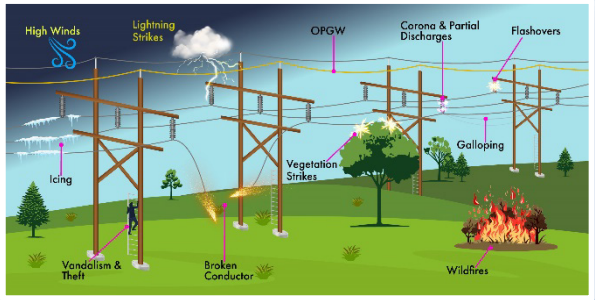
Supplemental Project Notice

EVALUATION OF OPTICAL FIBER AS AN OVERHEAD TRANSMISSION LINE MONITORING SENSOR

Full-Scale Laboratory Testing



PROJECT HIGHLIGHTS

- Determine accuracy of optical fiber monitoring technology for multiple events/conditions
- Validate technology prior to field implementation
- Improve understanding of applying monitoring data

Background, Objectives, and New Learnings

A new technology in the industry utilizes overhead optical fiber (such as OPGW) as a long, continuous sensor to detect an array of electrical, mechanical, and thermal interferences that may occur on or close to the line.

The primary objective of this project is to determine how accurately the technology can detect an array of specified use cases. These use cases include:

- Lightning strikes
- Dynamic line ratings
- Flashovers and short circuits
- Theft and vandalism
- Wildfires
- Corona and partial discharges
- Excessive wind and conductor galloping
- Icing
- Vegetation strikes

The study will also determine whether the technology is able to differentiate between the various use cases. The study will include testing for false positives and false negatives. The accuracy of the detection of these use cases will also be analyzed and this can in turn be used to gauge the viability of the technology.

Any use cases not covered in the above may be discussed and included in the project scope.

Benefits

Use cases that detect severe weather conditions can act as an early warning system to any public entities in the vicinity of the line especially in remote areas. Furthermore, there is significant potential public benefit in the increased early warning capability this technology offers towards any system instability issues that may arise. The technology offers accurate feedback which in turn allows for quick re-energization from any unplanned outages.

Utilities can utilize this technology to monitor large sections of their overhead transmission line assets real-time. This may assist utilities to plan and react to overhead line maintenance and inspections.

Using this technology for Dynamic Line Rating (DLR) has the potential to offer a low-cost solution relative to DLR sensors, however this technology has not been evaluated for ratings accuracy.

Project Approach and Summary

The project will be divided into three parts:

1. Development of test protocols. A detailed test plan will be developed for each use case. These test plans will be discussed with participants to ensure all needs are adequately met.
2. Test execution. Each test will be executed for the allotted time as defined in the first step. Participants will be accommodated to witness any testing for all use cases.
3. Summary of results. After each use case test is concluded a summary of results will be presented to and shared with all participants.

Deliverables

- Test plans for each use case
- Facility demonstration for all planned use cases
- Presentations on summaries of results for each use case

Price of Project

The cost will vary depending on the technology selected. An estimated cost is $105k per utility per year over a 2-year period. A minimum of four participants are required to complete the full scope of work.

Project Status and Schedule

The project is expected to run over a 2-year period with updates every six months.

Who Should Join

This project is applicable to any utilities that utilize or plan to utilize optical fiber on their overhead lines. This project may be highly beneficial to any utilities that have any existing challenges or are looking to improve the performance pertaining to any of the described use cases of the technology.

Additionally, utilities preparing for FERC22-5 will gain valuable insights on DLR.

Contact Information

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

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