Stray and Contact Voltage Working Group
Matthew Norwalk, Chair
Chuck DeNardo, Vice Chair (Appointed)
Scott Kruse, Secretary

2018 IEEE PES Joint Technical Committee Meeting
Hyatt Regency Jacksonville
Jacksonville, FL

January 8, 2018
1PM – 5PM

Approved Meeting Minutes

Attendees

Jay Avanessian – CNIGUARD
Bryan Beske - American Transmission Co.
Heide Caswell – Pacificorp
Anthony Cedrone - Con Edison of NY
Daniel Chen - Con Edison
Larry Clark – Alabama Power Co.
Larry Condrad – N/A
Chuck DeNardo – Consultant
Alexander Dornhelm – Con Edison
Doug Dorr - EPRI
Andra Flaherty - Snohomish County PUD
Fred Friend – AEP
Keith Frost – Com Ed
Dave Gilmer – Tri Axis Engineering
Thomas Gwinn – NRECA
Stuart Hanebuth – Power Survey Co.
Ray Hisayasu – Puget Sound Energy
Tyler Jones - Pacificorp
David Kalokitis – Power Survey Co.
Scott Kruse – Power Survey Co.
Frank Lambert – Ga. Tech/ Neetrac
John Lauletta – Exacter
James Leary – Con Edison
John McDaniel – National Grid
Robert Naphen - National Grid
Matt Norwalk - SCE
Scott Peele – Duke Energy
Rob Schaerer – Power Engineers
Erin Spiewak – IEEE Staff
Clay Stocklin – Power Engineers, Inc.
Val Werner - We Energies
Jeremy Wright – UK Power Networks
Malia Zaman – IEEE.org

The Stray and Contact Voltage Working Group met at the 2017 IEEE PES Joint Technical Committee Meeting on Monday afternoon January 8th at the Hyatt Regency in Jacksonville, FL. There were approximately 33 people in attendance.

The meeting began with a review of the obligatory slides, and then moved on to a review of the meeting agenda.

The meeting continued with attendee introductions and circulation of the sign in sheet. The meeting minutes from Chicago were reviewed with no changes. Anthony Cedrone motioned to approve and Dave Kalokitis seconded. The minutes were approved.

Since the IEEE SA staff and members of the IEEE foundation weren't present, the Chair asked Jeremy Wright to present.

Jeremy Wright from UK Power Networks, presented: Mobile Asset Assessment Vehicle (MAAV), Cable Pits and Canary Monitoring. He gave an overview of UK Power Networks and the development of the MAAV program. During the MAAV trials they identified a new significant class of losses which they identified as Contact Voltage losses. They found them to be the result of energized cable sheaths or lighting columns which are contacting the earth. They can be modeled as earthing rods and the model results matched measured values found during the trial period. They are working with Princeton University Andlinger Center Researchers to validate the findings and the results will be published in early 2018. UK Power Networks has realized significant benefits with the MAAV, such as improved safety, environmental benefits, and improved reliability. They also perform cable pit inspections from above ground or with an insulated pole camera where not able to inspect from above. They perform partial discharge and transient earth voltage testing on every joint in the cable pit. He went on to discuss the various mitigation techniques used which include insulating blankets, vented covers and cable wraps. Additionally, he mentioned they developed a device called the Cable Canary to look at radio frequency current to predict cable failures. After the presentation Jeremy took questions. What are Princeton's plans for the document? UK Power Networks will make it available and shareable, the information could be used in the IEEE documents. Did the study quantify the losses? They used actual finding from around the world. Is the partial discharge done on a discharged circuit? No. Is partial discharge done on the low voltage side to compare to the CV finding? No, it is only done on the high voltage side, 11kV.

The IEEE foundation spoke to the group about their goal to raise 30 million dollars through donations from individuals and corporations.

The group took a break from 1:57PM to 2:14PM.

After the break, Erin Spiewack from IEEE SA, addressed the group regarding our status as a working group. Apparently, the assumption that we were still a working group maintaining the guide was incorrect. Currently the group is a study group and to become an approved working group we must submit a new Project Authorization Request (PAR) as early as January 26th. Once the PAR gets approved the group is reset and the selected Chair can appoint or hold an election for new officers. Also, mentioned was that working groups can now record meetings to be used to write the minutes, but you must announce it before the meeting. The recording would not be able to be stopped for any off the record conversations since meetings are an open forum.

Anthony Cedrone presented Case Study Forms. He began with a review of the format for capturing case studies and emphasized that submitters would remain anonymous. The format included the following fields: Environment, System type, Voltage identified, Voltage measured, Discovered/reported by, Summary of as found, Summary of steps taken to troubleshoot/ mitigate, Tools used to troubleshoot, Notes of interest and Pictures/Schematics. He asked the group if the format was acceptable and no one had any objections. Next Anthony went through an example of an ENE on a transit system metal fence and how it would look in the form. The submitter would be assigned a number which will be logged and held confidentially by the chair

or someone designated. By doing things this way the form data can be parsed and searched in a database. He added that additional detail can be added, for example we might add whether it was a customer or utility issue, or add source identifiers. Since this is the third time Anthony has presented to the group on the case study forms, he requested that participants submit case studies and include all additions to the form fields that they want to add.

The Chair, Matt Norwalk from Southern California Edison, presented Stray and Contact Voltage Case Studies. The first one was a confined livestock case study reported by a dairy farm owner who was shocked while washing his hands in the milking parlor. It turned out to be the result of a substation neutral riser connector failure. The second was an inductive coupling case study reported by a paint manufacturer that noticed sparking when opening a railroad spur gate. The main track ran in the shared right of way with the transmission lines and there was induced voltage on the tracks. The customer isolated the track going into their facility to fix the problem. The third was an inductive coupling case study reported by a pool contractor shocked changing a lamp in wet niche fixture. The recorded voltage profile of the pool fixture to water matched that of the 230kV tower. Opening the service neutral corrected the voltage issue, so they isolated the customer on a dedicated transformer. The final case study was a capacitive coupling case study reported by a cattle rancher that stated after a 500kV line was added to an existing right of way that cows were not drinking from a water trough. There was 186V open circuit measured from the water to the probe in the air, but nothing could be done except for the trough to be moved. However, during the investigation a cow drank from the trough so they must get used to the sensation.

Break from 3:35PM to 3:52PM.

After the break the meeting resumed with discussion of the PAR submission. The Chair asked if the group wanted to move the guide to a recommended practice. It was determined that keeping it as a guide would be the best path for getting it published in the 4yr time frame. Next, he took us through the PAR to make revisions. The Project Title will remain the same. The Scope will be changed by removing the “often referred to as stray voltage”. The Purpose we modified to “This guide describes the variety of publicly and privately accessible voltages resulting from the delivery and use of electrical energy. It provides information essential to understanding diagnosing and mitigating stray and contact voltage, thereby enhancing public safety”. Additional plans for the new guide will be adding case studies, reorganization for better use, emerging topics and better graphics. There was a motion to submit the PAR by Larry Conrad and Anthony Cedrone seconded.

There was no new business to discuss.

Motion to adjourn by Anthony Cedrone, seconded by John McDaniel. Meeting adjourned at 4:15PM.

The next meeting will be at the 2018 IEEE PES General Meeting, August 5-10, 2018, in Portland, OR.