

IEEE Product Safety Engineering Society

IEEE PSES TSTC

Meeting Minutes: 27 June 2012

Members present: Don Gies (Alcatel-Lucent), Peter Lim (Alpha Technology), Al Martin (TE Connectivity), Mick Maytum, Paul Ng (GE Energy), Joe Randolph (Randolph Telecom), Gary Schrempp (Dell), Anne Venetta-Richard (Alcatel-Lucent), Peter Tarver (Enphase Energy), Jim Wiese (Adtran).

Members absent: Tim Ardley (Adtran), Philip Havens (Littelfuse), Doug Parker (Adtran), Dan Roman (Dialogic), Tom Smith (TJS Technical Services Inc), Steve Zugay (Cree),

1. Attendance/Introductions

Attendees introduced themselves.

2. Previous meeting minutes were distributed for comment

The minutes from the last meeting were approved as submitted

3. New business

None

4. Discussion – AC Power Cross Considerations for Non-Telecom Signaling Lines (e.g. Ethernet, Alarms) Run in Outside Plant

Last meeting: What do you do with an outside line in a campus environment? Do you protect against both lightning and power cross? Ethernet lines are an example of this. Sometimes folks string their own wires, and are not aware of the NEC or the need for protection. Randy Ivans gave a review of the building blocks in UL 60950. Jim suggested asking UL for a PAG on this. UL has a PAG on POE, but not on dry Ethernet. Jim suggested that this committee send a letter to UL asking them to withdraw the POE PAG and replace it with an improved PAG that covered all types of lines that could go to the outside plant.

Peter Tarver: There was a PAG that said do not run Ethernet lines to the outside plant.

Jim: Those ports had to be marked “do not run to outside plant”.

Don: Is this a UL issue only, or also at other agencies?

Peter: Can we get these types of circuits included in IEC 62102?

Jim: This is solely a North American issue.

Joe Randolph: Did we discuss how long the lines need to be at last meeting?

Jim: We discussed that there is limited risk of 600 V exposure, but a lot of exposure to 120 V.

Joe: We need to do a better job of describing the lines than “outside plant”. Less than 1000 m has been one definition.

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Don: If you have lightning exposure, need a protector. NEC 800-93 says that need protector if line is greater than 143 ft. But you don't know where your equipment will be installed, so assume worst case.

Jim: GR-1089 tried to address the issue. It said that if max range is less than 500 ft, you probably do not have exposure to high voltage line. Inside a building you generally have a 20 A breaker, so test for 25 A at 120 V. People run Ethernet from house to garage by tie-wrapping the line to the power line.

Joe: What is the problem we are trying to solve?

Jim: The Issue was power cross in the PAG from UL. Section 4 in UL 60950 describes the issue we are talking about. Power cross in UL 60950 is UL's equivalent to 2nd level power cross.

Joe: Safety and reliability have been conflated. Does current scheme expose public to fire hazard?

Jim: Possibly yes. Ethernet is supposed to be intrabuilding only, but now it's running outside the building. Present PAG says take line to be TNV1, but don't do power fault.

Don: Should we take this to the National Committee? What do we do with signal lines, alarm lines, Ethernet?

Joe: The issue seems to be GPR – two adjacent buildings could be at different potentials due to different ground references. Also Running a 300 ft Ethernet line inside a building may not be different from running it outside, since the building walls don't offer much attenuation to an EM pulse.

Jim: Focus on overvoltage, not lightning.

Joe: There is overvoltage exposure, but hard to figure out what it is. The 600 V test assumes a primary protector.

Jim: We need to figure out what an appropriate test should be. It seems like 120 V, 25 A is adequate.

Don: The 600 V was the sneak-under voltage of a carbon block protector.

Jim: The breakdown voltage of carbon blocks drops to 425 V after the first half of an AC cycle, and continues to drop after that.

Joe: The risk of contact to a 600 V power line in a run of less than 300 ft is negligibly small. Nearly all AC voltage on lines 1500 ft or shorter is due to induction. We need to separate induction from direct contact.

Don: Neither UL or CSA have taken a position on what tests to do on lines under 300 ft.

Peter Tarver: If you have SELV circuit that is subject to transients, it becomes TNV1. Ethernet has traditionally not had the same kind of problems that are seen on a telecom line. But now we do see incidents of problems.

Joe: The incidents are nearly all lightning, not power cross.

Jim: We have seen Ethernet jacks blown, from which we conclude that the surge had a lot of energy.

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Al: Chrys Chrysantos did a study of induction on telephone lines, and found that max was 7 A, with average around 4 A.

Jim: UL 60950 applies the 120 V test to TNV1 or TNV3.

Joe: Originally Bell Labs had a lot of debate on power cross. The conclusion was that the probability of a 600 V 60 A test was rare. But eventually the conclusion was that in a big system there was enough of a probability of a 600 V 60 A event that the test should be included.

Jim: We should have the same test regardless of how you classify the line [i.e. the test should be line-type agnostic].

Don: When the only thing you put on the line was a phone, there was a network that protected against power cross.

Joe and Jim: They could actually burned up.

Peter: Don't need to run the 120 V test if have >120 V isolation to ground. In Ethernet, 1500 V isolation to ground is required, so don't need to run test.

Jim: Some manufacturers put a protector to ground. GR-1089 doesn't allow it, however UL says that if there is a protector to ground, it can be removed. IEEE 802.3 allows you to check isolation to either option A or B.

Don: Suppose I do have outside plant line, and I don't do any isolation [e.g. relay contact]. Do I have a power cross issue? Is the line TNV1? It's only a TNV1 because it goes to outside plant. The determination is often left to the judgment of the manufacturer.

5. Lightning-Induced GPR – A. Martin. Concern for ground potential rise is popping up in so many standards-writing activities these days, especially for standards involving outside-plant installations.

No time to discuss this. Discussion on this will be postponed to the August meeting, as Al will be on vacation in July.

6. IEC TC108 National Committee Activity – D. Gies, T. Smith

- a. Follow-up from national committee meetings with respect to TSTC proposals for IEC 60950-22.

Don: There was a vote in TC108, but he need to look up the result. Question arose as to when we can use the standard. If equipment can't be accessed, then it should be allowed to cool down before servicing. Now if a surface exceeds 90 oC it fails.

7. ATIS/Telcordia Activity

- a. New Telcordia GR-3171-CORE, Generic Requirements for Network Elements Used in Wireless Networks Physical Layer Criteria.

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No discussion

b. New activity?

GR-3108 CORE Just started

GR-47 CORE in July

8. IEC 62368-1 – Impact on Telecom Industry.

There has been much discussion from the industry as to whether IEC 62368-1, “Audio, Information and Communication Technology Equipment – Part 1: Safety Requirements,” should be globally adopted as national safety standards, replacing IEC 60950-1 and IEC 60065.

We have heard pros and cons for adoption. The pros tendency is that there are more options available for service-access equipment, whereas the cons tendency is that there are additional tests that will add expense to testing and certification.

With respect to the telecom industry, what are the pros and cons for adopting IEC 62368-1?

No discussion

9. Additional agenda items

a. News

Howard Davis at Verizon is no longer doing NEBS. The job was taken over by Todd Talbot

10. Old Business

a. Smart Grid Issues

Nothing

b. 380 V DC power systems

Nothing

c. Lightning/Ground potential rise discussions

Nothing

Next meeting: TBD

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

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)

IEEE Product Safety Engineering Society
Jeff Whitmire (Manager, Regulatory Compliance at Adtran)

Telecommunications Technical Activities Committee Roster