

CASE STUDY: AM PROTECTION FOR TRANSMISSION LINE DEVELOPMENT

PROJECT OVERVIEW

Lawrence Behr Associates (LBA) was engaged by a major U.S. energy provider to evaluate and mitigate potential AM broadcast interference associated with new 230 kV transmission line construction in the Mid-Atlantic region. The region is characterized by dense infrastructure development and sensitive RF environments.

Initial screening identified a nearby high-power, FCC-licensed AM broadcast facility as vulnerable to coverage pattern impacts due to its proximity to the proposed transmission corridor and the directional nature of its licensed operation. Portions of the transmission route passed within close range of the broadcast facility, requiring detailed analysis and proactive mitigation to protect licensed operations.

Through advanced electromagnetic modeling and targeted AM Protection measures, LBA ensured the transmission infrastructure could be constructed and energized without impacting broadcast service or project schedules. The project was successfully completed in 2024.



THE CHALLENGE

The AM broadcast facility operates with a directional, high-power antenna system, making it particularly sensitive to nearby conductive structures. Multiple proposed transmission structures were located within FCC-defined AM evaluation distances, increasing the likelihood of signal interaction.

Metallic transmission poles, crossarms, and overhead shield wires form electrically continuous systems that can intercept and reradiate AM radiofrequency energy. If left unaddressed, this reradiation can distort a station's licensed antenna pattern beyond allowable limits.

Key challenges included:

- Transmission structures located within AM evaluation distances
- Structural configurations that increased effective electrical height
- The need to protect broadcast operations while maintaining aggressive construction timelines

ENGINEERING ANALYSIS

LBA performed a comprehensive electromagnetic modeling analysis to evaluate potential AM interaction between the proposed transmission line and the nearby broadcast facility. The evaluation included a review of all transmission structures along the selected route, with modeling inputs developed to reflect real-world structure geometry and electrically continuous components.

LBA's analysis incorporated more than 60 years of transmission line interaction experience and accounted for increased effective electrical height associated with structural complexity. Results were used to identify structures requiring mitigation and to support a targeted AM Protection System design approach.



AM PROTECTION SYSTEM STRATEGY

Using the modeling results, LBA developed a targeted AM Protection System strategy based on engineered detuning techniques. Rather than applying mitigation uniformly, LBA designed structure-specific AM Protection solutions tailored to each configuration and project requirement.

The AM Protection System strategy included:

- Custom AM Protection circuits engineered for individual pole configurations
- Use of proprietary Detunipole™ components where required
- Optimization of tuning parameters using mathematical modeling
- Verification that mitigation measures would not affect licensed broadcast operations
- Modular, pole-delivered hardware to streamline installation and support contractor efficiency
- As-built documentation to support utility records and long-term asset management



In addition to RF performance, the AM Protection System was designed to align with utility construction and operational requirements, including:

- Coordination with utility safety, accessibility, and line integrity standards
- Compatibility with OPGW (Optical Ground Wire) and associated transmission components
- Comprehensive as-built documentation provided for utility records and long-term asset management

All AM Protection measures were engineered to remain effective throughout construction and long-term operation without requiring broadcast outages or operational interruptions.

RESULTS

The engineered AM Protection solution successfully mitigated reradiation risks associated with the transmission infrastructure, ensuring:

- Preservation of the AM station's licensed directional antenna pattern
- Alignment with FCC protocol throughout construction and operation
- No disruption to broadcast operations
- A defensible engineering record supporting the transmission project

The transmission line project advanced with confidence, supported by early risk identification and proven AM Protection engineering.

WHY LBA

With over six decades of experience supporting broadcast and utility infrastructure nationwide, LBA provides trusted AM detuning and AM Protection engineering for complex transmission projects. LBA's AM Protection solutions include proprietary Detunipole™ hardware designed to mitigate reradiation effects on transmission structures where conventional approaches are insufficient.

LBA's approach emphasizes:

- Early identification of AM interaction risks
- Advanced mathematical modeling for defensible evaluations
- Structure-specific AM Protection system design
- Support across all stages of transmission development

CONTACT LBA

To learn more about LBA's AM Protection and detuning services:

Lawrence Behr Associates (LBA)

Email: lbagr@lbagroup.com

Phone: 800.522.4464

Website: www.lbagroup.com