

## **IEEE Product Safety Engineering Society**

IEEE PSES TSTC

Meeting Minutes: July 24, 2013

Members present: Don Gies (Alcatel-Lucent), Philip Havens (Littelfuse), Al Martin (TE Connectivity), Mick Maytum.

Members absent: Tim Ardley (Adtran), Paul Ng (GE Energy), Doug Parker (Adtran), Dan Roman (Creston Electronics), Tom Smith (TJS Technical Services Inc), Steve Zugay (Cree), Peter Lim (Alpha Technology), Joe Randolph (Randolph Telecom), Gary Schrempp (Dell), Peter Tarver (Enphase Energy), Anne Venetta-Richard (Alcatel-Lucent), Jim Wiese (Adtran),

### **1. Attendance/Introductions**

Attendees introduced themselves.

### **2. Previous meeting minutes**

The minutes from the last meeting was approved as submitted

### **3. New business**

Mick: IEEE 60950 wants an SPD to withstand 6 kV 3 kA surge. Why don't insulation barriers have to withstand 6 kV? A Power port has high capacitance, an Ethernet port has low capacitance. So by capacitance voltage division, most of the incoming surge will occur across the Ethernet port.

Don: IEC 60950-1 allows putting an SPD on incoming power to knock down surge to cat 2. If the installation uses off-the-shelf equipment, it may be necessary to knock down surge voltage with a SPD.

Mick: In 2-phase power systems such as exist in the US and Japan, if an MOV is put on line 1 but not line 2, then in response to a surge, line 1 will be held down, but not line 2. The result will be a differential line1 to line 2 surge.

Don: Years ago no one considered steady-state overvoltage in equipment. SPDs in this situation could catch fire. So SPDs were taken out. But now they are being put back in. SPDs were sometimes rated for US voltage, but caused a problem when sold elsewhere.

### **4. Members attending IEEE Symposium on Product Compliance Engineering in Austin, TX.**

Don will give a paper on surge protection of electrical equipment: Offense and defense. Offense: Things that the power utility has to prevent – switching transients, ferroreosonance, lightning suppression. Defense: Assume that equipment will withstand specified amounts of surge. IEC 60664 overvoltage categories: If can't withstand these, then put something there to help equipment withstand the test voltages.

### **5. AC Power Cross Considerations for Non-Telecom Signaling Lines (e.g. Ethernet, Alarms) Run in Outside Plant – Jim Wiese**

Don: We had an outdoor product with Ethernet. NEC says if the product has telecom, primary protection is required. So is Ethernet telecom? UL PAG: POE should be treated as TNV-1. The power cross test as described in UL 60950 §6.4 wasn't required. But generally you need to do the power cross test. Even if the IEEE PSES TSTC meeting minutes from 27 February, 2013

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power cross test is not needed, the impulse test is required. If the end product is listed and has a primary protection, a primary protector isn't required. Gordon's Bell Northern paper said that power cross is not expected if the line goes only a short distance.

Mick: Gordon's paper was good for the time (basically POTS), but doesn't apply to Ethernet. High voltage isolation barriers eliminate need for protectors. A manufacturer says what the barrier will withstand. However if system purely relies on isolation barrier, it needs to be tested at higher voltage than the manufacturer's rating. For example if the barrier is rated at 10 kV, then testing needs to be done at 12.3 kV. Current standards don't comprehend using an isolation barrier in lieu of an SPD.

Don: Telecom industry and radio industry evolved separately. Bell labs studied the system in great detail. Cable industry evolved on the cheap. Now they are being lumped together for testing purposes, and it doesn't work. Ethernet is not classical telecom, because the architecture is different. Runs are much shorter than telecom runs, so threats are different.

Mick: After a test at withstand voltage, there is a verification test where you apply a voltage in excess of local mains supply. This test is to verify that the insulation resistance is still OK. A 500 V test would ensure SPDs don't conduct. In this case a power cross is redundant.

Mick: Power induction plus power cross = power fault.

Don: When you have an international discussion on testing, the result comes down to who has to withstand the biggest surge, and what kind of test equipment do you have to do the test.

## **6. National Electrical Code/Canadian Electrical Code compliance with fixed "cord pendants" on outdoor equipment.**

Don: The issue with power cords for small product to be sold everywhere is that the practice most commonly allowed around the world is not allowed in US and Canada. Little things like metro equipment have a knock-out for power cord. But service providers don't want to send someone up the pole to disassemble a box every time they have a problem. What they want is a detachable cord for outside use, but these are hard to find. In case of DC you don't have a set of DC plugs. Could use a cord pendant – cable with a connector on one end [article 400 of NEC]. As things get smaller, don't want to run conduit up to them.

Mick: If there is a surge on the AC line running with an Ethernet cable going outside a building, how much of a surge on the AC line gets coupled to Ethernet?

## **7. Additional agenda items**

None

## **8. Old Business**

None.

## **Next meeting**

Proposed Wednesday, 28 August 2013.

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Respectfully submitted,

Al Martin

Secretary

Participant	Employer	Telephone	E-mail	IEEE Member?	PSES Member?	Linkedin Subgroup	Other Committee
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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**