

IEC 60950 (-1) in IEEE 802.3- 2015 and published amendments

802.3 Isolation Ad Hoc

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IEC 60950 and 60950-1 locations

- 119 occurrences in the IEEE Std 802.3-2015
- Clauses:
 - 8,9,10,12,14,15,23,25,27,32,33,38,40,41,52,53,55,58,59,60,68,70,71,72,75,84,86,87,88,89,93,94,95,Annex 83A,Annex 83B, Annex 86A
- Also occurs in the following amendments currently published.
- IEEE Std 802.3bw-2015, IEEE Std 802.3by-2016, IEEE Std 802.3bq-2016, IEEE Std 802.3bp-2016, IEEE Std 802.3bn-2016, IEEE Std 802.3bz-2016

Where Used? (IEEE Std. 802.3-2015)

- Normative References

- 2 references (60950:1991, 60950-1)

- Isolation Requirements

- 14 references (Each references the spec more than 1x)
 - 8.3.2, 9.9.3.1, 12.10.1, 14.3.1.1, 15.3.4, 23.5.1.1, 23.12.4.12 (PICS), 25.4.6, 32.6.1.1, 32.13.5.8 (PICS), 33.4.1, 40.6.1.1, 40.12.7 (PICS), 55.5.1

- General Safety

- 63 references
 - 8.7.1, 8.8.6.11 (PICS), 14.7.123.12.4.16, 14.10.4.5.15 (PICS), 23.9.1, 23.12.4.12 (PICS), 23.12.4.16 (PICS), 27.5.1, 27.7.4.11 (PICS), 32.10.1, 32.13.5.11 (PICS), 33.4.1, 33.7.1, 33.8.3.9 (PICS), 38.7.1, 38.12.4.5 (PICS), 40.9.1, 40.12.10 (PICS), 41.4.1, 41.6.4.11 (PICS), 52.10.1, 52.15.3.11 (PICS), 53.10.1, 53.15.4.5 (PICS), 55.9.1, 55.12.9 (PICS), 58.8.1, 58.10.3.6 (PICS), 59.8.1, 59.10.3.6 (PICS), 60.10.1, 60.12.4.12 (PICS), 68.10.3.5 (PICS), 70.9.1, 70.10.4.5 (PICS), 71.9.1, 71.10.4.6 (PICS), 72.9.1, 72.10.4.7 (PICS), 75.8.1, 75.10.4.19 (PICS), 84.10.1, 84.11.4.5 (PICS), 86.9.1, 86.11.4.5 (PICS), 87.9.1, 87.13.4.6 (PICS), 88.9.1, 88.12.4.6 (PICS), 89.8.1, 89.11.4.5 (PICS), 93.10.1, 93.11.4.5 (PICS), 94.5.1, 94.6.4.6 (PICS), 95.9.1, 95.12.4.5 (PICS), 83A.6.1, 83A.7.7 (PICS), 83B.3.1, 83B.4.6 (PICS), 86A.7.1, 86A.8.4.4 (PICS)

- Regulatory requirements

- 10.8.3

8.3.2.1 Electrical isolation

The MAU must provide isolation between the AUI cable and the coaxial trunk cable. This isolation shall withstand at least one of the following electrical strength tests:

- 1500 V rms at 50 Hz to 60 Hz for 60 s, applied as specified in 5.3.2 of IEC 60950: 1991.
- 2250 Vdc for 60 s, applied as specified in 5.3.2 of IEC 60950: 1991.
- A sequence of ten 2400 V impulses of alternating polarity, applied at intervals of not less than 1 s. The shape of the impulses shall be 1.2/50 μ s (1.2 μ s virtual front time, 50 μ s virtual time of half value), as defined in IEC 60060.

There shall be no isolation breakdown, as defined in 5.3.2 of IEC 60950: 1991, during the test. The resistance after the test shall be at least 2 M Ω , measured at 500 Vdc. In addition, the isolation impedance between the DTE and the coaxial cable shield shall be less than 15 Ω between 3 MHz and 30 MHz.

14.7.1 General safety

All equipment meeting this standard shall conform to IEC 60950-1.

10.8.3 Regulatory requirements

The MAU and medium should consider IEC 60950 in addition to local and national regulations. See IEC 60950 and [B53].

Where used - amendments

- IEEE Std. 802.3bw-2015: 96.9.1(GS), 96.11.4.9 (PICS)
- IEEE Std. 802.3by-2016: 112.8.1(GS), 112.11.4.5 (PICS)
- IEEE Std. 802.3bq-2016: 113.5.1(I), 113.9.1(GS), 113.12.10 (PICS)
- IEEE Std. 802.3bp-2016: 97.9.1(GS), 97.11.13 (PICS)
- IEEE Std. 802.3bn-2016: 100.5.1(GS), 100.7.3.3 (PICS)
- IEEE Std. 802.3bz-2016: 126.5.1(I), 126.9.1(GS), 126.12.9 (PICS)

Inconsistent use of dated references

- Dates to be used when specific sections are referenced.
 - 23.12.4.12: None per IEC 60950: 1991 (dated when not necessary?)
 - 32.6.1.1: Section 5.3.2 of IEC 60950 (Not Dated but should be)

Inconsistent test definition

- For the Isolation test specified there are 3 options which include a pulse test and has two references depending on clause:
 - A sequence of ten 2400 V impulses of alternating polarity, applied at intervals of not less than 1 s. The shape of the impulses shall be 1.2/50 μ s (1.2 μ s virtual front time, 50 μ s virtual time of half value), as defined in **IEC 60950-1:2001 Annex N**.
 - This is also referenced in other clauses as:
 - A sequence of ten 2400 V impulses of alternating polarity, applied at intervals of not less than 1 s. The shape of the impulses shall be 1.2/50 μ s (1.2 μ s virtual front time, 50 μ s virtual time or half value), as defined in **IEC 60060**.
- 33.4.1 electrical strength tests: c) uses 1500 V where all other references are 2400 V. Note that the pulse is also different and this is likely intended (Need assistance from the PoE folks)

Is the current scope of the ad hoc sufficient?

- “There are subclauses titled 'Electrical isolation' throughout IEEE Std 802.3 requiring isolation meet one of three electrical strength tests with references to IEC 60950-1...”
 - Currently there are 14 Clauses with this Isolation text that needs addressing
 - There are 63 instances of IEC 60950 or IEC 60950-1 called out in “General Safety” sub-clauses

How to implement?

- Maintenance Request or amendment project?
 - In general there are only 3 types of references that use almost identical text.