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|                 8802-3/802.3 REVISION REQUEST 1168         |        2
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DATE:                   19th Jul, 2005                                          5
NAME:                   IEEE PoEP Isolation Ad Hoc                              6
COMPANY/AFFILIATION:    IEEE PoEP Isolation Ad Hoc                              7
E-MAIL:                 stds-802-3-poep@ieee.org                                8
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REQUESTED REVISION:                                                            10
    STANDARD:           IEEE Std 802.3-2005                                    11
    CLAUSE NUMBER:      Clause 14, 25, 40 and 33                               12
    CLAUSE TITLE:       10/100/1000BASE-T and DTE Power via MDI                13
                                                                               14
PROPOSED REVISION TEXT:                                                        15
                                                                               16
See attached.                                                                  17
                                                                               18
RATIONALE FOR REVISION:                                                        19
                                                                               20
See the following presentations:                                              21
                                                                               22
http://www.ieee802.org/3/poep_study/public/jul05/peker_1_0705.pdf             23
http://www.ieee802.org/3/poep_study/public/jul05/patoka_1_0705.pdf            24
http://www.ieee802.org/3/poep_study/public/jul05/law_1_0505.pdf               25
http://www.ieee802.org/3/poep_study/public/jul05/law_1_0705.pdf               26
                                                                               27
IMPACT ON EXISTING NETWORKS:                                                   28
                                                                               29
This new text will not make any existing conformant equipment non-            30
conformant or non-interoperable.                                              31
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|  Please attach supporting material, if any                          |        35
|  Submit to:- Bob Grow, Chair IEEE 802.3                             |        36
|             E-Mail: Bob.Grow@intel.com                             |        37
|                                                                     |        38
|             +------- For official 802.3 use -----------+           |        39
|             | REV REQ NUMBER: 1168                      |           |        40
|             | DATE RECEIVED: 19th Jul, 2005             |           |        41
|             | EDITORIAL/TECHNICAL                       |           |        42
|             | ACCEPTED/DENIED                           |           |        43
|             | BALLOT REQ'D YES/NO                       |           |        44
|             | COMMENTS: 20-July-05 Ver: D1.0 Status: R  |           |        45
+-------------+-------------------------------------------+-----------+        46
| For information about this Revision Request see -                   |        47
|http://www.ieee802.org/3/maint/requests/revision_history.html#REQ1168 |       48
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14.3.1.1 Isolation requirement

A MAU that encompasses a PI within its MDI (see 33.1.3) shall meet the isolation requiremnts defined in subclause 33.4.1.

A MAU that does not encompass a PI within its MDI shall provide isolation between the DTE Physical Layer circuits including frame ground and all MDI leads including those not used by 10BASE-T.

This electrical separation shall withstand at least one of the following electrical strength tests.

a) 1500 V rms at 50 Hz to 60 Hz for 60 s, applied as specified in subclause 5.2.2 of IEC 60950-1: 2001.
b) 2250 Vdc for 60 s, applied as specified in subclause 5.2.2 of IEC 60950-1: 2001.
c) A sequence of ten 1500 V impulses of alternating polarity, applied at intervals of not less than 1 s. The shape of the impulses shall be 1.2/50 μs (1.2 μs virtual front time, 50 μs virtual time of half value), as defined in IEC 60950-1.

There shall be no insulation breakdown, as defined in Section 5.2.2 of IEC 60950-1: 2001, during the test. The resistance after the test shall be at least 2 MΩ, measured at 500 Vdc.

Most certainly subject to change.

33.4.1 Isolation

PDs and PSEs shall provide isolation between all accessible external conductors, including frame ground, and all MDI leads including those not used by the PD or PSE.

Note - Any equipment that can be connected to a PSE or PD through a non-MDI connector that is not isolated from the MDI leads needs to provide isolation between all accessible external conductors, including frame ground, and the non-MDI connector.

Accessable external conductors are specified in subclause 6.2.1 b) of IEC 60950-1: 2001.

This electrical separation shall withstand at least one of the following electrical strength tests.

a)   1500 V rms at 50 Hz to 60 Hz for 60 s, applied as specified in subclause 5.2.2 of IEC 60950-1:2001.
b)   2250 Vdc for 60 s, applied as specified in subclause 5.2.2 of IEC 60950-1:2001.
c)   An impulse test consisting of a 1500 V, 10/700μs waveform, applied 10 times, with a 60 second interval between pulses, applied as specified in subclause 5.2.2 of IEC 60950-1:2001.

There shall be no insulation breakdown, as defined in subclause 5.2.2 of IEC 60950: 1991, during the test. The resistance after the test shall be at least 2 MΩ, measured at 500 Vdc.

Conductive link segments that have different isolation and grounding requirements shall have those requirements provided by the port-to-port isolation of network interface devices (NID).

40.6.1.1 Isolation requirement

A PHY that encompasses a PI within its MDI (see 33.1.3) shall meet the isolation requiremnts defined in subclause 33.4.1.

A PHY that does not encompass the PI of a PD within its MDI shall provide electrical isolation between the port device circuits, including frame ground (if any) and all MDI leads. This electrical separation shall withstand at least one of the following electrical strength tests:

a)   1500 V rms at 50 Hz to 60 Hz for 60 s, applied as specified in subclause 5.2.2 of IEC 60950-1: 2001.
b)   2250 Vdc for 60 s, applied as specified in subclause 5.2.2 of IEC 60950-1: 2001.
c)   A sequence of ten 1500 V impulses of alternating polarity, applied at intervals of not less than 1 s. The shape of the impulses shall be 1.2/50 μs (1.2 μs virtual front time, 50 μs virtual time of half value), as defined in IEC 60950-1.

There shall be no insulation breakdown, as defined in Section 5.2.2 of IEC 60950-1: 2001, during the test. The resistance after the test shall be at least 2 MΩ, measured at 500 Vdc.

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Most certainly subject to change.

14.3.1.1 Isolation ~~requirement~~ requirement

A MAU that encompasses a PI within its MDI (see 33.1.3) shall meet the isolation requiremnts defined in subclause 33.4.1.

A MAU that ~~encompasses the PI of a PD within its MDI (see 33.1.3) shall provide isolation between all external conductors, including frame ground, and all MDI leads including those not used by 10BASE-T. A MAU that~~ does not encompass ~~the~~ a PI ~~of a PD~~ within its MDI shall provide isolation between the DTE Physical Layer circuits including frame ground and all MDI leads including those not used by 10BASE-T~~. This electrical separation shall withstand at least one of the following electrical strength tests~~.

This electrical separation shall withstand at least one of the following electrical strength tests.

   a)   1500 V rms at 50 Hz to 60 Hz for 60 s, applied as specified in ~~Section~~ subclause 5.~~3~~2.2 of IEC 60950-1: ~~1991~~2001.
   b)   2250 Vdc for 60 s, applied as specified in ~~Section~~subclause 5.~~3~~2.2 of IEC 60950-1: ~~1991~~2001.
   c)   A sequence of ten ~~2400~~1500 V impulses of alternating polarity, applied at intervals of not less than 1 s. The shape of the impulses shall be 1.2/50 μs (1.2 μs virtual front time, 50 μs virtual time of half value), as defined in IEC ~~60060~~60950-1.

There shall be no insulation breakdown, as defined in Section 5.~~3~~2.2 of IEC 60950-1: ~~1991~~2001, during the test. The resistance after the test shall be at least 2 MΩ, measured at 500 Vdc.

33.4.1 Isolation

The PSE shall provide electrical isolation between the PI device circuits, including frame ground (if any), and all PI leads.

The PD shall provide electrical isolation between all external conductors, including frame ground (if any), and all PI leads.

This electrical isolation shall be in accordance with the isolation requirements between SELV circuits and telecommunication network connections in subclause 6.2 of IEC 60950-1:2001.

PDs and PSEs shall provide isolation between all accessible external conductors, including frame ground, and all MDI leads including those not used by the PD or PSE.

Note - Any equipment that can be connected to a PSE or PD through a non-MDI connector that is not isolated from the MDI leads needs to provide isolation between all accessible external conductors, including frame ground, and the non-MDI connector.

Accessible external conductors are specified in subclause 6.2.1 b) of IEC 60950-1: 2001.

This electrical isolation separation shall withstand at least one of the following electrical strength tests:.

a) 1500 Vrms steady-state 1500 V rms at 50-60 50 Hz to 60 Hz for 60 seconds 60 s, applied as specified in subclause 6 subclause 5.2.2 of IEC IEC 60950-1:2001.

b) An impulse test consisting of a 1500 V 2250 Vdc for 60 s, /700μs waveform, applied 10 times, with a 60 second interval between pulses, applied as specified in subclause 6 subclause 5.2.2 of IEC 60950-1:2001.

There shall be no insulation breakdown, as defined in subclause 6.2.2.3 of IEC 60950-1:2001.

c) An impulse test consisting of a 1500 V, 10/700μs waveform, applied 10 times, with a 60 second interval between pulses, applied as specified in subclause 5.2.2 of IEC 60950-1:2001.

There shall be no insulation breakdown, as defined in subclause 5.2.2 of IEC 60950: 1991, during the test. The resistance after the test shall be at least 2 MΩ measured at 500 Vdc.

Conductive link segments that have different isolation and grounding requirements shall have those requirements provided by the port-to-port isolation of network interface devices (NID).

For NIDs, the requirement for isolation is encompassed within the isolation requirements of the basic MAU/PHY/medium standard (See 14.3.1.1, TP-PMD, and 40.6.1.1.). Equipment with multiple instances of PSE and/or PD shall meet or exceed the isolation requirement of the MAU/PHY with which each is associated.

The requirements for interconnected electrically conducting link segments that are partially or fully external to a single building environment may require additional protection against lightning strikes or other hazards. Protection requirements for such hazards are beyond the scope of this standard. Guidance on these requirements may be found in Section 6 of IEC 60950-1:2001, as well as any local and national codes related to safety.

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40.6.1.1 Isolation requirement

A PHY that encompasses a PI within its MDI (see 33.1.3) shall meet the isolation requiremnts defined in subclause 33.4.1.

A PHY that ~~encompasses the PI of a PD within its MDI (see 33.1.3) shall provide isolation between all external conductors, including frame ground (if any), and all MDI leads. A PHY that~~ does not encompass the PI of a PD within its MDI shall provide electrical isolation between the port device circuits, including frame ground (if any) and all MDI leads. This electrical separation shall withstand at least one of the following electrical strength tests:

a) ~~1500~~ 1500 V rms at 50 Hz to ~~60~~ 60 Hz for ~~60~~ 60 s, applied as specified in ~~Section~~ subclause 5.~~3~~2.2 of IEC 60950~~-~~1: ~~1991~~2001.

b) ~~2250~~ 2250 Vdc for ~~60~~ 60 s, applied as specified in ~~Section~~ subclause 5.~~3~~2.2 of IEC 60950~~-~~1: ~~1991~~2001.

c) A sequence of ten ~~2400~~ 1500 V impulses of alternating polarity, applied at intervals of not less than ~~1~~1 s. The shape of the impulses shall be 1.2/~~50 µs~~ 50 µs (1.~~2 µs~~ 2 µs virtual front time, ~~50 µs~~ 50 µs virtual time ~~or~~ of half value), as defined in IEC ~~60060~~60950-1.

There shall be no insulation breakdown, as defined in ~~Section~~ Section 5.~~3~~2.2 of IEC 60950~~-~~1: ~~1991~~2001, during the test. The resistance after the test shall be at least ~~2~~2 MΩ, measured at ~~500~~ 500 Vdc.