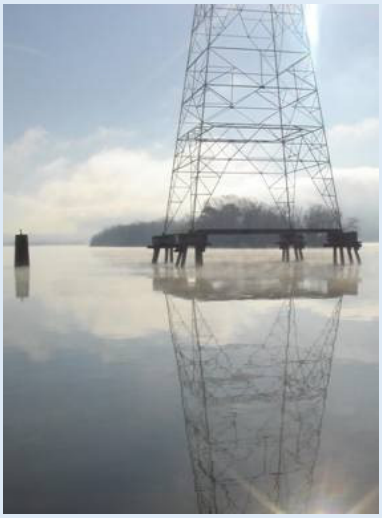
Supplemental Project Notice

FLEET MANAGEMENT APPROACH TO STUCTURE AND FOUNDATION CORROSION MANAGEMENT



Early morning tower inspection on the river

PROJECT HIGHLIGHTS

- Steel structure designs and construction standards are not optimized for corrosion control.
- Maintenance practices are not aligned with the severity of the environment.
- Inspection cycles are not standardized and procedures are not well defined.
- Acceptance and reject criteria are not well established.

Background, Objectives, and New Learnings

Corrosion on electric utility assets costs the U.S. economy billions of dollars each year with $600 million directly attributed to the power delivery sector. Through proactive inspection and mitigation practices, 25–30% of these losses may be avoided.

Mergers during the last 60 years have complicated operations of the remaining IOU's. This is due to a wide variety of structure designs, construction standards, maintenance practices and environment within the new service territory.

The objective of this project is to provide a tool by which a utility may identify structures experiencing degradation due to corrosion and extend the service life of those structures.

Field surveys with EPRI crews, laboratory sample testing, and environmental modeling provide the following results:

- Consolidation and alignment of structural designs with the environment in both atmospheric and sub-grade exposure
- Optimized maintenance practices by selecting the best-in-class mitigation methods.
- Recommendations for design changes and alternate materials in the design
- Models of the service environment so that structure populations may be screened for assets in high-risk locations.

New learnings encompass many aspects of life cycle decisions.These decisions may include the following:

- How to design an asset to be compatible with the environment?
- What is the appropraiate inspection method for that specific asset?
- When should that inspection be made to minimize degradation?
- What may be done to extend the service life through better corrosion control?
- When should that asset be removed from service?

Benefits

- Reduced O&M costs by screening systems for structures requiring maintenance.
- Optimize structural designs for increased corrosion resistance.
- **I**ncreased structure service life through improved corrosion control methods.
- Reduced risk by identification of structures at risk.

Project Approach and Summary

This is a multiyear project that is designed to gather information about how a structure degrades in all areas of a utility's service territory and make recommendations to increase the service life for each location.

- Survey approximately 75 structures each year to develop and validate an environmental model and soil library that may identify highly corrosive locations.
- Deploy atmospheric corrosion coupons to develop an atmospheric corrosion map that may identify severe corrosion environments.
- Analyze the soil samples collected at each survey site to categorize the soils by corrosivity and identify the most significant environmental factor controlling that corrosion rate.
- Forecast inspection cycles.
- Forecast maintenance and replacement schedules by geographic region and environmental severity.
- Align the appropriate mitigation methods with the environmental severity. Examples may be coating system selection, ground sleeves, pole material, engineered backfills, or cathodic protection designs.
- Improve corrosion control through material selection and structural designs.

Deliverables

A report which includes:

- System environmental model and GIS-based maps
- Field survey and sample collection data
- **L**aboratory analysis of the field samples
- Recommendations for coating systems, material selection for design, and backfill designs
- Cathodic protection system templates for field crews to install, troubleshoot, and maintain
- Workshop for the transfer of new learning to engineers, construction and maintenance personnel

Price of Project

The cost to participate in this multiyear project is scope dependant based upon the asset population and a statistically significant sample of structures. Pricing may vary outside of North America and should be confirmed with the project manager. The project qualifies for tailored collaboration (TC) or self-directed funding (SDF).

Project Status and Schedule

There are eight (8) milestones to monitor the status of this project.

- The engineering study to determine survey sites and quantity of structures to complete a health assessment.
- The field survey to determine both atmospheric and subgrade corrosion rates for the metals used in the construction of the assets.
- Installation of the atmospheric coupon racks by the utility linemen
- Analysis of the field data and characterizing of the coupons and soil samples
- Retrieval of the atmospheric coupon racks and subsequent analysis.
- Draft report for review by the utility technical staff
- Final report delivery and technical transfer workshop for utility personnel
- The schedule will depend upon the structure sample size for the field survey work.

Who Should Join

This project should be of interest to any utility that needs additional life-cycle information on structural degradation of their assets due to a corrosive environment.

Contact Information

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

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