



PROJECT PROFILE

Building a Steel Asset Assessment Program on a Budget

The Situation

Memphis Light, Gas and Water (MLGW) is the nation's largest three-service municipal utility, providing electric, gas, and water to more than 429,000 customers in Memphis and surrounding Shelby County in west Tennessee. Incorporated in 1939, MLGW's infrastructure increased as the city of Memphis grew. Today, Memphis is one of Tennessee's most populous cities, and MLGW is the Tennessee Valley Authority's (TVA) largest customer, accounting for 11% of TVA's total load.

MLGW maintains both a distribution system and more than 450 miles of electric transmission lines. Overall, the system is comprised of roughly 3,000 steel structures, most of which are four-legged lattice towers. Many of these steel structures are aging and most likely in poor condition, putting grid resilience at risk, but MLGW has limited resources to fund an assessment program with full excavations. To begin managing this critical asset class, MLGW partnered with Osmose to develop a cost-effective, risk reduction program.

The Solution

Much like wood pole assessment methodologies, there are cost-friendly alternatives to completing full excavations and assessments on each steel structure. There were no previous inspection records for any of MLGW's structures that showed visible damage, so Osmose worked with the utility to develop a tailored program. A system-wide, partial excavation program was ultimately deemed the best solution to quickly locate priority reject structures and address them accordingly. Osmose implemented this accelerated assessment with a two-fold approach to complete the project.

Phase 1: Osmose performed a partial excavation on each structure along with an environmental study to locate priority rejects. No life extension (coatings or cathodic protection) was applied during this phase so that the entire system could be inspected quickly and cost-effectively. While the depth and accuracy of accelerated assessments are not as optimal as full assessments performed during a comprehensive assessment, the process is very effective at locating structures that pose the greatest risk to a system.

In a short amount of time, Osmose assessed the entire system, which included thousands of tower legs and hundreds of steel poles. Findings from the assessment revealed many above-grade mechanical damage rejects, as well as some foundations that had substantial corrosion below-grade and concrete damage.



700 REJECTS DISCOVERED

About 50 were deemed priority structures where failure appeared to be imminent

Phase 2: After the accelerated assessment was completed, the utility elected to repair the reject and priority legs. (Figure 1)

Results

Osmose was able to assess every steel structure on MLGW's system. The structural condition ratings and soil environmental profile collected during Phase 1 were evaluated to identify structures with the greatest need for life-extending mitigation, such as protective coatings or cathodic protection. After the reject legs are repaired, the utility will be positioned to start a cyclical, targeted program to extend the service life of its non-reject steel structures. This will help MLGW budget for those critically in need of restoration and avoid costly and premature structure replacements in the future.

Key Takeaway

For utilities managing steel structures with limited funding, accelerated field assessment provides an alternative method that balances efficiency and accuracy in a pragmatic and cost-effective way.

The advantages of an accelerated assessment, when compared to the more comprehensive approach, include speed and efficient use of budget resources. It allows the utility to address greater numbers of structures while still surfacing defects, and it places less of a burden on O&M resources by employing smaller teams. Ultimately, an accelerated assessment gives the utility a broad overview of where and how to prioritize resources and a more targeted approach to mitigating structure issues.

Figure 1. Osmose technician assessing one of MLGW's corroded steel towers. The red arrows point to areas where corrosion had completely severed load-carrying



“The team at Osmose went above and beyond to make this project as smooth as possible. Our steel structures are ready for another 70 years of life.”

Jason Mayo, P.E.,
MLGW Lead Transmission Engineer

To learn more, contact your local Osmose expert, call 770.632.6700, or email steel@osmose.com.