Cl **00** *SC* **0** *P* **25** *L* **6** # r01-7

Anslow, Peter — Ciena Corporation

Comment Type **E** *Comment Status* **X**

Once an amendment has been approved and published the 'P' in the designation is removed, hence IEEE Std P802.3bk-2013 should read IEEE Std 802.3bk-2013.

SuggestedRemedy

Change 'IEEE Std P802.3bk-2013' to read 'IEEE Std 802.3bk-2013' throughout the draft.

Proposed Response *Response Status* **O**

Cl **01** *SC* **1.4.52b** *P* **25** *L* **39** # r01-20

Rolfe, Benjamin — Blind Creek Associate

Comment Type **TR** *Comment Status* **X**

The resolution to comment I-8 fails to provide an valid reason for rejecting the comment. The statement identified in comment I-8 constitutes information not appropriate in a definition as defined by the ieee style manual. This standard does not meet the requirements stated therein, and no valid reason is given for correcting the deficiency. The resulting error hides potentially important information in a non-normative clause, which may lead to implementation errors and interoperability issues (thus it is a technical issue). Admitting that a a normative requirement is stated in non-normative language reinforces the need to correct the draft.

SuggestedRemedy

Implement the proposed resolution to I-8 and remove extraneous text from the definition of the term and ensure that normative characteristics are properly contained in appropriate normative clauses. Alternately delete the definition.

Proposed Response *Response Status* **O**

Cl **45** *SC* **45.2.1.100** *P* **59** *L* **36** # r01-2

Marris, Arthur — Cadence Design Syst

Comment Type **T** *Comment Status* **X**

Add enable for transmitter linearity test pattern in Table 45-73 and reference it in Clause 94

SuggestedRemedy

1.1501.11 Transmitter linearity test pattern enable
1 = Enable transmitter linearity test pattern
0 = Disable transmitter linearity test pattern

Proposed Response *Response Status* **O**

Cl **45** *SC* **45.2.1.88a** *P* **46** *L* **6** # r01-8

Anslow, Peter — Ciena Corporation

Comment Type **E** *Comment Status* **X**

The tables inserted as Table 45-67b and 45-67c are the first tables being inserted after Table 45-67 so they should be Tablse 45-67a and 45-67b. (This incorrect numbering is probably due to the insertion of Table 45-15a above them in the draft.)

SuggestedRemedy

Re-number the tables as Tables 45-67a and 45-67b

Proposed Response *Response Status* **O**

Cl **45** *SC* **45.2.1.98a** *P* **61** *L* **13** # r01-13

Szczepanek, Andre — Inphi Corporation

Comment Type **TR** *Comment Status* **X**

Allowing arbitrary non-zero polynomial seeds (via seed_i) breaks the uniqueness property of the training frame delimiter (0x00FF0000). Any seed that creates a PRBS pattern starting with 8 or more zero bits combined with a status report ending in 3 zero bits will create a false training frame delimiter, if there are an even number of DM transitions in the DM payload. If this occurs at training start there is a 50% probability of a consistent false lock.

SuggestedRemedy

Add this sentence to the end of the paragraph :
"If the default seed values are not used, the values used must be selected carefully. Seed values that produce a PRBS sequence starting with 8 or more zero bits shall not be used."

Proposed Response *Response Status* **O**

Cl **78** *SC* **78.1.1** *P* **82** *L* **48** # r01-9

Anslow, Peter — Ciena Corporation

Comment Type **E** *Comment Status* **X**

The newly added text in 78.1.1 contains six instances of "Clause xx". These should either be cross-references or shown in green.

SuggestedRemedy

Change the six instances of "Clause xx" to cross-references where they exist in the P802.3bj draft and in green where they don't.

Proposed Response *Response Status* **O**

Cl **78** *SC* **78.1.1** *P* **85** *L* **4** # r01-31

Marris, Arthur — Cadence Design Syst

Comment Type **T** *Comment Status* **X**

Alert requests can be sent over XLAUI/CAUI in addition to quiet requests.

SuggestedRemedy

Change:
"transmit quiet requests"
to:
"transmit quiet and alert requests"

Change:
"interfaces infer the quiet request"
To:
"interfaces infer quiet and alert requests"

Add reference to 83.5.11.1 in this paragraph.

Proposed Response *Response Status* **O**

Cl **78** *SC* **78.1.3.3.1** *P* **83** *L* **32** # r01-12

Anslow, Peter — Ciena Corporation

Comment Type **E** *Comment Status* **X**

This paragraph has been modified in the response to comment i-50 (and also considering comment #56 against P802.3bm D2.0).
However, the added sentence "For some PHYs with an operating speed of 40 Gb/s or greater, deep sleep is optional as shown in Table 78-1." is rather confusing.
Table 78-1 does not show anything related to deep sleep being an option for the PHYs in 802.3 as modified by P802.3bj. For all of the PHYs with an operating speed of 40 Gb/s or greater shown in Table 78-1 deep sleep is an option. This sentence would be much clearer if it had the same format as the last sentence of this paragraph concerning fast wake.

SuggestedRemedy

Change the sentence to "Deep sleep is optional for PHYs with an operating speed of 40 Gb/s or greater that implement EEE."

Proposed Response *Response Status* **O**

Cl **78** *SC* **78.1.3.3.1** *P* **85** *L* **32** # r01-16

Marris, Arthur — Cadence Design Syst

Comment Type **TR** *Comment Status* **X**

This paragraph says that deep sleep support is called out in Table 71. This is not true, it will be 802.3bm that will indicate in Table 71 which PHYs do not support deep sleep.

Also it says deep sleep "is similar to the mechanism defined for PHYs with an operating speed less than 40 Gb/s". This is not correct, deep sleep is the mechanism defined for PHYs with an operating speed less than 40 Gb/s. So delete this qualification. It is important to do this because otherwise the explanation of AN in 78.3 will not make sense.

Also there should be an explanation of how fast wake differs from normal operation.

SuggestedRemedy

Change the paragraph so that it reads as follows:
"For PHYs with an operating speed of 40 Gb/s or greater that implement the optional EEE capability, two modes of LPI operation may be supported: deep sleep and fast wake. Deep sleep refers to the mode for which the transmitter ceases transmission during Low Power Idle (as shown in Figure 78-3). Deep sleep support is optional for PHYs with an operating speed of 40 Gb/s or greater that implement EEE and mandatory for PHYs with an operating speed less than 40 Gb/s that implement EEE. Fast wake refers to the mode for which the transmitter continues to transmit signals during Low Power Idle so that the receiver can resume operation with a shorter wake time (as shown in Figure 78-3a). Fast wake support is mandatory for PHYs with an operating speed of 40 Gb/s or greater that implement EEE.

For transmit, other than the PCS encoding LPI, there is no difference between fast wake and normal operation.

Add the following text to the end of the second sentence in the first paragraph of 78.1.3.3.2 PHY LPI receive operation
"If in fast wake mode BIP running disparity is not calculated while in the fast wake state which is entered on reception of the sleep signal."

Proposed Response *Response Status* **O**

Cl **80** *SC* **80.3.1** *P* **111** *L* **52** # r01-22

Marris, Arthur — Cadence Design Syst

Comment Type **TR** *Comment Status* **X**

Clause 74 is the BASE-R FEC

SuggestedRemedy

Change:
RS-FEC (see Clause 74)
To:
BASE-R FEC (see Clause 74)

Proposed Response *Response Status* **O**

Cl **80** *SC* **80.3.1** *P* **121** *L* **52** # r01-3

RAN, ADEE — Intel Corporation

Comment Type **ER** *Comment Status* **X**

Response to comment i-91 against D3.0 was implemented incorrectly:

The sentence starting with "The IS_RX_LPI_ACTIVE.request primitive" relates to clause 74 FEC rather than RS-FEC. The second sentence is badly punctuated (semicolon instead of a period as in the response).

In addition, stating what RS-FEC doesn't do (without referring to clause 91) is unnecessary. Clause 91 is clear enough. The fact that only clause 74 FEC uses this primitive is clearly stated in 80.3.3.6.

SuggestedRemedy

Change

"The IS_RX_LPI_ACTIVE.request primitive is used to communicate to the RS-FEC (see Clause 74) that the PCS has detected LPI signaling. This allows the FEC to use rapid block lock; the RS-FEC does not use this signal."

To

"The IS_RX_LPI_ACTIVE.request primitive is used to communicate to the BASE-R FEC (see Clause 74) that the PCS has detected LPI signaling. This allows the FEC to use rapid block lock."

Proposed Response *Response Status* **O**

Cl **80** *SC* **80.3.3.5** *P* **116** *L* **10** # r01-19

Marris, Arthur — Cadence Design Syst

Comment Type **E** *Comment Status* **X**

For consistency consider changing all instances of:
"Without EEE capability (with the deep sleep mode option)"
To:
"Without EEE deep sleep mode capability"

SuggestedRemedy

Change all instances of:
"Without EEE capability (with the deep sleep mode option)"
To:
"Without EEE deep sleep mode capability"

Proposed Response *Response Status* **O**

Cl **82** *SC* **82.2.18.3.1** *P* **154** *L* **19** # r01-30

Marris, Arthur — Cadence Design Syst

Comment Type **T** *Comment Status* **X**

This comment is against Figure 82-17--LPI Receive state diagram.
Consider adding LPI_FW switch to all transitions out of RX_SLEEP state.

SuggestedRemedy

Add "* LPI_FW = FALSE" qualifier to the three transitions out of the RX_SLEEP state that do not already have a LPI_FW qualifier.

Proposed Response *Response Status* **O**

Cl **82** *SC* **82.6** *P* **164** *L* **49** # r01-4

RAN, ADEE — Intel Corporation

Comment Type **TR** *Comment Status* **X**

Transition condition includes "rx_down_count = 255". According to the response to comment i-104 against D3.0 it should include "rx_down_count = 1".

SuggestedRemedy

In transition from RX_WAKE to RX_ACTIVE, replace "rx_down_count = 255" with "rx_down_count = 1".

Proposed Response *Response Status* **O**

Cl **83** *SC* **83.3** *P* **158** *L* **36** # r01-21

Marris, Arthur — Cadence Design Syst

Comment Type **T** *Comment Status* **X**

Deep sleep mode is actually described in 78.1.3.3.1 rather than 78.3.

SuggestedRemedy

Change cross reference from 78.3 to 78.1.3.3.1.
Page 158 line 36 (or just reference Clause 78 here); also
Page 158 line 54
Page 101 line 38 (Clause 80)
Page 158 line 36, 54 (Clause 83)
Page 166 line 29 (Clause 84)
Page 170 line 30 (Clause 85)
Page 315 line 1 (Clause 94)
Page 379 line 15(Annex 83A)
Page 166 line 29 (Clause 84)

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.10.2** *P* **213** *L* **14** # r01-53

Dudek, Michael — QLogic Corporation

Comment Type **T** *Comment Status* **X**

With the use of COM to specify cables and calibrate the interference tolerance test MDNEXT, MCFEXT, and ICN are only used for the test fixture specifications Note there are no longer any specification numbers for these parameters for the cable.

SuggestedRemedy

Delete the MDNEXT and MDFEXT rows in Table 92-10. Relabel sections 92.10.8, 92.10.9, and 92.9.10 replacing "cable Assembly" with "Test Fixture" and moving them to the end of section 92.11.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.10.2** *P* **238** *L* **8** # r01-39

Dawe, Piers J G — Mellanox Technologie

Comment Type **E** *Comment Status* **X**

92.10.2, Cable assembly insertion loss, is a confusing section because for over a page it goes through a fitting procedure, then doesn't do anything with the answer, then provides limits - but for measured, not fitted?

SuggestedRemedy

Use subclauses to divide the fitted and non-fitted material. Consider putting the non-fitted material first.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.11.1.2** *P* **251** *L* **36** # r01-42

Dawe, Piers J G — Mellanox Technologie

Comment Type **T** *Comment Status* **X**

The HCB reference insertion loss has been reduced by scaling all three terms. Yet slide 12 of diminico_3bj_01a_0114.pdf shows measurements with a little more curvature than the new reference loss.

SuggestedRemedy

Adjust the three coefficients so that the insertion loss is more curved.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.11.3.1** *P* **254** *L* **46** # r01-40

Dawe, Piers J G — Mellanox Technologie

Comment Type **T** *Comment Status* **X**

Now that the minimim mated loss has been increased, there is a larger gap between min and max, degrading measurement accuracy, yet at least at the lower frequencies, performance is clearly better than these specs allow, as shown in slide 8 of diminico_3bj_01a_0114.pdf.

SuggestedRemedy

In eq 92-45, low frequency part, reduce the ~f term but add a quadratic term so that the spec remains continuous at 14 GHz.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.11.3.1** *P* **264** *L* **40** # r01-26

Healey, Adam — LSI Corporation

Comment Type **TR** *Comment Status* **X**

The definition of RMS insertion loss deviation is incomplete. The frequency range for the fitted insertion loss must also be defined.

SuggestedRemedy

Change the second paragraph of 92.11.3.1 to the following. "The RMS insertion loss deviation, ILD_RMS, is calculated according to 93A.4 with f_b=25.78125 GHz, T_t=9.6 ps, and f_r=0.75 x f_b. The fitted insertion loss is computed over the range f_min=0.01 GHz to f_max=25 GHz. ILD_RMS shall be less than 0.13 dB."

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.11.3.3** *P* **254** *L* **6** # r01-43

Dawe, Piers J G — Mellanox Technologie

Comment Type **T** *Comment Status* **X**

The newly relaxed mixed-mode specs for the compliance boards imply that the mixed-mode specs for CAUI-4 (and OIF VSR) must be relaxed also, possibly degrading useful performance and/or requiring that something else must be tightened up.

SuggestedRemedy

Review what compliance board performance is practicable. Can the mixed-mode specs be returned to the D3.0 limits?

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.14.4.5** *P* **273** *L* **24** # r01-34

Palkert, Thomas — Molex Incorporated

Comment Type **GR** *Comment Status* **X**

CA2 references equation 92-25 but the constraints on a1/a2/a4 have been removed so we should not have a PICS related to equation 92-25. Equation 92-28 specifies the ILcmin but does not have PICS.

SuggestedRemedy

In PICS CA2 Change reference from equation '92-25' to equation '92-28'

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.7.12** *P* **197** *L* **22** # r01-23

Healey, Adam — LSI Corporation

Comment Type **T** *Comment Status* **X**

The requirement corresponding to the first line of item b) could be stated more clearly.

SuggestedRemedy

Replace the first sentence of item b) with the following. "In addition to the coefficient update process specified in 72.6.10.2.5, the period from receiving a new request to responding to that request shall be less than 2 ms, except during the first 50 ms following the beginning the start-up protocol. The beginning of the start-up protocol is defined to be entry to the AN_GOOD_CHECK state in Figure 73-11." A similar change is needed in 93.7.12 and 94.3.10.7.5.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.7.12** *P* **197** *L* **23** # r01-48

Dudek, Michael — QLogic Corporation

Comment Type **T** *Comment Status* **X**

It is extremely difficult to understand what is intended here due to poor sentence structure etc. The intent of this comment is not to technically change what is in the draft, but I may have mis-understood the original intent, however the different wording in clause 94 helps.

SuggestedRemedy

Either A - Change the beginning of the section to. "The coefficient update process shall be as specified in 72.6.10.2.5 with the following additional requirements. i) The time to complete the process is 50ms from the beginning of training (as demarcated by the entry to the AN_GOOD_CHECK state in Figure 73-11).
ii) . The period from receiving a new request to responding to that request shall be less than 2ms, where the start of the period is the frame marker of the training frame with the new request and the end of the period is the frame marker of the training frame with the corresponding reponse. A new request occurs when the coefficient update field is different from the coefficient filed in the preceding frame. The response occurs when the coefficient status report field is updated to indicate the corresponding action is complete."
or B - if the intent is that the requirement to respond only starts 50ms after the start of training then delete "In addition to the coefficient update process specified in 72.6.10.25" as it is covered by the first sentence in the section.
Make the same change to 93.7.12 on page 247, and 94.3.10.7.5 on page 340.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.8.3** *P* **199** *L* **17** # r01-51

Dudek, Michael — QLogic Corporation

Comment Type **T** *Comment Status* **X**

With the specification of Signal-to-noise-and-distortion and the use of this specification in COM to qualify the cables it is no longer necessary to have the far end noise specifications for the Tx.

SuggestedRemedy

Delete the Far-end noise rows and also section 92.8.3.5

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.8.3.2** *P* **200** *L* **36** # r01-49

Dudek, Michael — QLogic Corporation

Comment Type **TR** *Comment Status* **X**

With an ASIC that just passes the return loss for TP0a/TP5a and a worst case compliance board it is not possible to pass the host return loss specifications. The return loss of the host being used to test the cables in the COM calculation is worse than the effective host return loss so relaxing this specification will not cause a system issue. A presentation will describe this.

SuggestedRemedy

Change the equation 92-1 to 8.5-0.35*f from 0.01 to 8GHZ, and 3.9-7.4*log(f/14) from 8 to 19GHz. Make the same changes to equation 92-22. Make corresponding changes to figure 92-5.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.8.3.2** *P* **223** *L* **18** # r01-36

Dawe, Piers J G — Mellanox Technologie

Comment Type **ER** *Comment Status* **X**

The graphs in this clause and Annex 92A are bitmaps, with their disadvantages. Unlike others e.g. in 72, 85, 93, 86A.

SuggestedRemedy

Replace with vector graphics.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.8.3.6.1** *P* **226** *L* **49** # r01-38

Dawe, Piers J G — Mellanox Technologie

Comment Type **E** *Comment Status* **X**

This says "the test pattern PRBS9 as specified in 83.5.10", but 83.5.10, PMA test patterns (optional), is a long subclause that's really about controlling the various test pattern modes, not pattern definition. It does say "a PRBS9 pattern (as defined in Table 68-6)". Let's make the document a little more user friendly.

SuggestedRemedy

Cut out the indirection: change "the test pattern PRBS9 as specified in 83.5.10" to "the PRBS9 pattern (see Table 68-6)".
Similarly in 92.8.3.8.
In 92.8.3.9.2, change "a PRBS9 pattern (see 83.5.10)." to "a PRBS9 pattern (see Table 68-6).

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.8.3.6.1** *P* **226** *L* **49** # r01-37

Dawe, Piers J G — Mellanox Technologie

Comment Type **T** *Comment Status* **X**

This says "capture ... per 85.8.3.3.4 with M not less than 32 samples per unit interval." and 85.8.3.3.4, Waveform acquisition, says "The waveform shall be captured with an effective sample rate that is M times the signaling rate of the transmitter under test. The value of M shall be an integer not less than 7." (It's "effective" so that equivalent-time scopes are allowed.)
But there is no need to capture with such high oversampling (nor with integral oversampling): the need is to process the linear fit algorithm with M>=32. Measuring with M=32 with an equivalent-time scope would take longer than needed.

SuggestedRemedy

Change "per 85.8.3.3.4 with M not less than 32 samples per unit interval." to "per 85.8.3.3.4. The captured waveform is resampled so that M is an integer, not less than 32 samples per unit interval."

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.8.3.9.2** *P* **230** *L* **43** # r01-57

Healey, Adam — LSI Corporation

Comment Type **T** *Comment Status* **X**

This comment is submitted on behalf of Vinu Arumugham.
Noise from switching aggressors need to be included.

SuggestedRemedy

All aggressor lane transmitters shall be transmitting PRBS31 pattern with amplitude set to maximum value.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.8.4.2** *P* **232** *L* **45** # r01-41

Dawe, Piers J G — Mellanox Technologie

Comment Type **ER** *Comment Status* **X**

Equation 92-22, for receiver differential input return loss, is just the same as Equation 92-1 for transmitter differential output return loss. Don't waste the reader's time.

SuggestedRemedy

Change "The differential input return loss, in dB, of the receiver shall meet Equation (92-22)." to "The differential input return loss, in dB, of the receiver shall meet Equation (92-1).". Remove Equation 92-22. The PICS RC4 remains.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.8.4.4.3** *P* **211** *L* **5** # r01-52

Dudek, Michael — QLogic Corporation

Comment Type **T** *Comment Status* **X**

Erroneous sentence. The disturbers are to be set to a given amplitude. There can't be 3dB difference between them.

SuggestedRemedy

Delete the sentence "The amplitudes of each of the disturbers should not deviate more than 3dB from the mean of the disturber amplitudes."

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.8.4.5** *P* **236** *L* **45** # r01-58

Healey, Adam — LSI Corporation

Comment Type **T** *Comment Status* **X**

This comment is submitted on behalf of Vinu Arumugham.
The jitter tolerance test is not stressful enough and the SJ spec. is not aligned to Clause

SuggestedRemedy

The test procedure is as described in 92.8.4.4.5 except that during the test the pattern generator sinusoidal jitter frequency and peak-to-peak amplitude are as specified in Table 88-13. In addition, the pattern generator is set to generate 0.05UI BUJ.

Proposed Response *Response Status* **O**

Cl **93** *SC* **93.8.2.4** *P* **236** *L* **45** # r01-59

Healey, Adam — LSI Corporation

Comment Type **T** *Comment Status* **X**

This comment is submitted on behalf of Vinu Arumugham.
The jitter tolerance test is not stressful enough and the SJ spec. is not aligned to Clause

SuggestedRemedy

Receiver jitter tolerance is verified for jitter frequency and peak-to-peak amplitude values specified in Table 88-13.

Proposed Response *Response Status* **O**

Cl **93** *SC* **93.8.3** *P* **231** *L* **34** # r01-44

Dawe, Piers J G — Mellanox Technologie

Comment Type **T** *Comment Status* **X**

The limit for effective total uncorrelated jitter, peak-to-peak is the same 0.18 UI here at TP2 as it is in Table 93-4 At TP0a. As the host channel and connector must add some Gaussian jitter, this seems inconsistent.

SuggestedRemedy

Tweak one of the limits to make room for host channel and connector.

Proposed Response *Response Status* **O**

Cl **93** *SC* **93.9.3** *P* **300** *L* **7** # r01-35

Palkert, Thomas — Molex Incorporated

Comment Type **TR** *Comment Status* **X**

COM results are inconsistent due to VNA resolution at low frequencies and selected DC extrapolation method.

SuggestedRemedy

Change fmin from .05 GHz to .1GHz and specify DC extrapolation method.

Proposed Response *Response Status* **O**

Cl **93A** *SC* **93A.1.2.3** *P* **346** *L* **51** # r01-29

Moore, Charles — Avago Technologies

Comment Type **TR** *Comment Status* **X**

Equation 93A-10 gives a transfer characteristic which is non-causal which will cause difficulties in computing COM. Also equations 93A-11 and 93A-12 are known to be incorrect. We need a new package, and host trace, model.

SuggestedRemedy

A specific proposal will be made in a presentation.

Proposed Response *Response Status* **O**

Cl **93A** *SC* **93A.1.2.3** *P* **347** *L* **7** # r01-50

Dudek, Michael — QLogic Corporation

Comment Type **TR** *Comment Status* **X**

To match the description of the transmission line given on line 32, (and to match the accepted comment i-172), the value of p1 in table 93A-3 needs to be negative not positive.

SuggestedRemedy

Change the value of p1 from "0.106" to "-0.106".

Proposed Response *Response Status* **O**

Cl **93A** *SC* **93A.1.2.3** *P* **411** *L* **38** # r01-27

Healey, Adam — LSI Corporation

Comment Type **TR** *Comment Status* **X**

The transmission line model defined in this Annex is not causal and erroneously uses an f^2 term to model insertion loss deviation. The equations for cascading X 1 mm sections to yield a X mm tranmission line are also inaccurate, especially for shorter, lower loss tranmission lines. These inaccuracies impair the ability of COM to differentiate between acceptable and unacceptable channels.

SuggestedRemedy

Replace the equations in 93A.1.2.3 with equations more grounded in transmission line theory that are causal by construction. Supporting material will be provided that defines a such a model that is a function of 5 real-valued parameters. Replace the parameters and values in Table 93A-3 and Table 92-12 (to be provided as part of the supporting material).

Proposed Response *Response Status* **O**

Cl **93A** *SC* **93A.1.3** *P* **413** *L* **22** # r01-5

RAN, ADEE — Intel Corporation

Comment Type **E** *Comment Status* **X**

The reflection coefficients (Gamma 1 and 2), as defined, are constant across all frequencies, so they need not be a function of frequency. In equation 93A-16 they appear as scalars in the numerator and as functions of frequency in the denominator.

SuggestedRemedy

Delete the (f) arguments after Gamma_1 and Gamma_2, in equation 93A-15 and in the denominator of equation 93A-16 (6 instances total).

Proposed Response *Response Status* **O**

Cl **93A** *SC* **93A.1.4** *P* **403** *L* **39** # r01-15

Marris, Arthur — Cadence Design Syst

Comment Type **E** *Comment Status* **X**

Equation 93A-17 is truncated

SuggestedRemedy

Fix to make H(k) visible. Also fix text on lines 43 and 45.

Proposed Response *Response Status* **O**

Cl **93A** *SC* **93A.1.6** *P* **415** *L* **42** # r01-33

Mellitz, Richard — Intel Corporation

Comment Type **GR** *Comment Status* **X**

Equation 98A-28 essentially reduces a to proportion of channel attenuation times (sigma_e+sigma_n) but divided by (L-1). The effect of sigma_e + sigma_n is not affect by levels. The impact it requires a lower sndr level for clause 94.

SuggestedRemedy

In equation 98A-28 change As to As*(L-1)
In table 94-13, page 356 line, 35 change SNDR to 33
And
In table 94-17, p373, line 42change SNR_TX to 33

Proposed Response *Response Status* **O**

Cl **93A** *SC* **93A.1.6** *P* **415** *L* **42** # r01-28

Healey, Adam — LSI Corporation

Comment Type **T** *Comment Status* **X**

The parameter SNR_TX is set to the minimum SNDR required from compliant transmitters. The value of SNR_TX is used to define a noise source with variance sigma_TX^2 which presumably accounts for the degradation in performance due to minimum SNDR. However, the expression for sigma_TX^2 includes factors of sigma_X^2 and (A_s/R_LM) = h(0)(t_s)/(L-1). The definition of SNDR is 10*log10(p_max^2/(sigma_e^2+sigma_n^2)). If we take sigma_e ~ 0 and p_max ~ h(0)(t_s) then we find the effective SNDR for the COM transmitter to be about 10*log10((L-1)^2/sigma_X^2)+SNR_TX. For 100GBASE-CR4 and 100GBASE-KR4, L = 2 and the SNDR of the COM transmitter is SNR_TX as expected. For 100GBASE-KP4, the SNDR of the COM transmitter is 12 dB better than SNR_TX. This seems inconsistent with the notion of representing worst-case impairments.

SuggestedRemedy

Remove the extraneous factors and change Equation (93A-28) to sigma_TX^2 = h(0)(t_s)^2*10^(-SNR_TX/10). Adjust the SNDR limit for 100GBASE-KP4 transmitter and corresponding value for SNR_TX as necessary.

Proposed Response *Response Status* **O**

Cl **93A** *SC* **93A.1.6** *P* **416** *L* **11** # r01-14

RAN, ADEE — Intel Corporation

Comment Type **GR** *Comment Status* **X**

Table 93A-1 specifies ranges of values for c(-1) and c(1) without stating which combinations are permitted. It can be implied that any combination of valid c(-1) and valid c(1) is permitted.

On the other hand, the transmitter specifications in clauses 92-94 create minimum requirements for the ratios R_pre and R_post, which implicitly define minimum required values for c(-1), c(0) and c(1). Some combinations of c(-1) and c(+1) imply c(0) which is below its required minimum, so it is not guaranteed that all transmitters will support them.

For example, To reach R_post=4, the required coefficients are c(-1)=0, c(0)=0.62 and c(1) is -0.38; this creates minimum requirements for c(0) and c(1). Similiarly, from R_pre, the minimum requirement for c(-1) turns out to be -0.18. However, if c(-1) and c(+1) would both be set to their minimum values, the value for c(0) would be 0.44 which is below its minimum requirement.

It should be clarified that combinations in which any coefficient is outside its minimum requirement should not be used in COM.

SuggestedRemedy

Add the following sentence after "The FOM is calculated for each permitted combination of c(-1), c(1), and g_DC values per Table 93A-1":

The combination of c(-1), c(1) values is constrained as required by the transmitter full-scale ratio specifications for the Physical Layer that invokes this method.

Proposed Response *Response Status* **O**

Cl **93A** *SC* **93A.4** *P* **355** *L* **19** # r01-56

Dudek, Michael — QLogic Corporation

Comment Type **T** *Comment Status* **X**

ILDrms isn't technically the RMS of the insertion loss deviation. It is the weighted RMS insertion loss deviation

SuggestedRemedy

Change "The RMS insertion" to "The weighted RMS insertion"

Proposed Response *Response Status* **O**

Cl **93A** *SC* **93A.4** *P* **355** *L* **24** # r01-55

Dudek, Michael — QLogic Corporation

Comment Type **T** *Comment Status* **X**

The definition for ILDrms here is different from the definition in OIF CEI 3.1, and has multiple issues (eg. The result depends on the number of samples and it will be a large number because 10^(0) is 1.)

SuggestedRemedy

Change the definition to match that in OIF CEI 3.1. That definition has been provided to the editors. It is square root sum((W(fn)*(ILD(f))^2/N)

Proposed Response *Response Status* **O**

Cl **93A** *SC* **93A.4** *P* **410** *L* **26** # r01-45

Dawe, Piers J G — Mellanox Technologie

Comment Type **E** *Comment Status* **X**

Why fn? I believe in 40 and 100G Ethernet we have tried to use i as the index. N might be the number of points.

SuggestedRemedy

Change fn to fi (7 places) and n to i under the big sigma.

Proposed Response *Response Status* **O**

Cl **93A** *SC* **93A.4** *P* **410** *L* **26** # r01-47

Dawe, Piers J G — Mellanox Technologie

Comment Type **T** *Comment Status* **X**

The ILDrms formula needs a denominator.

SuggestedRemedy

Within the square root, divide by sum(W).

Proposed Response *Response Status* **O**

Cl **93A** *SC* **93A.4** *P* **410** *L* **26** # r01-46

Dawe, Piers J G — Mellanox Technologie

Comment Type **T** *Comment Status* **X**

Isn't ILD done in dB space not raw response?

SuggestedRemedy

10^(ILD(fn)/10) should be ILD(fn)^2, I think.

Proposed Response *Response Status* **O**

Cl **93A** *SC* **93A.4** *P* **420** *L* **26** # r01-25

Healey, Adam — LSI Corporation

Comment Type **TR** *Comment Status* **X**

The equation for ILD_RMS is incorrect.

SuggestedRemedy

Change the equation to sqrt(sum_over_n(W(f_n)*ILD(f_n)^2)/N).

Proposed Response *Response Status* **O**

Cl **93A** *SC* **93A.4** *P* **420** *L* **33** # r01-24

Healey, Adam — LSI Corporation

Comment Type **E** *Comment Status* **X**

There is only one rise and fall time.

SuggestedRemedy

Change "...20% to 80% rise and fall times, T_t." to "...20% and 80% rise and fall time, T_t."

Proposed Response *Response Status* **O**

Cl **93C** *SC* **93C.1** *P* **357** *L* **46** # r01-11

Anslow, Peter — Ciena Corporation

Comment Type **E** *Comment Status* **X**

In (see Figure 93C-6), "Figure 93C-6" should be a cross-reference.

SuggestedRemedy

Make "Figure 93C-6" a cross-reference.

Proposed Response *Response Status* **O**

Cl **93C** *SC* **93C.2** *P* **417** *L* **47** # r01-32

Mellitz, Richard — Intel Corporation

Comment Type **TR** *Comment Status* **X**

The peak voltage of the transmitter should be account for. For a "transmitter with high quality termination" V_f should be set to 0.4V. Otherwise V_a and V_fe should be set to the measured V_f as long as it is > 0.4V. The COM calculation is somewhat insensitive to V_f in a normal sense. However for calibration there would be and impact on the applied noise.

SuggestedRemedy

Change
The procedure is based on the calculation of COM which uses the parameters defined in the COM parameter table in the PMD clause that invokes this method with the following exceptions. The value of sigma_RJ and ADD are set based on a transformation of measured parameters as specified in the PMD clause that invokes this method. The value of SNRTX is set based on a transformation of the measured parameters specified in the PMD clause that invokes this method. In the COM computation the transmitter package model is included only if a compliant transmitter with a similar termination is used. If a transmitter with high quality termination is used, in the COM calculation, the termination is modeled as ideal and a Gaussian low pass filter is added to Equation (93A-17) which has the same 20%-80% transition time as the transmitter measured at TP0a.
To:
The procedure is based on the calculation of COM which uses the parameters defined in the COM parameter table in the PMD clause that invokes this method with the following exceptions. The value of sigma_RJ, ADD, V_f are set based on a transformation of measured parameters as specified in the PMD clause that invokes this method. The value of SNRTX and V_f is set based on a transformation of the measured parameters specified in these PMD clause that invokes this method. In the COM computation the transmitter package model is included only if a compliant transmitter with a similar termination is used. If a transmitter with high quality termination is used, in the COM calculation, the termination is modeled as ideal and a Gaussian low pass filter is added to Equation (93A-17) which has the same 20%-80% transition time as the transmitter measured at TP0a and V_f is adjusted in the transmitter to the V_f parameter specified in this PMD clause that invokes this method. If V_f is not adjustable it must within the range for the V_f parameter specified in this PMD clause that invokes this method. In this case the parameters V_a and V_fe defined in the COM parameter table are set to the measured value fo V_f.
Alternatively:
The procedure is based on the calculation of COM which uses the parameters defined in the COM parameter table in the PMD clause that invokes this method with the following exceptions. The value of sigma_RJ and ADD are set based on a transformation of measured parameters as specified in the PMD clause that invokes this method. The value of SNRTX is set based on a transformation of the measured parameters specified in the PMD clause that invokes this method. In the COM computation the transmitter package model is included only if a compliant transmitter with a similar termination is used. If a transmitter with high quality termination is used, in the COM calculation, the termination is modeled as ideal and a Gaussian low pass filter is added to Equation (93A-17) which has the same 20%-80% transition time as the transmitter measured at TP0a.
The transmitter voltage amplitude is adjusted to the parameter V_f defined in the PMD clause that invokes this method.
Editorial license granted

Proposed Response *Response Status* **O**

Cl **94** *SC* **94.2.10** *P* **281** *L* **43** # r01-10

Anslow, Peter — Ciena Corporation

Comment Type **T** *Comment Status* **X**

In Tables 94-4 and 94-5 several of the Register/bit number values are now incorrect ("1.16" has been removed from them).
Also, the MDIO status variable names for the last four rows of Table 94-5 don't match the names in Table 45-67c

SuggestedRemedy

For the last 6 rows of Table 94-4 and the last 4 rows of Table 94-5 insert the "1.16" missing at the beginning of the Register/bit number.
For instance the value for PMA transmit overhead pattern changes from "2.7:0" to "1.162.7:0"
Also, make the variable names in the last four rows of Table 94-5 and Table 45-67c match.

Proposed Response *Response Status* **O**

Cl **94** *SC* **94.2.10** *P* **326** *L* **38** # r01-1

Marris, Arthur — Cadence Design Syst

Comment Type **E** *Comment Status* **X**

Reinstate deleted "1.16" for register numbers in Tables 94-4 and 94-5.

SuggestedRemedy

Add 1.16 in front of changed text for Register/bit number in Tables 94-4 and 94-5.

Proposed Response *Response Status* **O**

Cl **94** *SC* **94.2.9.4** *P* **326** *L* **10** # r01-17

Marris, Arthur — Cadence Design Syst

Comment Type **T** *Comment Status* **X**

Add the word "repeating" to make it consistent with previous test pattern subclauses.

Add text to describe control variables for the Transmitter linearity test pattern

SuggestedRemedy

Change:
"The transmitter linearity test pattern is a 160-symbol pattern"
To:
"The transmitter linearity test pattern is a repeating 160-symbol pattern"

Add following text to the end of 94.2.9.4:
"The transmitter linearity test pattern is enabled by the test_pattern_enable and TX_linearity_enable control variables. If the optional Clause 45 MDIO is implemented, the control variables map to the registers and bits defined in 94.2.10."

Add TX_linearity_enable to Table 94-4 referencing 1.1501.11

Also make sure the enable bit 1.1501.11 is added in Clause 45. I have submitted a separate comment for this.

Proposed Response *Response Status* **O**

Cl **94** *SC* **94.3.10.10** *P* **341** *L* **49** # r01-18

Marris, Arthur — Cadence Design Syst

Comment Type **E** *Comment Status* **X**

Re-instate deleted text "data stream". This text is shown as deleted in the comparison version but not the clean version.

SuggestedRemedy

If necessary re-instate deleted text "data stream" at the end of 94.3.10.10.

Proposed Response *Response Status* **O**

Cl **94** *SC* **94.3.12.7** *P* **309** *L* **26** # r01-54

Dudek, Michael — QLogic Corporation

Comment Type **T** *Comment Status* **X**

There is a disconect between the allowed SNDR here and the equivalent TxSNR in the COM code because TxSNR in the COM code is relative to the 1/3 eye height whereas SNDR is related to the full amplitude.

SuggestedRemedy

Change the TX SNDR requirement from 27dB to 36.54dB (or change the meaning of TxSNR in the COM code).

Proposed Response *Response Status* **O**

Cl **99** *SC* **99** *P* **1** *L* **33** # r01-6

Anslow, Peter — Ciena Corporation

Comment Type **E** *Comment Status* **X**

The text on page 1 line 33 should say "prepared for sponsor ballot recirculation" rather than "prepared for Working Group ballot". Also, the copyright year should be 2014 throughout the draft.

SuggestedRemedy

Change text to: "prepared for sponsor ballot recirculation". Also, change the copyright year to be 2014 throughout the draft.

Proposed Response *Response Status* **O**