans approximately 10,221 miles with 32 distribution substations that deliver 5.3 billion kilowatt-hours of TVA-generated electricity annually.

With a system of this size, special situations call for unique solutions. About 15 years ago, the utility began transitioning parts of its predominantly wood pole-based distribution line to steel poles to meet specific needs. This approach has served the coop well.

Clive Buttrey, an electrical engineer with MTEMC, explains, "We put steel poles in place when we need long-term reliability. These are typically areas that are ordinarily inaccessible such as near

limited access highways that might require road closures, or unstable areas such as on the side of a hill, railway crossings, or swamp lands. Also, pole replacements which require mandatory overtime to replace due to outage windows, or poles with labor intensive equipment mounted on them, both of which drive up replacement costs, are well suited for steel.



When deciding whether to replace aging wood poles with steel poles, MTEMC performs a cost comparison study that evaluates labor and material costs with the assumption that the lifespan of a wood pole is 30 years and a steel pole 80-100 years.

Any pole in a remote location has excessive costs associated with installation, repair or replacement since they often require a bulldozer/crawler truck for access. Other installations have time constraints on replacement due to limited outage windows, or other external constraints such as rail and highway shutdowns, that mandate overtime work that increases labor costs. Steel poles are placed in these locations because they are low maintenance, lighter weight and have longer life spans.

"If the labor cost to replace a pole in our network is more than the difference between the material cost of a steel pole versus a wood pole, then we generally go with steel," Buttrey explains. "This translates to

approximately 20 new steel poles for replacement of existing poles each year. Additionally, we use steel poles for the bulk of new labor-intensive installations.” According to Buttrey, lifetime ownership costs of steel poles can be proven comparable to or less than wood poles in certain situations.

According to utility industry data gathered by EDM International, the actual cost of a utility pole structure (18 percent) is minimal when compared with the entire cost of constructing a typical line project.



Dan Snyder of AISI’s Steel Market Development Institute says this research and other evaluations of lifetime ownership cost clearly illustrate the importance of using a material like steel that will provide the greatest amount of reliability to protect the large investment required to build a line -- the other 82 percent. He adds, “In our experience, over the lifetime of a distribution pole, a utility typically must install two wood poles to equal the lifespan of one steel pole. Electric utilities must also keep in mind that for a given pole installation, material (pole and all apparatus) costs usually equate to less than a third of the installed cost. Therefore, from an overall cost standpoint, it may be beneficial to consider steel in order to protect a utility’s overall investment in the construction and maintenance of a typical line project.”

While MTEMC does not rely on the Institute of Electrical and Electronics Engineers (IEEE) power distribution reliability indices, officials do believe that the use of steel poles should keep scheduled interruptions to a minimum as the number of installed steel poles increases. Currently, the MTEMC distribution system includes over 123,000 wood poles, almost 2,000 steel poles, and about 50 concrete poles.

As one of the original Tennessee Valley Authority’s retail power distributors, MTEMC has delivered power to local farmers and homeowners since 1936. Serving one of the fastest growing areas in the country, MTEMC is the state’s largest electric cooperative and the sixth largest in the United States providing services to about 183,000 residential and business members in a 2,100 square mile, four-county area directly south of metropolitan Nashville

For more information about steel distribution poles, contact Dan Snyder, Manager Business Development, AISI’s Steel Market Development Institute, (202) 452-7100, or visit <http://www.steel.org/utilitypoles>. Clive Buttrey of MTEMC can be reached at (615) 494-1526.

