SCC18 Adhoc Report

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September 13, 2018

Adhoc meetings

- Adhoc met on July 18, 25; August 1, 15, 22; and September 11
- Primary goal was to generate IEEE 802.3 Public Comments for NFPA 70 and comments to be submitted against IEC TC64/PT716 64/2880/CD by the IEEE 802.3 Category D liaison expert. [recall that motions were made in July to give the adhoc authority to submit on behalf of 802.3.]
- Minutes are posted in the Adhoc public area.
- Links to NFPA and IEC docs are linked to password protected access
- Summary of the Adhoc recommendations follow

Adhoc Comment File Recommendations

http://www.ieee802.org/3/ad_hoc/SCC_18/public/TC716_and_NEC_SR_comments-082218.pdf

Or simply google ‘SCC18 adhoc’ link will be third from the top in the table on the public area

http://www.ieee802.org/3/ad_hoc/SCC_18/public/index.html

IEC 60364 TC716 64/2280/CD

Part 716.1

This part of IEC 60364 specifies requirements in electrical installations for the distribution of ELV DC range power using balanced, information technology cables and accessories primarily designed for data transmission, as specified in terms of a Category within the reference implementations of ISO/IEC 11801-1 using power feeding equipment in accordance with IEC62368-3.

Comment: The reference to 11801-1 should be dated. The entire proper reference is: ISO/IEC 11801-1:2017 as modified by Cor 1:2018. IEEE 802.3 notes that PoE systems specified in IEEE Std 802.3 include the PoDL systems defined in Clause 104 that operate on a single pair. 11801-1 at present only covers the 2-pair and 4-pair systems compatible with 802.3 Clause 33 and Clause 145. Additionally, 11801-1 may never cover single pair.

Part 716.433.1.101

716.433.1.101 Protection against thermal effects including overcurrent

The protection against thermal effects and overcurrent shall be achieved by at least one of the three following principle measures:

- use of a protective device to disconnect any overcurrent in the circuit conductors
- designing the circuit so as to prevent an overcurrent to arise
- limitation of overcurrent by the characteristics of supply

Overload protection shall be provided by limitation of the power supply for all parallel sources of the power supply devices. The disconnection in case of overload shall be within 1 s. The circuit shall not reset automatically.

716.433.1.101 continued

Comment: The sentence “The circuit shall not reset automatically.” seems to disallow products that have multiple levels of current limit with different protections at each limit. The 802.3 PoE specification requires a (self-resetting) current foldback when the maximum rated supply current is exceeded. Outside the scope of the IEEE 802.3 specification, products usually have a fuse to meet the stated overcurrent protection required by specifications such as IEC 62368. The text should be clarified so that it is more explicit that multiple protection levels are allowed as long as one of the protections does not reset automatically.

Power Sourcing Equipment (PSE) operation as specified in IEEE P802.3bt is described in the following:

PSEs have current limits Ilim and Icut. Icut is a ‘PSE may shut off power to the port’ current limit and Ilim is a ‘PSE shall shut off power to the port’ current limit. Icut is reached when a Power Device (PD) draws more power than it advertised during classification for longer than 75ms max. Ilim is reached when the PD exceeds this power by a given percentage that varies according to the Type (this percentage decreases with increase power output/draw ~14% max). The Ilim min timing is Type dependent but is 75ms max for any Type. Most PSEs will choose the lower Tlim numbers (6 or 10ms) as thermal dissipation can be problematic at these operating points. In either of these cases (Icut or Ilim), the PSE moves back to detection after shutting off power to the port. If the PD presents valid detection and classification signatures and falls within the startup inrush current limits, power will be applied again automatically. This is by design. Customers do not want to manually intervene in a misbehaving PD (misbehaving being a PD product that is poorly designed such that it exceeds the current limits occasionally but is not damaged or a hazard). The PSE has an error delay timing spec that requires a 750ms delay before subsequent powering attempts. These timing requirements limit the duty cycle of any error event to less than 10% to ensure that there is no heating due to successive fault events.

IEEE 802.3 requests that the language of this section be modified to allow the above described behavior as hundreds of millions of ports are already in existence that will not conform and likely cannot be upgraded to comply.

One solution would be to clarify it is just the overload protection that cannot reset automatically. This can be accomplished by making a new section just for overload and adding a sentence to the overcurrent section:

After the list of principle measures in 433.1.101 add:

The measure used to protect against thermal effects and overcurrent may reset automatically.

716.433.1.101a Protection against overload

716.433.1.101 with comment included

716.433.1.101 Protection against thermal effects including overcurrent

The protection against thermal effects and overcurrent shall be achieved by at least one of the three following principle measures:

- use of a protective device to disconnect any overcurrent in the circuit conductors
- designing the circuit so as to prevent an overcurrent to arise
- limitation of overcurrent by the characteristics of supply

The measure used to protect against thermal effects and overcurrent may reset automatically.

716.433.1.101a Protection against overload

Overload protection shall be provided by limitation of the power supply for all parallel sources of the power supply devices. The disconnection in case of overload shall be within 1 s. The circuit shall not reset automatically.

Part 716.521.101

716.521 Types of wiring system

716.521.101

Information technology cables used for the distribution of DC power shall comply with Category 5, Category 6, Category 6A, Category 7, Category 7A, Category 8.1 or Category 8.2

Comment: change “Information technology cables used for the distribution of DC power…” to “Information technology cables and components used for the distribution of DC power…”

716.521.101 with comment included

716.521 Types of wiring system

716.521.101

Information technology cables *and components* used for the distribution of DC power shall comply with Category 5, Category 6, Category 6A, Category 7, Category 7A, Category 8.1 or Category 8.2

Part 716.523.1.101

716.523 Current carrying capacities

716.523.1.101

The maximum operating temperature for cables complying with ISO/IEC 11801-1 requirements for Category 5, Category 6, Category 6A, Category 7, Category 7A, Category 8.1 or Category 8.2 shall not exceed 60°C.

Comment: Change to: The maximum operating temperature for Category 5, Category 6, Category 6A, Category 7, Category 7A, Category 8.1 or Category 8.2 cables and components specifically shall not exceed the temperature requirements of ISO/IEC 11801-1.

Motion SCC18a

Move that the IEEE 802.3 Working Group have the TC716 Direct Representative file the comments found on slides 5, 7, 9, and 11 in 0918_SCC18_report.pdf against 64/2280/CD by September 14, 2018.

Move: Chad Jones

Second: Geoff Thompson

Technical, 75%

NEC

These comments have been filed against NFPA70 second revision

250.119 Equipment Grounding Conductors

PC #1:

This comment is filed on behalf of the IEEE 802.3 Working Group. For reference, this comment is labeled IEEE802.3#1.

The addition of PoE to 725.144 in the 2017 NEC has the unintended consequence that green conductors in a Category cable must be equipment ground. 250.119 Exemption No. 1 allows green conductors to not be equipment ground, but only for circuits of less than 50V. Some IEEE compliant standardized PoE systems have a minimum port voltage of 50V and all of them limit maximum port voltage to 57V. Therefore, IEEE compliant PoE does not qualify for the exemption, making hundreds of millions of PoE installations violate the Code. This exemption was added from the inception of this text, specifically for Category cabling. If these Ethernet ports were forced to follow Code, they would not be functioning today as the requirement to have the green conductors be equipment ground would halt communication. An exemption in practice exists where it does not exist in text – hundreds of millions of these ports have been installed for almost 20 years operating at or above 50V with zero record of loss. IEEE 802.3 requests to fix the exemption by changing 50V to 60V. When PoE was developed, 60V was chosen as the maximum allowable voltage based on the Safety Extra Low Voltage (SELV) section of IEC/UL 60950.

250.119 Equipment Grounding Conductors

PC#2:

This comment is filed on behalf of the IEEE 802.3 Working Group. This is a companion comment to a previous comment labeled IEEE802.3#1. If IEEE802.3#1 is accepted, this comment is withdrawn.

The addition of PoE to 725.144 in the 2017 NEC has the unintended consequence that green conductors in a Category cable must be equipment ground. 250.119 Exception No. 1 intends to allow Category cable to have green covered or insulated individual conductors that are not equipment ground but limits the exemption to 50V, therefore excluding PoE systems which operate up to 60V (based on the SELV section of IEC/UL 60950). An alternate solution to raising the voltage in Exception No. 1 to 60V is to add a new exception.

Exception No. 1a: Systems using Category cabling as described in ANSI/TIA-568.2-D-2018 that have 2.25kV DC or 1.5kV AC isolation from earth ground to the twisted pair signal conductors shall be permitted to use a conductor with green insulation or green with one or more stripes for other than equipment grounding purposes.

NEC 725

PC#3:

This comment is filed on behalf of the IEEE 802.3 Working Group.

IEEE 802.3 believes that using different terms (“nominal current” in 725.121(C) and 725.144 and “rated current” in 840.160) leads to confusion. We recommend that 725.121(C) and 725.144 use “rated current” along with an informational note to clarify the meaning of “rated current” as the highest output current per conductor that the power source is designed to deliver excluding fault and transient conditions, and making allowance for unbalance found in these systems will provide more usable code. IEEE 802.3 supports the work of the Correlating Committee commissioned PoE TG that developed the following informational note (as covered in PC755 along with companions PC763, PC765, PC766, PC769, and PC772 filed by Ernest Gallo on behalf of the TG):

Informational Note No. 6: Rated Current for power sources covered under 725.144 is the highest output current per conductor the power source is designed to deliver to an operational load at normal operating conditions, as declared by the manufacturer. In the design of these systems, the actual current in a given conductor might vary from the rated current per conductor by as much as 20%. An increase in current in one conductor is offset by a corresponding decrease in current in one or more conductors of the same cable.

NEC 725

Informational Note No. 6: Rated Current for power sources covered under 725.144 is the highest output current per conductor the power source is designed to deliver to an operational load at normal operating conditions, as declared by the manufacturer. In the design of these systems, the actual current in a given conductor might vary from the rated current per conductor by as much as 20%. An increase in current in one conductor is offset by a corresponding decrease in current in one or more conductors of the same cable.

Liaison

Motion SCC18b

Move that the IEEE 802.3 Working Group approve IEEE_802d3_to_EA_0918_draft.pdf with editorial license granted to the Chair (or his appointed agent) as liaison communication from the IEEE 802.3 Working Group to the Ethernet Alliance.

Move: Chad Jones

Second:

Thank You