Stray and Contact Voltage Working Group
Matthew Norwalk, Chair
Sal Martino, Vice Chair
Scott Kruse, Secretary

2021 IEEE GM WebEx Meeting

July 20, 2021
2PM – 3:30PM EDT

Approved Meeting Minutes

Attendees

Voting Members

Larry Conrad – Conrad Technical Services
Alexander Dornhelm – Con Edison
Fred Friend – AEP
Dave Gilmer – Unaffiliated
Bryan Glenn – SCE
Kevin Grant – Con Edison
Joe Grappe – Duke Energy
Stuart Hanebuth – Osmose
Tyler Jones – Pacificorp
David Kalokitis – Osmose
Scott Kruse – Osmose
Sal Martino – Duke Energy
John McDaniel – National Grid
Chris Mullins – Power Monitors, Inc
Matt Norwalk– SCE
Paul Ortmann – Idaho Power Co.
Marty Page – Georgia Power
Muayad Tarabain – Hydro One

Non-Voting Members

John Ainscough – Xcel Energy
Philip Baranowski - Osmose
Masoud Davoudi – PGE
Charlie Fijnvandraat – FCG Energy
Andrew Reid – Con Edison
Rob Schaerer – Power Engineers

The Stray and Contact Voltage Working Group held a WebEx meeting Tuesday afternoon July 20, 2021. There were 24 people in attendance. The meeting was recorded for the purpose of writing up the minutes.

The meeting began with the Chair introducing the Officers and requesting that participants use the chat to list their name, e-mail, and affiliation. It was verified that a quorum was established.

Next the group reviewed the agenda which was approved with a motion by Sal Martino and seconded by John McDaniel.

The patent slides were posted for review by the group, and no one identified any patent information. The Chair pointed out an addition to the guidelines for IEEE Working Group meetings, which encouraged people to formally object to discussions regarding inappropriate topics.

The January 12th JTCM WebEx meeting minutes were approved by the group, John McDaniel motioned, and Larry Conrad seconded the approval.

Sal Martino gave an update on the Editing Subgroup which has been meeting regularly and updating the content of the guide. The plan was to have the document ready for review at this meeting, but the group is still updating clauses 7 and 9. The new goal is to get it out to the group by the third quarter, September/October timeframe, and try to get it to ballot by the end of the year. Anyone interested in volunteering to help with the document can e-mail any of the group officers.

The Chair led the group through a contribution from Bryan Beske regarding Ground integrity testing of electrical systems as referred to in IEEE Standard 80 & 81. There was a good description of the testing, but it might need examples of actual objects that would be tested. It was mentioned that care should be taken to make sure the equipment you are using to test with is in good working order and to follow the manufacturers recommendations. The content Bryan submitted has been posted to iMeet and should be reviewed by members who have access to help determine what applies to the guide. Anyone who doesn't have access to iMeet can request a copy from the Chair. Additionally, for more reference the information from Bryan comes from Standard 81 clause 10.

New Business:

The Chair asked if anyone had any new investigations to mention. Joe Grappe discussed a pool in NC that was built to NEC code with the single ground conductor and now the homeowner is dealing with NEV issues. He mentioned Doug Dorr was involved with the investigation but would have to share the specific details since he was not in attendance. There was additional discussion about NEV levels that cause pool shock complaints and how most seem to be below 5 volts and could be avoided by adding the equipotential grid.

Marty Page discussed a call that came into a field engineer regarding a corroded copper line that created a gas leak. Initially the gas company thought it was stray voltage, but it turned out to be contact voltage. An underground service conductor to a house had gone bad leading to a voltage reading of 28-30 volts just above the fault. The bad conductor corroded the gas pipe. There was discussion about AC being a cause of corrosion, and it was determined that AC voltages in the teens and above

seem to accelerate corrosion in the right circumstances. The National Association of Corrosion Engineers (NACE) has studied and documented these effects.

The Chair shared two investigations with the group. The first one was a pool investigation where there was 15-20 volts between the pool water and deck. It turned out the neighbors built a garage within 3 feet of the pool, and they had a faulted branch circuit feeding the garage. Once a new circuit was installed the voltage at the pool went away. The single conductor pool ground did not provide any protection against the faulted feed.

The next investigation was a customer complaining of low herd production at random times day and night. The distribution system was phase to phase overhead with no primary neutral. Customer's transformer was delta high side and delta low side with 3 phase 4 wire service. Took recordings of the voltages and saw transients on the phase voltage and NEV voltage going up to 12.5 volts. It turned out there was a shorted secondary winding in the transformer. This stressed the importance of setting up a recording voltmeter.

Muayad Tarabain led a discussion on the idea that increased grounding leads to diminishing returns. He mentioned he had a case study he could share with anyone interested. The Chair discussed the difficulties of grounding in different soils conditions and inquired if anyone knew of any grounding standards that might be a good reference for the guide. Muayad suggested that emphasizing the benefits of proper grounding could be a good addition to clause 9.

Round Table:
Marty Page wanted to know if anyone had a walkaway voltage they were willing to share for pool investigations. It was emphasized that someone would have to be sure to verify measurement of the maximum voltage and not just spot check at a time when the voltage wasn't present. Also, a walkaway voltage could only be used after a thorough investigation determined there were no contact voltage issues. Muayad pointed out that the NEV nuisance shock is an indicator that the pool is not bonded properly and if there was a primary fault there could be real consequence.

The Chair addressed the timeline for publication of the document. The PAR expires on December 31, 2022. As long as the group continues moving forward with the guide we should be in a good position to get an extension. He also addressed that the current Guide is good for 10yrs from publication, so it is not going to become obsolete in the event of an extension. Anyone who wants to volunteer to help on Clause 7 or flow charts should contact one of the officers of the group. The next meeting will be at the JTCM and the editing subgroup will continue to meet regularly.

Marty mentioned he came across a section of the NEC, 680.42 that had an exception for hot tubs and spas that did not require the single ground conductor. The chair thought it might be associated with a height requirement for the hot tub or spa. It was suggested that this might be addressed in the clause on pools.

John McDaniel motioned to adjourn, and Sal Martino seconded, meeting adjourned at 3:29PM ET.

The next meeting will be held during the IEEE Join Technical Committee Meeting, January 2022.