

IEEE Product Safety Engineering Society

Minutes of the IEEE PSES TSTC teleconference held Wednesday, June 25, 2014 at 11:00 AM EST, for one hour.

1. Attendance/Introductions

Members present: Don Gies (Alcatel-Lucent), Al Martin (retired), Mick Maytum (MJMaytum), Paul Ng (GE Energy), Joe Randolph (Randolph Telecom), Dan Roman (Colgate Palmolive), Tom Smith (TJS Technical Services Inc)

Members absent: Tim Ardley (Adtran), Philip Havens (Littelfuse), Peter Lim (Alpha Technology), Mick Maytum (MJMaytum), Doug Parker (Adtran), Gary Schrempp (Dell), Peter Tarver (Enphase Energy), Jim Wiese (Adtran), Anne Venetta-Richard (Alcatel-Lucent), Steve Zugay (Cree).

2. Meeting arrangements

Don Gies supplied the call-in number:
Bridge No. (Toll Free): 1-800-771-8734
International Access: +1-647-723-3953
Access Code: 5825978

3. Previous meeting minutes

The minutes from the last meeting were approved as submitted

4. New business or new agenda items

None

5. TC 108 Meeting – San Jose, CA , 12-16 May 2014 – Don Gies

Don Gies attended. The IEEE TSTC proposal on battery cabinet ventilation, amended per recommendations from US TAG Meeting in Melbourne, FL and per ad hoc committee in San Jose, CA, has been forwarded to TC 108 as a draft CDV for IEC 60950-22, Second Edition. See attached.

Don: This has been 4 years in progress. Section 11 of document shows our proposals. The audience at the TC108 meeting was stunned that the problem was occurring. The information will be put in the second edition. This will be faster than waiting for IEC 62368.

Joe: It's remarkable that it took 4 years for the control of a hazard like an explosion to get into a standard.

Don: A champion to carry a proposal all the way to finish is needed. Can't just surface the problem and wait for something to happen.

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Joe: Considering the time taken to address a serious problem, the GM nod may be relevant: A committee will be called to solve a problem. Everyone nods, and then goes back to work and nothing happens. Probably similar in standards work.

Don: The TC meetings have a lack of telecom guys.

Don: The next step is to distribute the proposal to the IEC for distribution to the national committees for discussion. Have to insist on using the boost charge regime.

Paul: Any discussion of equalization?

Don: If you go past 57.6 V, then you have to perform the gas generation test.

Mick: How will the document go out?

Don: The document will be a CDV.

Mick: Prior to the meeting, use the collaboration tools. It's a filing system where people put their contributions. These then appear as items for the meeting agenda.

Don: I will be a member of MT2.

Mick: You need to be on the list of official members of MT2. Check list to be sure you're there. If you are on the list you can access the collaboration tools, otherwise you can't.

6. Protection of DC feeds to radio equipment at the top of towers – Al Martin

- a) What protection is typically installed on equipment that will be located at the top of towers, and is any consideration given to the height of the tower?
- b) What lightning waveshape is considered when designing protection for equipment to be located at tower tops?
- c) Is there any information about the failure of installed protection to protect equipment located at tower tops?

Mick: Discussed his paper reviewing the work by Raycap. Raycap ran an experiment where they injected a 10/350 surge to 20 M tower to see what showed up on the DC feed. The waveform on the DC feed was shorter than the surge to the tower. The protectors are at the top and bottom of the tower. What happens: The protector clamps. You get an inductive kick due to the inductance of the DC feed line. The inductance kick establishes the current in the DC feed. The conductive clamps lock up the energy in the inductance. An Annex to K.97 says that if you can determine the current in the DC feed, then you get the $\frac{1}{2} LI^2$. Energy. As there are 2 protectors, each one will need to withstand half the energy stored in the inductance. The IEC is still debating the matter.

Joe: How much was theory and how much experiment?

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Mick: It was experiment. Raycap constructed a U-shaped tower so they could surge it. The Raycap paper had photos of the current. The paper is private in an IEC collaboration folder.

Action: Mick will ask if the paper can be released for discussion.

Joe: How is the DC feed grounded?

Mick: It is grounded at the tower bottom. At the top it is bonded to the tower via an SPD.

Don: Want to make sure that the current goes down the return lead.

Mick: In the ITU-T document they look at shielded DC feeds as well.

Joe: I don't see lightning rods at top of tower. Why don't they try harder to keep lightning away from the equipment?

Don: If you have an average lightning current to ground hitting a tower, what proportion gets coupled onto the DC feed?

Mick: It's the rate of rise that counts. The ITU-T annex says 3 – 5 %. You might have expected to see a mutual coupling, but there wasn't much if any in the Raycap study. We don't worry about the surge waveform, only about the amount of inductive energy stored.

Joe: What are the current practices for protecting feeds to equipment at tower tops, e.g. GRs?

Don: I don't know of current practices for that.

Joe: A lot of documents cover what to do at the bottom of the tower, but not at the top.

Al: Telcordia has a proposal out to create a GR for DC feeds to equipment at tower tops.

Don: Let's look closer at Mick's report for the next meeting.

7. Old Business

Japanese Ethernet practice

Mick: Joe and I pondered why the Japanese wanted such a high voltage on their Ethernet equipment. The Japanese equipment doesn't have a protective earth – it's floating.

Don: The Japanese made a proposal at the IEC meeting to allow an SPD to bridge the reinforced insulation barrier.

Joe: Allowing the bridging of insulation assumes a reliable connection of the SPD to ground. But nothing is said about the integrity of the ground.

Joe: Mick's explanation makes sense of the Japanese drawings. Now it's clear how you can have a surge going in one port and out another.

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Mick: In UK you have a line and a neutral. The neutral is teed off as an earth, and the house can be a long distance from the earth. So the house is really floating. No ground rod at the service entrance.

j Lightning Surge Damage to Ethernet and POTS Ports Connected to Inside Wiring - Joe Randolph

Joe's paper was awarded "Best Paper" at the ISPCE 2014 Conference in San Jose, CA.

Joe: Can send Don the presentation that he used at the conference. A review of what we know. Sometimes you get a higher surge on the mains than expected. Do the Japanese bond appliances to ground?

Mick, Yes.

Mick: Japanese have an isolation transformer dongle for Ethernet.

Paul: What is duration of the surges the Japanese are protecting against?

Joe: They are lightning surges. They picked 13 kV, as it seems to work.

Joe: The more units you have in the field, the more painful a given failure rate becomes.

Mick: Ethernet is an uncontrolled environment – lines run wherever a customer wants to run them. There may be a Japanese contribution at the next ITU-T meeting.

Joe: Astounded at the voltage withstand of insulation – even magnet wire is often good for 10 kV.

Tom: IEC 60335-2 [standard for home appliances] says 1mm solid insulation required for supplementary insulation, and 2mm solid insulation required for reinforced insulation.

Joe: Seems like more thickness than is needed. Transformers often have a very thin insulation between primary and secondary windings – certainly not 2mm.

Tom: The 2mm requirement may be more for physical than electrical damage.

Paul: Is life testing done to validate thin material?

Tom: There are base tests in IEC 60325. There are a huge number of dash standards that can have additional requirements.

Next meeting

Proposed **Wednesday, 23 July 2014**.

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Respectfully submitted,

Al Martin

Secretary

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Guest: Jack Burns, Dell, IEEE PSES, VP Technical Activities

Chair: Peter Tarver

Vice Chair: Don Gies

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Secretary: Al Martin

- 1) UL Standards Technical Panel for Subjects 60950-1, -21, -22, -23
- 2) TIA TR 41.7, TR41.7.1
- 3) IEEE Surge Protective Devices Committee
- 4) ATIS Protection Engineers Group
- 5) ITU-T, SG5, WP1
- 6) Canadian National Subcommittee for IEC TC108
- 7) TIA TR 41.7.10 (Smart Grid)
- 8) US TAG to IEC TC 108

Other LinkedIn members:

hifi cha, China (Independent Consumer Electronics Professional)

Jeff Whitmire (Manager, Regulatory Compliance at Adtran)

Telecommunications Technical Activities Committee Roster