NEETRAC
National Electric Energy Testing, Research, and Applications Center

NEETRAC NEWS

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In This Issue...

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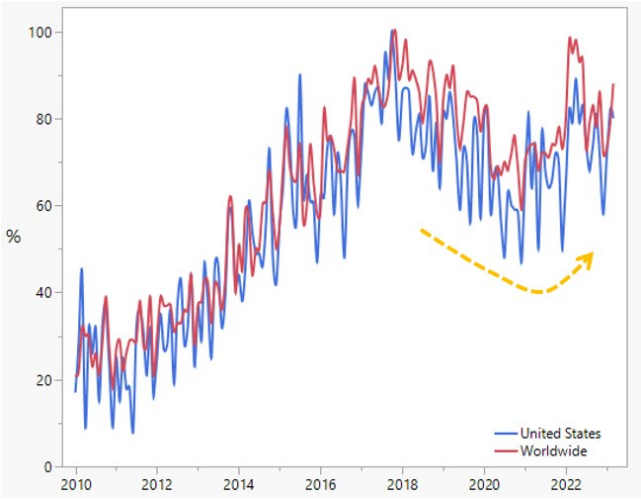
Baseline Projects Recently Launched

NEETRAC launched the following Baseline project proposals presented during the May 2023 Management Board Meeting. If you would like to serve as an advisor for any of these projects, please email suzanne.schmidle@neetrac.gatech.edu and indicate which projects interest you.

Evolution of Utility Microgrid Experience

Baseline Project Number 23-128

PI: Diana Ramirez-Wong, diana.ramirez@neetrac.gatech.edu



This work will update the utility industry perspective on microgrids, building upon the findings from NEETRAC BL #18-178, which explored trends and commonalities of utility microgrids in early 2020. The primary goal is to trace the evolution of driving forces, developments, challenges, and potential risks within existing and planned utility microgrids in the dynamic landscape of modern power systems.

To achieve these goals, the following research approach will be undertaken:

1) Survey of Online Resources: Comprehensive review of published papers, reports, articles, case studies, and other utility microgrid material.
2) In-depth Interviews with Utilities / Operators: Capture firsthand experiences and lessons learned about the practical aspects of microgrid implementation and operation.
3) Collection of Information from Industry Fora: Conference and workshop information that can offer a broader understanding of the microgrid landscape and emerging issues.

Baseline Projects Recently Launched - Cont'd

Correlation of Laboratory Corrosion Tests to Outdoor Exposure Mechanisms

Baseline Project Number 23-131

PI: Tristan Cline, tristen.cline@neetrac.gatech.edu

The concerns surrounding the use of corrosion test procedure GMW 15288 in IEEE enclosure integrity standards are related to its reliability and relevance in qualifying coating systems. The findings from project 21-064 have indicated that the use of this test should be questioned, possibly due to inconsistencies or limitations in its ability to accurately predict real-world corrosion behavior.

This project's primary objective is to compare the results of laboratory corrosion tests to those obtained from field tests conducted in various environments, including Arizona (AZ), Florida (FL), Georgia (GA), and Ohio (OH), with an exposure period of five years.

The key aspects of the project are as follows:

1) Selection of Diverse Materials: The study will involve a wide range of materials commonly used in enclosures and other relevant applications. This diverse material selection will help in assessing the performance of different coating systems under various conditions.

2) Field Corrosion Tests: Corrosion data from field tests conducted in AZ, FL, GA, and OH will be collected. These field tests will represent real-world exposure conditions and provide valuable insights into how different coating systems perform in different environments over a five-year period.

3) Laboratory Corrosion Tests: Various laboratory corrosion tests will be conducted on samples of the same materials used in the field tests. These laboratory tests will aim to simulate corrosion under specific conditions and will be compared to the actual field corrosion data.

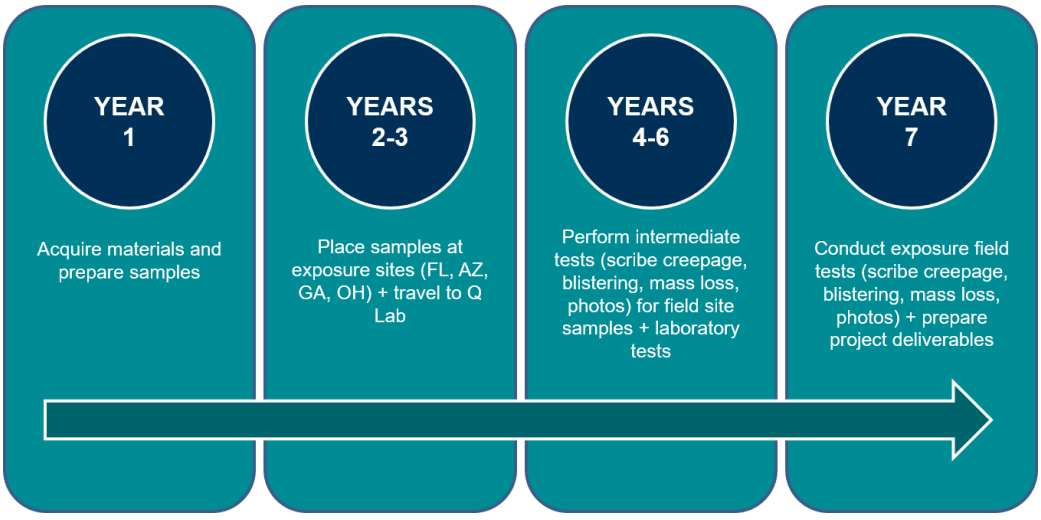
4) Failure Mechanism Analysis: The project will investigate the failure mechanisms observed in both laboratory and field corrosion tests. By identifying similar failure patterns, researchers can determine which laboratory tests are more representative of real-world conditions.

5) Correlation Assessment: The data collected from the laboratory and field tests will be analyzed and compared to determine the correlation between the two sets of results. This analysis will highlight the reliability of specific laboratory tests in predicting field performance accurately.

6) Recommendations: Based on the findings, the project will provide recommendations for selecting appropriate laboratory corrosion tests that can be used to qualify coating systems for diverse materials effectively. It will also address the shortcomings of the current GMW 15288 test procedure and propose possible improvements or alternatives if needed.

By undertaking this investigation, the project aims to improve the accuracy and reliability of corrosion testing methodologies, allowing for better decision-making regarding the selection and qualification of coating systems used in various applications. Ultimately, the research findings can contribute to more robust IEEE enclosure integrity standards and help industries ensure the long-term performance and durability of their products in real-world environments.

Planned Project Schedule



Baseline Projects Recently Launched - Cont'd

Management of Device Firmware Updates

Baseline Project Number 23-129

PI: Thomas Parker, thomas.parker@neetrac.gatech.edu

This project's objective is to investigate how utilities and manufacturers handle firmware updates for Intelligent Electronic Devices (IEDs) and determine the magnitude and frequency of firmware-related issues. This research is essential, as firmware plays a critical role in the proper functioning of IEDs, including recloser controllers, capacitor bank controllers, voltage regulators, switchgear controllers, and line sensors. Utilities typically freeze firmware versions to mitigate risks, but updates become necessary due to material / equipment availability and evolving technology demands.

The research will focus on the following key aspects:

1) Firmware Update Practices: The project will examine how utilities and manufacturers currently manage firmware updates for IEDs, including understanding the processes involved, the frequency of updates, and the factors that trigger updates.

2) Firmware Test Procedures: Utilities often lack visibility into the specific firmware tests performed by manufacturers. The study will aim to identify common firmware testing practices employed by manufacturers during the development and release of new firmware versions for IEDs.

3) Frequency and Severity of Firmware Issues: The research will investigate the frequency and severity of firmware-related issues experienced by utilities. This includes downtime caused by firmware failures, the financial impact of dealing with such issues, and potential safety incidents resulting from faulty firmware.

4) Surveys: The research will involve conducting surveys among utilities and manufacturers to gather data on their firmware update practices and experiences with firmware-related issues.

The significance of this research lies in documenting the challenges and risks associated with firmware updates for IEDs. By identifying existing practices and understanding the frequency and severity of firmware-related issues, utilities and manufacturers can work towards developing more robust firmware update processes. This will help ensure the reliable and safe operation of IEDs, minimizing potential risks associated with firmware updates.

Impact of Neutral Corrosion on Service Reliability of Jacketed Cable Systems - Phase II

Baseline Project Number 23-138

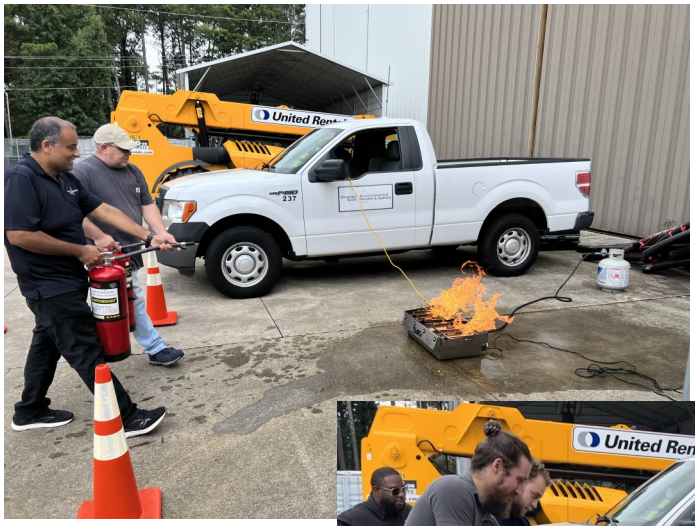
PI: Anil Poda, anil.poda@neetrac.gatech.edu

Laboratory Aging

Forensic evaluations of extruded dielectric cables at NEETRAC often show substantial corrosion of the cable metallic shield (neutral) even though the cable may be jacketed. The corrosion appears to be the result of moisture migration between the jacket and the cable core insulation shield. The purpose of this project is to better understand the fault performance of LCT and reduced round wire (RW) neutral designs without water blocking material and the full round wire neutral with water blocking material. A root cause analysis will be performed on the flat strap (FS) neutral design to understand the reasons for the difference in the performance of the corroded FS neutral design observed in BL #16-190.

NEETRAC Fire Safety

As a part of our commitment to safety, NEETRAC staff is required to participate in fire safety training. As a part of this training, the GA Tech fire department came down to the NEETRAC campus for a quick presentation and demonstration about how to respond in the case of a fire. It was then time to put what we learned to the test by picking up an extinguisher and putting out a fire!



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Management Board Meetings

The next three Management Board meetings have been scheduled for the following dates:

February 7 - 8, 2024

May 22 - 23, 2024

September 25 - 26, 2024

For details, please visit the Member Section of the NEETRAC website at www.neetrac.gatech.edu.

2023/2024 NEETRAC Member Management Board Representatives

1. Aluma-Form…….. Pete Landsgaard
2. Ameren……. John Crotty
3. American Electric Power…….. Ramadan Issack
4. BC Hydro……..Hudson Giesbrecht
5. Borealis Compounds, Inc.……..Susan Song
6. Conductores Monterrey…… Raul Garcia
7. Consolidated Edison……. Frank Doherty
8. Dominion Energy……..Liz Sullivan
9. Dow ……..…….. Tim Person
10. DTE Energy……Abdalla Sadoon
11. Duke Energy……...Chris Fletcher
12. Eaton…….. Alan Yerges
13. Exelon……. Lisa Perrone
14. FirstEnergy……..Chris Slattery
15. Gresco Utility Supply……..Brad Schafer
16. Hubbell Power Systems……Charles Worthington
17. LS Cable & System……Tim West
18. Nova Scotia Power……Charlene MacMullin
19. NRECA……Reed Cooper
20. Okonite……...Bill Crawford
21. Pacific Gas & Electric…….. Ty Kneller
22. PPL Corporation……..……Adam Eshleman
23. Prolec GE…….. Carlos Gaytan
24. Prysmian Group……Jared Weitzel
25. Rauckman Utility Products……..Jim Rauckman
26. San Diego Gas & Electric……..…. Kevin Galloway
27. Slacan Industries……..Ian Pollock
28. Smart Wires…….. Haroon Inam
29. Southern California Edison……Alan Kasanow
30. Southern Company……..Susan White
31. Southern States, LLC…….. Steve Fan
32. Southwire Company……... Yuhsin Hawig
33. Tacoma Power……..Joe Rempe
34. TE Connectivity……Brian Ayres
35. TVA…… Steven Coley
36. WEC Energy Group…….. Michael Smalley