NEETRAC
National Electric Energy Testing, Research, and Applications Center

NEETRAC NEWS

Volume 78 ▪ December 2022

In This Issue...

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Baseline Project Recently Completed

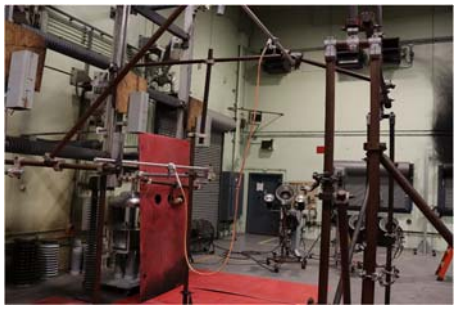
The following Baseline project closeouts were presented at the September 2022 Management Board Meeting. The reports will be finalized and distributed to eligible Members in the coming months. In the meantime, please contact the project PI listed below for more information.

Survival Performance of New and Aged Temporary Protective Grounds

Baseline Project Number 19-151

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

Temporary Protective Grounds (TPGs) play a critical role in crew safety by establishing an equipotential safe-work-zone when they are deployed and, more importantly, conducting any unexpected fault current to ground while crew work is conducted. They also safeguard the crew from high voltages that could be induced or applied due to equipment failure, operational errors, and/or back-feeds.



TPGs have to be properly sized and assembled for the application under consideration. This involves considering variables such as system operating voltage and the highest possible fault current level. In particular, the current magnitude and duration of the fault are critical factors in sizing the TPGs since they must be capable of carrying the maximum available fault current for the duration of the fault while keeping the voltage to the lowest possible level.

To guarantee proper TPG performance, TPG designs are tested and qualified on new assemblies using symmetrical currents or asymmetrical currents (H-rating). ASTM F855 added the H-rating category to the standard in the 2019 revisions. TPGs deployed in the field are more likely to see asymmetric fault currents. The asymmetric fault currents consist of rms ac and dc offset current components. The rms ac component is determined by the sub-transient impedances inherent to rotating machinery, transformers, and lines. The dc offset component is determined by the reactance to resistance (X/R) ratio at the fault location looking back into the power system and the instant of fault initiation in the voltage waveform.

Baseline Project Recently Completed - Cont'd

TPGs are generally rated by their ultimate rating capacity. This capacity is a calculated maximum current that a TPG is capable of conducting for a pre-established time without fusing or melting. For asymmetric fault currents, the additional heating from the dc current component may decrease TPG expected rated performance. Therefore, the main goal of this project was to assess the survival performance of new and aged TPGs when they are tested using asymmetric fault currents.

A balanced set of new and aged TPGs were tested. All of the samples were provided by NEETRAC Members and included a variety of cable sizes, lengths, and clamp types. Correlations between diagnostic measurements, such as dc resistance measurements and TPG performance, were established and analyzed. This work generated a better understanding of the usefulness of such diagnostic tools for TPG condition assessment.

Understanding the IEEE Entity Standards Development Process

Baseline Project Number 20-156

PI: Joe Goldenburg, joe.goldenburg@neetrac.gatech.edu

This project explored IEEE's relatively new entity standards development process. The IEEE Standards Association describes their Entity membership as a way for "companies to engage and influence technology development to ensure their business interests are heard and represented". NEETRAC found several issues with some existing entity standards, including conflicts with requirements in North America for the construction, maintenance, and operations of overhead lines. NEETRAC developed a presentation that details the concerns that Management Board representatives and Technical Advisors have with the entity standards development process. The presentation includes information on how to tell whether a standard was developed using the Entity or Individual process. It has been delivered at three industry forums and two NEETRAC Members standards engineering groups. To obtain a copy, please contact Joe Goldenburg at 404.675.1858.

Performance Relationship Between Enclosure Paint Standards and the Real World

Baseline Project Number 21-064

PI: Tristen Cline, tristan.cline@neetrac.gatech.edu

IEEE transformer enclosure standards use a Simulated Corrosive Atmospheric Breakdown (SCAB) test procedure from GMW 15288 to evaluate enclosure coatings. NEETRAC Members were concerned about how well the SCAB test reflects real world failure mechanisms, as well as its repeatability across test labs. NEETRAC reviewed forty-eight articles and fifteen standards relevant to this topic. In consultation with the project's Technical Advisors, NEETRAC determined that alternative test methods have a higher correlation to service environments. The NEETRAC Management Board authorized NEETRAC to present the project findings to relevant IEEE corrosion mitigation working groups. For more information, please contact Tristen Cline at 404.675.1815.

New NEETRAC Staff Member

Please join us in welcoming our newest staff member, Diana Ramirez-Wong. Diana joined NEETRAC in September 2022. She has 5 years of experience in polymer compounding for cable manufacturers and a total of 12 years of lab research experience covering broad aspects of polymer chemistry, from synthesis to self-assembly, processing, and characterization.

Diana earned a B.Sc. in Chemical Engineering in 2006 from Durango's Technological Institute (MX), and her interest in materials science motivated her to slightly change paths by getting a M. Sc. degree in 2009 from CINVESTAV and later moving to Europe. Thanks to an ERASMUS grant, she received the Ph.D. in Physics and Chemistry of Materials from a joint program between Université Catholique de Louvain (BE) and Université Pierre-et-Marie-Curie (FR) in 2014.

Over the years, she has been part of interdisciplinary scientific and engineering teams, delivering a dozen of high level peer reviewed publications as well as a few cable compound products. Complementary to the projects, Diana has contributed to mentoring activities for students in academia and with small teams of technicians in the industry.

Diana is eager to learn, expand her knowledge of the electric grid, and apply her materials background at NEETRAC.

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Management Board Meetings

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

January 25 - 26, 2023

May 17 - 18, 2023

September 19 - 20, 2023

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

2022/2023 NEETRAC Member Management Board Representatives

1. Aluma-Form…….. Pete Landsgaard
2. Ameren…… John Crotty
3. American Electric Power…….. Jim Salerno
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 ……..…….. Paul Caronia
10. DTE Energy……Abdalla Sadoon
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……..……Adam Eshleman
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…….. Tim Qualheim
28. San Diego Gas & Electric……..…. Kevin Galloway
29. Slacan Industries……..Ian Pollock
30. Smart Wires…….…… Haroon Inam
31. Southern California Edison……Alan Kasanow
32. Southern Company……..Michael Pearman
33. Southern States, LLC…….. Steve Fan
34. Southwire Company……... Yuhsin Hawig
35. Tacoma Power……..Joe Rempe
36. TE Connectivity……Brian Ayres
37. TVA…… Steven Coley
38. WEC Energy Group…….. Michael Smalley