Georgia Tech NEETRAC
National Electric Energy Testing, Research and Applications Center

NEETRAC NEWS

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In This Issue...

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Two food trucks (plus a beer truck) kept the NEETRAC staff full and happy.

NEETRAC's 25th Anniversary

A lot has happened since the genesis of NEETRAC on January 2, 1996. On that date, we transitioned from being the Georgia Power Research Center to being Georgia Tech NEETRAC. We started with 10 Members – companies who were willing to try out a new concept of manufacturer + electric utility R&D collaboration. Today, we have 37 Members representing a wide variety of electric utilities and manufacturers throughout the United States, Canada, and Mexico! Over the years, our skills, expertise, and capabilities have expanded tremendously. Data analytics, field testing, reliability studies, high tension load cycle testing, system operations studies (Volt/Var) are all now a part of the NEETRAC portfolio, complementing the capabilities that were there at the beginning (high voltage, high current, and mechanical testing, along with quality assurance and forensics). To celebrate this momentous anniversary, the NEETRAC staff, old and new, gathered for food and fun.

Who will topple the Jenga tower?! Carlos Agosto, Travis Bosnyak, Oscar Rodriguez, Thaddeus Willis, Rick Hartlein, & Chris Harper

Caryn Riley, J.C. Hernandez, & Joe Goldenburg

A fun game of cornhole with Bryan Davant, Perry Arrington, & Alex Pearson

Tom Champion (ret.), Ray Hill, & Shashi Patel (ret.)

Oversized Uno with Anil Poda, Anita Carter, Tristan Cline, & Travis Bosnyak

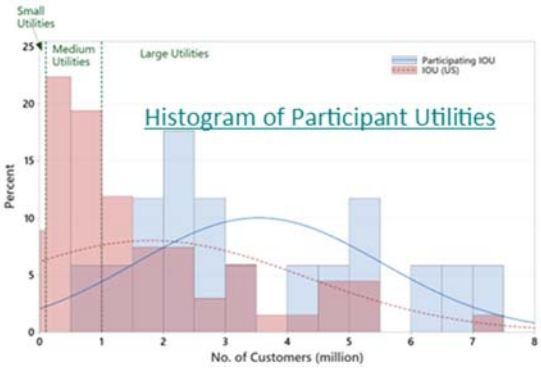
Baseline Projects Recently Completed

The following Baseline project closeouts were presented at the virtual January 2022 Management Board Meeting. The reports will be finalized and distributed to eligible Members in the coming months. In the meantime, please contact the project PI listed below for more information.

Power Cable System Design Evolution

Baseline Project Number 19-149

PI: J.C. Hernandez, jean.hernandez@neetrac.gatech.edu



In 2014, NEETRAC conducted a baseline project (14-214) to gather benchmark information on utility cable and accessory specifications, usage, and maintenance practices. The information gathered was compared to previously obtained benchmark data. The work done in this project extended the 10-year technical specification trend developed by Dudas, et al. to a 20-year trend using newly obtained data from within the NEETRAC membership. As cable system technology evolves and utility practices change, the information gathered helps utilities and manufacturers understand current trends in the use of different insulation types, cable designs, and installation practices.

Impact of 5G Communications on Electric Utility Infrastructure

Baseline Project Number 20-046

PI: J.C. Hernandez, jean.hernandez@neetrac.gatech.edu

Example of a 5G antenna installed on a utility pole

New 5G networks were expected to have wide-scale deployment beginning in 2020. Telecom operators are aggressively working to force electric utilities to allow antenna installations on their existing infrastructure (i.e., utility poles). The challenges to the electric utility industry can be both practical and technical. This project reviewed current 5G antenna technology, engaged with utility subject matter experts, and provided utilities with information on the various issues they are facing as 5G communications are being deployed on electric grid infrastructure. Specific information is available to NEETRAC membership, but the main takeaway of this work is a need to have improved Utility ↔ Telecom interaction to facilitate both installation of 5G networks as well as their safe operation.

Strategic Plan - Technology

Baseline Project Number 20-134

PI: Dylan Summer, dylan.summer@neetrac.gatech.edu

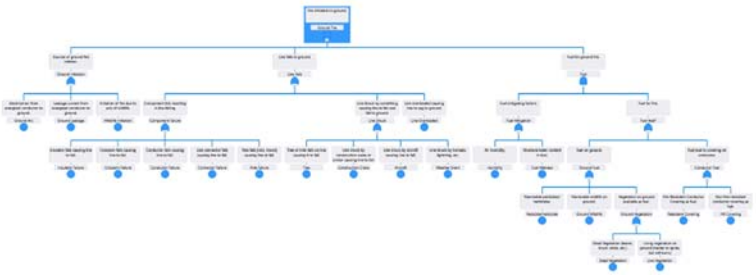
The energy delivery industry is changing / evolving. NEETRAC needs to understand and address the effects of that evolution on Member needs while maintaining our testing and applied research identity. In this project, NEETRAC worked with the TAs to develop a better understanding of the needs of our Members. Ultimately, it was determined that the Members want NEETRAC to maintain current capabilities and activities while emphasizing activities in analytics, connections, communications, DER, knowledge topics, reliability, forensics, and new technology.

Baseline Projects Recently Completed - Cont'd

Fire Initiation - Overhead Distribution Systems Including Covered Conductors

Baseline Project Number 19-152

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



Example branch of a fault tree developed by NEETRAC

Arcing faults that result from bare energized overhead line contact with the earth or objects, such as other conductors or trees, can potentially cause ground fires. Replacing bare overhead conductors with covered conductors is frequently considered a means of minimizing arcing faults and, therefore, believed to minimize the risk that an overhead conductor will cause a fire. However, fire initiation is a complicated process where many potential ignition and fuel sources interact.

Fault tree software was identified and a probabilistic approach was developed to implement a fault tree methodology that could include known fault probabilities from utility data. This methodology was intended to define the interaction pathways and to parameterize the likelihood of any particular pathway becoming dominant in the fire initiation process. The data files for the fault trees developed will be archived and available to the NEETRAC Members for distribution.

Testing of Fire Proofing Materials / Techniques Used in Cable System Vaults - Part 2

Baseline Project Number 19-150

PI: Ray Hill, ray.hill@neetrac.gatech.edu

Furnace test without samples and furnace heat active

A test protocol specifically designed to evaluate the effectiveness of fire proofing materials / techniques applied to cable systems within the confines of electric utility cable vaults, manholes, and tunnels was developed in Baseline project #18-032. This project has evaluated those new test protocols by conducting both the direct flame impingement and indirect flame (furnace) tests on available fire proofing materials as suggested by the project TAs.

Initial feedback provided by the test laboratory resulted in adjustments to the size of the ribbon burner and upper temperature limits for the direct flame impingement test. These modifications were in place for all testing. During the indirect flame or furnace testing, instability in the furnace temperature caused by ignition of a test sample indicated that sample types should not be mixed during this test type. Multiple fire proofing materials were evaluated with both test methods and the lab results presented to the NEETRAC membership. In general, the times to reach the test protocol failure limits were much shorter than originally expected.

The test protocol was revised to include the laboratory experience and two temperature rise levels for the furnace testing — moderate and severe. One or both of the test methods and severity levels may be selected depending on the application. Through this project, it was verified that the test protocol provides reasonable facsimiles of fires within underground cable vaults, manholes, and tunnels, measures time to "failure" of various fire proofing materials, and supplies data to compare fire proofing materials or installation methods of the same fire proofing material under the same test conditions. The protocol will be made available to all NEETRAC Members for their use in evaluating their own fire-proofing materials and installation methods.

Looking Back - 2021 in Review

2021 was a challenging but busy year for NEETRAC! As seen below, we have initiated and completed a large number of projects, made improvements and expansions to our business capabilities, and maintained a high level of customer satisfaction.

Baseline Projects Closed: 8

Baseline Reports Delivered: 8

Member/Non-Member Projects Initiated: 82

Member/Non-Member Projects Completed: 82

Enhancements to NEETRAC Capabilities: 11

Industry Papers / Presentations: 1

Average Customer Satisfaction Score: 7.69 out of 9

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Management Board Meetings

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

May 18 - 19, 2022

September 21 - 22, 2022

January 25 - 26, 2023

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

IEEE PES T&D Show - April 2022

On April 26 - 28, several NEETRAC staff members will travel to New Orleans, LA to exhibit at the IEEE PES T&D Conference & Exposition. If you will be in attendance, please plan to come by and see us at **booth #7021**! We look forward to seeing you!

IEEE PES T&D CONFERENCE & EXPOSITION

2021/2022 NEETRAC Member Management Board Representatives

1. Aluma-Form…….. Pete Landsgaard
2. Ameren…… James Huss
3. American Electric Power…….. Jim Salerno
4. BC Hydro……Fred Dennert
5. Borealis Compounds, Inc.……..Susan Song
6. Conductores Monterrey…… Raul Garcia
7. Consolidated Edison…… Frank Doherty
8. Dominion Energy…….. Liz Sullivan
9. Dow Chemical Company……..Paul Caronia
10. DTE Energy……Naera Haghnazarian
11. Duke Energy……...Chris Fletcher
12. Eaton…….. Alan Yerges
13. Exelon…… Lisa Perrone
14. FirstEnergy……..Randy Coleman
15. Gresco Utility Supply……..Brad Schafer
16. Hubbell Power Systems……Charles Worthington
17. LS Cable & System……Tim West
18. Nova Scotia Power……Jim McFadgen
19. NRECA……Reed Cooper
20. Okonite……...Bill Crawford
21. Pacific Gas & Electric…….. Jim Gill
22. PPL Corporation……..……Chris Fatzinger
23. Prolec GE…….. Carlos Gaytan
24. Prysmian Group……Jared Weitzel
25. Public Service Electric & Gas…... Ed Gray
26. Rauckman Utility Products……..Jim Rauckman
27. S&C Electric……..Marshall Mauney
28. San Diego Gas & Electric……..… Christian Henderson
29. Smart Wires…….. Haroon Inam
30. Southern California Edison……Alan Kasanow
31. Southern Company……..Michael Pearman
32. Southern States, LLC…….. Joe Rostron
33. Southwire Company……... Yuhsin Hawig
34. Tacoma Power……..Joe Rempe
35. TE Connectivity……Brian Ayres
36. TVA…… Steven Coley
37. WEC Energy Group…….. Michael Smalley