

# OPTICAL GROUND WIRE AND SHIELD WIRE CORROSION DUE TO BIRD MUTES



*Vulture perching on shield wire*

## PROJECT HIGHLIGHTS

- Provide insight on bird streamer corrosion mechanisms of OPGW and Shield wires
- Help utilities in selecting OPGW and shield wire that will offer prolong life in high traffic avian corridors
- Test bird mute protection systems for efficacy and durability

## Background, Objectives, and New Learnings

Shield wire and optical ground wire (OPGW) are important parts of the overhead line system protecting the conductors from lightning and allowing communication. These cables are usually resistant to atmospheric corrosion and made of materials such as galvanized steel, aluminum, aluminum alloys, aluminum-clad steel, and stainless steel. However, it has been observed that in high traffic avian corridors where vultures and other birds use shield wire as perches, bird excrement (or bird mutes) has led to the severe corrosion of shield wire and, in some instances, loss of communication in OPGW.

The objectives of this project are:

- To understand the corrosion mechanisms of shield wire and OPGW materials when exposed to bird mutes, evaluate if a specific material is more resistant to bird mutes than others.
- To use the test data to estimate a degradation rate which a utility can then use to approximate time to failure and replacement schedule.
- To test bird mute protection systems for efficacy and durability.

## Benefits

This work helps support R&D efforts in filling the knowledge gap in understanding how bird mutes corrode and degrade shield wire and OPGW, which is not well known. The learning could then be applied to optimize selection of shield wires, OPGWs, or conductor protection devices that will resist bird mute corrosion or delay failure due to bird mute corrosion. This will result in the proactive maintenance of OPGW and shield wire which will improve public safety and provide more reliable power to the public.

## Project Approach and Summary

The following high-level tasks will define the project approach:

1. **Individual Strand testing:** Up to three OPGW and/or shield wire samples sent to EPRI from each participating utility for evaluation will be opened and the corrosion resistance of individual strands tested in a laboratory aging procedure using

artificial bird mutes and tested against actual bird mutes by placing them into vulture cages (if available). Strand corrosion rate and loss of strength will be measured.

2. **Full Shield wire and OPGW Corrosion Testing:** Up to 3 OPGW and/or shield wire samples sent to EPRI from each participating utility for evaluation will be tested as received. The corrosion resistance of the samples will be tested in a laboratory aging process using artificial bird mutes and tested against actual bird mutes by placing the samples in vulture cages (if available). Samples strength loss will be measured.
3. **Cable Protection Device Testing:** EPRI intends to test up to 2 conductor protection devices designed to reduce bird mute corrosion on shield wire and OPGW per utility. EPRI intends to perform tests to determine their efficacy and durability.

## Deliverables

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Expected project deliverables include:

- A webcast at the end of the project discussing results and findings.
- A final report including:
  - Corrosion evaluation of the different materials composing OPGW and/or shield wire.
  - Results on the efficacy of the bird streamer protection system.
  - Recommendation for OPGW and/or shield wire selection based on data.

## Price of Project

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The project will cost \$40k per utility with a minimum of two utilities to complete the entire scope of work.

## Project Status and Schedule

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The project is estimated to take 12-months to complete from the kickoff meeting.

## Who Should Join

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Utilities with recurring problems regarding bird impacts on OPGW and shield wire. Utilities that have tried, without success, bird repellent techniques and that are seeking guidelines in selecting OPGW and shield wire that will offer the longest life against bird streamer corrosion.

## Contact Information

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