

Minutes of the IEEE PSES TSTC teleconference held Wednesday, March 8, 2017 at 11:00 AM EST, for an hour and 45 minutes.

1. Attendance/Introductions

Members present: Don Gies (Nokia Bell Labs), Philip Havens (Littelfuse), Al Martin (retired), Paul Ng (GE Energy), Joe Randolph (Randolph Telecom), Dan Roman (Colgate-Palmolive), Svetlana Ulemek (Burndy), Jim Wiese (Adtran).

Members absent: Ernie Gallo (Ericsson – Telcordia), Peter Lim (Alpha Technology), Mick Maytum (MJMaytum), Gary Schrempp (Dell), Tom Smith (TJS Technical Services Inc), Anne Venetta-Richard (Nokia).

Interested parties (not present)

Tim Ardley (Adtran), Doug Parker (Adtran), Peter Tarver (Enphase Energy), Steve Zugay (Cree)

2. Meeting arrangements

Join WebEx meeting

<https://nokiameetings.webex.com/join/don.gies>

Meeting number: 953 999 550

Join by phone

8200300 Internal

+14702263458 US Atlanta

Access code: 953 999 550 Join me now in my Personal Room.

Join WebEx meeting

<https://nokiameetings.webex.com/join/don.gies>

Meeting number: 953 999 550

Join by phone

8200300 Internal

+14702263458 US Atlanta

Access code: 953 999 550

[Global call-in numbers](#)

Join by video conferencing system

*953 999 550 Internal

@ 953 999 550@nokiameetings.webex.com External

3. Previous meeting minutes

The minutes of the February 8, 2017 meeting were reviewed and approved.

TSTC Minutes Archive:

https://drive.google.com/drive/folders/0B0EePJcWj2GudEF1UUV5bnBQcEE?usp=sharing_eixa_nl&invite=CL-iu_QD&ts=5876e988

This link is temporary – the minutes are now on IEEE PES website. Here is the link to that: <http://ewh.ieee.org/soc/pses/technical-minutes.html>

4. New business

Upcoming meetings: PEG meeting March 14-16 (several members going). TC108 meeting in China April 3 (Jim and Philip going), IEEE PES SPDC meeting May 19-23 (Al, Mick, Philip going), also IEC and ATIS

5. USB Changes – Phil Havens

Philip: The new type C USB connector has a fine pitch (0.5 mm). The PCB layout for the connector pad is 0.3 mm. The result is 0.2 mm clearance, which requires a pollution condition 1. But it should be condition 3. IEC 62368 has force test which could apply to USB connector. Some of the HV pins are right next to each other, which could result in an issue of shorting and/or flashover. Currents of up to 5 A can flow. Philip will bring up issue to SG5.

Jim: ITU-T K.55 talks about various safety issues, not ITU-T K.50

Don: Is there an issue with cables handling 5 A?

Philip: The connector is rated for 5 A, cable 3 A. The issue is narrow clearances. There is no minimum wire gage restraint.

Jim: What are you proposing?

Philip: I want to put appropriate tests into the safety standards. Repeated connection and disconnection offers an opportunity for contamination. That's an uncontrolled environment.

Joe: How could they use anything else?

Philip: Clearances only qualify for condition 1

Paul: Traditionally pollution condition 2 is used. That could be a problem if issue is not pitched properly.

Joe what is highest voltage?

Philip: 20 V.

Joe: There's a blanket waiver for voltage below a certain limit – we shouldn't need to worry about clearances below 5 V.

Don: I use short circuit analysis. If you do short out the pins, what's going to happen?

Philip I have some customers that are having field-related problems with boards burning.

Don: Is it enough to cause a cell-phone to burn?

Philip: I have evidence of USB connectors burning.

Joe: I would be worried about a circuit that has 20 V and 3 A – it could build up a lot of heat. There is some voltage below which air will not break down.

Al: Yes – gas breakdown is governed by the Paschen curve.

Joe. Surface contamination is most likely to be the problem.

Paul: IPC2221B is the generic standard for circuit board spacings. IPC9592 is a bit more rigid – it is used by reliability engineers.

Don: TC108 has been discussing this.

Philip: I brought this up with TC108. They say we're late in the process, and should address the issue in the SG.

Don: Paul Robinson is also interested in this.

Joe: Consulting the Paschen curve, the minimum voltage for the spacings considered is 320 V. I think the main focus should be on creepage conditions.

Jim: Conformal coatings reduces pollution degree

Philip: I think this is a field issue that needs to be considered.

6. Changes to 2017 National Electrical Code Regarding powering over low-power interfaces: - Ernie Gallo

Changes have been made to Articles 840, 725 and possible other areas regarding requirements and marking of Class 2 and Class 3 circuits intended to power devices. Common examples are power over Ethernet and USB.

Jim: Filling in for Ernie. Ernie is giving presentation about NEC issues at PEG. We've been talking about trying to put the POE insulation issue into 840. Inspectors say that if a circuit carries over 60 W, they're covered by the table in 740. Ernie heading task force to push POE stuff into 725, and leave 840 as is. Major wording changes are occurring.

Don: So if there is powering over connectors, then go back to 725.

Jim: No matter what wattage is, if the circuit carries over 60 W, go to 725. But that's not where it belongs. There is a major disagreement in the titles of 840 and 830. There is no definition of broadband. What does it mean when it says premises powered equipment? Power for the system doesn't necessarily have to come from the premises. Need to clarify this. If there isn't agreement on titles, the requirements can't be addressed. Ernie will talk about changes to 840 and 825 at the PEG meeting. I will talk about real world equipment. Ernie says that all equipment is in the building. That won't work.

Joe: I agree that it won't work.

Joe: a better title for 840 would be "communications systems where power is derived from the premises".

Don: I look it this way: Either equipment is powered from system, or from a wall outlet.

Jim: There is a requirement to have a network terminal involved. This not a problem. But definition says equipment is powered from premises, and connected to communications service provider. Premises communications equipment is the issue. Article 840 says equipment can't be installed if it is not connected to service provider.

Don: What is concern?

Jim: The concern is that article 840 not be screwed up for service providers. Article 840 requires the use of listed communications cable, but cables entering from outside are not listed.

Jim: Article 841.160 says that communications circuits shall comply with power limits. If the circuits carry over 60 W, then go to 725.

Philip: That would also cover USB cables.

Jim: Inspectors want control of circuits over 60 W. Traditional telecom services are not a problem. But reverse power feeding is a problem. Ernie's group is focusing on this. If there is power on the cable the earlier requirements are now overwritten.

Don: The reason for unlisted cable is to allow service providers to bring cable into building and terminate it there.

Jim: Intent of 841.160 was to allow power on the cable, but nothing further. The GFAST system looks like an article 800 system, except the 60 V max power comes from a wall output, so the GFAST system takes power from the customer. The GFAST terminal could be some distance from the building. An inspector can't tell which way the power is going. Reverse powering is a growing application, and it needs to be properly considered.

Joe: I'm happy with 840 as it is. I thought 800 was telecom only.

Jim: The thinking is that 840 is any communication system. It needs to be clear that if the system is not connected to a service provider, then it is covered by 725.

Joe: The theme I've heard at PEG meetings is that we like 840. Service providers don't want to be put in the same box as other services. They want to preserve special status.

Jim: That's the issue. The issue is using 840 to solve a 725 problem. There is a proposal to limit currents to 333 mA.

Don: The purpose of the article 800 is to cover equipment that gets its power from wall outlet and transfers it to something else in the building. If systems start using it to power circuits and go over 60 W, such circuits should be in 725. Could solve problem by deleting the 60 W

Jim: A GFAST system can have equipment that is powered remotely from the service provider's equipment.

Don: Up to now the specific article in the NEC code has not come up. Generally the issue is the fire rating of the cabinet: How many hours can you survive inside a cabinet before the fire breaks out. Usually the issue with code is not related to powering.

Jim: The whole issue is that the AHJ doesn't want powering over 60 W.

7. IEC 62368-1, 3 updates

Don on -1: Paul had issue when power is a 480 V delta input. IEC 60950 treated that like any other power. Under the new standard you have to take the worst case, so a 4000 V dielectric test is required. Paul submitted proposal that you only need to do the transient test. That proposal was accepted by US TAG.

Don: If the cabinet has a NiCd battery, the manufacturer's test data can be used in place of the tables in IEC 62368-1. Eriksson: Why not measure hydrogen evolution rate?

Don: IBM has found that in big water-cooled systems were not considered.

Jim: International edition of IEC 62368 did not have a provision for message waiting. In 2nd edition there is a deviation for message waiting.

Don: Even the simplest proposals can catch a lot of flack.

Jim: They really don't want telecom in the standards, and don't want to address the issues. For example, there are 4 different terms for ringing, and they rejected a suggestion to use one term. They won't put the message waiting issue into IEC 62368.

Don on -3: US TAG accepted the proposal to eliminate the 400 V conductor-to-conductor rating requirement – revert back to 200 V. There was a proposal to get rid of "shalls", because they shouldn't be there.

Jim: US TAG proposed to getting rid of -3.

Don: But there are things in -3 that are OK. Push installation instructions. Consider keeping the voltage requirements.

Jim: The TAG voted no because RTF-V is out of line with North American practice. When document went out for CDV, the changes in ITU-T K.50 weren't known, so -3 is not harmonized.

Don: It's unlikely that the whole -3 document will be scrapped. Instead push harmonization with ITU-T K.50.

Jim: There is a misunderstanding on what sections apply.

Don: Be very focused on harmonization with K.50. Anything else won't fly.

Don: Jim share your comments with the group.

8. Old Business

None

Next meeting

The proposal is to hold meetings on the second Wednesday of the month. So the next meeting will be Wednesday April 11, 2017.

Respectfully submitted
Al Martin, Secretary