

Working Group D2 Cable Systems (IEEE 525)
Meeting Notes of October 7, 2014 – Nashville, TN

Chair: Debra Longtin
Vice Chair: Steve Shelton
Secretary: Brian Farmer
Tech. Editor: Adam Zook

Meeting called to order by the Chair, Deb Longtin at 8:05, welcoming members and guests.

Total attendance: 23; Members 11; Corresponding Members 1; Guests 11

Quorum was present (needed 11 members)

Buhle, Kevin	Member
Cain, J Brian	Guest
Campbell, Donald	Guest
Chavis, Michael	Guest
Farmer, Brian	Secretary
Gaetz, Alan	Member
Gravelle, Joseph	Member
Hoffman, Zack	Guest
Holcombe, Charles	Guest
Largent, Bruce	Guest
Longtin, Debra	Chair

Maniego, Regninaldo	Guest
Moreau, DJ	Member
Mosbacher, Karl	Guest
Nadeau, Mike	Member
Patel, Poorvi	Guest
Patel, Shashi	Corresponding Member
Patel, Shashikant	Member
Postma, Nathaniel	Guest
Shelton, Steven	Vice Chair
Simha, Vinod	Guest
Strahl, Kenneth	Member
Watkins, Diane	Member

The slides were shown regarding call for acknowledgement of any potentially essential patents and duty to inform.

Introduction of all attendees were made.

1. Brian reviewed the meeting notes from the Portland meeting May 2014.
2. Overall schedule and the day's agenda were reviewed. The intention is to review and resolve all outstanding items at this meeting. Plan to ballot this winter and review comments at the spring meeting. PAR expires 12/15.
3. Noted that the draft on the website is not the latest. Latest was just received from the technical editor the evening before and includes all comments he had received. This version is the one used for review at the meeting.
4. Status of open items from last meeting.

Section	Person	Issue	Status
5.2	Kevin B.	Verify if IEEE 1202 has 70,000 BTU cable tray propagation flame test (to replace reference to IEEE 383)	Complete (yes)
6.2.10	Craig P	Additional text on non-metallic armored cable	Open
Annex C	DJ M, Shashi P	Discuss and determine errors/ correction C.20, C.21 7 C.22 (short circuit capability). Update Annex O (Shashi) & P (DJ) as needed	Complete (Eq. C20 modified, C22 deleted. Added two columns for K constant, imperial and metric, to table.)
Annex P	Craig P	Complete new table describing various FO applications (ID, type. Location, applications, comments)	Complete (New Table P.4)
Annex P	DJ M, Ben H	Complete fiber optic calculations (based on new table)	Complete (Table P.9)
Annex P	Alan G	Provide updated Fig 2 to Adam (Control House vs Control Bldg)	Complete (Figs P1, P2 & P3 harmonized)
Annex P	Alan G	Revise SLD/GA to resolve conflicts	Complete (Figs P1, P2 & P3 harmonized)

5. Review of Comments from Mike Nadeau (6/17): Comments all involved Figures P.1, P.2 and Table P.6. **All comments have been incorporated.**

6. Wireline Subcommittee comments (7/14): 1. Normative references and bibliography not yet completed, and therefore not checked. **Adam or Zach** to perform thorough check. 2. Reference to IEEE 1590 – need to replace with IEEE 487.2 or 487.3. Which one or both? **Adam or Zach** to review and change as needed.

7. Review of comments from Kim Nuckles (10/3): Group reviewed each comment.

1. 4.1: 600V: Accepted.
2. 4.3.3: Group decided not to add 20 AWG or 22 AWG to Table C3 as these are not 'commonly used'. Revised text to say 'typical from 6 – 14 AWG, but other sizes may also be utilized.' Also modified next sentence.
3. 4.3.3: Grammar: Accepted.
4. C.1.3: ASTM B8- revision date. **Adam or Zach** to review entire document and remove revision dates to references unless needed.
5. C.1.3: Stranding Class I. Group decided not necessary and not to add.
6. C.3: Equation numbering: After review, looks like use of a and b is correct based on references further down. However, existing numbering seems to have gotten skewed during editing. Per current style guideline, equations must be sequentially numbered and not use alpha suffixes, like 2a. **Adam** to check entire Annex C to

number equations correctly and that equations and text align. Also check references back to Annex C from Annexes O & P.

8. Review of Annex P, Large Scale Example. The following items and actions were noted. Most of the changes noted below were incorporated real time during the meeting. However, the technical editor should check to see that each is addressed.

Note: The meeting ended after item g) below. However, the group also met informally on 10/8 to continue reviewing Annex P. Items beginning with h) below are from the follow up meeting.

- a) No fiber circuits are used on the 138 kV equipment. Only 345 kV equipment.
- b) Should **use** 'control building' not 'control house'.
- c) Table P1, soil condition, **change** Annex O&P to only say 'dry soil'. Also **change** O&P lightning activity to 'Negligible'.
- d) Per style guide, **use** 'Clause' when referring to a major section. Such as "See Clause 6."
- e) P.3.2.3: Discussed temperature rating of PVC conduit. Newer PVC conduit is designed for 90C. Older conduit may limit operating temperature of cables to 75C. 90C was assumed and used in the cable calcs. Similar text also is in 3.2.1 & 3.2.2. Group decided the cautionary note would be more appropriate in E.2.1 and not in Annexes O & P. **Steve** will draft (done) a new paragraph for E.2.1. The group then removed related language in P.3.2.1, P.3.2.2 & P.3.2.3. **Need to review** Annex O to see if similar edits are appropriate.
- f) P.3.2.1 **Change** 'dry' to 'wet' environment.
- g) P.3.4. First line, **change** reference from 4.7 to 4.6. (Check Annex O also)
- h) Figures P.1, P.2, P.3 and Tables P.5 & P.6. Much discussion about consistency of nomenclature for certain pieces of equipment, particularly the PTs. Update figures and tables accordingly. **Re-label** the tertiary reactors on P.1 single line and P.2 GA to "15 kV reactor and Neutral VT." **Change** Fig. P.3 and Tables 5 & 6 from PT to VT. **Change** all 138 kV VT to CVT on P.1 to match P.2 and Tables 5 & 6.
- i) P.5.1 **Identify** 345CB6 as the CB used in the calcs. (furthest)
- j) P5.2: **Add** sentence to describe cable type used.
- k) P.5.4: **Add** clarifying statement that the calc applies to all types of VTs and that the example is for CCVT1.
- l) P.5.4.4: **Correct** burden to 9.1. Need to **verify** equation (should $\sqrt{3}$ be included?) **Shashi** to review. Result may change burden. Also **check** Annex O.
- m) Fig P.5: **Delete** figure and associated paragraphs below, replaced by new Fig P.4 Communications Cable Diagram.
- n) P.6.4 Found out there are no pulling calcs using fiber circuits out to the transformers and breakers. Copper cables were assumed in the calcs. This

would not match Fig P.4. Communications Cable Diagram. **Steve and DJ** will look into changing copper to fiber optic or adding another example using fiber optic.

o) Table P.6: **Add** 3- 500 kcmil neutral conductors to station service feed.

9. Schedule: The group did not vote on going to ballot due to the number of issues found with Annex P. The plan forward is:

1. Completed document, including all revisions to Chair Deb Longtin by end of October. (Tech editing and work on items to be done in parallel.)
2. Working group to review completed doc. first three weeks of November
3. Call for vote from working group on whether to go to ballot at end of November
4. If WG votes to go to ballot, next steps are Mandatory Editorial Coordination (30 days); Initiate invitation (form ballot pool) (30 days, concurrent with MEC); Initiate Sponsor Ballot (30 days); Ballot comment review and resolution at Spring Meeting.

10. Next meeting will be in Minneapolis, week of May 17.

11. Meeting adjourned at 12:00

Meeting notes and latest drafts to be posted on the website under Password Protected Files.
[WGD2 Cable Systems in Substations](#)

Respectfully submitted by Brian Farmer, Secretary