

MINUTES
IEEE PES FIBER OPTIC SUBCOMMITTEE
PSCCC-FO
September 18-19, 2019
Meeting - Final

Attendees:

Jim Ryan	Del Khomarlou
Bob Kluge	Bill Byrd
Mark Naylor (via phone)	Tewfik Schehade
Corrine Dimnik	Mike Warntjes
Joseph Martin Regaldo	Monty Tuominen (via Skype)
Denise Fry	Robin Ghossein
Jack Roughan (ZTT)	Brett Boles
Schicaco(Dean) Quan	Mike Riddle
Austin Farmer	Bruce Freimark
John Jones	

Important Message Regarding Changes in PSCCC-FO

Bill Byrd PSCCC-FO Chair announced that he is stepping down for personal reasons and has nominated Del (Delavar) Khomarlou (d.khomarlou@hydroone.com) to be the chair and Corrine Dimnik (Corrine.dimnik@kinectrics.com) to be the co-chair going forward.

Bill Byrd is a legend in our industry. His wealth of technical knowledge, his organizational skills and ability to provide historical context made this subcommittee what it is today and we owe him a debt of gratitude. We will miss you Bill. We hope that you find the time to continue working with the fiber optic subcommittee and provide us with your guidance.

General House Keeping, Discussions, Updates & Old Business:

The meeting was called to order on September 18, 2019 at 12:00 noon.

Next Conference call will be on Wednesday December 11, 2019 at 11:00 AM EST. A Webex invite will go out. The Webex application has phone option with local numbers. Using a separate phone line and not computer audio will make things simpler.

Next fact-to-face meeting: Charlotte, N.C. April 1-2, 2020 starts at 12:00 noon.
We will meet at Wingate Hotel.

Wingate Hotel

4328 Business Center Drive
Charlotte, NC 28214
704-395-3600

A Group rate will be negotiated and provided in December conference call.

The meeting room cost (approx. \$366) will be divided among attending members.

Old Business:

Request for new Subcommittee Secretary: Need a volunteer.

New name of our subcommittee is: PSCCC-F0. The F denotes Fiber optic and letter zero (0) means we are a subcommittee.

Detailed Minutes: IEEE PSCCC- F0 Meeting - Charlotte, NC.

Date: September 18-19, 2019

Items discussed:

Denise Fry: Sheave size recommendation and presentation for IEEE 524): Denise provided a detailed presentation on the issues of sheave sizes for ADSS which can become very large (42") and difficult - if not impossible – to install following 524 recommendations. Manufacturer recommendations are often better, but differ from each other.

Denise has submitted a proposal for discussion and approval. Denise proposal is attached to the minutes and breaks the sizes according to angle ($x < 20$, $x > 20$) and span lengths with 300-600 ft (91 m – 183 m) being short spans and anything above 600 ft (183 m) long spans. In metric, we can have 100-200 m as short spans and above 200 m as long spans. For OPGW on transmission lines, a possible recommendation could be to use small sheave for < 15 degree angle and larger sheaves (524 or manufacturer recommendation) for > 15 degree angle.

A similar situation exists for the bull wheel on the puller/tensioner. Manufacturers (InCab, AFL, Prysmian, ZTT and PLP) to send Denise their recommendations for both ADSS and OPGW. Denise to provide recommendations for sheave and bull wheel sizes for both ADSS and OPGW so that we can discuss in the next conference call and also present to IEEE 524.

Will try to attach Denise presentation (or a shorter version since it is 40 MB) to these minutes.

Bob Kluge, Joseph Martin: IEEE 524: IEEE 524 standard has sections discussing installation of OPGW and ADSS, but these are very generic and incomplete. Joseph Martin made detailed comments on IEEE 524 (attached). Bob Kluge to discuss with IEEE 524 on their publication schedule. Our subcommittee can either provide detail comments to IEEE 524 using what Joseph Martin has already started or undertake to write an entire section on ADSS, OPGW, Wrap and OPPC installation practices (time permitting). May require extension of IEEE 524 PAR, in order to give our committee time. In the meantime, members should provide additional comments or feedback on Joseph's detailed excel file.

D. Khomarlou: IEEE 525 and IEEE PSCCC-E0 (wireline subcommittee) liaison: Liaison activity presentation is attached. The one relevant issue is that IEEE 525 is starting a grounding group to look at – among other things - OPGW grounding practices inside a substation, connecting to substation ground grid.

Brett Boles: IEEE Smart Distribution Group Status Report: Brett Boles mentioned that the smart distribution group has adopted wireless solutions/technologies for most of their communications needs over fiber. This is also the trend seen in distribution automation in

utilities (e.g. Hydro One). There would be very limited involvement required from IEEE PSCCC-F0.

Jim Ryan/Joseph Martin Regaldo: IEC/CCITT

Background:

IEEE 1222 creep test is an optional test. It allows the use of one of two test methods:

IEC 61395 (Overhead Electrical Conductors—Creep Test Procedures for Stranded Conductors) or IEC 60794-1-21 Method E32.

The IEC ADSS standard (IEC 60794-4-20) specifies the new IEC 60794-1-21 E32 test method but allow the use of the previous IEC 61395 test method if agreed between the purchaser and supplier.

The activities associated with the two creep tests adopted by IEC are complete.

Jim Ryan: 1222 Working Group Chair: IEEE 1222 Update Status

Balloted in July 2019

50- 55 comments received with one person giving negative comments.

Addressed the comments and limited re-ballot was successful.

The document has will be going to REVCOM on October 6, 2019 and expect publication before the end of 2019.

Monty Tuominen: Induced currents /Electrocution Presentation: Monty presented (remotely via Mike Riddle) his analysis on real-life electrocution cases during installations of fiber optic armored cables on aerial poles using messenger wires. The possibility of getting a nuisance shock (< 5 ma) vs. a real life-threatening shock (10-100 mA) which is possible when both ends of the messenger wire are grounded were discussed.

Corrine Dimnik, Austin Farmer : IEEE 1138 Revisions:

Extensive comments on 1138 by Bruce Freimark and Bob Kluge . Went through 1138 document and discussed comments one by one.

There were a number of editorial and content changes based on the comments. These should be captured in the Excel sheet kept by Austin.

Some of these are:

1st short circuit in the test section was put back at 95%, somehow it had changed to 90 % in this revision.

Lightning section has changed a great deal. The subgroup on lightning has been busy and members are encouraged to read and comment.

Normative references and Bibliography will need some revision. There are standards/ documents quoted in the bibliography section which don't match anything. IEEE 1138 may need to be checked to see if it meets the style manual requirements with respect to normative reference. Corrine will look into this.

IEEE 1138 PAR is valid until December 2020.

If all comments are resolved, we may expect to vote the latest version of IEEE 1138 out of committee in the March 2020 meeting.

Felix Chen (Working Group Chair) & Joseph Martin Regaldo: IEEE 1595 Standard (1595D3 OPPC):

Much work was done by Joseph and Felix on updating the standard. Joseph provided the updates.

Some of these (not all) are:

- List of participants in the standard needs to be updated.

- IEC standard for OPPC to be referenced. The IEC standard is not finalized yet.

- IEC standard for fiber types will be used as well instead of quoting different ITU types.

- MRDT: Attention shall be paid to fiber stresses which may be experienced by fiber inside OPPC due to elongation of the cable. Elongation due to normal and emergency conditions (short and long term currents) should be considered.

- Lightning Test is considered conditional test for OPPC. Phase wires experience lightning less frequently, but they could. Lightning test will be the same as in 1138, copied over.

- There will be distinction made between:

 - Continuous current carrying test

 - Emergency current carrying test

- Test will be modified to have corrected values based on initial conditions and ratings to be defined using IEEE 738 standard. Modification will also cover continuous and emergency test duration down to 60 min after stabilization unless customer asks for longer duration.

- Testing of the blocking material/gel at continuous temperature for 24 hour and at emergency temperature for another 24 hour. The idea is to see if there are chemical changes in the gel which may affect the cable/fiber performance down the road.

Mark Naylor 1591.3 & 1594 Working Group Co-Chair: IEEE 1591.3 Wrap Cable

Mark provided responses received to comments via phone and through presentation by Austin Farmer.

Some of the comments (not all) resolved are:

- IEEE 516 reference is used.

- Use the same terminology in IEEE 1138 (finalized in this meeting) with respect to meeting local regulations/applicable laws.

- RIV definition requested: already in the standard.

- Wind Loading on Hardware: the wind loading shall not exceed the existing requirement for similar insulators or be as specified by the customer.

- There may be an opportunity to study wind loading on hardware for a future revision.

1591.3 will be sent for re-ballot (limited to issues raised and sections modified only). Mark will work with Erin Spiewak (IEEE) for clarifications. It will be a short, 10 day ballot.

Mark will send a new version of the standard to the group (via chair or directly).

John Jones, Bob Kluge Working Group Members (1591.1 OPGW hardware):

John Jones provided a presentation on changes to 1591.1

Temporary grounding clamps and repair hardware (repair rods) have been included.

Repair rods are subjected to both Tension test (mechanical to MRDT and Optics test left to customer) as well as mechanical crush.

Note: There is a need for a standard dealing with splice boxes in the future.

Jack Roughan (ZTT): OPPC Hardware 1591.4: Jack provided a short update on 1591.4. PAR for OPPC hardware (1591.4) was approved on 2019-05-21 and is valid until Dec. 31, 2023.

In October 2019, Joseph Martin will travel to China and work directly with ZTT on both 1595 and 1591.4 OPPC standards.

There will be more discussions on 1591.4 in the December conference call.

Meeting Adjourns

Appendix (Informative): Bearing pressure Sheave Formula - From IEEE 524 Draft Annex G Provided by Joseph Martin

Annex G

(informative)

Recommended bearing pressure on sheave linings

Considering bearing pressure between conductors and stringing sheaves, it should be noted that the pressure per unit of length between the conductor and sheave groove is a function of the tension (T) in the conductor, the diameter of the sheave to the bottom of the groove (D_s), and the diameter of the conductor (D_c). The pressure is independent of the angle of radial contact around the sheave and the resulting load on the traveler. The bearing pressure is therefore expressed by the following equation:

$$P = \frac{3T}{D_s D_c} \quad (G.1)$$

where

- P = bearing pressure,
- T = conductor tension,
- D_s = diameter of sheave to bottom of groove,
- D_c = diameter of conductor or pulling line.

Limits or guidelines for conductors have been 500–700 psi for lined sheaves, less for unlined ones. To obtain reasonable wear on sheave linings, maximum allowable unit bearing pressure for steel pulling lines is 2000 psi for neoprene, 3500 psi for urethane.

Examples:

- T = 12 000 lb for pulling line
- T = 6000 lb for each conductor
- D_s = 24 in (diameter of sheave to bottom of groove)
- D_c = 0.625 in (diameter of pulling line)
- D_c = 1.502 in (diameter of conductor)
- $P = \frac{3 \cdot 12000}{24 \cdot 0.625}$
- P = 2400 psi representing unit bearing pressure for the 5/8 in OD pulling line
- $P = \frac{3 \cdot 6000}{24 \cdot 1.502}$
- P = 500 psi representing unit bearing pressure for the 1.502 in OD conductor

