EPRI

2024

AT A GLANCE

Substation Corrosion Management

Program 37.104

Research Value

- Provide new lessons to asset management teams for life cycle decisions.
- Develop processes and training for inspection and maintenance operations.
- Optimize maintenance budgets through population assessment (targeted inspections) and predictive maintenance of ground grids.
- Develop guidelines for material selection and application to reduce theft of grounding system conductors and optimize corrosion control measures.
- Improve worker and public safety by proactively identifying areas of ground grid degradation.
- Assess the efficacy of a cathodic protection system which eliminates subgrade corrosion.

Member Benefits

- Optimized maintenance budgets by targeted inspections
- Increased personnel and public safety by screening the service territory for “at risk” structures
- Extended asset service life to meet criteria for capitalization of maintenance operations

All assets within a substation are subject to degradation and have maintenance programs to extend the service life or a replacement scheduled. The project provides guidance in understanding the degradation rates of assets in soil and atmospheric exposure, how to select the appropriate corrective action, and ensure that the corrective action is aligned with the environment. This is achieved through:

- Evaluating existing, new, and emerging inspection technologies to understand the limitations and benefits so that utilities can select these tools based on the construction specifications.
- Determining corrosivity levels of the soil series at a substation so that engineers can select the appropriate materials for the ground grid designs, foundations, and tank bottoms.
- Determining corrosivity levels of the soil series at a substation so that maintenance personnel understand when to inspect and maintain the ground grid and other substation assets.
- Define corrosion control options and provide guidance for the appropriate mitigation methods for substation assets in soil exposure.

EPRI Technical Contact

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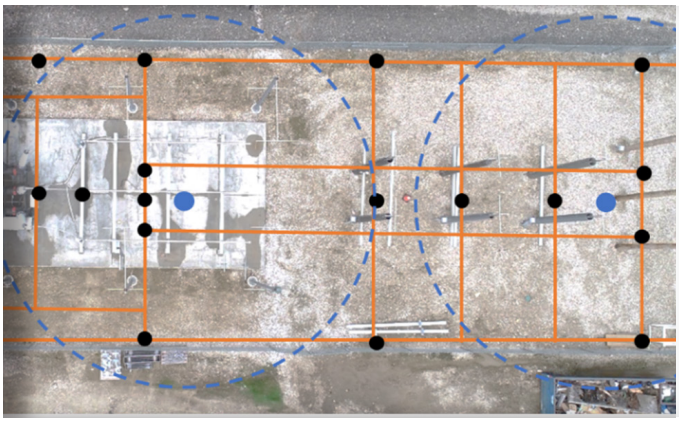
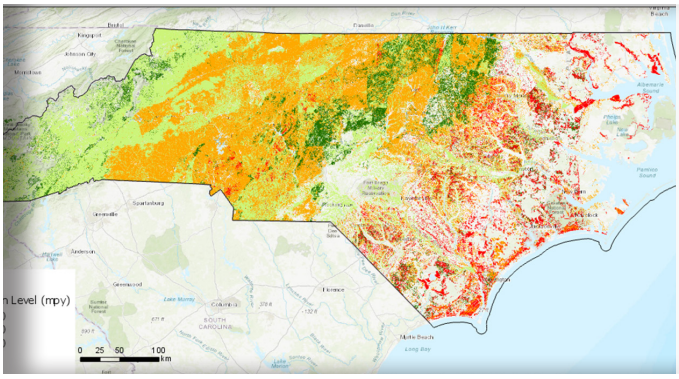
Research Highlights



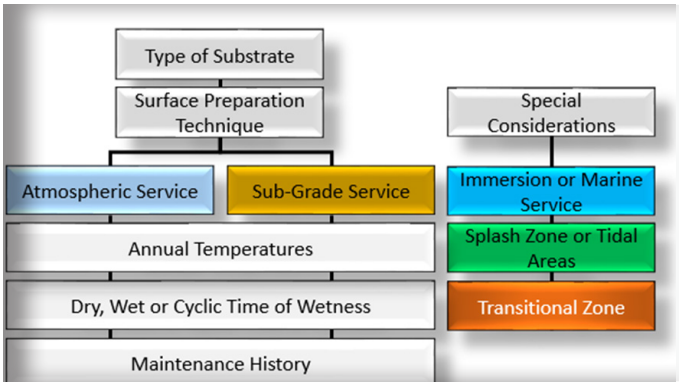
Refinement of Impressed Current Cathodic Protection for Corrosion Control on Ground Grids

- Eliminate corrosion of the ground grid conductor
- Reduce or eliminate circulating current corrosion on buswork
- Control corrosion on tank bottoms and perimeter fences



Subgrade Corrosion in Substations

- Subgrade Corrosivity Maps to Screen a population of substations for highly corrosive soils
- Identifying “at risk” locations within the substation
- Align the mitigation method with the corrosion severity Substations



Coating Selection and Application Webapp

- Coating formulations evolve due to environmental restrictions, so research evaluates the changes in efficacy
- Assessment of new and emerging coating systems to understand strengths and weaknesses
- Align the coating system with its service environment

For more information, contact:

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