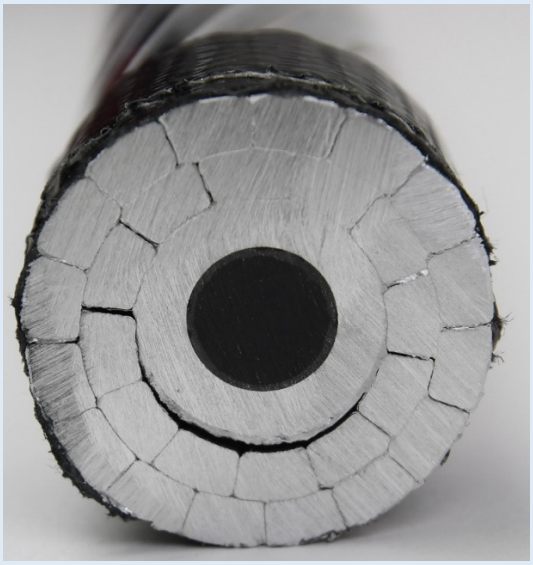
Supplemental Project Notice

TS CARBON CORE CONDUCTOR/CONNECTOR EVALUATION

Long-Term and Short-Term Testing



Cross-Section of a Drake Sized TS Carbon Core Conductor

PROJECT HIGHLIGHTS

- Long-term thermal mechanical aging testing
- Short-term mechanical tests
- Conductor and connector tests
- Long-term field monitoring

Background, Objectives, and New Learnings

New conductors known as Advanced Conductors have been developed to meet the need of increasing the transmission capacity of existing corridors.

The characteristics of advanced conductors are higher current carrying capacity by allowing the conductor to operate at high temperatures, and lower sags for the same conductor temperature when compared to the conventional aluminum-conductor steel-reinforced (ACSR) conductors. Although all advanced conductors possess the same general characteristics, they could be vastly different from one another.

For some advanced conductors, non-conventional composite materials that were developed in recent years are used for the conductor core. The electric power utilities were not confident in adopting advanced conductors, especially those that use more innovative technologies.

One of the newer advanced conductors is the TS Carbon Fiber Core Conductor. This conductor has a carbon core, encapsulated in an aluminum sleeve, which is manufactured in China and the outer aluminum strands are stranded onto the core in North America. As this is a very recent addition to the available advanced conductors, various long-term and short-term testing is required to better understand the performance and longevity of this conductor.

The projects objectives are to:

- Perform long term aging tests on the conductor and connector system to better understand the performance levels over time.
- Perform short term corrosion, mechanical and electrical tests on the conductor and connector system to benchmark the conductor's performance.
- Monitor performance levels of an in-field installation.

Benefits

EPRI's intent with this project is to quantify the long-term performance of the TS conductor and to benchmark its short-term test performance. By doing so, participating utilities may be able to gain a better understanding of this conductor and how it will perform under various conditions.

By understanding the advantages and limitations of this conductor, participating utilities may be able to undertake safer operation of their overhead transmission lines and improve their inspection and maintenance practices, which could result in improved line performance and reliability.

Project Approach and Summary

This project will undertake a combination of short-term and long-term tests to better understand the Thermal and Mechanical performance of the TS Carbon Fiber Core Conductor.

1. Short-term laboratory testing of the conductor and connector system, may include:
   - Salt spray tests
   - Core strength tests
   - Sequential mechanical testing
   - Short circuit tests
   - Radial crush tests
   - Maximum load test tests
   - Bending test
   - Heat resistance test (aluminum strands)
2. Long-term thermal-mechanical laboratory testing of the conductor technology, may include:
   - Current cyclical testing in the Charlotte Laboratory (approximately 7500 hours)
   - Post thermal-mechanical evaluation tests
3. Long-term field monitoring:

   A field installation of the TS Carbon Core conductor is intended to be monitored to gain a better understanding of the real world thermal and ice-loading performance.
4. Conference calls:

   Conference Calls are planned to be held with the funding utilities to discuss the project's progress and results.

Deliverables

The non-proprietary results of this work will be incorporated into EPRI R&D Program 35, and made available to the public, for purchase or otherwise.

The planned deliverables for this project include:

- Test plan for each test performed.
- A test report detailing the long-term tests.
- A test report detailing the short-term tests.
- A PowerPoint presentation detailing the results of the project.
- A WebEX meeting to review the test report findings.

Price of Project

The one-time cost to join the project is $40k. A minimum of two funders will be required to complete the long-term tests. A minimum of six funders will be required to complete the full scope of work.

Project Status and Schedule

The project is expected to be completed within 36 months of starting the long-term testing.

Who Should Join

Utilities wanting to gain a better understanding of the performance (long-term and short-term) levels of the new TS conductor. Utilities that are using or considering using the TS conductor on their Overhead Lines.

Contact Information

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

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