DIGIOIAGRAY
CONSULTING ENGINEERS & SCIENTISTS

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APPLIED RESEARCH

DiGioia Gray is recognized as a group of experts in electric system engineering, specializing in the practical aspects of substation, transmission line and foundation analysis and design.

Our firm routinely performs applied research with utilities, institutes, universities and governmental agencies. We help develop state-of-the-practice design and analysis methods, and are leaders in the development of transmission reliability-based design methodologies through a long-time consultancy with the Electric Power Research Institute (EPRI) and the Centre for Energy Advancement through Technological Innovation (CEATI).

DiGioia Gray's founders, Dr. Anthony DiGioia Jr., and Richard Gray, for over 50 years have been at the fore-front of electric system and transmission line applied research. This tradition continues with our current staff and has allowed DiGioia Gray to be a premier research and development consultancy that contributes innovative engineering solutions to solve challenging problems that face our society today. Our staff actively participates in the development of power industry standards and codes used by utilities engineering firms for the design and construction of the electric power grid. Through years of research and work on standards, guides and codes, DiGioia Gray applies in-depth knowledge to the design of the electric power system. We look forward to the opportunity to work with and tailor research projects to the needs of our clients.

SELECT CODES / STANDARDS INVOLVEMENT

American Society of Civil Engineers (ASCE)

- Guide for Design of Steel Transmission Towers (ASCE-52)
- Guidelines for Electric Transmission Line Loading (ASCE-74)

Deep Foundation Institute (DFI) Technical Committees

- Electric Power Systems Foundations Committee white paper, "Best Practices for Deep Foundations used in the Electric Transmission System"
- Codes and Standards Committee white paper, "Terminology and Evaluation Criteria of Crosshole Sonic Logging (CSL) as applied to Deep Foundations"

Institute of Electrical and Electronics Engineers (IEEE)

- Guide for Transmission Structure Foundation (IEEE-691)

CIGRE International Council on Large Electric Systems

- Foundation Design and Testing (WG B2.07)
- The Designs of Transmission Line Support Foundations - An Overview, 2001
- Design and Installation of Monopole and Ground Anchor for OHL Support Foundation, 2005

National Electric Safety Code (NESC)

- Subcommittee on OH Line - Strength and Loading (Part 2, Sections 24-27, Appendix C)

American Society for Testing and Materials (ASTM)

- Committee on Soil and Rock (D18)

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APPLIED RESEARCH

SELECT RESEARCH PROJECTS

Electric Power Research Institute (EPRI)

- Manager for FAD Tools software
- Optimization of Transmission Line Design using Life Cycle Costing
- Current Practice for Geotechnical Design of Transmission Line Structure Foundations
- A guideline for Overhead Transmission Line Inspection and Assessment Methods for the Inspection and Assessment of Connection Hardware on Transmission Structures (part of Yellow Book in 2012)
- Transmission Structure Foundation Design Guide
- Overhead Line Reliability-Based Design Approach for Extreme Event Failure Analysis
- Guide for Successful Transmission Line Siting, 3002001188 (2013 update)
- Evaluation of methods for the hardening of Transmission Lines Against Longitudinal Cascades.
- Development of a computer program to analyze and design transmission lines to eliminate longitudinal cascades due to extreme events.
- Transmission Design Practices to Facilitate Good and Safe Construction
- Compact Structure Design Concepts for High-Voltage Transmission Lines
- Dynamic Response of Substation Structures to Fault Current Forces: Phase 1 & Phase 2
- Reference Guide of Design Features and Processes to Facilitate the Construction and Maintenance of Transmission Line Structures (ongoing)

Centre for Energy Advancement through Technological Innovation (CEATI)

- Guide for Determining Deflection Criteria for Steel Poles supported by Drilled Shaft Foundations
- Best Practices for the Design of Transmission Line Structures Located in Water for Protection against Additional Loads Imposed During Floods and Foundation Scour
- Best Practice Guide for Fire Protection of Transmission Lines
- Guide for Transmission Line Foundations with Least Impact to the Environment
- Review of Non-Ceramic Insulator Standards; Manufacturer Practices and Design Information (ongoing)
- Application of Transmission Structures for Under-built and Other Uses (ongoing)
- Understanding Ground Anchoring Systems for Overhead Line Foundations (ongoing)

SPONSORED UTILITY RESEARCH PROJECTS

Rock Drillability Research Project (ongoing)

- Tailored collaboration with EPRI

Direct Embedment Research Projects (ongoing)

- Development of appropriate backfill properties and methods

Design Guideline Documents for Foundations (ongoing)

Mechanically Spliced Full-Length Anchor Bolts