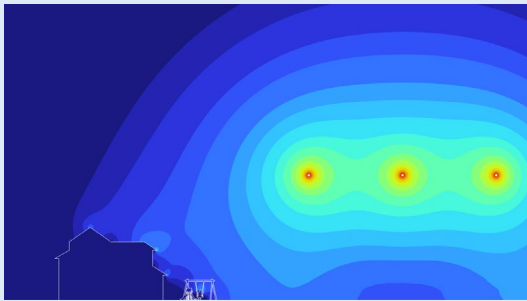


TRANSMISSION LINE EMF MITIGATION STRATEGIES

P60 EMF/RF Health Assessment and Safety



PROJECT HIGHLIGHTS

- Transmission expansion and urban encroachment increasingly require EMF mitigation beyond standard design practices for select overhead and underground lines.
- Utilities lack a concise, engineering-focused reference comparing the effectiveness and relative cost of available EMF mitigation options.
- This project delivers:
 - A practical inventory of EMF mitigation strategies
 - Quantitative analysis demonstrating mitigation effectiveness
 - Relative cost and performance ranking to support design, permitting, and stakeholder discussions
 - Targeted training to strengthen engineers' understanding of EMF fundamentals, modeling results, and mitigation implications

Background, Objectives, and New Learnings

Low-frequency electric and magnetic fields are an inevitable consequence of operating overhead and underground transmission lines. In most cases, electric and magnetic field (EMF) exposure criteria can be achieved through conventional transmission line design choices such as conductor configuration, phase spacing, and corridor layout. However, utilities occasionally encounter situations where standard techniques are insufficient due to site constraints, proximity to sensitive receptors, heightened public concern, or the exposure problem develops after the line is built.

In these cases, utilities must consider mitigation measures that fall outside typical design practices. While a range of EMF mitigation options exists, information on their relative effectiveness, implementation considerations, and cost is often dispersed across reports, legacy studies, or institutional knowledge held by a limited number of experts.

The objective of this project is to provide utilities with a clear, technically rigorous reference document that systematically evaluates electric and magnetic field mitigation strategies for overhead and underground transmission lines. The project will identify representative high-exposure scenarios, apply electromagnetic field analyses to assess mitigation options, and rank those options based on relative performance and cost. By consolidating this information into a single, practical resource, the project facilitates development of informed, defensible decisions regarding EMF mitigation strategies. This resource can also provide pre-construction value for transmission projects by providing ready access to information that can support siting, design, regulatory compliance, and stakeholder communication efforts.

Benefits

Improved Decision-Making: Provides utilities with a structured comparison of EMF mitigation options, supported by quantitative analytical results by cost and effectiveness.

Enhanced Stakeholder Support: Strengthens technical justification for mitigation and facilitates decisions during permitting, siting, and public engagement.

Practical Applicability: Addresses both overhead and underground transmission configurations representative of real-world utility challenges.

Project Approach and Summary

This section describes the anticipated scope of work. The final scope will reflect funding level and funder priorities.

1. EMF Engineering Training for Utility Engineers

Develop and deliver targeted EMF engineering training to support consistent understanding of EMF fundamentals, modeling results, and mitigation implications for transmission line design.

2. Compile Mitigation Strategies

Compile and describe EMF mitigation strategies commonly considered as part of standard transmission line design, as well as additional strategies that may be applied outside normal design practices and specific scenarios from Funder participants.

3. Representative Case Development

Identify overhead and underground transmission configurations associated with relatively high electric and magnetic field exposure levels that would be candidates for mitigation.

4. Analytical Evaluation of Mitigation Options

Perform EMF analyses on representative cases to quantify the effectiveness of selected mitigation strategies and their relative cost.

5. Reporting and Knowledge Transfer

Prepare a technical report summarizing EMF fundamentals, mitigation techniques, and analytical results, and deliver webinars focused on specific mitigation cases.

Deliverables

- Technical report on transmission line EMF mitigation strategies, including analytical results
- Webinars on EMF fundamentals, mitigation strategies, and project summary
- Webinar summarizing project findings

Price of Project

The cost for each participant is \$50,000. A minimum of two participants are required. The project is eligible for use of Self-Directed Funds (SDF).

Project Status and Schedule

24 months

Who Should Join

- Utilities planning/operating overhead or underground transmission projects with EMF issues
- Utilities facing increased right-of-way encroachment or EMF complaints
- Engineers, planners, and designers responsible for EMF assessment, mitigation, or response

Contact Information

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

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