Cl **40** *SC* **40.6.1.1** *P* **12** *L* **14** # 10004

Robert Busse Transition Networks

Comment Type **TR** *Comment Status* **R**

Comment Title: Removal of '(if any)' text
The text, '(if any)', referring to frame ground as something that should be isolated from the MDI leads, is included in clause 40.6.1.1 and is not included in clause 14.3.1.1, nor does it appear in clause 33.4.1. For purposes of notable mention, the '(if any)' text is absent in many other isolation clauses of the IEEE802.3 standard, 12.10.1, 23.5.1.1, 32.6.1.1, 32.13.5.8, and 40.12.7. Why should this text be inconsistent? If there is not a 'frame ground' then the statement is not relevant and if there is something called 'frame ground' it must be isolated. Never-the-less the text should be the consistent, either include the '(if any)' everywhere when referring to the presence of frame ground or get rid of it! The purpose of the corrigendum is, after all, to clarify and correct isolation text and make it less confusing to implementers.

SuggestedRemedy

Remove the '(if any)' text from clause 40.6.1.1. or add the '(if any)' text to all other relevant clauses, 14.3.1.1, 33.4.1, et al. This applies to clauses 12.10.1, 23.5.1.1, 32.6.1.1, 32.13.5.8, and 40.12.7 IEEE802.3 standard as well. The corrigendum falls short of its PAR goal to clarify and correct isolation text and make it less confusing to implementers if this text is not consistent.

Response *Response Status* **W**

REJECT.

The reason 'if any' does not appear in subclause 14.3.1.1, and many others, is that the Clauses they appear in, consider the absence of frame ground to be beyond the scope of the standard. In the case of 10BASE-T for example subclause 14.7.2.2 contains the following warning:

'WARNING It is assumed that the equipment to which the MAU is attached is properly earthed, and not left floating nor serviced by a "doubly insulated ac power distribution system." The use of floating or insulated equipment, and the consequent implications for safety are beyond the scope of this standard.'

In the case of 1000BASE-T, this warning does not exist, therefore the text 'if any' appears.

Motion: Accept the above resolution.

M: M McCormack S:Y Darshan
Y: 11 N: 0 A:0

---ooo000ooo---

The following rebuttal was posted by the commenter to the IEEE 802.3au Task Force reflector:

There are many aspects to this rebuttal due the nature of the response. In addition it is incumbent on the interim committee to explain why comment #10 was accepted and comment #4 rejected in entirety. The response, duplicitous accept/reject criteria, and lack of corrective action is not helpful in fulfilling the intent of the PAR, “Current specifications are confusing to implementers, and consequently we are receiving a significant number of interpretation requests on isolation, and this would be reduced with improved text.”

First of all my intention was to make the text consistent in the standard. As I explained in my comment the inclusion of the words ‘if any’ is not consistent. Even though the ‘if any’ is not necessary or relevant and redundant, I chose to offer in my comment to either keep the ‘if any’ and use the text in all isolation clauses or get rid of it entirely. I don’t know how to explain it any more simply than in my comment. This wordsmith level of comment is the depth I wanted to go but…now that the door has been opened by the response much more needs to be said!

Secondly, if the reason for the ‘if any’ truly is the absence of the ‘WARNING’ statement in Clause 40 then the clarification should properly place the ‘WARNING’ statement where it belongs! This was not part of my original comment but had I known that ‘if any’ was included merely due to the desire to not include the traditional warning statement, I would have made this the focus of my comment. Therefore, the ‘if any’ should be deleted and the proper warning statement included in Clause 40! I also find it interesting that Clause 41 contains the warning and Clause 40 does not given the criteria of Clause 41.1.3.

Thirdly, the response text using the ‘WARNING’ statement is not relevant to my comment. The ‘if any’ text is contained in an isolation requirement clause of a 1000BASE-T and presumably a conformance requirement for the equipment in which it is implemented. Most ‘WARNING’ statements of this nature except the depreciated 10BASE-5 ‘WARNING’ statement (to use a pithy term from the response to comment #8), refer to “…equipment to which the [PHY, MAU, repeater, etc.] is attached is properly earthed….” The ‘if any’ text cannot be referring to frame ground in the example warning text absent in 1000BASE-T since equipment earthing is clearly identified in the warning and not isolation from frame ground. The response to my comment is therefore not a proper one.

Fourthly, the interim committee has fortunately swerved into another area of confusion with regard to isolation and its close relationship with grounding. The so-called warnings are strategically placed in the standard to call attention to the user and provide instructions to avoid injury or death. This may be another topic for future maintenance, but I am on a roll, and this comment response offers the warning as a reason for rejection. According to IEEE style, “Warnings call attention to the use of materials, processes, methods, procedures, or limits that have to be followed precisely to avoid injury or death…Warnings and cautions should start with a clear instruction, followed with a short explanation (if necessary).” Warning statements are also normative. The warning statement(s) used to justify the rejection of the comment begins with an assumption followed by an ‘out of scope’ statement. Okay, what is to be precisely followed? The explanation evidently is ‘out of scope’. The reader is expecting information to avoid injury or death…not an assumption whose explanation is out of scope. In addition some warning statements use ‘earthed’ and some use ‘grounded’. As we know these are not the same from our IEEE100 dictionary; making the warning to prevent injury or lift threat ambiguous.

Fifthly, now that the warning statement has been called into attention, perhaps the text surrounding the warning statement should also be examined; this too for a subsequent maintenance request. Clause 27 text nearby to the warning statement direct those implementing an external PHY to ‘mechanically’ ground the PHY via the ground signals of the MII connector. Where are these ‘ground signals’ defined? Are they the power return

common? The shield evidently can be used, tying common to shield? Is this safe? The Clause 30 version specifies 'circuit ground'. Where is 'circuit ground' defined? Perhaps these are the return common as well. So much more to do in maintenance if isolation and its close relative grounding are to be clarified.

Sixth and most provocative is the ramification of warning statement clarification. It is normative, therefore all IEEE802.3 devices claiming conformance must follow the requirement and being a warning as well makes it especially outstanding in nature. This conformance statement therefore requires ALL devices claiming compliance to IEEE802.3 MUST be earthed. (I won't get into what doubly insulated power distribution is…that is another confusing choice of words all by itself.) It could be argued that doubly insulated Class II equipment is properly earthed by its definition.

However, the warning specifically identifies floating (Humm…I wonder what floating means?) and doubly insulated AC power distribution as not part of the standard. (What is a doubly insulated power distribution system anyway? IEEE100 does not define this but it does define 'floating'!) Instantly, all unearthed devices no longer can claim conformance to IEEE802.3. Wow, this may be of interest to not only IEEE's legal Dept. but many others as well if claims of IEEE802.3 conformance are falsely made to doubly insulated, 'floating', unearthed, non-conductive plastic enclosed equipment! Many manufactures may be shocked to find their products are not in conformance to the IEEE802.3 standard…no pun intended! Of course if IEEE802.3 equipment can be unearthed, doubly insulated (Class II) then perhaps it is really in conformance after all…? We then have unearthed accessible conducting metal and non-conductive plastic Class II enclosures; but of course due to the definition of chassis and ground the standard has always had unearthed chassis and enclosures as part of the standard independent of the warning. What about those warning statements that have 'grounded' instead of 'earthed'? Should they be changed to earthed or should perhaps all the warnings follow the IEEE style?

Cl **33** *SC* **33.4.1** *P* **11** *L* **20** # 10005

Robert Busse — Transition Networks

Comment Type **TR** *Comment Status* **A** *Global*

Comment Title: Definition/Specification of an accessible external conductor

According to the IEEE Style rules notes in the standard are just that, notes, and as such are not part of the standard and do NOT have to be followed or respected for devices to be compliant with the standard. Also, the IEC60950 test for accessible conductors need not be followed; thus allowing any exposed metal enclosure areas and terminal blocks, etc. to become essentially non-isolated from the MDI leads. Also, any equipment attached to the non-MDI connector, hardwired excluded, need not comply with the isolation statement of the note to be compliant with the standard. Also, if there is not specifically a physical connector then there is the distinct interpretation that isolation is not required even in the absence of the style issue.

The corrigendum falls short of its PAR goal to clarify and correct isolation text and make it less confusing to implementers if this text is part of a note and not required for compliance to the IEEE802.3 standard.

SuggestedRemedy

Remove the 'note' distinction of clause 33.4.1 and use a 'SHALL' statement as follows: Any equipment that can be attached to a PSE or PD as part of the MDI port circuit elements that is not isolated from the MDI leads shall provide isolation from the MDI leads and all accessible conductors, including frame ground. Accessibility of external conductors shall be determined by subclause 6.2.1b of IEC60950.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

The note will be promoted to normative text and included in the paragraph above.

Note - Notes in body are informative, notes in figures and tables are normative.

Cl **14** *SC* **14.3.1.1, 33.4.1, 40.6.1.** *P* **10, 11, 12** *L* **14, 2** # 10006

Robert Busse Transition Networks

Comment Type **TR** *Comment Status* **A** *Global*

Comment Title: Frame Ground undefined, 'All accessible conductors' clarifying text

Since the term 'Frame Ground' appears to be an IEEE802.3 term, not found in IEC60950, and a term used by Bellcore now Telcordia to describe relay rack frames and circuit pack structures, I was pleased to see 'all accessible conductors, including frame ground' in the draft in clause 33.4.1. I have also found an interpretation from the IEEE802.3 committee equating 'frame ground' with 'chassis ground' another term whose definition is elusive within IEEE802.3. Since the 802.3 standard refers much to IEC60950 it is curious that the definitions of IEC60950 are not used for the enclosure and protective earthing or protective bonding conductor or a reference made to a Bellcore/Telcordia document. Also, since equipment containing IEEE802.3 ports can be IEC60950 Class I, II, or III, the range of what is or is not a type of 'ground' or grounded can range from floating metal enclosures, i.e., chassis unearthed, to Isolated Bonding Networks in a CO.

The IEEE802.3 committee through a stroke of genius chose to add the text, 'all accessible external conductors' to the list of what is to be isolated from the MDI leads. Unfortunately, I was not pleased to find it absent in clauses 14.3.1.1 and 40.6.1.1. Note, there are also many other places the standard where 'frame ground' appears and is ambiguous such as clauses 12.10.1, 23.5.1.1, 32.6.1.1, 32.13.5.8, and 40.12.7. Is frame ground exposed enclosure metal if it is not actually earthed or is it a name only? What does grounded mean anyway? Is it the IEC60950 functional ground or protective ground or perhaps floating metal called frame ground in a Class II device? Or is floating metal not specifically called frame ground exempt? The premise for isolation is user protection from exposure to telecom voltages due to accidental or incidental coupling and/or fault conditions with or without the presence of POE elements. It would seem that a clear definition would be useful in all isolation clauses not just 33.4.1. The added text, 'all accessible conductors' does just that!

SuggestedRemedy

Add the text 'all accessible conductors' to clauses 14.3.1.1 and 40.6.1.1. This text should be added to all other places in the standard referring to 'frame ground' such as clauses 12.10.1, 23.5.1.1, 32.6.1.1, 32.13.5.8, and 40.12.7. The corrigendum falls short in its PAR goal to clarify and correct the isolation requirements to make implementation less confusing. This text would remove all the subjective interpretation of the definition of 'frame ground' by clearly stating all accessible conductors, including frame ground shall be isolated from the MDI leads. An IEC reference for 'Frame Ground' as protective bonding conductor should also be included.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Based on the interpretations referenced, 5-03/03 - Item 1 (1BASE5 Isolation), available at the URL -[http://www.ieee802.org/3/interp/interp-5-0303.pdf], will add a definition that states that 'Frame Ground' is the same as 'Chassis Ground' as well as the reference to IEEE 100 that contains the definition of Chassis.

---ooo000ooo---

The following rebuttal was posted by the commenter to the IEEE 802.3au Task Force reflector:

I am pleased that some corrective action is to be taken but the response is not sufficient even though my comment was accepted by the interim meeting attendees. The obvious is that the response and corrective action simply does not respond to the comment. Moreover it is not helpful in fulfilling the intent of the PAR, “Current specifications are confusing to implementers, and consequently we are receiving a significant number of interpretation requests on isolation, and this would be reduced with improved text.”

If IEEE100 actually defined ‘Chassis’ as opposed to using the phrase, “(1) …conducting connection to chassis or frame,” or (2, 3) subrack in accordance with… or as specified in IEC60050” the reference may be helpful. According to IEEE100 a chassis is a conducting connection to a chassis. What does this mean? I know what a subrack is, not unlike that which is described in my comment; subracks in frames. There is no indication that the chassis, still illusive in definition, is anything more than a conducting connection and mechanism for securing a circuit pack in a rack frame (subrack). We will need to make a leap and subjectively include other mechanisms in the definition of ‘chassis’ if not a subrack as referenced in IEEE100. By the way, the IEEE100 reference to IEC60050 subrack cannot be found in IEC60050. Neither I nor the IEC Office of the Terminology Committee chair, with whom I have been in contact, is able to find the definition of subrack in IEC60050!

The chassis or frame or the enclosure of a device may very well be an ‘accessible conductor’. If it is then we would not have to call it out separately from ‘frame ground’. But perhaps the chassis or frame or the enclosure of a device is not a conductor…wait…not so in terms of IEEE100! Clearly a chassis per IEEE100 is a conductor. Non-conductive chassis do not fit within the definition. Chassis must be conductive. Enclosures presumably could be chassis if conductive. Nonconducive enclosures are not chassis. Enclosures may be chassis if conductive on the inside but not on the outside making the conductor non-accessible. I will expand on this in the discussion of comment #7 response.

It would seem that including ‘accessible conductor’, albeit perhaps redundant with chassis, in all clauses containing isolation text as the remedy suggests does remove ambiguity. There is not a subjective interpretation of the definition of a chassis or if a subrack is really a chassis or if an enclosure is a chassis, but only what is conductive… I don’t know how to make use of the chassis definition as a connection to a chassis as a recursive definition.

Now for the ‘ground’ part of frame ground or chassis ground since the response and the 5/3/1993 interpretation response has made them synonymous. We now know that the chassis is a conductive connection. What is ground? Looking to IEEE100 once again as our authoritative reference, we find that it is a (1,2) transmission path to earth…or to a body that serves in place of earth, or a (3,4) conducting connection intentional or accidental to earth. I find it interesting that
ground also means an accidental conducting connection even if it is unintended; as in Class II metal enclosures providing an incidental ground. It is certainly possible to accidentally ‘ground’ the enclosure of Class II equipment to earth or other entity

Therefore, frame ground AKA chassis ground is a transmission path or conducting connection which includes unintended conductive connections; examples of which may be

accessible conductors or perhaps metallic enclosures of double insulated equipment…if any conductive enclosure is considered an IEC60050 subrack that is. Ground is not earth, grounding is not earthing, grounded is not earthed, and equipment with a ground (conductive connection) may or may not be earthed. Equipment with a ground or use of the term grounded requires a transmission path reference or an object, e.g., grounded to earth, grounded to the airframe, grounded to the vehicle frame, etc. When the term 'ground' or 'grounded' is used, the following question should always be asked, "To what?" Many readers of this text have likely, "Shorted a signal to ground." Meaning the signal was grounded to power return common. Not many of you mean you connected it to dirt (earth).

It would seem that including 'accessible conductor', albeit perhaps redundant with chassis, in all clauses containing isolation text as the remedy suggests does remove ambiguity. There is not a subjective interpretation of what ground is or if it is intended or accidental, but only what is conductive and accessible. This includes Class II equipment.

Interestingly, IEC60950 defines a protective bonding conductor without ambiguity. It is always an intentional earthing path. Perhaps IEEE's frame ground should be better defined by the IEC's protective bonding conductor if indeed frame ground is intentional grounding to earth.

Would it not be infinitely clearer and far less confusing for users of the IEEE802.3 standard to have consistent text and helpful references? Please refer to the PAR intent included above.

Cl **14** *SC* **14.3.1.1, 33.4.1, 40.6.1.** *P* **10, 11, 12** *L* **25, 3** # 10007

Robert Busse Transition Networks

Comment Type **TR** *Comment Status* **R** *Global*

Comment Title: Isolation Compliance/Insulation Breakdown Requirement Ambiguous

All clauses in this draft, 14.3.1.1, 33.4.1, and 40.6.1.1 have three components two of which are steady state, subparts A and B, in nature requiring application of a test voltage for a period of time and a third, subpart C, requiring application of impulse voltage. There is a wealth of interpretation and subjectivity here. Subpart A and B refer to IEC 60950 5.2.2 but...IEC 5.2.2 has to do with power mains primary and secondary circuits, not telecommunications circuits. Note, I won't mention the many other parts of the standard that also refer to IEC 60950 5.2.2 or 5.3.2 in older revisions of the standard. IEC60950 6.2.2 is the proper reference and appropriate for telecom port testing. The 5.2.2 reference and prior IEC60950 5.3.2 references are misleading and confusing.

Now it is understood that the voltage is to be 'applied' as specified as in IEC 60950 5.2.2. So the first thing we do is we ignore the voltage tables of IEC60950 5.2.2 and look only at the voltage application method. So what is a failure, i.e., what is insulation breakdown? Is it just the final resistance being less than 2M ohm measured at 500 volts? Or perhaps a failure is unsuccessful application of voltage as it is being elevated gradually. (What is gradual?) Or perhaps a failure is a single corona discharge or rapid increase in current during ramp up to the test voltage. (What is rapid?) Or is a failure to achieve the 60 second duration specified? Perhaps it is all of the aforementioned. Since passing the isolation test doesn't necessarily mean that the device tested will be operational after the test, perhaps a single discharge is all that will occur...if the test current limit is high enough to vaporize the offending circuit elements.

Does this sort of test meet passing criteria and the intent of proper isolation? There is no current limit specified in IEC60950 clause 5.2.2, only the 'rapid increase of current', whatever that means. However, there is a current specification is IEC60950 6.1.2. There is no requirement for 'fail-open' safety-like devices to be used for crossing the isolation boundary as in power mains isolation. The criteria of 2M ohms with a 500V test voltage can only be guaranteed by use of proper recognized specified devices. This is likely 'out-of-scope' for the IEEE802.3 standard and thus makes this element of the IEEE802.3 standard subjective and not a standard at all as port circuit elements without specified, deterministic isolation properties may be used.

Also, how does one judge single corona discharge for the application of impulses as described in subclause C using IEC60950 5.2.2 for insulation breakdown criteria? If the test is an entire sequence of ten impulses, then does a single corona discharge event for ALL ten impulses constitute a failure? Or does this mean that the application is only a single discharge for the test duration of ten and there be one discharge for each impulse as in IEC60950 6.2.2? Subpart C isolation breakdown as defined in IEC60950 5.2.2 is inappropriate for subclause C. IEC60950 clause 6.2.2 should be used instead where oscillograms are used for evaluation. There is not a way to evaluate insulation breakdown of impulse testing using IEC60950 5.2.2. The impulse test becomes purely subjective when evaluated according to IEC60950 5.2.2 in contradiction to IEC60950 itself unless IEEE802.3 provides the evaluation criteria.

In fact, the evaluation criteria of IEC60950 6.2.2 should be used throughout even for

subclauses A and B as IEC60950 refers to IEC60950 5.2.2 for steady state testing! This should be the case for all 802.3 ports and not just PSE and PD ports. Note, this should be changed in all references to isolation in the 802.3 standard. Perhaps a subsequent interpretation/maintenance request! IEC60950 5.2.2 references should be IEC60950 6.2.2! Only the waveform should be changed for non-powered IEEE802.3 ports satisfying the 1.2/50 waveshape. Ethernet ports are indeed more like telecom ports than primary or secondary power circuits.

The last issue is with the selection of IEC60950 6.2.1b. If the reference is for the test finger only perhaps the reference is proper. However, when evaluating the impulse test insulation breakdown, there is opportunity for confusion as to the evaluation criteria. Certainly unearthed conductive parts should be considered accessible conductors. The A criterion is based on the equipment parts as defined in 6.2.1a,b, c. So even though the 6.2.1b is chosen for the finger test, insulation breakdown may be evaluated according to 6.2.1a,b, c criteria...or is it? This will only be an issue when the IEC60950 reference to 5.2.2 is changed to 6.2.2 since there is no way to non-subjectively evaluate impulse insulation breakdown during impulse testing in IEC 60950 5.2.2.

SuggestedRemedy

This remedy applies to all isolation test clauses in the IEEE802.3 standard as well. Change all IEC60950 5.2.2 references to IEC60950 6.2.2. Make the application of steady state testing be for a duration of 60 seconds in all isolation testing clauses; after all 60 seconds is greater than 1 second and appeal for consistency is satisfied. Make the current limit of steady state testing be that of IEC60950 6.1.2. Define insulation breakdown as either a single event for the entire test (all 10 impulses) if no agreement can be reached to more properly refer to IEC60950 6.2.2 and allow oscillogram evaluation for impulse testing. Select the proper reference for equipment as determined by IEC60950 6.2.1 a, b, and c. Specify that port circuit elements that cross the isolation boundary shall be rated for 2400 volts or higher. If the IEEE802.3 standard requires 2400 volts of isolation then why can't it be plainly and simply specified along with the testing criteria? It should be! The way it is now if a single sample of a port circuit can be evaluated and pass one of the tests and fail 'open' without the use of properly rated MDI port circuit elements, the device design can be claimed compliant. It is confusing, purely subjective, and confusing to implementers not satisfying the goal of the corrigendum PAR.

Response *Response Status* **W**

REJECT.

Taking 10BASE-T as an example it is considered a SELV circuit by the IEC (see IEC TR62102) and would therefore require no isolation. During the development of 10BASE-T a concern was raised that a 10BASE-T port could be mistakenly patched into a telecom circuit in a patch panel. Due to this the isolation requirements found today in 10BASE-T was included. This isolation requirement was used in subsequently Twisted Pair clauses.

While it could be argued that we simply state that all Twisted Pair ports should be treated as TNV-1 circuits, this requirement would be a significant change from the existing requirements, could render existing implementations and components non-compliant and seems excessive for protecting against a possible short term misconnection.

Further subclause 14.7.1, 33.5.1 and 40.9.1 state that equipment meeting this standard shall conform to IEC 60950. Any requirements in IEC 60950 are therefore in addition to the requirements in IEEE Std 802.3 . Hence if a port type is considered a TNV circuit the requirement to meet IEC60950 subclause 6.2.2 is already there.

In respect to evaluating the definition of isolation breakdown contained in subclause 5.2.2 of IEC 60950, it is beyond the scope and expertise of this group.

Motion to accept this response:
M: M McCormack S:Y Darshan
Y: 12 N:0 A:0

---ooo000ooo---

The following rebuttal was posted by the commenter to the IEEE 802.3au Task Force reflector:

I am displeased that corrective action is not to be taken and my comment was not accepted by the interim meeting attendees. The response itself contains a wealth of information to be clarified. How the interim attendees convinced themselves to suggest IEEE802.3 ports may be treated as TNV-1 circuits in the example is illuminating and worthy of discussion. The response and lack of corrective action simply does not accurately respond to the comment. Moreover it is not helpful in fulfilling the intent of the PAR, “Current specifications are confusing to implementers, and consequently we are receiving a significant number of interpretation requests on isolation, and this would be reduced with improved text.”

Here then is my paragraph by paragraph rebuttal:

Paragraph one…

This paragraph provides good historical information but does not respond to the comment. It does, however, provide an opportunity for rebuttal! It is unclear to me that SELV circuits by mere definition imply no isolation requirement. IEC62102 specifies that 10BASE-T circuits do not ‘require’ earthing. In fact, IEC60950 clearly has provision for ‘earthed’ and ‘unearthed’ SELV circuits. Whether or not SELV circuits are earthed is application dependent. The question is isolation from what? If the isolation term used in paragraph one of the response is referring to the IEEE802.3 self imposed isolation requirement from frame ground then we have the following. Frame ground is an intentional or accidental conductor to earth and SELV circuits need not be isolated from earth. On the contrary IEEE802.3 Twisted Pair ports MUST be unearthed to satisfy implied IEEE802.3 environmental specifications. Must they be isolated from human contact as well to satisfy safety concerns? I will not discuss SELV (earthed or unearthed) isolation from other SELV circuits, et al, which indeed is required by IEC60950 as applied to multi-port devices.

As indicated in a later paragraph in this response the IEEE802.3 standard does contain environmental specifications for installation and network safety. It is not unreasonable to expect equipment attached to the network cabling also provide protection from electrical and safety hazards listed in the IEEE802.3 standard environmental clauses although the environmental clauses refer to network cabling and not specifically to the equipment guided by the IEEE802.3 standard. Isolation is a protection for the user/operator from incidental or accidental contact or coupling of the MDI leads to AC Mains potentials and transient events. Isolation is a remedy to a concern about current return paths making there way

through IEEE802.3 port wiring. Now then, since the isolation text is deemed so important to the IEEE802.3 standard that it is reproduced multiple times in the standard, even though this response declares isolation not necessary, the standard in the area of isolation should be consistent, understood, and verifiable non-subjectively by those implementing the standard!

Now for paragraph two…

While the interim meeting attendees suggested a method albeit patronizing whereby IEEE802.3 Twisted Pair ports could be treated as TNV-1 ports, I did not in my comment text. I merely suggested that the telecom testing procedure of IEC60950 6.2.2 should be used for the isolation testing. I still believe this is correct. IEEE802.3 Twisted Pair ports do not need to become somehow transformed into TNV-1 ports by merely using a test methodology. IEEE802.3 ports are more like telecom ports than power ports. By the logic of the interim attendees, IEEE802.3 ports must therefore obviously become (and have been) power ports. This response illustrates broken logic on the part of the interim attendees. My suggestion is to make proper use of the application and testing found in IEC60950 6.6.2, not redefine IEEE802.3 Twisted Ports. In fact IEC60950 6.2.2 references IEC60950 5.2.2 for steady state testing…TNV ports don't become power ports either!

The real issue and one avoided by the interim attendees and the balloted corrigendum text, is the impossible evaluation of pulse testing via IEC60950 5.2.2. IEC60950 Annex N provides the circuit definition for the impulse generation and Annex S provides the test procedure and oscillogram waveforms for evaluation. There is no association of IEC60950 5.2.2 with Annex N or Annex S. This amounts to essentially the lowering of the IEEE802.3 Twisted Pair port isolation to that of 500 volts…by default; not 1500 volts or 2400 volts as seemingly desired by the standard. The issue is with the word choice, using only the word 'applied' as opposed to 'applied and evaluated' or 'applied and insulation breakdown determined by…' the appropriate IEC600950 text. Perhaps this is intentional; that is not to use the IEC60950 evaluation criteria for IEEE802.3 isolation. That being the case, the steady state testing could be avoided by those implementing the standard in favor of the impulse test, as there is no evaluation criteria to observe the impulse shape for such testing in IEC60950 5.2.2. There is no accounting for transient protection device testing as in IEC60950 6.2.2. There is no specification of polarity in the Subclause 33.4.1 impulse test text as specified in IEC60950 6.2.2. There is not an application criterion that all MDI leads be tied together during the test as in IEC60950 6.2.2. (Perhaps one MDI lead is tested at a time with all others earthed?) Need I go on? Thusly, the isolation evaluation is reduced to 500 volts via the DC resistance test and 500 volts becomes the default isolation requirement if no oscillogram waveform is evaluated or testing criteria provided as in IEC60950 6.2.2.

In addition, I would find it amusing if it were not so serious, that for many years the IEEE802.3 standard has included warning statement(s) with similar text as in the response to comment #4 to instruct the user of possible injury or death. A warning is specifically defined by IEEE style. The comment #7 response to proper evaluation of such protection isolation is dismissed, rejected. Evidently, the possible short-term misconnection event in this comment response only represents a brief brush with injury or death…nothing to worry about!

Paragraph three…

I agree with all three factual statements! However, since IEEE802.3 Twisted Pair ports are SELV circuits…these three statements have nothing to do with responding to my comment. My comment is describing ambiguous nature of the isolation requirement and the ambiguous nature of the insulation breakdown requirement.

Paragraph four…

If any member of the interim group read IEC60950 5.2.2, they would find no evaluation criteria for impulse testing. Furthermore, how can responses to comments on the corrigenda be formulated by those not familiar with the referenced standard? Additionally, how can the corrigenda comments legitimately be rejected, or accepted for that matter, by individuals not knowledgeable of the vary criteria in IEC60950 referenced by the IEEE802.3 standard? I therefore believe that this statement in the response must be in error. The interim attendees did not abstain from voting due to lack of expertise. Indeed, all attendees voted unanimously in agreement that they had not the expertise.

Additional Comment about response to Clause 33.4.1 specification of IEC60950 6.2.1b…

The response from the interim committee did not include a response to my comment with respect to the IEC60950 6.2.1b reference. First of all I would like to point out that IEC60950 6.2.1 refers to TNV-1 and TNV-3 circuits. At this point we should all be in agreement that SELV IEEE802.3 ports do not become transformed into TNV-1 ports by utilizing the test methodology of this section of IEC60950. Therefore, since we have determined that frame ground may be unearthed by definition using IEEE100 as the authoritative reference and conductive Class II enclosures are likely chassis acting as a transmission path incidental ground, I contend that IEC60950 6.2.1a as well as IEC60950 6.2.1b should be used to evaluate accessibility. Furthermore, since Clause 33.4.1 includes text that identifies equipment can be connected to the PSE or PD through a non-MDI connector, I contend IEC60950 6.2.1c also applies. A physical non-MDI connector is used to connect to other equipment as defined in IEC60950 6.2.1c. I contend therefore that impulse testing for ALL IEEE802.3 isolation clauses must refer to IEC60950 6.2.1 as a whole including all sections 6.2.1a-c…and of course be evaluated by using IEC60950 6.2.2!

Cl **99** *SC* **Various** *P* **NA** *L* **NA** # 10008

Robert Busse Transition Networks

Comment Type **TR** *Comment Status* **R**

Comment Title: Corrigendum Does not adequately meet PAR objective

I take this opportunity to document and identify all IEEE802.3 clauses requiring attention that the corrigendum should address but does not or does not address adequately. This comment may very well be ruled 'out of scope' and therefore, I will plan a follow-up with an Interpretation/Maintenance Request to formalize and further document the issues.

The clauses that demand update and correction are as follows; all having either reference to only 'frame ground' and not accessible conductors, insulation test reference incorrect in IEC60950, improper insulation breakdown specification requirements for impulse testing, or simply unclear phrasing of text to be consistent with all other isolation text in the IEEE802.3 standard:

IEEE802.3 Clauses 8.3.2.1, 9.9.3.1, 12.10.1, 14.3.1.1, 15.3.4, 23.5.1.1, 23.12.4.12, 32.6.1.1,
32.13.5.8, 40.6.1.1, 40.12.7.

I also do not agree with the reference to IEC60950-2001 when there as a 2005 addition available. This corrigendum is being published in 2006 and therefore outdated at publication unless the references are made to the IEC60950-2005 document.

In addition, if the corrigendum does not take into account all of the above clauses of IEEE802.3 for update then there are dramatic differences in the standard regarding isolation. The reader is left to wonder why some requirements and references are different, e.g., various clauses reference one version of the same document and others reference an update. Why?

Furthermore, the exclusion of an update to the 100base-tx isolation is unjustifiable. Just because the FDDI PMD is used for 100base-tx is no reason to avoid an update to bring this part of the standard into consistency with the remainder of the document. Clauses 25.2, 25.3.and 25.4 are in place to provide a mechanism for exceptions and enhancements to the FDDI TP-PMD usage for 100base-tx. Not to take advantage of this corrigendum as a fresh start to bring the isolation enhancement to the 100base-tx is shortsighted and overall a detriment to the standard and its implementation. The corrigendum can provide much needed opportunity to identify and correct errors, deficiencies, and omissions in the FDDI TP-PMD as it is currently when used for 100base-tx. No, I am not proposing the IEEE802.3 committee can make changes to the ANSI X3-263 document! The corrigendum provides an official date of acceptance to grandfather in implementations that have taken advantage of the lack of isolation required by the FDDI TP-PMD. IEEE802.3 100base-tx implementations after the corrigendum date must adhere to the enhanced isolation requirements consistent with all other isolation clauses of the IEEE802.3 standard. Perpetuating inconsistencies is unacceptable especially when there is this corrigendum opportunity.

SuggestedRemedy

Add the following to the corrigendum: add enhanced FDDI TP-PMD isolation requirement to 100base-tx consistent with all other isolation clauses of the IEEE802.3 standard, reference IEC60950-2005 throughout the IEEE802.3 standard, update all clauses listed above to make them consistent with one another in terms of the isolation requirement and insulation testing thereof and include the text, 'all accessible conductors', to further define those elements requiring isolation from the MDI leads making a reference to 'frame ground' only less subjective. An IEC reference for 'Frame Ground' as protective bonding conductor should also be included.

Response *Response Status* **W**

REJECT.

Subclauses 8.3.2.1, 9.9.3.1, 12.10.1, 23.5.1.1, 23.12.4.12, 32.6.1.1, 32.13.5.8 are deprecated since these MAU/PHYs are not recommended for new installations and we are not aware of any new designs being implemented. Maintenance changes are therefore no longer being considered for this clause hence maintaining the references to the old documents, as well as the existing text is consistent.

The commenter is invited to submit a Maintenance Request for subclause 15.3.4. In respect to subclauses 14.3.1.1 and 40.6.1.1, updates to these subclauses are already included in the draft.

2005 Edition of IEC 60950:
The document hasn't been available to the group and therefore we cannot determine where the reference should be to. The commenter is invited to provide updated references to the 2005 edition.

100BASE-TX Isolation:
See response to comment #30.

Motion: Accept above response.

M: Y. Darshan S: D. Feldman
Y: 7 N: 0 A:1

---ooo000ooo---

The following rebuttal was posted by the commenter to the IEEE 802.3au Task Force reflector:

My rebuttal…

Here then is my paragraph by paragraph rebuttal:

Paragraph one…

Okay, maintenance changes are no longer being considered for the clauses identified in the comment hence maintaining the references to the old documents, as well as the existing text is deemed consistent. I understand the desire not to maintain clauses that are no longer supported provided they are clearly identified and published as such. Perhaps the interim committee can provide reference to the date maintenance ceased on these clauses and the recommendation that the clauses not be used to guide new designs. Have these clauses been withdrawn? If so what is the published withdrawal date? Also, I did not realize that the IEEE802.3 committee was to be informed of all new designs. I also cannot

find the PAR exclusion making depreciated clauses exempt from clarification; perhaps the interim committee can provide the PAR reference.

But wait! Comment #25 was accepted! There must be something misunderstood. Maintenance according to the above has been suspended on these clauses. Ms. Thaler suggested that there could be, "…some risk of injury if the user assumes…" if a warning is not included. Presumably risk of injury to the user and not to the equipment. The interim committee by their response changed the risk to that of the equipment failure by using a 'caution' statement, meaning damage to the equipment. Does this mean the interim committee attendees do not believe there can be injury to the user as Ms Thaler suggested? According to IEEE style, I see no clear instruction but rather just indication of a prior change to the standard.

Nevertheless, it is difficult for this commneter to understand the duplicitous nature of the interim committee. A maintenance change to an area of the standard not to be maintained was approved to add a cautionary statement regarding isolation and an update to the depreciated clauses to clarify the evaluation of the vary isolation cautioned properly is rejected. Specific comment contents notwithstanding, I challenge directly the interim committee attendees to explain why Ms. Thaler's comment to depreciated clauses is favored and accepted and my comment to depreciated clauses is not.

Paragraph two…

I shall submit the suggested maintenance request to subclause 15.3.4 among others including 14.3.1.1 and 40.6.1.1, et al.

Paragraph three…

I shall provide the suggested references. For purposes of updating the references, IEC609502005 6.2.1, IEC60950-2005 6.2.2, IEC60950-2005 Annex N, and IEC60950-2005 Annex S are the pertinent references, i.e., the same as IEC60950-2001.

Paragraph four…

Maintenance request forthcoming dependant on the actual textual content of Clause 25.