

Report of the meeting of the IEEE 802.3.bt task force cable heating ad hoc web and teleconference meeting 2/12/14

This meeting was attended by Paul Kish, Alan Flatman, Arne Keller, Val Maguire, Rob Gould, Chad Jones, Chris DiMinico, George Zimmerman, and Dave Tremblay.

Wayne briefly reviewed the patent policy and asked if anyone had anything to disclose. There were no responses.

There were two contributions that were reviewed, from Paul Kish and Wayne Larsen:

21214 kish Heating Effects for Remote Power Delivery Over Bundled Cables 12Feb2014

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During Paul's presentation, there were several issues discussed. Paul used a method with the cable mounted on a spool. This makes the heating somewhat worse, with an 81 cable bundle being similar to a 100 cable bundle suspended in air. The cables tested by Paul all were UTP cables. The cat 6 and 6A cables heat less, because they have larger conductor diameters. Conductor diameter, along with installations methods, is the main factor affecting heating. A cable bundle in air may not be the worst installation case, and an insulated cable bundle may have a much larger temperature rise. Paul repeats the concern we shared in Palm Desert, that 100 W of power transmission may not be supportable in all existing installations.

Paul's report makes reference to a 10 degree temperature rise allowance. Chris explained the origin of this, that when TSB-184 was developed in TIA, 45 degrees C was the hottest environment expected, some cables are rated for use up to 60 degrees C, and the 10 degrees fit within this with a certain safety margin. Paul pointed out that some cables are rated to 75 degrees C, and also that the resistance rises with the rise in temperature.

There was a theory offered, that a bundle of A+B cables (for example $70+30=100$) with only A (70) cables energized, would heat less than a cable of A (70) cables with all cables energized, because the other cables would conduct heat away.

There was an observation that having all cables in a large bundle energized to the maximum current level at the same time was unlikely. There would be an opportunity to allow larger current, if we could establish a “duty factor” less than 100 %, to use as the basis to calculate heating. We do not have a basis to establish this duty factor, and plan to ask the .bt task group to provide it.

This cable heating topic is also being studied in Cenelec. It is expected that Cenelec will make a report to ISO, which has a meeting from February 25 to March 1. It is hoped to get a report from the output of the ISO discussions at our next meeting, which is planned for March 7, same time.

Chris agreed to provide a summary of TIA TSB-184.

Action items:

- Ask .bt about duty factor
- Information about similar work being done in Cenelec
- Review of TSB-184 – Chris
- Contributions on maximum current and bundle size – all
- Next meeting March 7, 2014

Respectfully,

Wayne Larsen