Cl **00** *SC* **0** *P* **1** *L* **2** # 428
Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**

Page1, Line 2, 30: Typo, change "Amendement" to "Amendment"
Page3, Line 8: Typo, change "conciously" to "consciously"
page 3, line 10: typo, change consecuively to consecutively
page 3, line 37, typo, change to "superseded"
page 3, line 52, two periods, remove one period at end of sentence

SuggestedRemedy

As per comment

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **00** *SC* **0** *P* **4** *L* **29** # 417
Ganga, Ilango Intel

Comment Type **ER** *Comment Status* **D**

IEEE 802.3az: Replace Clause xx with appropriate clause/annex number used by EEE.

SuggestedRemedy

Replace with "This amendment includes changes to IEEE Std 802.3-2008 and adds Clause 78."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **01** *SC* **1.1.3.2** *P* **22** *L* **22** # 429
Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**

"CGMII is is": delete one "is"

SuggestedRemedy

As per comment

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **01** *SC* **1.1.3.2** *P* **22** *L* **30** # 147
D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**

add "PPI" as a compatibility interface

SuggestedRemedy

add the following
Parallel Physical Interface (PPI). The PPI is provided as a physical instantation of the PMD service interface for 40GBASE-SR4 and 100GBASE-SR10 PHYs. While conformance with implementation of this interface is not strictly necessary to ensure communication, it is recommended, since it allows maximum flexibility in intermixing PHYs and DTEs. THe PPI is optional

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **01** *SC* **1.3** *P* **22** *L* **41** # 248
Trowbridge, Stephen Alcatel-Lucent

Comment Type **TR** *Comment Status* **D**

Add reference to ITU-T Recommendation G.694.2 (CWDM grid) as this is now necessary for the 40GBASE-LR4 interface

SuggestedRemedy

Add:
ITU-T Recommendation G.694.2, 2003, Spectral grids for WDM applications: CWDM wavelength grid

after reference to G.694.1

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **01** *SC* **1.3** *P* **22** *L* **45** # 352
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Another reference for the list (not sure if it's a normative or informative reference)

SuggestedRemedy

Add G.709

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

G.709 is the standard for OTN
Add the following reference to Annex A (informative references):

ITU-T G.709 Interfaces for optical transport network (OTN)

Cl **01** *SC* **1.3** *P* **22** *L* **52** # 351
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

As we are not doing the maintenance work to remove all references to ANSI/EIA/TIA-455-127-1991, we can't do this by a 'change'

SuggestedRemedy

In the draft replace
'Change the following reference... Laser Diodes.'
with another entry for the 'insert' list,
TIA-455-127-A-2006, FOTP-127-A-Basic Spectral Characterization of Laser Diodes.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Section 1.4 recommends the user to refer to most recent editions where applicable. If the latest version supersedes the older version that is being referenced in 802.3ba, then it may be ok to change this reference.

Discuss this suggestion in the task force

See also comment # 354

Cl **01** *SC* **1.4** *P* **23** *L* **1** # 11
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

The definition of 40GBASE-LR4 is missing

SuggestedRemedy

Add the definition as:
"40GBASE-LR4: IEEE 802.3 Physical Layer specification for 40 Gb/s using 40GBASE-R encoding over four WDM lanes on single mode fiber with long reach. (See IEEE 802.3, Clause 87.)"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **01** *SC* **1.4** *P* **23** *L* **20** # 9
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

The definition of 40GBASE-SR4 is "IEEE 802.3 Physical Layer specification for 40 Gb/s using 40GBASE-R encoding over four lanes of, short reach, multi mode fiber." This implies that the fibre alone determines the reach.

SuggestedRemedy

Re-word as: "40GBASE-SR4: IEEE 802.3 Physical Layer specification for 40 Gb/s using 40GBASE-R encoding over four lanes of multi mode fiber with short reach. (See IEEE 802.3, Clause 86.)"

Similarly re-word 100GBASE-SR10 definition to:

"100GBASE-SR10: IEEE 802.3 Physical Layer specification for 100 Gb/s using 100GBASE-R encoding over ten lanes of multi mode fiber with short reach. (See IEEE 802.3, Clause 86.)"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **01** *SC* **1.4** *P* **23** *L* **22** # 607

Ganga, Ilango Intel

Comment Type **T** *Comment Status* **D**

Add 40GBASE-LR4 to the definitions list in 1.4

SuggestedRemedy

Insert the following text at line 22:

1.4.x 40GBASE-LR4: IEEE 802.3 Physical Layer specification for 40 Gb/s using 40GBASE-R encoding over four WDM lanes, long reach, single mode fiber. (See IEEE 802.3, Clause 87.)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See also comment #11 for remedy

Cl **01** *SC* **1.4** *P* **23** *L* **35** # 10

Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

The definition of 100GBASE-ER4 "IEEE 802.3 Physical Layer specification for 100 Gb/s using 100GBASE-R encoding over four WDM lanes, extended long reach, single mode fiber." This implies that the fibre alone determines the reach.

SuggestedRemedy

Re-word as: "100GBASE-ER4: IEEE 802.3 Physical Layer specification for 100 Gb/s using 100GBASE-R encoding over four WDM lanes on single mode fiber with extended reach. (See IEEE 802.3, Clause 88.)"

Similarly re-word 100GBASE-LR4 definition to:

"100GBASE-LR4: IEEE 802.3 Physical Layer specification for 100 Gb/s using 100GBASE-R encoding over four WDM lanes on single mode fiber with long reach. (See IEEE 802.3, Clause 88.)"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **01** *SC* **1.4** *P* **23** *L* **44** # 148

D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**

Parallel Physical Interface (PPI) is not defined.

SuggestedRemedy

Add
Parallel Physical Interface (PPI) - The interface between the Physical Medium Attachment (PMA) sublayer and the Physical Medium Dependent (PMD) sublayer. (See IEEE 802.3, Clause 86)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Parallel Physical Interface (PPI) - The interface between the Physical Medium Attachment (PMA) sublayer and the Physical Medium Dependent (PMD) sublayer for 40GBASE-SR4 and 100GBASE-SR10 PHYs. (See IEEE 802.3, Clause 86)

Cl **01** *SC* **1.4** *P* **23** *L* **44** # 12

Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

The definition of virtual lanes is awkwardly worded:
"Virtual Lane: In 40GBASE-R and 100GBASE-R, the PCS distributes encoded data to multiple logical lanes, these logical lanes are called virtual lanes. They are called virtual lanes since one or more of PCS lanes can be multiplexed and carried on a physical lane together at the PMA interface."

SuggestedRemedy

Re-word as:
"Virtual Lane: In 40GBASE-R and 100GBASE-R, the PCS distributes encoded data to multiple logical lanes, these logical lanes are called virtual lanes since one or more of the PCS lanes can be multiplexed and carried on a physical lane together at the PMA interface."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **01** *SC* **1.4** *P* **23** *L* **50** # 13

Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

The modified definition for "1.4.311 RMS spectral width" is shown in italic font. The font should match the base document

SuggestedRemedy

Change the font of the modified definition for RMS spectral width to match the base document

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Change font style to normal from italic

Cl **01** *SC* **1.5** *P* **24** *L* **11** # 15

Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

The abbreviation OPU3 is expanded as "Optical Payload Unit 3" but OPU is defined in ITU-T G.709 as "Optical channel Payload Unit"

SuggestedRemedy

Change to "Optical channel Payload Unit 3"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **01** *SC* **1.5** *P* **24** *L* **5** # 14

Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

The abbreviation for CAUI is expanded as "100Gb/s Attachment Unit Interface" but the other abbreviations use "Gigabit" rather than "Gb/s"

SuggestedRemedy

Change to "100 Gigabit Attachment Unit Interface"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **04** *SC* **4.4.2** *P* **25** *L* **17** # 246

Trowbridge, Stephen Alcatel-Lucent

Comment Type **T** *Comment Status* **D**

Should "96 bits" entry for 40 Gb/s and 100 Gb/s include reference to "NOTE 7" below the table? Note 7 explains that this could be as little as 8 bits in the Rx direction

SuggestedRemedy

Include reference to Note 7 in this table cell

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This is consistent with other notes in the Table 4-2 (for example see 1 Gb/s and 10 Gb/s operation)

Cl **04** *SC* **4.4.2** *P* **25** *L* **46** # 16

Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

Underneath the new note 7 there is a box containing "WARNING Any deviation from the above specified values may affect proper operation of the network."
This warning box is already present in the base standard beneath the notes to Table 4-2.
Is this warning to be added again part way through the notes? If so, this has the effect of effectively removing the warning from all of the notes except new note 7 and the last note.

SuggestedRemedy

Remove the warning box from below the new note 7

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Yes, there is a warning box in the base standard below Table 4-2. The editing instruction just instructs to insert the new note. It is ok to provide additional text for completenes or to alert the reader of the requirement.

The publication editor would be able to remove this redundancy during merge.

Cl **30** *SC* **30.3.2.1.2** *P* **27** *L* **11** # 151

D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**

30.3.2.1.2 aPhyType needs updated

SuggestedRemedy

add
40GBASE-R Clause 82 40 Gb/s 64B/66B
100GBASE-R Clause 82 100 Gb/s 64B/66B

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

See comment #150

Cl **30** *SC* **30.3.2.1.2** *P* **27** *L* **15** # 612

Ganga, Ilango Intel

Comment Type **TR** *Comment Status* **D**

Add appropriate attribute for 40GBASE-R and 100GBASE-R

SuggestedRemedy

Insert the following attributes to the end of the list APPROPRIATE SYNTAX:

40GBASE-R Clause 82 40 Gb/s multilane 64B/66B
100GBASE-R Clause 82 100 Gb/s multilane 64B/66B

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

See comment #150

Cl **30** *SC* **30.3.2.1.3** *P* **27** *L* **21** # 613

Ganga, Ilango Intel

Comment Type **TR** *Comment Status* **D**

Add appropriate attribute for 40GBASE-R and 100GBASE-R to aPHYTypeList

SuggestedRemedy

Insert the following attributes to the end of the list APPROPRIATE SYNTAX:

40GBASE-R Clause 82 40 Gb/s multilane 64B/66B
100GBASE-R Clause 82 100 Gb/s multilane 64B/66B

Also change the Note at the end of 30.3.2.1.3 (IEEE Std 802.3-2008) as follows:

NOTE-At 10 Gb/s, 40 Gb/s or 100 Gb/s the ability of the PMD must be taken into account when reporting the possible types
that the PHY could be.;

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

See comment #150

Cl **30** *SC* **30.5.1.1.14** *P* **27** *L* # 608

Ganga, Ilango Intel

Comment Type **T** *Comment Status* **D**

update the text in 30.5.1.1.44 (802.3-2008) for 40 Gb/s and 100 Gb/s:

SuggestedRemedy

Change following text in 30.5.1.1.44 aFECmode after BEHAVIOUR DEFINED AS:

or FEC enable bit in 10/40/100GBASE-R FEC control register (see 45.2.1.85).;

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

See comment #150

Cl **30** *SC* **30.5.1.1.15** *P* **27** *L* # 609
Ganga, Ilango Intel

Comment Type **T** *Comment Status* **D**

update text in 30.5.1.1.15 aFECCorrectedBlocks for 40 Gb/s and 100 Gb/s

SuggestedRemedy

change text after BEHAVIOUR DEFINED AS as follows:

For 1000BASE-PX or 10GBASE-R or 40GBASE-R or 100GBASE-R PHYs, a count of corrected FEC blocks. This counter will not increment for other PHY types.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

See comment #150

Cl **30** *SC* **30.5.1.1.16** *P* **27** *L* # 610
Ganga, Ilango Intel

Comment Type **T** *Comment Status* **D**

update text in 30.5.1.1.16 aFECUnCorrectableBlocks for 40 Gb/s and 100 Gb/s

SuggestedRemedy

change text after BEHAVIOUR DEFINED AS as follows:

For 1000BASE-PX or 10GBASE-R or 40GBASE-R or 100GBASE-R PHYs, a count of corrected FEC blocks. This counter will not increment for other PHY types.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

See comment #150

Cl **30** *SC* **30.5.1.1.2** *P* **27** *L* **22** # 149
D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**

30.5.1.1.2 needs to be updated.

SuggestedRemedy

Add

30.5.1.1.2 aMAUType
40GBASE-KR4 - R PCS/PMA over an electrical backplane PMD as specified in Clause 84
40GBASE-CR4 - R copper over 8 pair 100-Ohm blanaced cable as specified in Clause 85
40GBASE-SR4 - R fiber over 8 OM3 multi-mode fibers as specified in Clause 86
40GBASE-LR4 - R fiber over 4 wavelengths on single mode fiber as specified in Clause 87
100GBASE-CR4 - R copper over 20 pair 100-Ohm blanaced cable as specified in Clause 85
100GBASE-SR10 - R fiber over 20 OM3 multi-mode fibers as specified in Clause 86
100GBASE-LR4 - R fiber over 4 wavelengths on 10km single mode fiber as specified in Clause 88
100GBASE-ER4 - R fiber over 4 wavelengths on 40km single mode fiber as specified in Clause 88

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

See comment #150

Cl **30** *SC* **30.5.1.1.2** *P* **27** *L* **22** # 614
Ganga, Ilango Intel

Comment Type **TR** *Comment Status* **D**

Insert the following subclause 30.5.1.1.2 aMAUType and add 40G and 100G list

SuggestedRemedy

Insert the following to the aMAUType attribute list after 10GBASE-T.

40GBASE-R Multilane R PCS/PMA as specified in Clause 82 over undefined PMD
40GBASE-KR4 40GBASE-R PCS/PMA over an electrical backplane PMD as specified in Clause 84
40GBASE-CR4 40GBASE-R PCS/PMA over 4 lane shielded copper balanced cable PMD as specified in Clause 85
40GBASE-SR4 40GBASE-R PCS/PMA over 4 lane OM3 multimode fiber PMD as specified in Clause 86
40GBASE-LR4 40GBASE-R PCS/PMA over 4 WDM lane long reach single mode fiber PMD as specified in Clause 87

100GBASE-R Multilane R PCS/PMA as specified in Clause 82 over undefined PMD
100GBASE-CR10 100GBASE-R PCS/PMA over 10 lane shielded copper balanced cable PMD as specified in Clause 85
100GBASE-SR10 100GBASE-R PCS/PMA over 10 lane OM3 multimode fiber PMD as specified in Clause 86
100GBASE-LR4 100GBASE-R PCS/PMA over 4 WDM lane long reach single mode fiber PMD as specified in Clause 88
100GBASE-ER4 100GBASE-R PCS/PMA over 4 WDM lane extended long reach single mode fiber PMD as specified in Clause 88

Update the Register names in first paragraph after BEHAVIOUR DEFINED AS

PMA/PMD control 2 register
PCS control 2 register

Change the last paragraph after BEHAVIOUR DEFINED AS as follows:
The enumerations 1000BASE-X, 1000BASE-XHD, 1000BASE-XFD, 10GBASE-X, 10GBASE-R, 10GBASE-W, 40GBASE-R and 100GBASE-R shall only be returned if the underlying PMD type is unknown.;

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

See comment #150

Cl **30** *SC* **30.5.1.1.4** *P* **27** *L* # 615
Ganga, Ilango Intel

Comment Type **TR** *Comment Status* **D**

Update the text in 30.5.1.1.4 (802.3-2008) for 40 Gb/s and 100 Gb/s:

Change following text in 30.5.1.1.4 aMediaAvailable after BEHAVIOUR DEFINED AS:

SuggestedRemedy

Change following text in 30.5.1.1.4 aMediaAvailable after BEHAVIOUR DEFINED AS:

Any MAU that implements management of Clause 28 or Clause 73 Auto-Negotiation will map remote fault indication to MediaAvailable "remote fault."

Change following text in 30.5.1.1.4 aMediaAvailable after BEHAVIOUR DEFINED AS in last paragraph:

10/40/100GBASE-R PCS Latched high BER status bit (45.2.3.12.2)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

See comment #150

Cl **30** *SC* **30.6.1.1.5** *P* **27** *L* # 616
Ganga, Ilango Intel

Comment Type **TR** *Comment Status* **D**

Update attribute 30.6.1.1.5 aAutoNegLocalTechnologyAbility for 40G and 100G PHY types

SuggestedRemedy

Insert the following to the list after 10GBASE-KRFD:

40GBASE-KR4FD Full duplex 40GBASE-KR4 as specified in Clause 84
40GBASE-CR4FD Full duplex 40GBASE-CR4 as specified in Clause 85
100GBASE-CR10FD Full duplex 100GBASE-CR10 as specified in Clause 85

Change the text after BEHAVIOUR DEFINED AS as follows:

This indicates the technology ability of the local device, as defined in Clause 28, Clause 37 and Clause 73.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

See comment #150

Cl **30** *SC* **30.6.1.1.5** *P* **27** *L* **22** # 150

D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**

need to update 30.6.l.1.5 aAutoNegLocalTechnologyAbility

SuggestedRemedy

Add
30.6.l.1.5 aAutoNegLocalTechnologyAbility
40GBASE-KR4FD - Full duplex 40GBASE-KR4 as specified in Clause 84
40GBASE-CR4FD - Full duplex 40GBASE-CR4 as specified in Clause 85
100GBASE-CR10FD - Full duplex 100GBASE-CR10 as specified in Clause 85

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Editor's note: corrected subclause number]

The editor will implement this and many other additions to Clause 30 in the next draft.

Cl **30B** *SC* **30B.2** *P* **270** *L* **17** # 619

Ganga, Ilango Intel

Comment Type **TR** *Comment Status* **D**

Update 30B.2 ASN.1 module for CSMA/CD managed objects to add 40G and 100G PHY types

SuggestedRemedy

Insert following lines to the list PhyTypeValue::= ENUMERATED:
Insert to the end of the list after 2BASE-TL

40GBASE-R (82) --Clause 82 40 Gb/s multilane 64B/66B
100GBASE-R (821) --Clause 82 100 Gb/s multilane 64B/66B

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Given that project 802.3.1 will be taking responsibility for MIB updates based on the contents of Clause 30. Further changes to annexes 30A & 30B are no longer necessary.

Cl **30B** *SC* **30B.2 ASN.1** *P* **270** *L* **15** # 617

Ganga, Ilango Intel

Comment Type **TR** *Comment Status* **D**

Update 30B.2 ASN.1 module for CSMA/CD managed objects to add 40G and 100G PHY types

SuggestedRemedy

Insert following 3 lines to the list "AutoNegTechnology::= ENUMERATED" as follows:
Insert after 1000GBASE-TFD:
40GBASE-KR4 (822), --40GBASE-KR4 PHY as defined in Clause 84
40GBASE-CR4 (823), --40GBASE-CR4 PHY as defined in Clause 85
100GBASE-CR4 (8211), --100GBASE-CR10 PHY as defined in Clause 85

Proposed Response *Response Status* **W**

PROPOSED REJECT.

See comment #619

Cl **30B** *SC* **30B.2 ASN.1** *P* **270** *L* **16** # 618

Ganga, Ilango Intel

Comment Type **TR** *Comment Status* **D**

Update 30B.2 ASN.1 module for CSMA/CD managed objects to add 40G and 100G PHY types

SuggestedRemedy

Insert following lines to the list after "TypeValue::= ENUMERATED" as follows:
Insert after 10GBASE-T:

40GBASE-R (821) Multilane R PCS/PMA as specified in Clause 82 over undefined PMD
40GBASE-KR4 (822) 40GBASE-R PCS/PMA over an electrical backplane PMD as specified in Clause 84
40GBASE-CR4 (823) 40GBASE-R PCS/PMA over 4 lane shielded copper balanced cable PMD as specified in Clause 85
40GBASE-SR4 (824) 40GBASE-R PCS/PMA over 4 lane OM3 multimode fiber PMD as specified in Clause 86
40GBASE-LR4 (825) 40GBASE-R PCS/PMA over 4 WDM lane long reach single mode fiber PMD as specified in Clause 87

100GBASE-R (8210) Multilane R PCS/PMA as specified in Clause 82 over undefined PMD
100GBASE-CR10 (8211) 100GBASE-R PCS/PMA over 10 lane shielded copper balanced cable PMD as specified in Clause 85
100GBASE-SR10 (8212) 100GBASE-R PCS/PMA over 10 lane OM3 multimode fiber PMD as specified in Clause 86
100GBASE-LR4 (8213) 100GBASE-R PCS/PMA over 4 WDM lane long reach single mode fiber PMD as specified in Clause 88
100GBASE-ER4 (8214) 100GBASE-R PCS/PMA over 4 WDM lane extended long reach single mode fiber PMD as specified in Clause 88

Proposed Response *Response Status* **W**

PROPOSED REJECT.

See comment #619

Cl **45** *SC* *P* **29** *L* **2** # 551

Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

MDIO base on 1.5 V HSTL logic in CL 45 is outdated and often require extra power source.

SuggestedRemedy

Suggest to use JESD8-14A-01 duplicate table 45-65 MDIO electrical interface characteristics for 40/100 GbE
Vdd - Supply Voltage 0.9 to 1.1 V
Vih - Input high voltage 0.65*Vdd to Vdd+0.2
VIL - Input low voltage -0.2 to 0.35*Vdd
Voh - Output high voltge at Ioh=-2 mA, 0.75*Vdd (min)
Vol - Ouput low voltage at Iol=2 mA, 0.25*Vdd (max)
Ci - Input capacitace - 10 pf
CL - Bus loading - 470 pf

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: Removed text "all" from subclause field]

There is no demonstrated demand to make such a substantial change. If the TF decides that it wishes to expand its scope to include such a change then text will be developed to define the new signaling in a manner that includes backward compatibility.

Cl **45** *SC* *P* **58** *L* # 533

Vijayaraghavan, Divya Altera Corp.

Comment Type **E** *Comment Status* **D**

Page: 58, 63

- Table 45

-97a: register value should be 3.51 not 3.50
- Table 45

-99a: register value should be 3.53 not 3.50

SuggestedRemedy

Always compare to 2 or 4, but not both.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The editor does not understand the proposed remedy.

Change Table 45-97a, register number from 3.50 to 3.51

Change Table 45-99a, register number from 3.50 to 3.53

Cl **45** *SC* **45.2.1** *P* **29** *L* **15** # 439

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **D**

The use of "Backplane/Copper/TBD" is particularly ugly. The TF needs to settle on a vergage and stick to it. It doesn't need to be perfect - exceptions and usage changes can always be noted where required.

All of the usage in 802.3ba is BASE-R copper so that usage seems to be the most obvious. There may be some small exceptions for non BASE-R backplane (I haven't checked all the details) but these can be covered with specific notes. Future BASE-R copper may not use the same registers, but that bridge can be crossed when (if) we reach it.

SuggestedRemedy

Change "Backplane/Copper/TBD" to "BASE-R copper"

Table 45-3 and all related 45.2.1 register definitions.

The footnote below Table 45-3 can be retained (with the name change). The verbage at the beginning of each register definition should mimic the footnote.

Remove the editor's note.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1** *P* **29** *L* **6** # 368

Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **D**

The device address structure of Clause 45 dates from XENPAK days. As the PMD and PMA may now be separate, they cannot always be managed as a single MMD unless a proxy is used. Even then, one loses the ability to control each one independent of the other with the present allocation of MMDs to registers. Also, there can be multiple separate PMAs for any port, with multiple possible loopback positions for example.

SuggestedRemedy

Continue to manage the PMD with device address 1, but allocate a device address number (the next available is 8) to PMA. Use a register within address 8 as an addressing scheme to distinguish between multiple PMDs of the same port. Copy the old stuff relevant to 40G/100G PMAs from 1 to 8, put the new stuff in 8. I believe a nAUI interface can count as a n:n PMA, but there could be two sorts like the 'PHY XS and DTE XS' in 10G.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The commenter highlights a major problem with the current MMD structure that relates to the architecture of 802.3ba. However the remedy does resolve the problem and will cause problems with backward compatibility.

Alternate remedy:

Current device address 1 is defined for PMA/PMD and it I sapproriate to leave it as such. There must always be a PMA sublayer bound to the PMD and this device address should refer to those two sublayers.

A new and separate device address can be used to address higher PMA sublayers. It may be advantageous to use a different sublayer name to apply to these higher level PMA layers. For example PMA Extender layer (PMAX). Each separate PMAX that is distinct from the PMA/PMD should be allocated a device address.

Therefore device address 8 will be PMAX-1 the lowest PMAX layer; device address 9 will be PMAX-2 the next lowest PMAX layer and device address 10 will be PMAX-3 the next PMAX layer. The editor believes that 3 PMAX layers will be sufficient.

The PMAX layers will share the same register addresses and definitions as each other. Only functions that are required to be separate from the PMA/PMD will be defined in the PMAX layers (e.g. loopback). Clearly there will be need for careful review of the register set that is included for PMAX layers.

On a practical note - it can be expected that silicon manufacturers will offer select pins or other means to allow system developers to use silicon devices to perform PMAX functions in a flexible manner.

Cl **45** *SC* **45.2.1** *P* **33** *L* **13** # 17

Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

Table 45-3 Note a says "The name "Backplane/Copper/TBD" is used to denote PHYs that use the PMD described in Clause 72, including PHYS designated as BASE-KR and BASE-CR"
but Clause 72 only covers 10GBASE-KR

SuggestedRemedy

change "The name "Backplane/Copper/TBD" is used to denote PHYs that use the PMDs described in Clause 72, 84 or 85, including PHYs designated as BASE-KR and BASE-CR"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.1.3** *P* **34** *L* **25** # 128

D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**

note states "Change Table 45-7 for 40Gb/s and 100 Gb/s PMA /PMD type selection," and then 45.2.1.6.1 is also noted to be changed for 40 Gb/s and 100 Gb/s PMA/PMD type selections. However, 45.2.1.1.3 states "When bits 5 through 2 are set to 0000 the use of a 10G PMA/PMD is selected. More specific
selection is performed using the PMA/PMD control 2 register (Register 1.7)"

SuggestedRemedy

modify 45.2.1.1.3 to state

"When bits 5 through 2 are set to 0000 the use of a >=10G PMA/PMD is selected. More specific selection is performed using the PMA/PMD control 2 register (Register 1.7)"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.4** *P* **33** *L* **47** # 18

Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

The editing instruction says "Insert 45.2.1.4.7 and 45.2.1.4.8 as follows:" but the inserted clauses are 45.2.1.4.8 and 45.2.1.4.9 (leaving room for 802.3av to insert 45.2.1.4.7

SuggestedRemedy

change editing instruction to "Insert 45.2.1.4.8 and 45.2.1.4.9 as follows:"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.4.8** *P* **33** *L* **49** # 152
D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**

Note reads to "Insert 45.2.1.4.7 and 45.2.1.4.8 as follows" but the sections are entered in as 45.2.1.4.8 and 45.2.1.4.9

SuggestedRemedy

The section #'s are correct per Table 45-6, but the note is incorrect. Ignore note.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See comment #18

Cl **45** *SC* **45.2.1.6.1** *P* **34** *L* **29** # 19
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

The first sentence is modified to be "The PMA/PMD type of the PMA/PMD shall be selected using bits 4 through 0." However Table 45-7 uses bits 5 through 0

SuggestedRemedy

Change "using bits 4 through 0." to "using bits 5 through 0."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.6.1** *P* **34** *L* **32** # 20
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

The text "and the 40G/100G PMA/PMD extended ability register 2" has been added, but the register is now called just "40G/100G PMA/PMD extended ability register" in Table 45-12a

SuggestedRemedy

change added text from "and the 40G/100G PMA/PMD extended ability register 2" to "and the 40G/100G PMA/PMD extended ability register"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Add the "2" in table entry.

Cl **45** *SC* **45.2.1.6.1** *P* **34** *L* **33** # 21
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

This states "A PMA/PMD shall ignore writes to the PMA/PMD type selection bits that select PMA/PMD types it has not advertised in the PMA/PMD status 2 register." However the PMA/PMD type is now advertised in three registers as per the preceeding text.

SuggestedRemedy

change "it has not advertised in the PMA/PMD status 2 register" to "it has not advertised"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.76** *P* **39** *L* **33** # 464
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

Clause 72 is not being changed in this draft (including no change in title). It doesn't make sense to be changing this subclause if Clause 72 PMD's are the only ones being used and clause 72 is the single PMD 10GBASE-KR (ie Clause 72 is not being changed to include reference to other PMD's than 10GBASE-KR). Otherwise the ISO reference models in the other clauses should indicate 10GBASE-KR as the PMD layer.

SuggestedRemedy

reference other clauses besides clause 72 on line 36 or change clause 72 to include other items besides 10GBASE-KR (and change it's title). Also do the equivalent for Clause 45.2.1.77 to 45.2.1.87

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See comment #17

Cl **45** *SC* **45.2.1.8** *P* **35** *L* **9** # 430
Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**

Fix typo "usee" to "use"

SuggestedRemedy

Per comment

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.81a** *P* **43** *L* **5** # 283

Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

Several very minor editorial issues in clause 45 collected in to one comment.

SuggestedRemedy

Remove underline from Table 45-58a page 43 line 5
Remove underline from Table 45-58b page 44 line 21
Space missing in "status register3" page 61 line 8
Space missing in "Table45-133" page 65 line 13

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.84** *P* **45** *L* **15** # 376

Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Need a shorter name than 'Backplane/Copper/TBD FEC'. Something neutral as to application, which may evolve over the months and years.

SuggestedRemedy

K-FEC ?

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See comment #439

Cl **45** *SC* **45.2.1.84** *P* **45** *L* **28** # 375

Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **D** *FEC*

The moderate power taken by FEC is spent four ways: encoding (basically a CRC generation), error detection (CRC checking), error correction, and re-coding as non-FEC 64B/66B and error marking. A significant fraction of the power and complexity goes in error correction; all the rest is straightforward. Most of the latency is taken by error correction and optional PCS error marking. In some scenarios e.g. a copper cable approaching 10 m, we need FEC for its excellent error detection capability. In other scenarios e.g. 40GBASE-KR4, 100GBASE-ER4, we do (or should) allow FEC for its error detection as well.
But when a particular link is up and running, a receiver that is happy with its received BER can switch the correction off, with no need for handshaking with the transmitter. This still gives excellent error detection, and remains compatible with PCS error indication. In principle this could be done lane by lane but the remedy below treats all the lanes as a group. There is another comment for Clause 74, and a short presentation.

SuggestedRemedy

Add another register bit in Table 45-61,
1.170.2
xxx FEC error correction disable ability
A read of 1 in this bit indicates that the xxx FEC sublayer is able to operate while detecting but not correcting received errors.
RO
Insert new 45.2.1.84.1 xxx FEC error correction disable ability (1.170.2)
When read as a one, bit 1.170.2 indicates that the xxx FEC decoder is able to operate while detecting but not correcting received errors (see 74.7.4.5). When read as a zero, the xxx FEC decoder is not able to operate while detecting but not correcting received errors.
Add another register bit in Table 45-62,
1.171.2
FEC error correction disable
A write of 1 to this bit configures the xxx FEC decoder to operate while detecting but not correcting received errors.
R/W
Insert new 45.2.1.85.1 10 Gb/s FEC error correction disable (1.171.2)
This bit instructs the xxx FEC decoder to operate while detecting but not correcting received errors (see 74.7.4.5)
When bit 1.171.2 written as a one, if 1.171.1 is one, the xxx FEC decoder shall operate while detecting but not correcting received errors (see 74.7.4.5). When bit 1.171.2 is written as a zero, the xxx FEC decoder shall either correct as well as detect received errors according to 74.7.4.5, or neither detect nor correct, as determined by bits 1.170.0 and 1.171.0.
The default value of bit 1.171.2 is zero.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

In the event that the TF decides to change the definition in Clause 74 to allow "partial FEC"

then ability and control bits will be added to Clause 45.

Cl **45** *SC* **45.2.1.86** *P* **47** *L* **2** # 431

Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**

Double period (..), delete a period

SuggestedRemedy

As per comment

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.1.87b** *P* **48** *L* **12** # 411

Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**

repetition of lanes lanes, delete "lanes"

SuggestedRemedy

per comment

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3** *P* **48** *L* **10** # 432

Barrass, Hugh Cisco

Comment Type **E** *Comment Status* **D**

Table 45-82 is incomplete - there are more elements in the base document that are not shown here.

SuggestedRemedy

Show table elements from the base document or elipses where blocks are ommitted.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.11** *P* **52** *L* **24** # 86

Szczepanek, Andre Texas Instruments

Comment Type **ER** *Comment Status* **D**

Bit 3.23.3 advertises the ability to test a PRBS9 pattern.
However there is no corrsponding "PRBS9 receive test-pattern enable" in Table 45-94.

SuggestedRemedy

I dont think there was any intention to add PRBS9 pattern verification.
There is no mention of it in the PMA clause iether.
Remove Bit 3.23.3

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected subclause number field from 45-90 to 45.2.3.11]

The ability and control for PRBS9 was defined in 802.3ae and cannot be deleted.

Cl **45** *SC* **45.2.3.11** *P* **52** *L* **9** # 229

Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

The description implies that the PCS can support a PRBS31 or PRBS9 test pattern, but for 100/40GBASE-R these are now part of the PMA functions, not the PCS (and there can be multiple locations of the test patterns).

SuggestedRemedy

Clarify the text that for 100/40GBASE-R PRBS patterns are in the PMA, and add the appropriate PMA registers for this functionality.

This also has to be corrected in table 45-94.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Add register bits in MMD 1 (PMA/PMD) for ability and enable to match the test patterms defined in 83.6.7.

Update PMA register block with the following:

1.x.15 PRBS31 pattern testing ability
1.x.11:0 PRBS31 error count

1.y.15 PRBS31 transmit test pattern enable
1.y.14 PRBS31 receive test pattern enable

The wording of 45.2.3.11 is correct as it covers 10G, 40G and 100G.

Cl **45** *SC* **45.2.3.12.3** *P* **54** *L* **23** # 645

Nicholl, Gary Cisco

Comment Type **TR** *Comment Status* **D**

In keeping with nicholl_02_0508 and the follow-up discussion at the Munich meeting I would like to request that the size of the BER be increased from 6 bits to at least 24 bits.

SuggestedRemedy

I will be providing a contribution in Dallas with a suggested remedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected subclause number]

See also comment #646

Notwithstanding that the TF will review presentation and in the absence of an alternative at this time, the editor suggests:

Add 2 registers - 3.44, 3.45
3.44 BER high order
3.45 Errored blocks high order

Each register is defined in tandem with the existing 8 bit counters. The high order counter contains bits 23:8 and the value latches on read of the lower 8 bits (status register 2). The counter also resets on read of status register 2. These bits shall be held at all ones in the case of overflow.

Also change the last sentence of 45.2.3.12.3 & 45.2.3.12.4 to "If the [corresponding high order register] is not implemented then these bits shall be held at all ones in the case of overflow."

Cl **45** *SC* **45.2.3.12.4** *P* **54** *L* **30** # 646

Nicholl, Gary Cisco

Comment Type **TR** *Comment Status* **D**

In keeping with nicholl_02_0508 and the follow-up discussion at the Munich meeting I would like to request that the size of the Errored Block counter be increased from 8 bits to at least 24 bits.

SuggestedRemedy

I will be providing a contribution in Dallas with a suggested remedy.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected subclause number]

See comment #645

Cl **45** *SC* **45.2.3.13** *P* **54** *L* **37** # 230

Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

In 100/40GBASE-R the pseudo random test pattern is just sending idles scrambled, so there are no seed patterns needed.

SuggestedRemedy

Remove the additions of 100/40GBSE-R to this register.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

No change to this register - remove it from the draft.

Cl **45** *SC* **45.2.3.15** *P* **55** *L* **18** # 220
Gustlin, Mark Cisco

Comment Type **ER** *Comment Status* **D**

Currently it says:

"The test-pattern methodology is described in 49.2.8"

But this should also refer to clause 82 for 40/100G.

SuggestedRemedy

Change to:

"The test-pattern methodology is described in 49.2.8 for 10 Gb/s and in 82.2.10 for 40/100GBASE-r"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change to

The test-pattern methodology is described in 49.2.8 and 82.2.10

Cl **45** *SC* **45.2.3.16** *P* **56** *L* **1** # 221
Gustlin, Mark Cisco

Comment Type **ER** *Comment Status* **D**

Table name is incorrect, should include 40/100.
Is:
Table 45-95-10GBASE-R PCS test-pattern error counter register bit definitions

SuggestedRemedy

Change to:
Table 45-95-10/40/100GBASE-R PCS test-pattern error counter register bit definitions

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.17a** *P* **56** *L* **19** # 23
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

This refers to Table 45-96 but the new table is 45-96a

SuggestedRemedy

Change reference to Table 45-96a

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.17a** *P* **57** *L* **1** # 219
Gustlin, Mark Cisco

Comment Type **ER** *Comment Status* **D**

Table title should include "register 1" since there are register 2,3 etc...

Table 45-96a-Multi-lane BASE-R PCS alignment status register bit definitions

SuggestedRemedy

Change it to:

"Table 45-96a-Multi-lane BASE-R PCS alignment status register 1 bit definitions"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Editor's note: Corrected subclause field from Table 45-96a to 45.2.3.17a]

Cl **45** *SC* **45.2.3.18a** *P* **58** *L* **15** # 24
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

This refers to Table 45-97 but the new table is 45-97a

SuggestedRemedy

Change reference to Table 45-97a

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.18a** *P* **59** *L* # 235
Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

In table 45-97a, the bits are numbered incorrectly, they should all be 3.51.x vs. 3.50 since the previous register used 3.50.x already.

SuggestedRemedy

Change to 3.51.x in this table.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.18a.4** *P* **60** *L* **1** # 25
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

Titles of 45.2.3.18a.4 through 45.2.3.18a.8 refer to the wrong bits and in 45.2.3.18a.4 "bit 3.51.9" should be "bit 3.51.8"

SuggestedRemedy

change titles of 45.2.3.18a.4 through 45.2.3.18a.8:
from "Lane 16 lock (3.51.9)" to "Lane 16 lock (3.51.8)"
from "Lane 15 lock (3.51.3)" to "Lane 15 lock (3.51.7)"
from "Lane 14 lock (3.51.2)" to "Lane 14 lock (3.51.6)"
from "Lane 13 lock (3.51.1)" to "Lane 13 lock (3.51.5)"
from "Lane 12 lock (3.51.0)" to "Lane 12 lock (3.51.4)"
and in 45.2.3.18a.4 change "bit 3.51.9" to "bit 3.51.8"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.19a** *P* **61** *L* **3** # 26
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

This refers to Table 45-98 but the new table is 45-98a

SuggestedRemedy

Change reference to Table 45-98a

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.19a.1** *P* **61** *L* **45** # 27
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

In 45.2.3.19a.1 through 45.2.3.19a.8 the text refers to "bit 3.50.x" which should be "bit 3.52.x"

SuggestedRemedy

Change "bit 3.50." to ""bit 3.52." in 16 places

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.20a** *P* **62** *L* **37** # 522
Ofelt, David Juniper Networks

Comment Type **E** *Comment Status* **D**

There are some cut-paste errors.
In 20a - there are references to "register 2" that should be "register 4"
In 20a.1 - There are references to bit "3.51" that should be "3.53"
In table 45-99a - The bit numbers references in the table are listed as "3.50", they should be "3.53".
All the other sections in 20a.3 reference "3.51" and instead of "3.53"

SuggestedRemedy

Change the references to "register 2" to "register 4"
Change the references to "3.51" to "3.53"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Editor's note: corrected subclause number]

Cl **45** *SC* **45.2.3.20a** *P* **62** *L* **39** # 28
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

This refers to Table 45-98 but the new table is 45-99a
also text contains "Multi-lane BASE-R PCS alignment status register 2" which should be "Multi-lane BASE-R PCS alignment status register 4" in 4 places

SuggestedRemedy

Change reference to Table 45-99a
Change "Multi-lane BASE-R PCS alignment status register 2" to "Multi-lane BASE-R PCS alignment status register 4" in 4 places

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.20a** *P* **63** *L* **5** # 30
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

In Table 45-99a in the first column 3.50.x should be 3.53.x

SuggestedRemedy

Change "3.50." to "3.53." in 13 places

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.20a** *P* **63** *L* **5** # 236
Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

In table 45-99a, the bits are numbered incorrectly, they should all be 3.53.x vs. 3.50 since a previous register used 3.50.x already.

SuggestedRemedy

Change the numbering to 3.53.x

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.20a.1** *P* **62** *L* **50** # 29
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

In 45.2.3.20a.1 through 45.2.3.20a.12 the text refers to "bit 3.51.x" which should be "bit 3.53.x"

In 45.2.3.20a.4 "bit 3.51.9" should be "bit 3.53.8"

SuggestedRemedy

Change "bit 3.51." to ""bit 3.53." in 23 places and in 45.2.3.20a.4 change "bit 3.51.9" to "bit 3.53.8"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.20a.4** *P* **64** *L* **1** # 31
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

Titles of 45.2.3.20a.4 through 45.2.3.20a.8 refer to the wrong bits

SuggestedRemedy

change titles of 45.2.3.20a.4 through 45.2.3.20a.8:
from "Lane 16 aligned (3.53.9)" to "Lane 16 aligned (3.53.8)"
from "Lane 15 aligned (3.53.3)" to "Lane 15 aligned (3.53.7)"
from "Lane 14 aligned (3.53.2)" to "Lane 14 aligned (3.53.6)"
from "Lane 13 aligned (3.53.1)" to "Lane 13 aligned (3.53.5)"
from "Lane 12 aligned (3.53.0)" to "Lane 12 aligned (3.53.4)"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.3.6.1** *P* **50** *L* **54** # 234
Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

In clause 45, subclause 45.2.3.2.2, PCS recieve link status(3.1.2) , the supporting paragraph talks about 10GBASE-R using this bit as a latching low version of bit 3.32.12. This should be the same for 40/100GBASE-R.

SuggestedRemedy

Add in appropriate text for 40/100GBASE-R.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

In 45.2.3.2.2 change:

"10GBASE-R, 10GBASE-W, or 10GBASE-T"

to

"10/40/100GBASE-R, 10GBASE-W, or 10GBASE-T"

Cl **45** *SC* **45.2.3.7** *P* **51** *L* **33** # 22
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

In Table 45-87 new rows are added for bits 3.8.4 and 3.8.4 but the text is not in underline font

SuggestedRemedy

Change text of added rows to underline font

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.7** *P* **65** *L* **46** # 440
Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **D**

"Backplane/Copper/TBD" is ugly. This needs to be replaced with "BASE-R copper" for 802.3ba, but also needs "Backplane" for the other backplane functions.

SuggestedRemedy

Change "Backplane/Copper/TBD" to "Backplane, BASE-R Copper" in Table 45-133 and in 45.2.7.12.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **45** *SC* **45.2.7.12** *P* **66** *L* **17** # 32
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

In Table 45-142 bit 7.48.7 has been Reserved. However the whole row should be shown in underline font as it is new.

SuggestedRemedy

Show whole row for bit 7.48.7 in underline font

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **4A** *SC* **4A.4.2** *P* **267** *L* **21** # 70
Chung, Hwan Seok ETRI

Comment Type **T** *Comment Status* **D**

Rephrase sentence for consistency. Change "For 40 and 100 Gb/s operation, " to " For 40 Gb/s and 100 Gb/s operation,"

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Apply the same change to Note 7 in 4.4.2 in page 25

Cl **4A** *SC* **4A.4.2** *P* **267** *L* **28** # 294
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

Under the new note 4 there is a warning box containing "WARNING Any deviation from the above specified values may affect proper operation of the network." This implies that this warning note must be included again.

SuggestedRemedy

Delete the warning box and change the editing instructions to say that the new note 4 is inserted before the warning box.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

See response to comment #16

Cl **69** *SC* **69.1.1** *P* **69** *L* **11** # 378
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **D**

Don't say 'family of xxx Physical Layer signaling systems is extended' The reader is not required to know or care which Physical Layer signaling systems were standardised before which.

SuggestedRemedy

Change 'is extended to include' to 'includes', three times.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This is existing text from the base standard and does not need to be changed for 802.3ba.

Also the suggested remedy does not improve the readability of the text.

Cl **69** *SC* **69.1.3** *P* **70** *L* **20** # 523
Ofelt, David Juniper Networks

Comment Type **E** *Comment Status* **D**

The "I" in the "MDI" label is the wrong font size :).

SuggestedRemedy

Make it bigger...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[added 69 to subclause number in comment]

Cl **69** *SC* **69.1.3** *P* **70** *L* **34** # 153
D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**

Implementors may not specify a different data width for 40GBASE-KR4.

SuggestedRemedy

Add the following-
Modify bullet f as follows:

The MDI as specified in Clause 70 for 1000BASE-KX, Clause 71 for 10GBASE-KX4, Clause 72 for 10GBASE-KR, or Clause 84 for 40GBASE-KR4.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **69A** *SC* **69A.3** *P* **271** *L* **21** # 427
Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**

typo, change to "tolerance"

SuggestedRemedy

per comment

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

This is fixing a typo in the base standard so needs to done as a change.

Cl **73** *SC* **73** *P* **73** *L* **5** # 33
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

Format of Note does not conform to style guide

SuggestedRemedy

Either change "Note that" to "NOTE-" to make the note informative or change the font of the note to "Text" (10 point) for normative text.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change to informative text and also change the editing instruction appropriately.

Cl **73** *SC* **73.10.1** *P* **75** *L* **22** # 34
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

The PD definition has changed from "represents all of the following that are present: 1000BASE-KX PMA, 10GBASE-KX4 PMA, and 10GBASE-KR PMA."
to
"represents all of the following that are present: 1000BASE-KX PMA, 10GBASE-CX4, 10GBASE-KX4 PMA, 10GBASE-KR PMA, 40GBASE-KR4, 40GBASE-CR4, 100GBASE-CR10." where some have PMA afterwards and some don't

SuggestedRemedy

Change to "represents all of the following that are present: 1000BASE-KX PMA, 10GBASE-CX4 PMA, 10GBASE-KX4 PMA, 10GBASE-KR PMA, 40GBASE-KR4 PMA, 40GBASE-CR4 PMA, 100GBASE-CR10 PMA."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **73** *SC* **73.10.1** *P* **76** *L* **40** # 521
Valliappan, Magesh Broadcom

Comment Type **TR** *Comment Status* **D** *AN*

For KR4/CR4/CR10 implementations where PMD&AN are in one device and the PCS&MAC are in a different device separated by an XLAUI interface, there isn't a well defined way for autoneg to access link status from the PCS.

SuggestedRemedy

The best remedy is an in-band indication of link status through the XLAUI interface, but I dont know how this can be done.

Will submit a presentation if suitable solution is available.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The commenter makes a valid point but the task force will need to agree a solution.

This problem really concerns CAUI/XLAUI rather than Clause 73.

Add editor's note "A mechanism has yet to be specified for indicating link status from a PCS connected to a KR4/CR4/CR10 PMD through a CAUI/XLAUI interface".

[added 73 to subclause number in comment]

Cl **73** *SC* **73.10.2** *P* **77** *L* **1** # 241
Meyer, Jeffrey Centellax

Comment Type **E** *Comment Status* **D**

This is merely a grammar comment for the sentence "Timer for the amount of time to wait...". The sentence should begin with an article like "The timer for the amount of time to wait..". This also appears on line 9.

SuggestedRemedy

Begin the sentence with an article like "The".

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This is text from the base standard. Making a change like this is unnecessary and would require changing the definition of all ten timers in Clause 73.

Cl **73** *SC* **73.2** *P* **73** *L* **7** # 154

D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D** *AN*

Figure 73-1 only reflects 1 Gb/s and 10 Gb/s, and does not reflecto 40 Gb/s for 40GBASE-KR4 and 40GBASE-CR4 or 100 Gb/s for 100GBASE-CR10.

SuggestedRemedy

Add Fig 73-1 with the following modification : show location of auto-negotation sublayer for 40 Gb/s and 100 Gb/s.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **73** *SC* **73.3** *P* **73** *L* **19** # 155

D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D** *AN*

lane for auto-negotiation for 40GBASE-KR4, CR4, and CR10 is not indicated.

SuggestedRemedy

Add last paragraph of 73.3, as modified, per below:

When the MDI supports multiple lanes, then lane 0 of the MDI shall be used for Auto-Negotiation and for connection of any single-lane PHYs (e.g., 100BASE-KX or 10GBASE-KR).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[corrected subclause number in comment]

Also see comment # 270

Cl **73** *SC* **73.5.1** *P* **73** *L* **1** # 270

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **D** *AN*

Subclause 73.5.1.1 needs to be amended for 40GBASE-KR4, 40GBASE-CR4, and 100GBASE-CR10 to ensure the PHYs exchange DME pages on a common lane.

SuggestedRemedy

Amend last sentence of 73.5.1.1 to read: "When the PHY has 10GBASE-KX4, 40GBASE-KR4, 40GBASE-CR4, or 100GBASE-CR10 capability, DME pages shall be transmitted only on lane 0. The transmitters for unused lanes should be disabled as specified in 71.6.7, <insert appropriate cross-references>."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[corrected subclause number in comment]

See remedy in comment # 155

Cl **73** *SC* **73.5.1** *P* **73** *L* **27** # 441

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **D** *AN*

The editor's note notwithstanding, the paragraph needs rewording (because it's ugly!) and more importantly, the following paragraph regarding operation over multilane media must be changed.

SuggestedRemedy

Delete the editor's note and the paragraph in the existing draft. Replace with:

Change text as follows (underlines & strikeouts will need to be added by the editor):

DME pages can be transmitted by local devices capable of operating in 1 Gb/s, 10Gb/s, 40Gb/s and 100Gb/s; using 1, 4 or 10 lanes.

73.5.1.1 DME electrical specifications

Change text as follows:

Transmitter characteristics shall meet the specifications in Table 73-1 at TP1 while transmitting DME pages. Receiver characteristics shall meet the specifications in Table 73-1 at TP4 while receiving DME pages.

For any multi-lane PHY, DME pages shall be transmitted only on lane 0. The transmitters on other lanes should be disabled as specified in 71.6.7.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Delete the editor's note and the following paragraph as this text is redundant.

Renumber 73.5.1.1 to 73.5.1 and use the title "DME electrical specifications"

Implement the commenter's suggested remedy for 73.5.1.1 using appropriate underlines & strikeouts

Cl **73** *SC* **73.6.4** *P* **73** *L* **49** # 462

Chalupsky, David Intel Corp.

Comment Type **T** *Comment Status* **D** *AN*

There is unnecessary distinnction between CR4 and KR4 in autonegotiation.
In Table 45-3 (PMA/PMD registers) we have already set the precedent that backplane and copper registers should be kept common as much as feasible.
We should continue this practice.
Propose combining KR4 and CR4 Technology Ability fields, priority resolution, and state variables as indicated in Remedy.
Beyond simplicity there is a problem with advertising CR4 & KR4 in separate bits and allowing them both to be set. In this case the the underlying PHY cannot distinguish if the media is backplane or copper. The Priority Resolution Table says to pick CR4, but the meida may actually be a bakplane, so the result would be to indicate a CR4 reslution when it is actually KR4... and it doesn't matter. Combine the bits.

SuggestedRemedy

Table 73-1: Rename bit A3 "40GBASE-KR4/CR4" Reclaim the remaining bits by naming A4 as CR10 & returning A5 to reserved.

Table 73-2: Combine CR4 and KR4 into the same resolution priority level.

subclause 73.10.1: 40GKR4 and 40GCR4 into the same variable. Either pick one of the two existing varable names, or make a combined name like "40GCKR4". Change the description to "represents that the 40GBASE-KR4 or 40GBASE-CR4 PMA is the signal source"

subclause 73.10.1: definition of single_link_ready: combine CR4 & KR4 (5 & 6) into one line: "5) link_status_[40GCKR4] = OK" as appropriate for the variable name used ablve.

Table 45-142 (and subclause 45.2.7.12.2): combine autoneg resolution for CR4 and KR4 into the same bit, since autoneg cannot distiguish. Suggest using bit 5. Change the bit 5 description to read "...is negotiated to perform 40GBASE-KR4 or 40GBASE-CR4" (The name for this bit can be resolved in the future to be consistent with the "Backplane/Copper/TBD" names that need to be resolved elsewhere in the draft.)

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The CR4 and KR4 PMDs have different electrical specifications so the distinction is necessary.

Cl **73** *SC* **73.7.4.1** *P* **75** *L* **17** # 463

Chalupsky, David Intel Corp.

Comment Type **T** *Comment Status* **D** *AN*

Unecessary distinction between CX4 and KX4 in autonegotiation variables.
Subclause 74.7.4.1 line 17-18 already indicate sthat CX4 may be parallel detected, and that it is up to the system implementer to distiguish KX4 form CX4 as the PHY cannot.
To be consistent with that we should remove CX4 state variables from autoneg, because the PHY cannot distiguish parallel detected KX4 from CX4.

SuggestedRemedy

73.7.4.1, line 17. After sentence "Additionally, parallel detection may be used for 10GBASE-CX4" insert "Parallel detection of 10GBASE-CX4 should be indicated by setting the Negotiated Port Type to 10GBASE-KX4 in the management register 7.48.2."

subclause 73.10.1, page 76 line 8: delete the variable definition 10GCX4.
Page 76, line 37: delete line with "link_status_[10GCX4]=OK"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

CX4 and KX4 have different electrical specs so the distinction is necessary.

Add 10GBASE-CX4 negotiated port-type to a new bit in register 74.8 in Clause 45.

Cl **74** *SC* **74.3** *P* **79** *L* **21** # 156

D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**

Fig 74-1 only shows FEC for 10GBASE-R. The clause is being modified elsewhere to separate between serial and multi-lane PHY. It should be done in this figure as well.

SuggestedRemedy

Add Fig 74-1 with modification to show 40GBASE-R and 100GBASE-R layers as well.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **74** *SC* **74.4.2** *P* **79** *L* **34** # 442

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **D**

As the editor's note suggests - a diagram is needed.

SuggestedRemedy

Delete the editor's note after doing what it says.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **74** *SC* **74.4.2** *P* **79** *L* **41** # 239

Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

Today in clause 74, subclause 74.5.3 it describes the primitive FEC_SIGNAL_indication. This states if the FEC recieve is in lock or not. This is fine for the legacy 16 bit parallel interface, but for 40/100GbE the FEC block could be across a XLAUI or CAUI interface from the PCS. It would be better if we defined the behavior for loss of FEC lock also for the case where we just have the XLAUI or CAUI i/f between the PCS and FEC block.

SuggestedRemedy

Define the FEC loss of lock behavior as sending the raw unsynchronized bit stream to the PCS. Without FEC lock, and without the FEC block lock restoring the 66b blocks, the recieve PCS will be down and out of lock which is what we want in this situation.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Define the FEC loss of lock behavior as sending the raw unsynchronized bit stream to the PCS.

Change last sentence in 74.5.3.1 from:
"A value of FAIL denotes that errors have been detected by the Receive process indicated by the fec_signal_ok variable equal
to false, that prevent valid data from being presented to the PCS, in this case the FEC_UNITDATA.indication primitive and its associated rx_data-group<15:0> parameter are meaningless."

to:
"A value of FAIL denotes that errors have been detected by the Receive process indicated by the fec_signal_ok variable equal
to false, that prevent valid data from being presented to the PCS, in this case the FEC_UNITDATA.indication primitive and its associated rx_data-group<15:0> parameter are a direct pass through of PMA_UNITDATA.indication from the PMA."

Cl **74** *SC* **74.4.2** *P* **79** *L* **41** # 222

Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

Subclause 74.5 (which is not part of our D1.0) needs to be changed to enable it to hook up to our PCS and PMA sublayers.

Here are the current primitives for the FEC clause (based on the 16 bit wide parallel bus):
FEC (clause 74) primitives:
a) FEC_UNITDATA.request(tx_data-group<15:0>)
b) FEC_UNITDATA.indication(rx_data-group<15:0>)
c) FEC_SIGNAL.indication(SIGNAL_OK)

Right now this clause won't hook up to the PCS or PMA clause. Right now for the 40/100G PCS:
PMA_UNITDATA.requestx (x = 0-3 for 40GBASE-R) PMA_UNITDATA.indicatex (x = 0-3 for 40GBASE-R) PMA_SIGNAL.indication

We need to add the correct primitives to the FEC clause so it hooks up to the 40/100G PCS/PMA.

SuggestedRemedy

This could just be:
40GBASE-R and 100GBASE-R run one instance of the FEC sublayer on each PCS lane.
To hook up to the PCS or PMA sublayers, the following primitives are used.
For 40GBASE-R the primitives are:
PMA_UNITDATA.requestx (x = 0-3)
PMA_UNITDATA.indicatex (x = 0-3)
PMA_SIGNAL.indication

For 100GBASE-R the primitives are:
PMA_UNITDATA.requestx (x = 0-19)
PMA_UNITDATA.indicatex (x = 0-3)
PMA_SIGNAL.indication

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Add subclause 74.5 with suitable service interface definition for 40GBASE-R and 100GBASE-R.

Cl **74** *SC* **74.7.4.5** *P* **79** *L* **39** # 433

Barrass, Hugh Cisco

Comment Type **E** *Comment Status* **D**

The editor's note i sno longer required.

SuggestedRemedy

Delete the editor's note

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **74** *SC* **74.7.4.5** *P* **79** *L* **46** # 322

Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **D**

The moderate power taken by FEC is spent four ways: encoding (basically a CRC generation), error detection (CRC checking), error correction, and re-coding as non-FEC 64B/66B and error marking. A significant fraction of the power and complexity goes in error correction; all the rest is straightforward. Most of the latency is taken by error correction and optional PCS error marking. In some scenarios e.g. a copper cable approaching 10 m, we need FEC for its error detection. In other scenarios e.g. 40GBASE-KR4, 100GBASE-ER4, we do (or should) allow FEC for its error detection as well.
But when a particular link is up and running, a receiver that is happy with its received BER can switch the correction off, with no need for handshaking with the transmitter. This still gives excellent error detection, and remains compatible with PCS error indication. In principle this could be done lane by lane but the remedy below treats all the lanes as a group. There is another comment for Clause 74.

SuggestedRemedy

Add sentence 'For reduced power, latency and complexity, in some circumstances the FEC decoder detects errors but does not attempt to correct them. These circumstances are explained in the relevant PMD clauses e.g. Clause 84 to Clause 88.'
I intend to provide a short presentation showing the difference between error detection and error correction.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This needs approval by the task force.

Also the proposed remedy is not complete.

Cl **74** *SC* **74.7.4.5** *P* **79** *L* **49** # 524
Ofelt, David Juniper Networks

Comment Type **E** *Comment Status* **D**

Punctiation missing for "In case of sucessful decoding the decoder..."

SuggestedRemedy

Change to

"In case of sucessful decoding, the decoder..."

or possibly

"In the case of sucessful decoding, the decoder..."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[corrected subclause number in comment]

This is text from the base standard so should not be modified unless there is a serious problem with it.

Cl **74** *SC* **74.7.4.5** *P* **80** *L* **2** # 227
Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

So that 40G and 100G will have similar behavior when it comes to the PCS SM interactions with uncorrectable FEC blocks, change 40G marking behavior to be consistent with 100G (mark all blocks bad).

SuggestedRemedy

Change: The single lane PHY marks every 8th 64B/66B block, the four PCS-lane PHY marks every second
64B/66B block and the twenty PCS-lane PHY marks every 64B/66B block.

To: The single lane PHY marks every 8th 64B/66B block, the four and twenty PCS-lane PHYs marks every 64B/66B block.

Make the same change on line 31 of the same page also.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See comment 87, it is not strictly true to say the single lane PHY marks every 8th block.

Change text to:
The four and twenty PCS-lane PHYs mark all thirty two 64B/66B blocks in the FEC block as errored.

Cl **74** *SC* **74.7.4.5** *P* **80** *L* **2** # 87
Szczepanek, Andre Texas Instruments

Comment Type **ER** *Comment Status* **D**

"The single lane PHY marks every 8th 64B/66B block"
is not strictly true. It also always marks the last block in a frame (+7!)
This is repeated on line 31 on the same page

SuggestedRemedy

Change to
"The single lane PHY marks every 8th and the last 64B/66B word in an FEC block"
or similar. The four lane wording may need the same change.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[corrected subclause number in comment]

See remedy to comment # 227

Cl **74** *SC* **74.8** *P* **81** *L* **11** # 461
Chalupsky, David Intel Corp.

Comment Type **E** *Comment Status* **D**

Table 74-1 register names are "Backplane" but they are named "Backplane/Copper/TBD" in Clause 45. This is just a reminder that resolving the naming issue in Cl45 also applies to Table 74-1.

SuggestedRemedy

Apply resolution of Table 45-3 "Backplane/Copper/TBD" naming issue to Table 74-1.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Comments # 377, 443, 461 all raise this issue

Cl **74** *SC* **74.8** *P* **81** *L* **11** # 443
Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **D**

All of the register names need to change to match Clause 45.

SuggestedRemedy

Change the register names for all the registers in Table 74-1 to match Clause 45 (may be changed by another comment).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

comments # 377, 443, and 461 all raise this issue

Cl **74** *SC* **74.8** *P* **81** *L* **25** # 377
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

PMA/PMD register names ('Backplane FEC') do not match Clause 45 ('Backplane/Copper/TBD FEC') in this draft. The former is too specific, the latter is too long. Need a shorter name: something neutral as to application, which may evolve over the months and years.

SuggestedRemedy

K-FEC ?

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Comments # 377, 443, 461 all raise this issue

Cl **80** *SC* **1.4** *P* **87** *L* **21** # 85
Szczepanek, Andre Texas Instruments

Comment Type **E** *Comment Status* **D**

"at teast 100m"

SuggestedRemedy

"at least 100m"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **80** *SC* **80.1.1** *P* **85** *L* **12** # 311
Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **D**

The paragraph quoted has several problems and seems to have no purpose beyond advertisement. Any reader of a document like this will be above such material.
'The 40 and 100 Gigabit Ethernet extends the IEEE 802.3 protocol to operating speeds of 40 Gb/s and 100 Gb/s. The bit rate is faster and the bit times are shorter-both in proportion to the change in bandwidth while maintaining maximum compatibility with the installed based of IEEE 802.3 interfaces. The minimum packet transmission time has been reduced by a factor of four for 40 Gb/s and ten for 100 Gb/s.'
Extends? will be wrong when .3ba is rolled into the base standard. 'bandwidth' is wrong term. 'while maintaining maximum compatibility with the installed based of IEEE 802.3 interfaces' There is very little compatibility with the installed based of IEEE 802.3 interfaces intended (and none spelled out in the objectives). 'packet transmission time' means? For links up to 10 and 40 km, transmission time is substantially determined by the speed if light, not the MAC rate. 'factor of four' as compared with what?

SuggestedRemedy

Delete the paragraph. Anyone who thinks it leaves a void can bring in something better next time.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This point was discussed in the Task Force during Draft 0.9 review and the members recommended to leave the text as it provides useful information.

The commenter is encouraged to provide alternative text as an improvement

Cl **80** *SC* **80.1.1** *P* **85** *L* **15** # 465
Dudek, Mike JDSU

Comment Type **E** *Comment Status* **D**

typo

SuggestedRemedy

Change "based" to "base"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **80** *SC* **80.1.2** *P* **85** *L* **3138** # 71
Chung, Hwan Seok ETRI

Comment Type **T** *Comment Status* **D**

There are two types of description for MMF in D1.0 such as "multi mode fiber" and "multimode fiber". Across the entire document, "multimode fiber" was mostly used. So, to maintain consistency, it will be better to change "multi mode fiber" to "multimode fiber." The change should be done in following lines.

Clause 1, page 23, line 21: multi mode fiber->multimode fiber
Clause 1, page 23, line 42: multi mode fiber->multimode fiber
Clause 80, page 85, line 31: multi mode fiber->multimode fiber
Cluase 80, page 85, line 38: multi mode fiber->multimode fiber

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **80** *SC* **80.1.3** *P* **85** *L* **45** # 118
Marris, Arthur Cadence

Comment Type **E** *Comment Status* **D**

Style:
The word "respectively" is redundant.

SuggestedRemedy

Delete "respectively"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **80** *SC* **80.1.3** *P* **86** *L* **1** # 116
Marris, Arthur Cadence

Comment Type **E** *Comment Status* **D**

Punctuation
delete comma before and

SuggestedRemedy

Change
"MAC, and"
to
"MAC and"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **80** *SC* **80.1.3** *P* **86** *L* **36** # 380
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **D**

'It is important to note that': is just padding. If it didn't matter, we wouldn't say it.

SuggestedRemedy

Delete

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **80** *SC* **80.1.3** *P* **86** *L* **5** # 379
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

New figures in new clauses should do things properly.

SuggestedRemedy

Use upper and lower case as normal, e.g. change 'LAN CSMA/CD LAYERS' to 'LAN CSMA/CD layers'. Also in following clauses.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This issue was also discussed during 802.3 maintenance. All the layer diagrams in 802.3ba have been updated for consistency with the base spec.

Cl **80** *SC* **80.1.3** *P* **86** *L* **53** # 35
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

item e) currently reads "The PMD Service Interface, which, when physically implemented at an observable interconnection port, uses a 4 or 10 lane data path as specified in Clause 86."
To match the other items the name PPI should be included.

SuggestedRemedy

change "when physically implemented at an observable interconnection port" to "when physically implemented as PPI (Parallel Physical Interface) at an observable interconnection port"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **80** *SC* **80.1.4** *P* **87** *L* **18** # 466
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

The wording in this paragraph implies that shorter cables are not compliant.

SuggestedRemedy

Change "represents a physical medium of ....." to "represents the ability to operate over a physical medium of ....." 5 places.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See response to comments # 36 and # 112

Cl **80** *SC* **80.1.4** *P* **87** *L* **18** # 112
Marris, Arthur Cadence

Comment Type **T** *Comment Status* **D**

The PHYs need to be able to drive at least these distances while the media can be up to these distances.

SuggestedRemedy

Consider changing
"of at least"
to
"of up to at least"
in three places

Also change "teast" to "least" on line 21.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Also discuss comments # 36 and # 466 together

Cl **80** *SC* **80.1.4** *P* **87** *L* **18** # 36
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

This says "The letter C in the port type (e.g. 40GBASE-CR4 or 100GBASE-CR10) represents a physical medium of shielded balanced copper cabling assembly of at least 10 m in length.". But the physical medium is up to 10 m in length. It is the PMD that is capable of at least 10 m.

SuggestedRemedy

Either change "at least" to "up to" in 5 places in this paragraph,
or
change "represents a physical" to "represents a port capable of operation over a physical" in 5 places

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

See also comment # 112 and # 466

Cl **80** *SC* **80.1.4** *P* **87** *L* **18** # 284
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

Several very minor editorial issues in clause 80 collected in to one comment.

SuggestedRemedy

Change "for e.g." to "e.g." in page 87 lines 18 and 21
Change "concepts of MII:" to "concepts of the MII:" page 94 line 15
Change "implemented DIC" to "implemented the DIC" page 104 line 3
Change "a RXC" to "an RXC" page 106 line 38
Page 111 line 12 external reference to clause 21 should be blue

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

This comment also affects Clause 81

Cl **80** *SC* **80.1.4** *P* **87** *L* **21** # 412
Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**
Typo: change to "at least"

SuggestedRemedy
per comment

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Also see comment #85

Cl **80** *SC* **80.11** *P* **91** *L* **1** # 121
D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**
Clause 80.11 needs to be renumbered.

SuggestedRemedy
80.11 should be 80.6

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Cl **80** *SC* **80.11** *P* **91** *L* **1** # 130
D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**
subclauses not numbered properly - 80.11 should be 80.6

SuggestedRemedy
renumber 80.11 to 80.6

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Same as comment #121

Cl **80** *SC* **80.2.3** *P* **88** *L* **10** # 145
D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**
Optional XLAUI / CAUI not shown in Table 80-1.

SuggestedRemedy
show columns for 83A and XLAUI / CAUI. All 40GBASE-R PMDs should be optional for XLAUI and NA CAUI. All 100GBASE-R PMDs should be optional for CAUI and NA for XLAUI.

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Cl **80** *SC* **80.2.3** *P* **88** *L* **23** # 313
Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **D** *AN*
Auto-negotiation is an unnecessary burden on front-side ports. See another comment.

SuggestedRemedy
Provide two columns under '73', Auto-negotiation M for 40GBASE-KR4 only (blank for all others), Link Negotiation (if we keep that name) O or M as decided for 40GBASE-CR4 and 100GBASE-CR10. Revise 82.2.20.

Proposed Response *Response Status* **W**
PROPOSED REJECT.

AN requirement for CR PMDs is specified in Clause 85. This table captures this correlation.

Any change to AN requirement or new proposals for respective PMDs need to be discussed in the task force

Cl **80** *SC* **80.2.3** *P* **88** *L* **23** # 312

Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D** *FEC*

Clause 74 FEC is applicable to all these port types. Whether we like it or not, it can be applied. At least as far as error detection, it should be mandatory for 40GBASE-CR4 and 100GBASE-CR10. I expect it will turn out to be a practical necessity for 100GBASE-ER4.

SuggestedRemedy

Make Clause 74 FEC mandatory for 40GBASE-CR4 and 100GBASE-CR10, optional for all other port types in this table. The distinction between mandatory FEC detection and mandatory FEC correction can be explained elsewhere.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

FEC is specified as optional in Clauses 84 and 85. This table captures this correlation.

Any change to FEC requirement for respective PMDs need to be discussed in the task force

Cl **80** *SC* **80.2.3** *P* **88** *L* **37** # 38

Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

This paragraph mentions all of the PHY types except 40GBASE-LR4. Also, the english could be improved.

SuggestedRemedy

Add 40GBASE-LR4 to the list of 40G PHY types, change "The terms 40GBASE-R and 100GBASE-R refers" to "The terms 40GBASE-R and 100GBASE-R refer" and change "based upon 64B/66B data coding method" to "based upon the 64B/66B data coding method"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See response to comment #113

Cl **80** *SC* **80.2.3** *P* **88** *L* **38** # 113

Marris, Arthur Cadence

Comment Type **T** *Comment Status* **D**

This text is redundant as it repeats what is described in 80.1.4 Nomenclature. Also it does not mention 40GBASE-LR4 and 'terms' should be 'term'.

SuggestedRemedy

Delete
The term 40GBASE-R refers to a specific family of Physical Layer implementations for 40 Gb/s such as 40GBASE-KR4, 40GBASE-CR4 and 40GBASE-SR4. The term 100GBASE-R refers to a specific family of Physical Layer implementations for 100 Gb/s such as 100GBASE-CR10, 100GBASE-SR10, 100GBASE-LR4 and 100GBASE-ER4.
All 40GBASE-R and 100GBASE-R PHY devices share a common PCS specification defined in Clause 82,

So that the text reads:
The term '40GBASE-R and 100GBASE-R' refers to a specific family of Physical Layer implementations based upon 64B/66B data coding method specified in Clause 82 and the PMA specification defined in Clause 83.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **80** *SC* **80.2.3** *P* **88** *L* **45** # 323

Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Good introductory material overlooked in 82.1.3.

SuggestedRemedy

Either add sentence here 'The functions of the PCS, FEC, PMA, PMD and AN sublayers are summarized in 82.1.3.' or move 82.1.3. into 80.2.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

It is more appropriate to move the introductory text for different sublayers from Clause 82 to introductory Clause 80 instead of repeating it in PCS clause or individual clauses.

Cl **80** *SC* **80.2.3** *P* **88** *L* **5** # 37

Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

This contains "implementations and the Table 80-1 specifies" which reads awkwardly.

SuggestedRemedy

"implementations and the Table 80-1 specifies" to "implementations. Table 80-1 specifies"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[corrected page number from 87 to 88]

Cl **80** *SC* **80.2.6** *P* **89** *L* **11** # 620

Ganga, Ilango Intel

Comment Type **TR** *Comment Status* **D**

Service interface specification method and notation:

For all the service interfaces used in 802.3ba follow the defintion used in 1.2.2 and be consistent with service interfaces used in the base specification (IEEE 802.3-2008)

This comment applies to Clause 82 to Clause 88

In the base specification the only the parameters used in the primitive is a vector, none of the primitives are vectors. Whereas in 802.3ba the primitive is defined as a vector with just a single parameter. This is inconsistent with the base standard (IEEE Std 802.3-2008)

Change the service interface definition in 802.3ba to be consistent with the base standard

For example the PMD service interface in Clause 86 is defined as follows:
PMD_UNITDATA.request<n:0>(tx_biti), i=0..n
or in otherwords
PMD_UNITDATA.request0(tx_bit0)
PMD_UNITDATA.request1(tx_bit1)
...
PMD_UNITDATA.requestn(tx_bitn)

Instead define the primitives with parameter as vectors as in 802.3-2008
PMD_UNITDATA.request(tx_bit<n:0>)
or in otherwords
PMD_UNITDATA.request(tx_bitn, .. tx_bit2, tx_bit1, tx_bit0)

SuggestedRemedy

Change service interface definition in 802.3ba to be consistent with the base specification (IEEE Std 802.3-2008). Make this change globally to Clauses 80 through 88 and remove the editorial notes.

For example the PMD_UNIDATA.request primitive in PMD service interface will be redefined as follows:
PMD_UNITDATA.request(tx_bit<n:0>)
or in otherwords
PMD_UNITDATA.request(tx_bit<n>, .. tx_bit2, tx_bit1, tx_bit0)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

This comment affects Clauses 80 through 88

Cl **80** *SC* **80.2.6** *P* **89** *L* **14** # 314
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **D** *Review*

'Editor's note... The service interface notation used in 802.3ba PMD PMA clauses have some differences from the notations used for10GbE sublayer interfaces. The differences need to be explained in the introductory Clause 80
The definitions and notation for service interfaces in 802.3ba PMD/PMA will be reconciled, during TF review, as per the service interface definitions specified in 1.2.2 .'
What is the difference/issue?

SuggestedRemedy

If found to be OK, delete this and similar notes.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See response to comment #620.

Delete Editor's note as appropriate

Cl **80** *SC* **80.3** *P* **89** *L* **23** # 315
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D** *Delay*

MAC Control PAUSE can't be used with long links because the round trip latency becomes too much to cope with. At each higher MAC rate, this is ever more true. If the entity above the MAC wants to know the round trip latency, it should use Ping or similar method to find it out for a particular link. Even with this table, for many port types there is no guarantee that the nominal maximum latency is not exceeded because 'A PMD which exceeds the operational range requirement while meeting all other optical specifications is considered compliant'.

SuggestedRemedy

Remove the table rows for 40GBASE-LR4 PMD, 100GBASE-LR4 PMD and 100GBASE-ER4 PMD. Delete 87.2.1 and 88.2.1, change '87.2 Delay and skew' to '87.2 Skew', similarly 88.2.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The Pause requirement and text is consistent with 802.3-2008 base standard for different Physical layers.

Discuss with the task force removal of this requirement for specific PMDs.

Cl **80** *SC* **80.3** *P* **89** *L* **25** # 418
Ganga, Ilango Intel

Comment Type **ER** *Comment Status* **D**

Change "PHY implementors" to "PHY implementations"

SuggestedRemedy

per comment

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This text is consistent with rest of the sentence.

Cl **80** *SC* **80.3** *P* **89** *L* **32** # 316
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D** *Delay*

With multi-lane sublayers, these time units are confusing. 'bit time' was always confusing to PMD and PMA engineers.

SuggestedRemedy

Add a column in ns. Consider deleting one of the two 'Maximum' columns in D3.0. If we keep a column in bit times, change 'bit time' to 'MAC bit time'.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This unit is consistent with the definitions for delay in 802.3-2008 base standard

Cl **80** *SC* **80.3** *P* **89** *L* **34** # 300
Shafai, Farhad Sarance Technologies

Comment Type **TR** *Comment Status* **D** *Delay*

Based on implementations in FPGAs, I have measured the delay through the MAC, RS and MAC Control layers and would like to suggest the values for this delay that is currently in table 150-1 to be changed as per this comment.

SuggestedRemedy

In table 150-1, row 1, change 8129 to 17920.
In table 150-1, row 1, change 16 to 35.
Supplemental material is provided in support of this remedy.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: Commenter has used old clause numbers. Changed Clause number from 150 to 80]

Discuss this proposal in the Task Force along with delays to other sublayers.

Also see comment #301

Cl **80** *SC* **80.3** *P* **89** *L* **35** # 301
Shafai, Farhad Sarance Technologies

Comment Type **TR** *Comment Status* **D** *Delay*

Based on implementations in FPGAs, I have measured the delay through the PCS and would like to suggest the TBD values for the PCS round trip delays to be changed as described here. These delays are specified in table 150-1.

SuggestedRemedy

Change the TBD fields for 40GBASE-R PCS round trip delay to: 11264 bit time in column 2, and 22 pause quanta in column 3.
Change the TBD fields for 100GBASE-R PCS round trip delay to: 35328 bit time in column 2, and 69 pause quanta in column 3.
Supplemental material is provided in support of this remedy.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: Commenter has used old clause numbers. Changed Clause number from 150 to 80]

Discuss this proposal in the Task Force along with delays to other sublayers.

Also see comment #300

Cl **80** *SC* **80.3** *P* **89** *L* **44** # 317
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D** *Delay*

TBDs

SuggestedRemedy

Accept the proposed Round-trip delay limit for 40GBASE-SR4 and 100GBASE-SR10.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Update the TBDs for SR4 and SR10 based on the Task Force resolution for delay numbers

Cl **80** *SC* **80.3** *P* **89** *L* **46** # 39
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D** *Delay*

In Table 80-1 the reference for 40GBASE-LR4 is only to clause 87 rather than 87.2.1

SuggestedRemedy

Change "See 87." to "See 87.2.1."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The reference is to the "Delay" subclauses that specify the delay numbers in the respective clauses.

Change references in table to point to relevant subclauses that specify delays

Cl **80** *SC* **80.3** *P* **89** *L* **54** # 240
Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D** *Skew*

Currently clause 80 does not have the allowed skew constraints. It seems to me that it would be good to add in a table and some background on the skew constraints in this clause as well as putting the applicable skew constraints in each appropriate clause (PCS, PMA , PMD etc).

SuggestedRemedy

Add in a section based on the attached presentation into clause 80 and other appropriate clauses.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Add appropriate text and table based on Task Force discussion on Skew

Cl **80** *SC* **80.3** *P* **90** *L* **5** # 119

Marris, Arthur Cadence

Comment Type **E** *Comment Status* **D**

spelling of meter. Should this be 'metre'?

SuggestedRemedy

Consider changing to 'metre'.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Meter is the correct spelling

Cl **81** *SC* **81.1** *P* **93** *L* **46** # 131

D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**

choice of wording

SuggestedRemedy

reword
The purpose of the MII is to provide a simple and easy-to-implement logical interconnection between the Media Access Control (MAC) sublayer and the Physical Layer (PHY). The MII is not intended to be electrically
instantiated, rather it can logically connect layers within a device.

The MII is an optional logical interface between the Media Access Control (MAC) sublayer and the Physical Layer (PHY).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **81** *SC* **81.1** *P* **93** *L* **5** # 133

D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**

Use of "MII" is ambiguous.

SuggestedRemedy

Suggest XLGMII and CGMII be used when referring to speed appropriate MII.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Will change the references that are speed specific to XLGMII and CGMII. For example sublcause 81.1.3 would change from:
"The MII has been specified to suport 40 Gb/s and 100 Gb/s"
to:
"The XLGMII has been specified to suport 40 Gb/s and the CGMII has been specified to support 100 Gb/s"

Cl **81** *SC* **81.1.5** *P* **95** *L* **17** # 114

Marris, Arthur Cadence

Comment Type **T** *Comment Status* **D**

OSI not ISO

SuggestedRemedy

Change
"ISO (IEEE)"
to
"OSI"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Change
"This MII (like the original MII, GMII and XGMII) maximizes media independence by cleanly separating the Data Link and Physical Layers of the ISO (IEEE) seven-layer reference model"

To:
This MII (like the original MII, GMII and XGMII) maximizes media independence by cleanly separating the Data Link and Physical Layers of the OSI seven-layer reference model"

Cl **81** *SC* **81.3.1.1** *P* **100** *L* **53** # 104

Ebbers, Jonathan IBM

Comment Type **T** *Comment Status* **D**

For 100G, are we really going to run with TX_CLK and RX_CLK at 1.56GHz? This seems like quite a frequency jump; I'm surprised no consideration was given to expanding the bus width from 4 bytes to 8 or 16. We typically time the cores with 200 ps of margin, but 1.56G only gives us a 640ps cycle time. I think even at 45nm this would be very tight to time.

SuggestedRemedy

Clarify the frequency requirements or allow for a wider MII bus definition.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[changed subclause number from 3.1.1 to 81.3.1.1]

Someday people will run the bus that fast (TX_CLK and RX_CLK at 1.56GHz), but for now people will run the bus in multiples of 64 bits (2x64, 4x64 etc).

I can add in the following statement:
" The frequency of TX_CLK in practice can be reduced by making the bus wider in increments of 64 bits"

We would also want to add this note to the RX_CLK, subclause 81.3.2.1, line 16:
" The frequency of RX_CLK in practice can be reduced by making the bus wider in increments of 64 bits"

Cl **81** *SC* **81.3.1.3** *P* **102** *L* **7** # 318

Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Some of the lines shown are impossible with the hex values given.

SuggestedRemedy

Remove the lines below '0xFF' and above '0x00'. Also Fig. 81-6, 81-7.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Althought the comment makes some sense, the way that the data bus is shown is consistent with typical conventions on how a data bus is shown in a timing diagram, and is consistent with clause 46.

Cl **81** *SC* **81.3.4** *P* **108** *L* **17** # 115

Marris, Arthur Cadence

Comment Type **T** *Comment Status* **D** *clause49*

Most of the text and the state diagram in 81.3.4 has been copied verbatim from Clause 46.

SuggestedRemedy

Consider referencing sub clause 46.3.4 for link fault signalling rather than having a direct copy. Something along the lines of:

"Link fault signalling shall be implemented as described in 46.3.4. The four octet sequence ordered set shall start in lane 0 with the octets in lanes 4, 5, 6 and 7 set to 0x00."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

I think it is cleaner to leave it as is due to the changes in Table 81-5 and the paragraph before it (going from 4B to 8B ordered set)..

Cl **81** *SC* **81.3.4** *P* **108** *L* **22** # 319

Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Decide once and for all whether to allow 'unidirectional' operation at 40 and 100G. Per conversation at last meeting, it seems it's possibly helpful for an unprotected link, probably harmful for a protected link. Will there be unprotected managed 40G or 100G Ethernet links?

SuggestedRemedy

Decide and write it down. If we do allow unidirectional, the bad Hamming distance of the Sequence ordered_sets might be worth changing.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

There has been no mention in the baseline or any objectives of supporting operation in unidirectional mode. We should state this in this clause.

Cl **81** *SC* **81.3.4** *P* **108** *L* **22** # 237
Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

Remove
"[Editor's note (to be removed prior to publication) - The behavior described below does not allow unidirectional
operation]"

The behavior does not allow unidirectional operation which is what is intended.

SuggestedRemedy

As above.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Remove the editors note.

Cl **81** *SC* **81.3.4.3** *P* **109** *L* **51** # 275
Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **D**

"...with each pair of fault sequences separated by less than 128 columns and no intervening fault_sequences of a different fault value."

...seems to be inconsisent with the Link Fault Signaling state diagram (Figure 81-9). Ordered sets do not need to arrive in pairs.

SuggestedRemedy

Change to read "...with each fault sequence separated by less than 128 columns and no intervening fault_sequences of a different fault value."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Change
"...with each pair of fault sequences separated by less than 128 columns and no intervening fault_sequences of a different fault value."
to:
"...with each fault sequence separated by less than 128 columns and no intervening fault_sequences of a different fault value."

Cl **81** *SC* **81.3.5** *P* **110** *L* **51** # 223
Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

Remove the following:

"81.3.5 PCS MDIO function mapping

[Editor's note (to be removed prior to publication) - Insert MDIO/MII variable mapping"

Clause 81 has no function mapping.

SuggestedRemedy

As above

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Remove:

"81.3.5 PCS MDIO function mapping
[Editor's note (to be removed prior to publication) - Insert MDIO/MII variable mapping"

Cl **82** *SC* **2.8** *P* **125** *L* **49** # 250
Estes, Dave UNH - IOL

Comment Type **E** *Comment Status* **D**

Typo, "or" instead of "of"

SuggestedRemedy

Change "and has lots or transitions" to "and has lots of transitions"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number 2.8 to 82.2.8]

Duplicate of #178, which was accepted.

Cl **82** *SC* **82** *P* **112** *L* **1** # 444

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **D** *clause49*

This clause reproduces most of Clause 49 without any reference to that clause. There are a number of reasons why this is a bad idea.

Firstly, it allows the definition of the 64B/66B PCS to diverge more than necessary for the development of 40 & 100G. This may cause problems, especially with developers who are planning to reuse parts of their 10GBASE-R designs for 40G or 100G. Subtle differences between the clauses will not easily be noticed. This may be particularly difficult for developers of multi-rate implementations (e.g. 4 x 10G that also supports 40G - or other combination silicon development).

It also wastes time reviewing and commenting on pages of specification that are already in the standard. Not to mention that LOAs may have to be resubmitted for IP that is already in Clause 49.

SuggestedRemedy

Rewrite the clause so that copied text is referenced and only the changes and additions are included in this clause.

The commenter will supply complete text if required (based on the existing Clauses 49 and 82).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Some subclauses that are unchanged are:
82.2.6, 82.2.14, figure 82-16 (PCS tx SM).
I propose that clause 82 just refer back to 49 for these.

All other subclauses that I saw have some differences. Figure 82-17 has just one minor difference for the entry requirements for RX_INIT, not sure how I would best address cases like this?
Changing many of the subclauses to refer back to clause 49 and then adding a number of changes seems to me that it will reduce the readability.

Cl **82** *SC* **82.1.1** *P* **113** *L* **12** # 120

Marris, Arthur Cadence

Comment Type **E** *Comment Status* **D**

Punctuation, delete comma before and.

SuggestedRemedy

Change
', and'
to
'and'

on lines 12 and 13

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.1.1** *P* **113** *L* **23** # 321

Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

'medium be compliant at the PMA level.' The medium is not at the PMA level, and not connected directly to the PMA. Also, there could be FEC between PMA and PCS.

SuggestedRemedy

Does this work: 'The 40GBASE-R and 100GBASE-R PCSs can operate with any full duplex medium requiring only that the sublayers below the PCS provide a compliant service interface to the PCS.'

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Change:
"40GBASE-R and 100GBASE-R can be extended to support any full duplex medium requiring only that the
medium be compliant at the PMA level."

"The 40GBASE-R and 100GBASE-R PCSs can operate with any full duplex medium requiring only that the sublayers below the PCS provide a compliant service interface to the PCS."

Cl **82** *SC* **82.1.1** *P* **146** *L* **1** # 320
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **D**

Draft says 'The terms 40GBASE-R and 100GBASE-R are used when referring generally to Physical Layers using the PCS defined here.' There should be nothing rate-specific in the PCS clause; these are generically useful PCSs that could be re-used at faster VL rates in future. The PCSs could be thought of as 'R4' and 'R20'.

SuggestedRemedy

No urgent need to rename them, but it's worth adding a sentence to say that one uses 4 PCS lanes and the other uses 20 PCS lanes, here in the Scope.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Right now this PCS is rate specific for 40 and 100G

Cl **82** *SC* **82.1.3.1** *P* **115** *L* **1** # 129
D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**

Bullet C is confusing in relation to what the actual functions in the PCS are, as the Tx PCS and Rx PCS seem to both be capable of adding / deleting idles.

SuggestedRemedy

Replace bullet c with the following text -

Compensation through insertion or deletion of idles for any rate difference caused by the insertion or deletion of alignment markers due to any rate difference between the MII and PMA

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change:
"Deleting (inserting) idles to compensate for the rate difference between the MAC and PMD due to the insertion (deletion) of alignment markers and due to any rate difference between the MII and PMA."

to:
"Compensation for any rate differences caused by the insertion or deletion of alignment markers or due to any rate difference between the MII and PMA through the insertion or deletion of idles."

Cl **82** *SC* **82.1.3.2** *P* **115** *L* **6** # 324
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Missing sublayers

SuggestedRemedy

Add new subclauses summarizing the FEC and AN sublayers.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Subclauses 82.1.3.x will be removed from clause 82 since they are redundant with what is already in clause 80.

82.1.3.1 Physical Coding Sublayer (PCS)
82.1.3.2 Physical Medium Attachment (PMA) sublayer
82.1.3.3 Physical Medium Attachment (PMD) sublayer

Cl **82** *SC* **82.1.3.3** *P* **115** *L* **21** # 195
Baldwin, Thananya Ixia

Comment Type **ER** *Comment Status* **D**

Title is incorrect:
82.1.3.3 Physical Medium Attachment (PMD) sublayer

SuggestedRemedy

Title should read:
82.1.3.3 Physical Medium Dependent (PMD) sublayer

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Subclause 82.1.3.3 is going to be deleted.

Cl **82** *SC* **82.1.3.3** *P* **115** *L* **22** # 107
Marris, Arthur Cadence

Comment Type **T** *Comment Status* **D**

The title of this subclause is wrong. Also there is no need to mention the PMD and MDI here. All in all this is just adding confusion.

SuggestedRemedy

Delete subclause 82.1.3.3.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.1.3.3** *P* **115** *L* **22** # 40
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

The title of 82.1.3.3 is "Physical Medium Attachment (PMD) sublayer". This should be "Physical Medium Dependent (PMD) sublayer"

SuggestedRemedy

Change "Physical Medium Attachment (PMD) sublayer" to "Physical Medium Dependent (PMD) sublayer"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Subclause 82.1.3.3 is to be deleted.

Cl **82** *SC* **82.1.4** *P* **115** *L* **30** # 132
D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**

wording is confusing, as it implies that the two pcs's use two interfaces.

SuggestedRemedy

Reword
There are two interfaces employed by the 40GBASE-R and 100GBASE-R PCSs.

to

There is one distinct interface employed for each rate of PCS.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.1.4** *P* **115** *L* **34** # 108
Marris, Arthur Cadence

Comment Type **T** *Comment Status* **D**

The sentence "The Reconciliation sublayer provides the same service interface to the PCS." does not make sense.

SuggestedRemedy

Delete this sentence.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.1.4** *P* **115** *L* **37** # 100
Ebbers, Jonathan IBM

Comment Type **E** *Comment Status* **D**

The 40GBASE-R PCS has a nominal rate at the PMA service interface of 10.3125 Mtransfers/s, which provides capacity for the MAC data rate of 40 Gb/s.
The 100GBASE-R PCS has a nominal rate at the PMA service interface of 5.15625 Mtransfers/s, which provides capacity for the MAC data rate of 100 Gb/s.

I think Mtransfers/s should be Gtransfers/s.

SuggestedRemedy

Change "The 40GBASE-R PCS has a nominal rate at the PMA service interface of 10.3125 Mtransfers/s, which provides capacity for the MAC data rate of 40 Gb/s. The 100GBASE-R PCS has a nominal rate at the PMA service interface of 5.15625 Mtransfers/s, which provides capacity for the MAC data rate of 100 Gb/s."

to

"The 40GBASE-R PCS has a nominal rate at the PMA service interface of 10.3125 Gtransfers/s, which provides capacity for the MAC data rate of 40 Gb/s. The 100GBASE-R PCS has a nominal rate at the PMA service interface of 5.15625 Gtransfers/s, which provides capacity for the MAC data rate of 100 Gb/s."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number 1.4 to 82.1.4]

Will correct this.

Cl **82** *SC* **82.1.4** *P* **115** *L* **39** # 187
Baldwin, Thananya Ixia

Comment Type **TR** *Comment Status* **D**

Incorrect units (Mtransfers/s) in the following sentences.
"The 40GBASE-R PCS has a nominal rate at the PMA service interface of 10.3125 Mtransfers/s, which provides capacity for the MAC data rate of 40 Gb/s. The 100GBASE-R PCS has a nominal rate at the PMA service interface of 5.15625 Mtransfers/s, which provides
capacity for the MAC data rate of 100 Gb/s."

SuggestedRemedy

The units should be Btransfers or Gtransers to convey billion transfers per second.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Already covered by comment #100, will be changing this.

Cl **82** *SC* **82.1.5** *P* **115** *L* **47** # 285
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

Several very minor editorial issues in clause 82 collected in to one comment.

SuggestedRemedy

Change "PMA service interfaces" to "PMA service interface" page 115 line 47
Change "wide, data" to "wide data" page 117 line 9
Change "to 64B/66B block" to "to 64B/66B blocks" page 117 line 10
Change "markers are shown" to "markers is shown" page 126 line 20
Change "for 40GBASE-R PCS:" to "for the 40GBASE-R PCS:" page 126 line 47
External links "21.5" and "14.2.3.2" should be blue page 130 lines 1 and 2
All blue text in 82.2.18.1 are register numbers which should not be blue
Blue text in 82.2.18.4 is a register number which should not be blue

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.1.6** *P* **116** *L* **18** # 190
Baldwin, Thananya Ixia

Comment Type **TR** *Comment Status* **D**

Figure 82-2-Functional block diagram
is missing the lane re-ordering function in the rx path.

SuggestedRemedy

Insert a block called "Lane Reorder" after "Alignment Lock Lande Deskew" block.
The new block must be before the PCS Receive block

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Right now the re-ordering is part of the lane deskew block and is described in 82.2.12 so I am not sure that it needs a separate block in the diagram.

Cl **82** *SC* **82.1.6** *P* **116** *L* **20** # 639
Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**

typo in the block diagram, change "AIIGNMENT" to "ALIGNMENT"

SuggestedRemedy

per comment

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Already covered by #103.

Cl **82** *SC* **82.1.6** *P* **116** *L* **29** # 336
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **D**

PMA_UNITDATA.indicate

SuggestedRemedy

PMA_UNITDATA.indication
Search and replace, 10 instances

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.1.6** *P* **116** *L* **44** # 225
Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

Remove:

"[Editor's note (to be removed prior to publication) - The primitive descriptions below need to be reconciled
with the FEC primitives.]"

Another comment has been added to clause 74 to make the changes so it can connect to clause 82.

SuggestedRemedy

As above

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.1.6** *P* **116** *L* **52** # 103
Ebbers, Jonathan IBM

Comment Type **E** *Comment Status* **D**

Figure 2

"AIIGNMENT LOCK LANE DESKEW" should be "ALIGNMENT LOCK LANE DESKEW".

SuggestedRemedy

Change "AIIGNMENT LOCK LANE DESKEW" to "ALIGNMENT LOCK LANE DESKEW".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number 1.6 to 82.1.6]

Cl **82** *SC* **82.1.6** *P* **116** *L* **6** # 224
Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

In figure 82-2 there is a box around the encode and scramble blocks that is labeled PCS transmit. Enlarge this box to incorporate the block distribution and alingment insertion also. Also enlarge the box labeled PCS recieve in include the BER monitor, alignment lock and lane block lock blocks.

Historically these boxes tried to include what was part of what state machine in clause 49, but it was not clear and confuses the issue.

SuggestedRemedy

As above

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2** *P* **116** *L* **48** # 325
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D** *clause49*

This PCS is extremely like the Clause 49 PCS. It costs a lot of unnecessary time going through it with a fine toothcomb to find where there are differences and where there are not.

SuggestedRemedy

Please add a subclause listing the similarities and differences. You might want to cover yourself by making it informative.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

This is similar to comment #444. For that comment I will delete subsclauses that are unchanged from 49 and refer to clause 49.

I also think it might be appropriate to add the following to subclause 82.1.2 which defines the relationship between this clause and others:

"This clause borrows heavily from Clause 49. 64b/66b endcoding is re-used with appropriate changes made to support 8 byte alignment vs. the 4 byte alingment in Clause 49. On top of 64b/66b encoding is a methodology to add alignment markers and distribute data to multiple lanes in order to support PMDs with multiple lanes."

Cl **82** *SC* **82.2.10** *P* **128** *L* # 438
Barrass, Hugh Cisco

Comment Type **E** *Comment Status* **D**

"sends 4 bits at a time" implies that the bits are sent as a vector.

SuggestedRemedy

Change:

it sends 4 bits (for 40GBASE-R) or 20 bits (for 100GBASE-R) of test pattern at a time

to

it sends the test pattern in 4 separate data streams (for 40GBASE-R) or 20 separate data streams (for 100GBASE-R)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.10** *P* **128** *L* **1** # 90
Szczepanek, Andre Texas Instruments

Comment Type **TR** *Comment Status* **D**

The test-pattern generator and checker sub-clauses require definition of the test pattern.

SuggestedRemedy

Use the 10GBASE-R pseudo-random pattern ?

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Changed subclause number 2.10 to 82.2.10]

Line 11 in subclause 82.2.10 does define it, but to make it clearer I propose:
Change:
"The input to the scrambler is the control block type with all idles."

to:
"The input to the scrambler is a control block with all idles. This is block type 0x1e with the control codes set to 0x00 from figure 82-5."

Cl **82** *SC* **82.2.10** *P* **128** *L* **1** # 446
Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **D**

The Test-pattern generators description is incomplete - when compared to the source in Clause 49.

It does not describe how the seed is placed in the scrambler, inverted etc.

SuggestedRemedy

The full text of 49.2.8 needs to be copied in, then the references to the square wave and PRBS sequences removed.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Most of 49.2.8 is not applicable. Comment #90 adds in more detail about the pattern (idle control). There are no plans to have invert patterns etc. Here is one clarification that might help people undertand the differences between clause 49 and this clause:
From:
When pseudo-random pattern is selected, the test pattern is generated by the scrambler using a random seed
loaded through the MDIO registers.
To:
"When pseudo-random pattern is selected, the test pattern is generated by the scrambler using a seed loaded through the MDIO registers. After the scrambler is seeded on startup, no re-seeding occur during test pattern operation."

Cl **82** *SC* **82.2.10** *P* **128** *L* **10** # 102
Ebbers, Jonathan IBM

Comment Type **E** *Comment Status* **D** *testing*

82.2.10 says that the scrambler starts off with a seed loaded from the MDIO registers. This seems to contradict 82.2.6 which says that there is no initial value for the scrambler. We suspect that there is no initial value for regular operation and a defined seed for test operation. Should the specification be more specific on this point?

SuggestedRemedy

Clarify the sentence in 82.2.6, "There is no requirement on the initial value for the scrambler." to "There is no requirement on the initial value for the scrambler for regular operation; test-patterns shall load an initial value from the MDIO registers."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number 2.10 to 82.2.10]

Cl **82** *SC* **82.2.12** *P* **128** *L* **30** # 204
Marris, Arthur Cadence

Comment Type **T** *Comment Status* **D**

Inappropriate use of the word "must".

SuggestedRemedy

Change "must reorder" to "reorders".

Also similar problem on line 34 but in this case consider using shall.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

From:
"The PCS must reorder lanes if they are received out of order"
To:
"The PCS reorders lanes if they are received out of order"

And
From:
"The skew budget that the PCS receiver must support is shown in Table 82-4"
To:
"The skew budget that the PCS receiver shall support is shown in Table 82-4"

Cl **82** *SC* **82.2.12** *P* **128** *L* **34** # 274

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **D** *skew*

This subclause states that "the skew budget that the PCS receiver must support is shown in Table 82-4." The skew budget in Table 82-4 presumes a concatenation of optional interfaces and a generous allocation for media skew that may not be present in every compliant implementation. Consider, for example, that a 40GBASE-KR4 PHY has a need for considerably less skew tolerance. By mandating a fixed tolerance, needless latency is introduced for this PHY type. One can expect a demand for low latency interfaces in the marketplace.

Also note that the receiver skew tolerance requirements are not defined in Clause 48 which defines similar deskew functionality.

SuggestedRemedy

It is sufficent to define the maximum skew contributions for each component of a 40 Gb/s and 100 Gb/s link leading up to the input of the PCS receiver. These contributions may be summarized in a table (such as Clause 48, Table 48-5) so that the implementer may easily calculate the skew tolerance required for the targeted application. Remove the normative requirement for PCS skew tolerance (including Table 82-4).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

How and where to handle the skew budget is TBD.

Cl **82** *SC* **82.2.12** *P* **128** *L* **38** # 526

Ofelt, David Juniper Networks

Comment Type **E** *Comment Status* **D** *skew*

People sometimes assume that designing in a large skew buffer will add latency. It would be good to add some clarifying text.

SuggestedRemedy

Add something like:

A design that allows for a large amount of skew tolerance does not add any additional latency. Latency due to skew only occurs due to the differential delay between all paths between the source and destination. The path with the largest latency will end up with the smallest skew buffer.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Changed subclause number 2.12 to 82.2.12]

I agree that something like this should be added somewhere in the document. At this point it is not clear where it belongs though. Once we determine where the bulk of the skew information is presented we should add this note there. I personally would like to see most of the skew information to move to clause 80.

Cl **82** *SC* **82.2.13** *P* **129** *L* **4** # 88

Szczepanek, Andre Texas Instruments

Comment Type **T** *Comment Status* **D**

There is confusion on this page as to where compensation for alignment marker removal is located.
* 82.2.13 says it is an RS sublayer function
* 82.2.15 says it is a Receive Process function
So which is it

SuggestedRemedy

compensation for marker insertion is a PCS transmit function So to be symmetrical compensation for removal should be in the receive process

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number 2.13 to 82.2.13]

Change:
"The difference in rate from the deleted alignment markers is compensated for by inserting idles by a function in the RS sublayer."

To:
"The difference in rate from the deleted alignment markers is compensated for by inserting idles by a function in the Receive process."

Cl **82** *SC* **82.2.15** *P* **129** *L* **27** # 266

Healey, Adam LSI Corporation

Comment Type **E** *Comment Status* **D**

Receive process must also insert idles to compensate for removal of alignment markers. Also suggest using similar language as 48.4.2.3 for the concept of clock rate compensation.

SuggestedRemedy

Suggest:

"The receive process must insert idles to compensate for the removal of alignment markers. If the PCS receive process spans multiple clock domains, it may also perform clock rate compensation via the deletion of idles or sequence ordered sets or the insertion of idles."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Change:
"Where the MII and PMA sublayer data rates are not synchronized to a 32:33 ratio, the receive process will insert idles, delete idles, or delete sequence ordered sets to adapt between rates."

"The receive process must insert idles to compensate for the removal of alignment markers. If the PCS receive process spans multiple clock domains, it may also perform clock rate compensation via the deletion of idles or sequence ordered sets or the insertion of idles."

Cl **82** *SC* **82.2.17.2.2** *P* **130** *L* **19** # 189

Baldwin, Thananya Ixia

Comment Type **TR** *Comment Status* **D** *amsm*

Incorrect inteval in the following definition. Should be 16384.
"am_valid
Boolean indication that is set true if received block rx_coded is a valid alignment marker. A valid alignment marker will match one of the encodings in Table 82-2 and it will be repeated every 16385 blocks. Note that we do not know which marker to expect on which lane."

SuggestedRemedy

Replace 16385 with 16384.
"am_valid
Boolean indication that is set true if received block rx_coded is a valid alignment marker. A valid alignment marker will match one of the encodings in Table 82-2 and it will be repeated every 16384 blocks. Note that we do not know which marker to expect on which lane."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Already covered by comment #251, will be corrected.

Cl **82** *SC* **82.2.17.2.2** *P* **130** *L* **43** # 251

Estes, Dave UNH - IOL

Comment Type **T** *Comment Status* **D**

The spacing of alignment markers is incorrectly stated as 16385 instead of 16384.

SuggestedRemedy

Change 16385 to 16384

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number 2.17.2.2 to 82.2.17.2.2]

Cl **82** *SC* **82.2.17.2.2** *P* **130** *L* **51** # 268

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **D**

What is the difference between deskew_error and !alignment_valid?

SuggestedRemedy

Clarify the difference. If there is no difference, delete deskew_error and substitute !alignment_valid in PCS deskew state diagram (Figure 82-14).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Makes sense, will change 82-14 appropriately and delete deskew_error

Cl **82** *SC* **82.2.17.2.2** *P* **131** *L* **18** # 3

Seung-Hwan, Kim ETRI

Comment Type **T** *Comment Status* **D**

Should be change 'rx_raw<63>' to 'rx_raw<71>'.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

change 'rx_raw<63>' to 'rx_raw<71>'.
Dupe of #527

Cl **82** *SC* **82.2.17.2.2** *P* **131** *L* **18** # 527
Ofelt, David Juniper Networks

Comment Type **E** *Comment Status* **D**

bit number is wrong- rx_raw is 72 bits wide, but the description does not number the bits properly.

SuggestedRemedy

OLD:

Vector containing one MII transfers. RXC<0> through RXC<7> are from rx_raw<0> through rx_raw<7>, respectively. RXD<0> through RXD<63> are from rx_raw<8> through rx_raw<63>,
respectively.

NEW:
Vector containing one MII transfers. RXC<0> through RXC<7> are from rx_raw<0> through rx_raw<7>, respectively. RXD<0> through RXD<63> are from rx_raw<8> through rx_raw<71>,
respectively.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number 2.17.2.2 to 82.2.17.2.2]

Cl **82** *SC* **82.2.17.2.2** *P* **131** *L* **29** # 252
Estes, Dave UNH - IOL

Comment Type **T** *Comment Status* **D** *amsm*

test_am is currently defined similarly to test_sh which will cause the PCS alignment marker lock state diagram to run on every received 66-bit block, instead of only running the state diagram on candidates for valid alignment markers.

SuggestedRemedy

State that test_am is set to true when the Lane deskew process has accumulated enough bits (16384*66) from the PMA to evaluate the next alignment marker.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number 2.17.2.2 to 82.2.17.2.2]

Add this to the definition.

Cl **82** *SC* **82.2.17.2.4** *P* **133** *L* **3** # 253
Estes, Dave UNH - IOL

Comment Type **T** *Comment Status* **D** *amsm*

am_cnt is currently written to use the last 4 block received.

SuggestedRemedy

Change the definition to use a "4*16384 block window"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Changed subclause number 2.17.2.4 to 82.2.17.2.4]

I will re-define it and make it clear that the window refers to alingment marker windows which are 16384*66 bits (not block windows).

Cl **82** *SC* **82.2.17.2.4** *P* **133** *L* **5** # 254
Estes, Dave UNH - IOL

Comment Type **T** *Comment Status* **D** *amsm*

am_invalid_cnt is currently written to use a 4 block window.

SuggestedRemedy

Change the definition to use a "4*16384 block window"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.17.2.5** *P* **133** *L* **19** # 255
Estes, Dave UNH - IOL

Comment Type **T** *Comment Status* **D**

31.25us_timer and 12.5us_timer are not referenced by the BER monitor state diagram.

SuggestedRemedy

Remove 31.25us_timer and 12.5us_time and define xus_timer as "Timer that is triggered every 31.25 us +1%, -25% (for 40GBASE-R) or 12.5 us +1%, -25% (for 100GBASE-R)"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number 2.17.2.5 to 82.2.17.2.5]

Cl **82** *SC* **82.2.17.3** *P* **133** *L* **26** # 41
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

In clause 81.3.4.3 there is a simple description of the Link Fault State Diagram. This says "The variable link_fault is set to indicate the value of a received Sequence ordered_set when four fault_sequences containing the same fault value have been received with each pair of fault sequences separated by less than 128 columns and no intervening fault_sequences of a different fault
value."
Simple descriptions for Figure 82-12-PCS lane lock state diagram, Figure 82-13-PCS alignment marker lock state diagram and Figure 82-15-BER monitor state diagram alon the lines of that above would be very helpful.

SuggestedRemedy

Add simple descriptions of the state diagrams for Figures 82-12, 82-13 and 82-15

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Add simple text descriptions of the PCS state diagrams.

Cl **82** *SC* **82.2.17.3** *P* **134** *L* **1** # 226
Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

The PCS lane lock and high ber SMs won't work properly with the FEC block due to how the FEC block marks errors.

SuggestedRemedy

Make the changes to the state machine to implement what is in gustlin_01_1108. This will be presented at the meeting.

And Remove:
"[Editor's note (to be removed prior to publication) - FEC errored block marking will likely change some of the state machines since the FEC sublayer will need to mark many blocks bad to ensure that all 64B
packets are dropped.]"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Make the changes as stated in slides 13 and 15.

Cl **82** *SC* **82.2.17.3** *P* **136** *L* # 192
Baldwin, Thananya Ixia

Comment Type **T** *Comment Status* **D**

"UCT" appears in Figure 82-12-PCS lane lock state diagram but not defined in the document.

SuggestedRemedy

Define UCT and list it in the Abbreviations section.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Added missing subclause number 82.2.17.3 to subclause field]

UCT is defined in subclause 1.2.1 and is in subclause 1.5 Abbreviations.
Also looking at many other clauses, I do not see UCT defined within other clauses. So to remain consistent it will not be defined in clause 82.

Cl **82** *SC* **82.2.17.3** *P* **137** *L* # 258
Estes, Dave UNH - IOL

Comment Type **TR** *Comment Status* **D**

Figure 82-13 - PCS alignment marker lock state diagram.

There is no valid exit from state INVALID_AM if am_lock<x> = false and am_invalid_count < 4.

SuggestedRemedy

Remove am_lock<x> from the exit condition to transition from state INVALID_AM to TEST_AM, making the exit condition "test_am * am_cnt < 4 * am_invalid_cnt < 4".

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Changed subclause number 2.17.3 to 82.2.17.3]

Looking at the SM, if you are in INVALID_AM, and you do not have am_lock, then you go to AM_SLIP. That is because when you are looking for am_lock you need to see two non errored ones in a row to declare lock. If you are not in lock, and you see an error, then you drop out, the invalid count at that point does not matter.

Talked to Dave by email:
I see what I did wrong, I misread the transition from INVALID_AM to AM_SLIP, I read it as "am_invalid_cnt=4 * !am_lock<x>" when it is really "am_invalid_cnt=4 + !am_lock<x>".
This way makes more sense!
He agrees to reject the comment.

Cl **82** *SC* **82.2.17.3** *P* **137** *L* # 106
Ebbers, Jonathan IBM

Comment Type **T** *Comment Status* **D** *amsm*

The definition of test_am appears to be inadequate. As defined, test_am will be true once for every 66-bit block and TEST_AM will be entered very frequently, causing !am_valid to be the exit path from TEST_AM almost every time, causing the FSM to never reach the 2_GOOD state.

SuggestedRemedy

Refine test_am's definition to be less like that of test_sh. After the first detection of a valid AM, test_am should be tied to a timer that counts down from 16383 before asserting the next test_am.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number from Figure 13 to 82.2.17.3]

Agree, several other comments have also pointed this out. It will be fixed.

Cl **82** *SC* **82.2.17.3** *P* **137** *L* **21** # 188
Baldwin, Thananya Ixia

Comment Type **TR** *Comment Status* **D** *amsm*

In Figure 82-13-PCS alignment marker lock state diagram, the Test_AM loop is not skipping 16383 blocks before checking for the next valid AM.

SuggestedRemedy

Insert a state and associated "16383 block" counter in the path between VALID_AM and TEST_AM to skip 16383 blocks before checking for the next valid AM.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number from Figure 82-13 to 82.2.17.3]

Agreed, Several other comments have pointed this out. It will be fixed.

Cl **82** *SC* **82.2.17.3** *P* **137** *L* **21** # 191
Baldwin, Thananya Ixia

Comment Type **TR** *Comment Status* **D** *amsm*

In Figure 82-13-PCS alignment marker lock state diagram, it appears the loop to fall out of lock will take either 4 or 7

SuggestedRemedy

We will submit a new diagram to Mark G

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number from Figure 82-13 to 82.2.17.3]

This is also addressed by comment #8. It will be fixed.

Cl **82** *SC* **82.2.17.3** *P* **137** *L* **23** # 8
Shafai, Farhad Sarance Technologies

Comment Type **TR** *Comment Status* **D**

The state diagram in figure 152-12 shows that after am_lock is achieved, if there are 4 !am_valid conditions in a fixed window of 4 alignment marker periods, then am_lock is set to false. Because the window is fixed in time, it is possible that up to 6 !am_valid conditions may occur and the state machine will remain in lock (i.e. 3 !am_valid conditions in one window followed immediately by 3 more !am_valid conditions in the next window).

SuggestedRemedy

Suggested remedy is to make the window "sliding". That is, if there are four consecutive !am_valid conditions over any four align maker periods, then the am_lock is set to false.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Make the appropriate changes to the state machine to have a sliding window.

Apparantly the commenter has commented using Draft 0.9 with old clause numbers. The clause number and subclause fields have been corrected to 82 to import into the comment database.

Cl **82** *SC* **82.2.17.3** *P* **137** *L* **27** # 534
Vijayaraghavan, Divya Altera Corp.

Comment Type **T** *Comment Status* **D** *amsm*

Inconsistency in am_cnt in alignment marker state machine

SuggestedRemedy

Always compare to 2 or 4, but not both.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Changed subclause number from Figure 82-13 to 82.2.17.3]

It compares to 2 for going in lock, 4 for out of lock, this is the baseline.

Cl **82** *SC* **82.2.17.3** *P* **137** *L* **27** # 99
Ebbers, Jonathan IBM

Comment Type **TR** *Comment Status* **D** *amsm*

It may require as many as 100,000 test_am instances before the AM Lock FSM will reach 2_GOOD (assuming that the location of the Alignment Marker is in the last of the 16384 possible locations checked by the PCS AM Lock State Machine). Is this a reasonable worst-case start-up delay?

SuggestedRemedy

Even though the AM_SLIP function is listed as implementation specific, indicate to the reader that the delay caused by the PCS AM Lock State Machine may take up to 100,000 blocks before reaching am_lock.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Changed subclause number from Figure 13 to 82.2.17.3]

Need more details on what should be changed.

Cl **82** *SC* **82.2.17.3** *P* **137** *L* **30** # 5
Seung-Hwan, Kim ETRI

Comment Type **T** *Comment Status* **D** *amsm*

Should be change 'am_cnt = 2 *' to 'am_cnt = 4 *'.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED REJECT.

If I understand the comment correctly, the am_cnt = 2 * is from the VALID_AM to 2_GOOD state transition. This should be 2, only two good markers in a row gets in you lock.

Cl **82** *SC* **82.2.17.3** *P* **137** *L* **33** # 6
Seung-Hwan, Kim ETRI

Comment Type **T** *Comment Status* **D** *amsm*

Should be change '2_GOOD' to '4_GOOD'.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This should remain 2_GOOD. The baseline has two good markers to get in lock.

Cl **82** *SC* **82.2.17.3** *P* **138** *L* # 256
Estes, Dave UNH - IOL

Comment Type **T** *Comment Status* **D**

Figure 82-14 - PCS deskew state diagram

Using "am_status" as an exit condition from state LOSS_OF_ALIGNMENT is redundant. It is redundant because !am_status is a global transition to the same state.

SuggestedRemedy

Change the exit condition from LOSS_OF_ALIGNMENT to ALIGN_ACQUIRED to "alignment_valid"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number 2.17.3 to 82.2.17.3]

Cl **82** *SC* **82.2.17.3** *P* **138** *L* **10** # 267
Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **D**

Per the PCS deskew state diagram (Figure 82-14), the definition of deskew_error in 82.2.17.2 (page 130, line 51), and the use of align_status in the Receive state diagram (Figure 82-17, page 141, line 2), a spurious bit error that occurs during an alignment marker will supress the receipt of all packets until the next next group of alignment markers arrives, which could be a significant number of packets. Hysteresis should be added to Figure 82-14 to avoid this hair-trigger behavior.

SuggestedRemedy

Modify state diagram such that four consecutive deskew_error indications are required to set align_status = FALSE. Due to the hysteresis in PCS alignment marker lock state diagram (Figure 82-13), it seems acceptable to set align_status = TRUE based on the single alignment_valid indication.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Had a long email conversation with Adam on this. The problem is with the following statement:

"alignment_valid
Boolean indication that is set true if all lanes are aligned. In order to be valid, each lane must be in am_lock, with each alignment marker matching a marker from Table 82-2. In addition each lane must have a unique marker value and the lanes must be deskewed so that each marker from all lanes are aligned. It is false otherwise."

This can mean that a single bit error that cause the alignment marker to not match would cause the SW to go out of alignment. This is bad, so here is the change:

Chang it to:

"alignment_valid
Boolean indication that is set true if all lanes are aligned. In order to be valid, each lane must be in am_lock, with each lane being locked to a unique alignment marker from Table 82-2. In addition all lanes must be deskewed so that each marker from all lanes are aligned. It is false otherwise."

Comment #268 where is it is proposed that the variable deskew_error is to be deleted is also related to this.

Cl **82** *SC* **82.2.17.3** *P* **139** *L* **35** # 257
Estes, Dave UNH - IOL

Comment Type **T** *Comment Status* **D**

Figure 82-15 - BER monitor state diagram

The sentence "xus_timer = 31.25 usec for 40GBASE-R or 12.5 usec for 100GBASE-R" is not necessary if xus_timer is defined in subclause 82.2.17.2.5. This sentence does not fully define the timer because it does not include the +1%/-25% tolerance.

SuggestedRemedy

Remove this sentence.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number 2.17.3 to 82.2.17.3]

Cl **82** *SC* **82.2.18** *P* **134** *L* **8** # 233
Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

Change the format of the PCS management clause with one consistent with the lastest table based format.

SuggestedRemedy

Replace subclause 82.2.18 with the attached document (gustlin_82_2_18.pdf).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.18.2** *P* **134** *L* **41** # 4
Seung-Hwan, Kim ETRI

Comment Type **T** *Comment Status* **D**

Should be change 'per 31.25' to 'per 31.25 us'.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.18.4** *P* **135** *L* **14** # 269
Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **D**

The data pattern that the PCS transmits to the PMA during loopback is not defined (TBD).

SuggestedRemedy

Recommend a continuous stream of of 0x00FF data words per Clause 49.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

This needs to be filled in, though I am not sure if 0x00ff is best or not?
If you meant send 0x00ff per lane, then that means the far end PCS is down (no alingment markers for instance, or 66b sync). Is that what we want? I have heard other suggestions that we send an ordered set to let the other side know what is going on.

Cl **82** *SC* **82.2.2** *P* **117** *L* **10** # 117
Marris, Arthur Cadence

Comment Type **E** *Comment Status* **D**

grammar, independent needs to be an adverb.

SuggestedRemedy

change to 'independently'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.2** *P* **117** *L* **3** # 141
D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **D**

Wording of statement: "The PCS comprises the PCS Transmit and PCS Receive processes for 40GBASE-R and 100GBASE-R." implies that a single PCS is defined for both 40G and 100G rates.

SuggestedRemedy

change sentence to:

The 40GBASE-R and 100GBASE-R PCS's comprise the PCS Transmit and PCS Receive processes for each rate of operation.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Change:
"The PCS comprises the PCS Transmit and PCS Receive processes for 40GBASE-R and 100GBASE-R"
To:
"The 40GBASE-R and 100GBASE-R PCS's comprise the PCS Transmit and PCS Receive processes for each rate of operation"

Cl **82** *SC* **82.2.21** *P* **135** *L* **35** # 228
Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

Remove this subclause. And remove the editors note saying to add it in, and remove this section since this is being put in section 82.2.18.

SuggestedRemedy

Remove section 82.2.21.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.21** *P* **136** *L* **27** # 242

Meyer, Jeffrey Centellax

Comment Type **E** *Comment Status* **D**

What does the "*" in the conditional statements mean? I suspect that this is a boolean AND? However most people use a & or && from what i have seen. You might explain your conventions for the state diagrams. I did see where the ++ operator was explained earlier in the document. Maybe "*" was explained and I missed it.

SuggestedRemedy

Add a footnote for the conventions or explain the "*" and "+" where the "++" operator was explained. It is confusing with a mulltiply and add.

Proposed Response *Response Status* **W**

PROPOSED REJECT.
This seems to be standard IEEE SM notation. See Clause 1, Figure 1-2 where this is defined.

Cl **82** *SC* **82.2.21** *P* **137** *L* **30** # 530

Ofelt, David Juniper Networks

Comment Type **T** *Comment Status* **D** *amsm*

Figure 82-13 - The state diagram is confusing (at least to me) about whether it is intending to declare alignment lock after 2 or 4 alignment blocks. The state diagram has a back arc from VALID_AM to TEST_AM if am_cnt < 4, but if am_cnt is two, then it exits to the 2_GOOD state and we declare that we have alignment lock for that lane.

There does not seem to be any text description of the process, so I can't double-check the intent that way.

SuggestedRemedy

If the state diagram is in error (should be am_cnt==4 to get lock), then fix it. Otherwise, add some descriptive text to 82.2.12 to describe the general algorithm. Actually, adding descriptive text in either case would be good.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Comment #41 also addressed part of this. The intent is to create lock after two markers. Descriptive text will be added.

Cl **82** *SC* **82.2.21** *P* **139** *L* **35** # 413

Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**

instead of usec, use the "micro" symbol for microsecond. See page 10 for symbols used in document.

SuggestedRemedy

Per comment

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.4** *P* **122** *L* **12** # 247

Trowbridge, Stephen Alcatel-Lucent

Comment Type **TR** *Comment Status* **D**

Align control block type 4b with other 66B codes. The mapping of 40GbE into ODU3 will use a transcoding algorithm that is used for other purposes (e.g., mapping of FC1200 into ODU2e) and there is improved reuse if codes are aligned. This would also leave the door open to future use of the Ethernet PCS format, for example if FC in the future were to do a 40G or 100G spec. Since the sequence ordered set only has two values (LF and RF), three bytes are plenty- we don't need 7 bytes.

SuggestedRemedy

Block type 4b should explicitly include the "O" code as in Figure 49-7 (rather than assuming a sequence ordered set) and four control characters (always idles in this case) in the latter half of the 66B block. An alternate solution would be to have 802.3ba use control code 0x55 rather than 0x4b and simply send the ordered set which appears once on the MII twice on the PCS.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Here are some proposed changes:
Change figure 82-5, keep block type 0x4b and remove block type 0x55. Re-define block type 0x4b to exactly what it was in clause 49 with the O type field to differentiate between sequence and signal ordered sets. Make appropriate changes to the text also. Note that the MII stays the same, but the upper bytes are dropped.

Cl **82** *SC* **82.2.4.10** *P* **123** *L* **37** # 262
Healey, Adam LSI Corporation

Comment Type **E** *Comment Status* **D**

It is not necessary to have two sub-clauses addressing ordered sets at the same level in the clause heirarchy.

SuggestedRemedy

Merge information in 82.2.4.10 and 82.2.4.5.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.4.10** *P* **123** *L* **41** # 525
Ofelt, David Juniper Networks

Comment Type **E** *Comment Status* **D**

Sentence unclear...

"When it is necessary to designate
the control character for the sequence ordered_set specifically, /Q/ will be used."

SuggestedRemedy

Clarify what is meant by needing to specify the control character.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Changed subclause number 2.4.10 to 82.2.4.10]

There have been several comments on the ordered set description. This will be clarified by combining the text from 82.2.4.5 and 82.2.4.10.

Cl **82** *SC* **82.2.4.11** *P* *L* # 101
Ebbers, Jonathan IBM

Comment Type **E** *Comment Status* **D**

"sent" and "received" are pretty ambiguous terms, especially since this is meant to apply to both the encoder (egress path) and decoder (ingress path). "received" is an especially poor choice of word given that it applies also to the Tx path.

SuggestedRemedy

Change
"The /E/ is sent whenever an /E/ is received. It is also sent when invalid blocks are received. The /E/ allows the PCS to propagate received errors."
to
"For both the encoder and decoder, the /E/ is generated whenever an /E/ is detected. The /E/ is also generated when invalid blocks are detected. The /E/ allows the PCS to propagate detected errors."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number 2.4.11 to 82.2.4.11]

Cl **82** *SC* **82.2.4.2** *P* **119** *L* **22** # 110
Marris, Arthur Cadence

Comment Type **T** *Comment Status* **D**

There is no mention of alignment marker insertion in Figure 82-3

SuggestedRemedy

Change "Block Distribution" to "Block Distribution and Alignment Marker Insertion"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.4.3** *P* **119** *L* **34** # 193
Baldwin, Thananya Ixia

Comment Type **E** *Comment Status* **D**

Figure 82-3-PCS Transmit bit ordering has "0 0 0" between the columns. Should be "..."

SuggestedRemedy

Replace "0 0 0" with "..."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.4.3** *P* **120** *L* **34** # 194
Baldwin, Thananya Ixia

Comment Type **E** *Comment Status* **D**

Figure 82-4-PCS Receive bit ordering has "0 0 0" between the columns. Should be "..."

SuggestedRemedy

Replace "0 0 0" with "..."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.4.3** *P* **121** *L* **14** # 111
Marris, Arthur Cadence

Comment Type **T** *Comment Status* **D**

Redundant text. Isn't this paragraph just repeating what has already been said in 82.2.4.1, page 118 line 32?

SuggestedRemedy

Consider deleting the redundant text from either 82.2.4.1 or 82.2.4.3.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

delete the redundant text from 82.2.4.3

Cl **82** *SC* **82.2.4.3** *P* **122** *L* # 259
Estes, Dave UNH - IOL

Comment Type **TR** *Comment Status* **D**

Figure 82-5 - 64B/66B block formats

The Block Payload descriptions for block types 0xb4, 0xcc, 0xd2, and 0xe1 are incorrect. They do not include enough single bit fields. 0xb4 should have 4 but only 3 are displayed, 0xcc should have 3 but only 2 are displayed, 0xd2 should have 2 but only 1 is displayed, 0xe1 should have 1 but none are displayed.

SuggestedRemedy

Add one single bit field to the Block Payload descriptions for block types 0xb4, 0xcc, 0xd2, and 0xe1.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number 2.4.3 to 82.2.4.3]

Already covered by comment #7 and proposed accepted.

Cl **82** *SC* **82.2.4.3** *P* **122** *L* **12** # 264
Healey, Adam LSI Corporation

Comment Type **E** *Comment Status* **D**

In Figure 82-5, it could be made more clear which control block format corresponds to a sequence ordered set and which corresponds to a signal ordered set without requiring the reader to cross-reference to Table 82-1.

SuggestedRemedy

Add a footnote to the table distinguishing the two ordered set block formats.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

A footnote will be added, though the format might change since there is another comment out about how ordered sets are handled (#247)

Cl **82** *SC* **82.2.4.4** *P* **121** *L* **35** # 164
D'Ambrosia, John Force10 Networks

Comment Type **TR** *Comment Status* **D**

The TF is waiting to hear back for confirmation from the ITU-T SG15 regarding the following statement -

The mapping of 40GBASE-R PCS into OPU3 specified in ITU-T Recommendation G.709 depends on the set of control block types shown in Figure 82-5. Any change to the coding specified in Figure 82-5 must be
coordinated with ITU-T Study Group 15.

SuggestedRemedy

Add Editor's note stating that awaiting confirmation from ITU-T SG15 of the statement above from Liaison sent from July 08 Plenary meeting.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.4.4** *P* **122** *L* # 7
Wong, Don Cisco Systems

Comment Type **ER** *Comment Status* **D**

Figure 82-5

For BlockTypeField 0xb4, 0xcc, 0xd2 & 0xe1, missing one more "single bit" field (marked by thin rectangle).

SuggestedRemedy

Add "thin rectangle" for BlockTypeField 0xb4, 0xcc, 0xd2 & 0xe1.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Added missing subclause number 82.2.4.4 to subclause field]

Will add the appropriate rectangles.

Cl **82** *SC* **82.2.4.4** *P* **122** *L* **7** # 202
Marris, Arthur Cadence

Comment Type **T** *Comment Status* **D**

Figure 82-5 improvements

SuggestedRemedy

Remove the slash (/) in the middle of the block foramt description. For example change D3/D4 to D3 D4.

Delete redundant row with block type field 0x4b

Width of C5, C6 and C7 is wrong for block type files 0xcc 0xd2 0xe1

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Yes on:Remove the slash (/) in the middle of the block foramt description. For example change D3/D4 to D3 D4.
Width of C5, C6 and C7 is wrong for block type files 0xcc 0xd2 0xe1

Not sure what is meant by this??
Delete redundant row with block type field 0x4b
0x55 are similar here, but they are used for different types of ordered sets.

Cl **82** *SC* **82.2.4.4** *P* **122** *L* **725** # 2
Seung-Hwan, Kim ETRI

Comment Type **T** *Comment Status* **D**

At Data Block Formats and Control Block Formats :
The slash('/') is used to seperate and represent two 4 bytes transfer in 10GBase-R, but in 40G/100GBase-R there is no need slash('/') between 8 bytes.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Also covered by #202

Cl **82** *SC* **82.2.4.5** *P* **122** *L* **12** # 532
Vijayaraghavan, Divya Altera Corp.

Comment Type **T** *Comment Status* **D**

Block Types 4b and 55 have the same format in the 64b/66b table (figure 82-5). Typo in block type 55.

SuggestedRemedy

Remove block type 55. Does not apply to 8 byte alignment.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

0x4b and 0x55 have different meanings in D1.0 (sequence vs. signal ordered sets). This also might change due to comment #247.

Cl **82** *SC* **82.2.4.5** *P* **123** *L* **37** # 263
Healey, Adam LSI Corporation

Comment Type **E** *Comment Status* **D**

It may be useful to point out that sequence and signal ordered set encoding differs from the encoding defined in Clause 49.

SuggestedRemedy

Add a note to highlight this difference.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This to me seems like a slippery slope, since many things in clause 82 differ from clause 49, do I put a note everywhere where this a difference?

Cl **82** *SC* **82.2.5** *P* **124** *L* **9** # 265

Healey, Adam LSI Corporation

Comment Type **E** *Comment Status* **D**

Text seems essentially correct but could be compacted and clarified, using similar language to 48.4.2.3. A lot of words are used to describe the concept of traversing clock domains, which really shouldn't be necessary for a user of the standard.

SuggestedRemedy

Suggest:

"The transmit process must delete idles or sequence ordered sets to accomodate the transmission of alignment markers. If the PCS transmit process spans multiple clock domains, it may also perform clock rate compensation via the deletion of idles or sequence ordered sets or the insertion of idles."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Change:
"Therefore, if the PCS is connected to an MII and PMA sublayer where the ratio of their transfer rates is exactly 32:33, then the transmit process only needs to perform rate adaptation to make room for the alignment markers. This will consist of deleting idles or deleting sequence ordered sets. Where the MII and PMA sublayer data rates are not synchronized to that ratio, the transmit process will need to insert idles, delete idles, or delete sequence ordered sets to adapt between the rates in addition for making room for alignment markers."
To:
"The transmit process must delete idles or sequence ordered sets to accomodate the transmission of alignment markers. If the PCS transmit process spans multiple clock domains, it may also perform clock rate compensation via the deletion of idles or sequence ordered sets or the insertion of idles."

Cl **82** *SC* **82.2.8** *P* **125** *L* **23** # 249

Estes, Dave UNH - IOL

Comment Type **E** *Comment Status* **D**

It is unclear how the Alignment markers are inserted without changing the PMA clock rate.

SuggestedRemedy

Insert a note indicating that columns of Idle will need to be deleted prior to the scrambler. The number of columns to delete will be an average of 1 column of Idle for every 16384 MII columns, however this is just an average since the alignment markers will be inserted on all lanes at the same time.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Changed subclause number 2.8 to 82.2.8]

Change:
"They interrupt any transfer that is already occurring so that the alignment markers can be inserted into all lanes at the same time."

to:
"They interrupt any transfer that is already occurring so that the alignment markers can be inserted into all lanes at the same time. Room for the alingment markers is created by periodically deleting IPG from the MII data stream"

Cl **82** *SC* **82.2.8** *P* **125** *L* **23** # 105
Ebbers, Jonathan IBM

Comment Type **T** *Comment Status* **D** *markers*

82.2.8 states that the alignment markers are inserted after 16383 66-bit blocks are transmitted. We assume this includes interrupting a data packet and not waiting until an IPG. Since we cannot possibly write over data, is this process handled at the same time and in the same way as clock compensation (idle/OSet insert/delete) in the async crossing? How can we be sure that the MII data presented to the PCS Transmitter will have enough excess bandwidth to allow for AM insertion and clock compensation?

SuggestedRemedy

Provide a more explicit description of the relationship between alignment marker insertion and idle insertion/deletion. Provide a specific minimum inter-frame size for transmitted MII data (from the MAC or RS) to allow for proper AM insertion and +/- 100 PPM clock frequency compensation.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Changed subclause number 2.8 to 82.2.8]

I would like the requester to more clearly state what the recommendation is. The numbering in figure 82.8 shows that the markers interrupting the regular data. Also there is plenty of IPG to delete in order to make room for the markers even with jumbo frames.

Cl **82** *SC* **82.2.8** *P* **125** *L* **24** # 186
Baldwin, Thananya Ixia

Comment Type **ER** *Comment Status* **D**

Another function of the alignment marker (lane re-order) is missing in the following sentence...
"In order to support alignment and de-skew of individual lanes at the receive PCS, alignment markers are added periodically to each lane."

Also, the words "alignment"and "de-skew" are redundant.

SuggestedRemedy

Add "lane reordering" and delete "alignment" in the sentence :
"In order to support de-skew and lane reordering of individual lanes at the receive PCS, alignment markers are added periodically to each lane."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.8** *P* **125** *L* **25** # 1
Seung-Hwan, Kim ETRI

Comment Type **E** *Comment Status* **D**

Spelling: Should be change 'de-skew' to 'deskew' for consistency.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.8** *P* **125** *L* **26** # 434
Barrass, Hugh Cisco

Comment Type **E** *Comment Status* **D**

It's not really a "regular 66-bit block" since it doesn't use a defined 64B/64B code.

SuggestedRemedy

Change "regular 66-bit block" "specially defined 66-bit block"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.8** *P* **125** *L* **49** # 178
Alping, Arne Ericsson AB

Comment Type **ER** *Comment Status* **D**

...has lots or transitions... (spelling error)

SuggestedRemedy

Change to: ...has lots of transitions...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Changed subclause number 2.8 to 82.2.8]

Cl **82** *SC* **82.2.8** *P* **125** *L* **49** # 435
Barrass, Hugh Cisco

Comment Type **E** *Comment Status* **D**

"that looks random and has lots or transitions"

Apart from the obvious typo, this phrase does not seem right - what does it mean to "look randon?"

SuggestedRemedy

Change "that looks random and has lots or transitions" to "that is defined to be balanced and irregular with many transitions"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change "that looks random and has lots or transitions"
to
"that is defined to be balanced and with many transitions"

Cl **82** *SC* **82.2.8** *P* **125** *L* **49** # 200
Marris, Arthur Cadence

Comment Type **E** *Comment Status* **D**

change "lots or" to "many"

SuggestedRemedy

as above

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.8** *P* **126** *L* **32** # 203
Marris, Arthur Cadence

Comment Type **T** *Comment Status* **D**

Use of boolean NOT operator. Is the use of the boolean operator ! appropriate for bit vector negation?

SuggestedRemedy

Consider changing M0 = !M4 to M4 is the inverse of M0 etc.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Personally I am not sure which is the best way, would like feedback from the group.

Cl **82** *SC* **82.2.8** *P* **126** *L* **33** # 299
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D** *markers*

During the review of Draft 0.9 Piers Dawe proposed that different lane markers should be used for 40GBASE-R and 100GBASE-R. If this is agreed, suitable lane markers have been generated and evaluated in the accompanying presentation.

SuggestedRemedy

If different lane markers are agreed for 40GBASE-R from 100GBASE-R then use the values in anslow_06_1108.pdf as the lane markers for 40GBASE-R

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

At this point I am not sure that the case has been made to the group that this is required. We should discuss it and decide if we want this or not.

Cl **82** *SC* **82.2.8** *P* **127** *L* **6** # 326
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D** *markers*

The two PCSs are distinguished by width not lane rate. In future we will consider using one or both at faster lane rates, and quite likely consider 20 x 10G for 200G. The lane markers for a 4-wide PCS should be distinct from a 20-wide PCS.

SuggestedRemedy

Add four new lane markers for the 4-wide 40GBASE-R PCS. Pete Anslow has the markers and a presentation.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Would like to get the groups opinion on this. We have not seen any presentations to justify this yet. This is also related to #299.

Cl **82** *SC* **82.2.9** *P* **126** *L* **42** # 445
Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **D**

The phrase "sends four bits of transmit data at a time" implies that the PCS is sending a 4 bit vector. This is not the case, it is sending 4 data streams.

Also, is there a reason why "four" is spelt out and "20" is not?

SuggestedRemedy

Change "sends four bits of transmit data at a time" to "sends four data streams"

Also change "sends 20 bits of transmit data at a time" to "sends twenty data streams"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.9** *P* **126** *L* **46** # 436
Barrass, Hugh Cisco

Comment Type **E** *Comment Status* **D**

"parallel" is not a good word - especially when it is followed by "serial"

SuggestedRemedy

Replace "parallel" with "separate"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **82** *SC* **82.2.9** *P* **126** *L* **47** # 437
Barrass, Hugh Cisco

Comment Type **E** *Comment Status* **D**

"on lane 0 bits 0 to 65 are sent"

This paragraph written by Yoda was...

Change to a more traditional word order

SuggestedRemedy

Change

"on lane 0 bits 0 to 65 are sent, on lane 1 bits 66 to 131 are sent; on lane 2 bits 132 to 197 are sent, on lane 3 bits 198 to 263 are sent, then on lane 0 bits 264 to 329 are sent etc."

to

"bits 0 to 65 are sent on lane 0, bits 66 to 131 are sent on lane 1; bits 132 to 197 are sent on lane 2, bits 198 to 263 are sent on lane 3, then bits 264 to 329 are sent on lane 0 etc."

With similar changes to the following paragraph for 100G.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Nice Star Wars reference, I agree it make sense to change the order.

Cl **82** *SC* **82.2.9** *P* **127** *L* **44** # 327
Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **D** *skew*

Tracking the last little bit of skew costs power in high speed analog circuitry. The PCS is implemented as a silicon chip in a package on a PCB. It has no need to generate anything remotely like 2 bits of Dynamic Skew (if 'bits' means UI). There could be several x 10 ps gate delay, most of which is correlated lane to lane (giving maybe 5 ps Dynamic Skew) plus perhaps 2" or 400 ps mismatched lane lengths on the PCBs, which might change by 5% over temperature and humidity: that's 20 ps. Total 25 ps (0.25 UI at 10G, 1 MAC BT for 40G, 2.5 MAC BT for 100G).

SuggestedRemedy

Change PCs dynamic skew output limit to 25 ps.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

My understanding is that 25ps would not be enough of a budget. More information is needed in this area. This is related to #240.

Cl **82** *SC* **82.2.9** *P* **127** *L* **5** # 535
Vijayaraghavan, Divya Altera Corp.

Comment Type **TR** *Comment Status* **D**

Lane 10: 2d and de are not inversions of each other. Which is right and which needs correction?

SuggestedRemedy

Fix incorrect value

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

In Lane 10, change 0x2d to 0x21

Cl **83** *SC* **0** *P* *L* # 95
Jongyoon, Shin ETRI

Comment Type **E** *Comment Status* **D**

Change all "sub-layer"
to
"sublayer" in clause 83 to keep consistency with other clauses.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83** *SC* **83** *P* **143** *L* **1** # 331
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **D**

sub-layer

SuggestedRemedy

To match base document, sublayer. Search and replace, 18 instances.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Also see comment #95

Cl **83** *SC* **83** *P* **146** *L* **10** # 332
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Text says 'the supportable PMA stages' but table is not complete. For example, Tx 2:1 is missing. If you add all the missing possibilities the table might get rather long, although the rows could be shallower. I don't think we should talk about 'initial version of the standard': 802.3 is very old, and we have not yet made any promises that there will be a version which will use more of this table.

SuggestedRemedy

Suggest you list only the 'prime factors'. For 40G, that's 4:2, 2:1, 1:2, 2:4., 1:1, 2:2, 4:4. Say in main text, not just a table note, that PMAs such as 4:1 and 1:4 may be made without going though the intermediate (in this case 2-wide) stage (and if such is true, they could map the lanes a bit differently to how a tree of atomic PMAs would).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Wording about initial version of the standard can be improved. Which rows to include in the table need to be reconciled with other conflicting comments.

Cl **83** *SC* **83** *P* **146** *L* **6** # 333
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Are these _logical_ lanes or just lanes?

SuggestedRemedy

?

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Logical lanes seems to be the correct term. PMA input and output lanes do not always have a physical realization.

Cl **83** *SC* **83.1.1** *P* **143** *L* **21** # 158

D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**

Per the baseline proposal, trowbridge_01_0708, PMA interfaces are abstract, logical, or physical.

SuggestedRemedy

Change wording
Electrical and timing specifications for the XLAUI and CAUI interfaces based on 10Gb/s per lane signaling are covered in Annex 83A. The PMD service interfaces for 40GBASE-SR and 100GBASE-SR PMD are covered in 86.1.1. Other PMA interfaces are specified as logical interfaces, and may not be realized physically.

to

The interfaces for the inputs of the 40GBASE-R and 100GBASE-R PCS's are defined in an abstract manner and do not imply any particular implementation. The PMD service interfaces for 40GBASE-SR and 100GBASE-SR PMDs are defined in 86.1.1. Other PMD service interfaces are defined logically. For 40GBASE-R PMA's, an interface, known as XLAUI, connecting PMA stages has been defined in Annex 83A. For 100GBASE-R PMA's, an interface, known as CAUI, connecting PMA stages has been defined in Annex 83A.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83** *SC* **83.1.1** *P* **143** *L* **22** # 134

D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**

Wording - A PMA connects to other sublayers.

SuggestedRemedy

change
The 40GBASE-R PMA can connect directly to one of the following Physical Layers: 40GBASESR4, 40GBASE-LR4, 40GBASE-CR4, or 40GBASE-KR4. The 100GBASE-R PMA can connect directly to one of the following Physical Layers: 100GBASE-SR10, 100GBASE-LR4, 100GBASE-ER4, or 100GBASE-CR10.

to

The purpose of the 40GBASE-R PMA is to attach the 40GBASE-R PMD of choice to the 40GBASE-R PCS. The purpose of the 100GBASE-R PMA is to attach the 100GBASE-R PMD of choice to the 100GBASE-R PCS.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Care needs to be taken that only the lowest PMA layer in the stack can connect directly to the indicated physical layers

Cl **83** *SC* **83.1.1** *P* **143** *L* **22** # 286

Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

Two very minor editorial issues in clause 83 collected in to one comment.

SuggestedRemedy

Change "for 40GBASE-SR and 100GBASE-SR PMD" to "for the 40GBASE-SR and 100GBASE-SR PMDs" page 143 line 22
Space missing in "isin" page 148 line 44

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Also see reponse to comment #158

Cl **83** *SC* **83.1.1** *P* **143** *L* **23** # 330

Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Draft says 'Other PMA interfaces are specified as logical interfaces, and may not be realized physically.' This looks like a prohibition.

SuggestedRemedy

Suggest 'Other PMA interfaces are specified as logical interfaces, without electrical or timing specifications.' ?

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Perhaps "might not be realized physically" is better

Also see response to comment #158

Cl **83** *SC* **83.1.2** *P* **143** *L* **30** # 334

Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

PCS lanes are not always virtual.

SuggestedRemedy

I think we should rename 'virtual lane' to 'PCS lane' throughout.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Need an acronym: suggest PCSL. In figure 83-4 and elsewhere, use z as lane count instead of v, and add to legend that z=4 for 40GBASE-R and z=20 for 100GBASE-R (consistent with p149 lines 32-40).

Also affects Clause 82.

Cl **83** *SC* **83.1.3** *P* **144** *L* **36** # 643

Nicholl, Gary Cisco

Comment Type **T** *Comment Status* **D**

I would like to see a PMA line loopback (by which I mean data loopback from/to the PMD service interface) as a mandatory requirement. This is something that was not included in the original 802.3ae spec (10GE), but is widely implemented and used by the industry (primarily for PMD compliance testing).

SuggestedRemedy

I will be making a contribution in Dallas to propose a remedy.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Changed subclause from 1.3 to 83.1.3]

Pending discussion of contribution. Note that just as the loopback toward the PCS is only applicable at the uppermost PMA layer, the proposed new loopback would apply only at the lowermost PMA layer

Cl **83** *SC* **83.1.3** *P* **144** *L* **46** # 96

Jongyoon, Shin ETRI

Comment Type **E** *Comment Status* **D**

Change "optionally provides data loopback"
to
"optionally provide data loopback".

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83** *SC* **83.1.3** *P* **144** *L* **47** # 626

CHANG, Frank Vitesse

Comment Type **T** *Comment Status* **D**

Feel "provide test generation and detection" not sufficient.

SuggestedRemedy

Change to "provide build-in-self-test (BIST) function with test pattern generator and checkor"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Changed subclause from 1.3 to 83.1.3]

BIST would be a new function that requires a presentation to justify adding the feature and to specify its operation. Different conclusion could be justified if there is a presentation in Dallas that receives support.

Cl **83** *SC* **83.1.4** *P* **145** *L* **6** # 157

D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**

Aspects of the PMA layering are incorrect.

SuggestedRemedy

XLAUI / CAUI should be marked as optional.
PMA (4:4) and PMA (10:10) with optional notes are actually conditional based on implementation of optional interface.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83** *SC* **83.1.4** *P* **146** *L* **1** # 467

Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

The statement on line 1 implies that only the items in table 83-1 are supportable. However the table is titled "example PMA variants". A 2 lane solution I believe is supportable at 100G and might be used in the future.

SuggestedRemedy

Either include all the supportable PMA stages in table 83-1 or change the sentence on line 1 to "Table 83-1 summarizes some examples of the supportable PMA stages for each interface rate however it is not exhaustive"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Need to reconcile with multiple comments on this table: comments #467, #624, #42, #43 plus a related comment #625.

Cl **83** *SC* **83.1.4** *P* **146** *L* **4** # 624

CHANG, Frank Vitesse

Comment Type **ER** *Comment Status* **D**

In table 83-1, some PMA stage examples become irrelavant such as 4 inputs to 1 outputs to cover 40g serial in 40GBASE-R transmit (& Receive), or 4(5) inputs to 1 outputs to cover 100g serial in 100GBASE-R transmit (& Receive).

SuggestedRemedy

Suggest take them out from the table.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Need to reconcile with multiple comments on this table: comments #467, #624, #42, #43 plus a related comment #625.

Cl **83** *SC* **83.1.4** *P* **146** *L* **41** # 42

Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

In Table 83-1 the 100GBASE-R receive list is almost the Tx list in reverse and swapped over, but not quite. Swapping 5:10 and 4:10 over would fix this

SuggestedRemedy

Swap the 5:10 and 4:10 rows in the table

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Need to reconcile with multiple comments on this table: comments #467, #624, #42, #43 plus a related comment #625.

Cl **83** *SC* **83.1.4** *P* **146** *L* **48** # 43

Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

In Table 83-1 Note 1 says "Not used in initial version of the standard" this would be better as "Not used in this version of the standard"

SuggestedRemedy

change "Not used in initial version of the standard" to "Not used in this version of the standard"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Need to reconcile with multiple comments on this table: comments #467, #624, #42, #43 plus a related comment #625.

Cl **83** *SC* **83.1.4** *P* **146** *L* **6** # 97

Jongyoon, Shin ETRI

Comment Type **E** *Comment Status* **D**

In Table 83-1 change "Logical output Lanes"
to
"Logical output lanes".

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83** *SC* **83.2** *P* **147** *L* **4** # 642

Ganga, Ilango Intel

Comment Type **TR** *Comment Status* **D**

A PMA is always bidirectional and contains both Transmit and Receive functions. So calling this as a separate RX PMA and a TX PMA is confusing and this is not consistent through out the clause. In some references in this clause the PMA implies both for e.g 20:10 PMA which includes both TX PMA and RX PMA.

So instead of referring this as RX and TX PMA, simply define the PMA as a single block which includes both Transmit and Receive functions. This medthodology is consistent with the definitions of PCS/PMA/PMD which are all bidirectional with TX and RX functions.

SuggestedRemedy

Define the PMA as a single block which includes both Transmit and Receive functions, illustrated in Fig 83-3 as single PMA block with TX and RX blocks inside the PMA. The TX function in the PMA connects to p input lanes and q output lanes. The RX function in the PMA connects to q input lanes and p output lanes. In this case the link status is associated with the RX function.

Also Change Fig 83-4 to illustrate both TX and RX functions

Also for primitives, the TX function can use PMA_UNIDATA.request and the RX function use PMA_UNIDATA.indication in the following manner

Transmit direction for data flowing from MAC to MDI
PMA_UNIDATA.request_in
PMA_UNIDATA.request_out

Receive direction
PMA_UNIDATA.indication_in
PMA_UNIDATA.indication_out

Signal indication
PMA_SIGNAL.indication_in
PMA_SIGNAL.indication_out

So this can be consistently mapped to the request and indication of PMD primitives or FEC primitives

Accordingly, update the text description and primitive definitions in 83.3

Proposed Response *Response Status* **W**

PROPOSED REJECT.

We discussed this in trowbridge_01_0708. There is a great deal of text that gets replicated if the general operation of m input lanes to n output lanes needs to be described twice because it occurs in Tx and Rx directions. The primitive naming all changes also if this proposal is accepted.

Cl **83** *SC* **83.2** *P* **148** *L* **4** # 528
Ofelt, David Juniper Networks

Comment Type **E** *Comment Status* **D**
Figure 83-4

Every variable in the figure is defined except for "v".

SuggestedRemedy
Add a label to define "v" to the figure.

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

[Changed subclause 2 to 83.2]

Cl **83** *SC* **83.2** *P* **148** *L* **44** # 201
Marris, Arthur Cadence

Comment Type **E** *Comment Status* **D**
change isin to "is in".

SuggestedRemedy
As above

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Multiple comments # 135, 414, 201, and 550

Cl **83** *SC* **83.2** *P* **148** *L* **44** # 135
D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**
Need a space between "isin"

SuggestedRemedy
change
Whether the PMA isin the Tx or Rx direction.

to

Whether the PMA is in the Tx or Rx direction.

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Multiple comments # 135, 414, 201, and 550

Cl **83** *SC* **83.2** *P* **148** *L* **44** # 550
Ghiasi, Ali Broadcom

Comment Type **E** *Comment Status* **D**
No space between is and in

SuggestedRemedy
Add space

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

[Changed subclause 2 to 83.2]

Also see comments #135, #414, and #201

Cl **83** *SC* **83.2** *P* **148** *L* **44** # 627
CHANG, Frank Vitesse

Comment Type **T** *Comment Status* **D**
Dono't feel "Where the PMA isin the TX or RX direction" is enough to cover loopback function.

SuggestedRemedy
Suggest such change sth like "Whether the PMA is unidirectiona in the TX or RX direction, or bidirectional (for the sake o loopback)".

Proposed Response *Response Status* **W**
PROPOSED ACCEPT IN PRINCIPLE.

Suggest using "Whether the PMA STAGE is in the Tx or Rx direction". There are lots of cases where compound items are built from multiple PMA stages in the same direction, and loopback is one where the function is built with the corresponding Tx and Rx stage.

Cl **83** *SC* **83.2** *P* **148** *L* **44** # 414
Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**
typo change to "PMA is in"

SuggestedRemedy
per comment

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Multiple comments # 135, 414, 201, and 550

Cl **83** *SC* **83.3** *P* **149** *L* **10** # 529

Ofelt, David Juniper Networks

Comment Type **E** *Comment Status* **D**

I find the usage of m, n, p, q, and x, y to be inconsistent throughout the text.

p and q seem to always be the the number of links on the RS/FEC facing and PMD sides of a given PMA.

x and y are introduced here "A Tx PMA with x input lanes and y output lanes is paired with an Rx PMA with y input
lanes and x output lanes" but then in 83.3.1 and 83.3.2, x is always used as the input lane count and y as the output lane count - this is direction independent.

Then in figure 83-4 and in the text that deals with bits assigned to virtual lanes (e.g. 83.6.2), m and n are used for the input and output lane count and "x" is used for the offset of the current bit.

SuggestedRemedy

Make the variable usage more consistent. One way would be to have the generic input and output lane counts be "m" and "n" and the direction-specific counts as "p" and "q". x and y can then be reserved for talking about bit positions or any other need for a generic variable.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Changed subclause 2 to 83.2]

We tried to do this, but with a slightly different usage. m and n were always direction specific (m is input and n is output). p and q were used with a pair of PMAs in opposite directions, and x and y were used in more generic contexts. Good to know specific cases where this seems not to be applied

Cl **83** *SC* **83.3** *P* **149** *L* **12** # 142

D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **D**

THe reference to the PMA or PMA stages is inconsistent and can cause confusion.

SuggestedRemedy

Reword -
Several PMA stages may be required to adapt between the number of VLs emerging from the PCS to the number of lanes required by a particular PMD. For example, a 4-lane interface for 100GBASE-R may involve a 20:10 PMA from the PCS, two 10:10 PMAs on either side of a CAUI for an extender, and a 10:4 PMA which finally interfaces with the PMD.

to

Several PMA stages may be required to adapt between the number of VLs emerging from the PCS to the number of lanes required by a particular PMD. For example, a 4-lane interface for 100GBASE-R may involve a 20:10 PMA stage from the PCS, two 10:10 PMA stages on both sides of a CAUI for an extender,
and a 10:4 PMA stage which finally interfaces with the PMD.

An example drawing would be useful.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83** *SC* **83.3.1.1** *P* **150** *L* **6** # 335

Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **D**

PMA_UNITDATA.inputx (input_bit_lane_x)

SuggestedRemedy

PMA_UNITDATA.inputx(input_bit_lane_x)
i.e. without the space. Same in following subclauses.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83** *SC* **83.4** *P* **151** *L* **44** # 606
D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**

The first sentence of this clause is

The PMA Service Interface exists between the PMA client (the PCS or FEC sub-layer) and the uppermost PMA in a set of one or more stacked PMAs (possibly including an extender sub-layer).

An extender sub-layer was not been defined by the baseline, though the XLAUI / CAUI can be perceived in this fashion.

SuggestedRemedy

Suggested rewording -

The PMA Service Interface exists between the PMA client (the PCS or FEC sub-layer) and the uppermost PMA in a set of one or more stacked PMAs, as well as between stages in a stacked PMA.

Presentation to be provided

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Should see presentation. Judging from other comments, better terminology may be "one or more PMA stages"

Cl **83** *SC* **83.5** *P* **152** *L* **12** # 98
Jongyoon, Shin ETRI

Comment Type **T** *Comment Status* **D**

Need to clarify "40GBASE-SR4 and 100GBASE-SR10 interfaces" in the following text.

"Note that electrical and timing specifications of the PMD service interface are defined only for 40GBASE-SR4 and 100GBASE-SR10 interfaces."

SuggestedRemedy

Change "Note that electrical and timing specifications of the PMD service interface are defined only for 40GBASE-SR4 and 100GBASE-SR10 interfaces."
to
"Note that electrical and timing specifications of the PMD service interface are defined only for 40GBASE-SR4 and 100GBASE-SR10 PMDs."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83** *SC* **83.5** *P* **152** *L* **14** # 415
Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**

typo, change to "specified"

line 23, typo change to "adjascent"

SuggestedRemedy

per comment

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83** *SC* **83.5** *P* **152** *L* **14** # 44
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

This says "For other PMDs, the PMA service interface is specificied only logically." This should be "PMD service interface"

SuggestedRemedy

change "the PMA service interface is specificied only logically." to "the PMD service interface is specificied only logically."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83** *SC* **83.6** *P* **152** *L* **3435** # 625
CHANG, Frank Vitesse

Comment Type **ER** *Comment Status* **D**

Since the TF decide not to define optical modules with 2x20g or 40g, so feel it is not appropriate to define the possible numbers of input of 2, 1 for 40GBASE-R. Same for 100GBASE-R with 2,1.

SuggestedRemedy

Suggest to take it out.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Needs to be reconciled with what we decide to do with Table 83-1. Note that the text indicates that the number of POSSIBLE input or output lanes is among the listed values, which is accurate, but we need to have an agreement on the best way to describe the difference between what is supported by the architecture and what is specified in the initial version of the standard.

Cl **83** *SC* **83.6** *P* **156** *L* **3** # 469
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

I agree that 8ones followed by 8 zeros is a good choice

SuggestedRemedy

Implement the 8one 8 zero and remove the TBD's

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83** *SC* **83.6.2** *P* **153** *L* **28** # 337
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

What does 'Tx PMA implemented synchronously with PCS' mean? For PMA implemented together with PCS, or integrated with PCS, surely the spec is 'Not applicable'?

SuggestedRemedy

For a Tx PMA receiving from the PCS, I believe 25 ps (which is 0.25 UI at 10 GBd) is adequate: see another comment for explanation.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

This should be covered by implementation of the Mark Gustlin's skew presentation which only specifies skew at defined skew points when they represent exposed interfaces. The case in question disappears with that formulation.

Cl **83** *SC* **83.6.2** *P* **153** *L* **3** # 416
Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**

to be consistent change to R x (v/m)

also on line 8, change to R x (v/n)

SuggestedRemedy

per comment

Proposed Response *Response Status* **W**

PROPOSED REJECT.

R x (v/m)=(R x v)/m, so no help is needed to evaluate correctly

Cl **83** *SC* **83.6.2** *P* **153** *L* **31** # 338
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Other Tx PMA Dynamic Skew tolerance should not have unnecessary padding, as compensating the last couple of UI with analog circuitry costs power. I believe CEI have a 1.5 UI limit for 'Relative Wander' (their term for Dynamic Skew). 'bits/VL' would need explaining.

SuggestedRemedy

Make this 150 ps (which is 1.5 UI at 10 GBd). Don't quote bits/VL.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

This should be aligned with the Mark Gustlin skew presentation and not necessarily with the comment

Cl **83** *SC* **83.6.6** *P* **154** *L* **34** # 628
CHANG, Frank Vitesse

Comment Type **TR** *Comment Status* **D**

In 83.6.6, PMA loopback mode should support lineside loopback and diagnostic loopback functions.

SuggestedRemedy

Suggest to define two kinds of loopback. in addition to lineside loopback illustrated in Fig 83-5, add the host-side loopback as 2nd option.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See comment 643. Presentation is expected to get TF concurrence.

Cl **83** *SC* **83.6.6** *P* **154** *L* **39** # 640

Ganga, Ilango Intel

Comment Type **T** *Comment Status* **D**

As per the 83.6.6 the "uppermost" PMA in the stack provides loopback function. It is ambiguous which one is the "uppermost", on the linkside or the host side?

Also in a stacked PMA where the PMA's are separated, loop back is desirable in both places in the stack. E.g MAC/PCS/PMA implemented in a separate chip and PMA/PMD or PMA/FEC/PMA/PMD in a separate chip.

SuggestedRemedy

Clarify the term "uppermost" PMA in 83.6.6.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See comment #143 which contains a suggested remedy.

Cl **83** *SC* **83.6.6** *P* **154** *L* **39** # 143

D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **D** *Review*

Description of the multi-stage PMA concept is confusing

SuggestedRemedy

At the PMA service interface, the uppermost PMA in a set of one or more stacked PMAs may provide a loopback function. The function involves looping back each input lane of the uppermost Tx PMA to an output lane of the uppermost Rx PMA.

to

The uppermost PMA stage in a set of one or more s PMA stages may provide a loopback function. The function involves looping back each input lane of the uppermost Tx PMA stage to an output lane of the uppermost Rx PMA stage.

Presentation to be provided.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83** *SC* **83.6.6** *P* **154** *L* **43** # 339

Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Lane mapping in loopback: as fibre-optic PMDs can't do loopback, one wants the PMA loopback to occur near the bottom of any tree of PMAs (e.g. this from 48.3.3 'NOTE-The signal path that is exercised in the Loopback mode is implementation specific, but it is recommended that this signal path encompass as much of the circuitry as is practical.' A 2^n-1 PRBS spread across 4 lanes is four 2^n-1 PRBSs, so I think we can still validate working silicon if the lanes get mixed up. Although if the silicon is faulty, it may be harder to know which lane is at fault.

SuggestedRemedy

Expect and allow the lanes to be repositioned in loopback.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Note that this applies to the proposed line side loopback rather than the existing host side loopback. As the comment observes, if you mix up the lanes, you can't tell which lane is at fault as the fault may be at the Tx or Rx. Other comments propose separate error counters per lane. This capability seems most useful if you do not mix up the lanes.

Cl **83** *SC* **83.6.7** *P* **155** *L* **25** # 231

Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

Officially adopt the test pattern strategy that is described here. Delete the editor's note.

SuggestedRemedy

Remove:
"[Editor's Note (to be removed prior to publication): There is no adopted baseline for test patterns - the following
is a placeholder based on gustlin_03_0708.pdf]"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83** *SC* **83.6.7** *P* **155** *L* **38** # 232
Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

Add in support for a PRBS9 pattern.

SuggestedRemedy

Change: "When transmit PRBS31 test pattern (see 49.2.8) is enabled (TBD - should a shorter pattern, e.g., PRBS9 (see 68.6.1) be included also?), the PMA generates a PRBS31 pattern on each of its output lanes."

To: "When transmit PRBS31 test pattern (see 49.2.8) is enabled, the PMA generates a PRBS31 pattern on each of its output lanes. When transmit PRBS9 test pattern is enabled, the PMA generates a PRBS31 pattern on each of its output lanes."

Also add in anywhere else in the clause where it is appropriate the support for the PRBS9.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83** *SC* **83.6.7** *P* **155** *L* **38** # 243
Meyer, Jeffrey Centellax

Comment Type **T** *Comment Status* **D**

Why is PRBS9 used for the short pattern? There are many more test equipment vendors and FPGA vendor cores for the ITU-T V.29 PRBS7 with 1+x^6+x^7 polynomial. It is shorter and quicker to see ISI evolving on a sampling scope.

SuggestedRemedy

Use the ITU-T V.29 PRBS polynomial

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The majority of those in the discussion and the majority of those who have commented prefer PRBS9. Would need a presentation to justify why V.29 should be used instead

Cl **83** *SC* **83.6.7** *P* **155** *L* **39** # 629
CHANG, Frank Vitesse

Comment Type **TR** *Comment Status* **D**

Agree with Editor comment on PRBS31 pattern is too long.

SuggestedRemedy

Suggest to add short patterns like PRBS7, PRBS9 or even CJPAK etc in the text. (PRBS9 is well established in LRM.)

Proposed Response *Response Status* **W**

PROPOSED REJECT.

PRBS31 will be present in any case. Multiple comments asking for PRBS9 which is proposed to accept. No other proposal for PRBS7

Cl **83** *SC* **83.6.7** *P* **155** *L* **39** # 468
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

It would be highly desirable to include the prbs9 function as suggested in the TBD note

SuggestedRemedy

Add the PRBS9 test pattern.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83** *SC* **83.6.7** *P* **155** *L* **47** # 531
Ofelt, David Juniper Networks

Comment Type **T** *Comment Status* **D**

Response to the Editor's question about should the BIST logic report errors per lane...

SuggestedRemedy

I think that we either need to provide a error counter per lane or there needs to be registers that capture the lane number of the first lane to see errors and then the error count for that lane.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Changed subclause 6.7 to 83.6.7]

Suggest that we provide error counter per lane. Reject BIST until a presentation is made and supported in the task force that specifies details of the operation.

Cl **83** *SC* **83.6.7** *P* **155** *L* **67** # 89
Szczepanek, Andre Texas Instruments

Comment Type **T** *Comment Status* **D**

Whilst defining the operation of the PRBS error counter for the PMA, the deficiencies of the current 10GBASE-R function should be considered.
The self-synchronous descrambling of the PRBS31 sequence shown in Figure 49-11 is both inaccurate and costly to implement.
1) The error count is 3x the number of received error bits only if errored bits do not appear 3 or 28 bits apart (the PRBS tap seperation). So in bursty environments the count will not be 3x the number of errors.
2) Compliance with the Figure 49-11 requires the ability to increment a counter at 10Ghz. Any practical implementation will have to be implemented in parallel and increment a counter at a lower rate (create a backlog of increments and do them whilst no errors are received).
Absolute compliance to Figure 49-11 at high bits rates is not practical.

Aggregation of these counters to 40/100G will only compound these issues

SuggestedRemedy

Set an accuracy limit for the error counter
eg indicate that the counter need only be bit accurate at error rates above say 1e-4, and for burst lengths of say less than 32bits

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Changed subclause 6.7 to 83.6.7]

Presentations made so far were entirely reuse of PRBS31 from 10GBASE-R. Need a presentation to justify why this cannot be reused and why the proposed alternative approach would be more feasible and would provide equivalent verification of the lanes.

Cl **83** *SC* **83.7** *P* **156** *L* **8** # 136
D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**

registers provide information., not "may provide"

SuggestedRemedy

change
The optional MDIO capability described in Clause 45 describes several variables that may provide control and status information for and about the PMA. Mapping of MDIO control variables to PMA control variables is shown in Table 83-3.

to

The optional MDIO capability described in Clause 45 describes several variables that provide control and status information for and about the PMA. Mapping of MDIO control variables to PMA control variables is shown in Table 83-3.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **3.4** *P* **286** *L* **33** # 602
Ghiasi, Ali Broadcom

Comment Type **ER** *Comment Status* **D**

please replace +- with symbol

SuggestedRemedy

Replace with the frame symbol

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **3.4** *P* **286** *L* **41** # 598
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

With faster process 24 ps is becoming limits the desing options

SuggestedRemedy

Change 24 ps Rise/Fall time to 20 ps

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **3.4** *P* **286** *L* **46** # 597
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Error rate for the Total jitter not defined

SuggestedRemedy

Add note TJ defined at BER 1E-15 with value of 0.64 UI

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **831.3.3** *P* **283** *L* **11** # 651
Li, Mike Altera

Comment Type **TR** *Comment Status* **D**

Transmitter equlization is not defined. As such channel jitter will be specificaed with the assumption that ISI is not compensated. This will eat the DJ margin of Tx and Rx while most of them today have the equlization capabilities.

Not defining equlization will result in expensive nXAUI specification, with ready silicon equlization unused.

SuggestedRemedy

Technical proposal is needed and approved to determine what type of equlization is best suitable for nXAUI channel (Tx, Rx, Tx+Rx) in terms of cost and performance.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Agreement on definition and values needed.

Cl **83A** *SC* **83A** *P* **279** *L* **1** # 278
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

This Note says "NOTE-This annex is numbered in correspondence to its associated clause; i.e., Annex 83A corresponds to Clause 83." However, the only Annex with a note of this kind is the first one, Annex 4A

SuggestedRemedy

Remove the note

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Cl **83A** *SC* **83A** *P* **280** *L* **1** # 649
Li, Mike Altera

Comment Type **TR** *Comment Status* **D**

BER for the nAUI link needs to be defined

SuggestedRemedy

A proposal on the BER for nXAUI is needed and approved.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Remedy not defined.

Cl **83A** *SC* **83A.1** *P* **280** *L* **31** # 170
D'Ambrosia, John Force10 Networks

Comment Type **TR** *Comment Status* **D**

There is an issue with Fig 83A-1. The PMA blocks above and below the XLAUI / CAUI are labeled "PMA." While some may think this is just a naming nomenclature, it does have the potential to cause confusion, as there are very different functions inherent in these PMA blocks.

SuggestedRemedy

Replace Fig 83A-1 with Fig 83-2, except only shadowed areas are the two AUIs.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

AUIs is not called out in Fig 83-2. Propose changing PMAs in Fig 83A-1 to XLAUI / CAUI

Cl **83A** *SC* **83A.1** *P* **281** *L* # 196
Mezer, Amir Intel

Comment Type **TR** *Comment Status* **D**

The XLAUI/CAUI specification is such that:
a. The transmit test point is defined right at the transmitter output.
b. The channel is normative
c. The receiver test point is defined right at the receiver input.
The question is:
Whose responsibility is it to ensure that the receiver input meets the specification defined in 83A.3.4.2 "Input signal definition"?
There may be a situation where each of the components meets the spec. requirements but the system does not work, i.e.
1. The tranmitter meets the spec. requirements at its input.
2. The channel meets its specifications.
3. The receiver operates flawlessly with the input signal as defined in 83A.3.4.2.
But, since the resultant receiver input Of transmitter+channel is not a requirement, the actual input signal will be different and the system will not work.

SuggestedRemedy

Leave the normative channel requirements.
Change the transmit test point so that it is tested at the receiver input.
If the transmitter meets the requirements, this will ensure a minimal input signal for the receiver.
In addition, define the tranmitter spec. requirements at that point so that they match 83A.3.4.2 "Input signal definition".

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The receiver requirements must be defined such that it takes into account worst case transmitter and channel characteristics. This should ensure interoperability

Cl **83A** *SC* **83A.1** *P* **281** *L* **16** # 360
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Isn't it quite feasible to interoperate between a nAUI lane and an XFI spec part? Even to comply to both at once?

SuggestedRemedy

Unless this is not so, say that this spec is similar to XFI (part of XFP), add reference for XFP document.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Although this is feasible, there may be risks in explicitly stating it is interoperable with XFI.
XFI loss budget including connector at 5.5GHz is 6dB. nAUI is looking at a 10dB budget.

Cl **83A** *SC* **83A.1** *P* **281** *L* **3** # 638
CHANG, Frank Vitesse

Comment Type **TR** *Comment Status* **D**

I donot agree XLAU or CAUI is just for chip-to-chip interconnect, this is only true for nx10g MMF module with non-retimed interface. For optical 4x25g SMF or 4x10g X40 modules, CAUI or XLAU could be interface connecting optical modules to host oard.

SuggestedRemedy

Suggest the change as:
The purpose of the XLAUI or CAUI is to provide a flexible chip-to-chip internection as well as the connection between optical module and host ASIC board.....

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **83A.1** *P* **281** *L* **6** # 291
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

Several very minor editorial issues in clause 83A collected in to one comment.

SuggestedRemedy

Change "example application of XLAUI includes providing lane" to "example application of XLAUI is to provide lane" page 281 line 6
Remove spurious empty paragraph from page 282 line 39
Use the +- symbol (Ctrl-q 1) page 283 line 14 and page 286 line 32
Use Greater than or equal to sign (Crtl-q 3) and Less than or equal to sign (Ctrl-q #) page 284 line 38, page 285 line 2 and page 288 line 5
Space missing in "10MHz" page 284 line 48

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **83A.1.1** *P* **281** *L* **23** # 512
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

I think that XLAUI and CAUI can only be used between PMA's not between other layers in the model

SuggestedRemedy

Delete bullet a)

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Electrical interface can be used in other areas

Cl **83A** *SC* **83A.2** *P* **282** *L* **19** # 328
Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **D**

The primary purpose of the nAUI spec is the same as the XFI spec at 10G: to provide a standardised and interoperable spec for plugging retimed transceiver modules into line cards or similar. Like XFI (part of XFP), it needs to take a connector into account (does not need to define the connector mechanicals) and define the compliance points with reference to the connector.

SuggestedRemedy

Use the six TP compliance points defined in 86.7.1, relegate the points in Fig 83A-2 to informative reference points like A and D in SFP+.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Additional compliance points may be required in nAUI, but they may not be the same six TP defined in 86.7.1.

Additional presentation material required.

Cl **83A** *SC* **83A.2.2** *P* **282** *L* **11** # 218
Mellitz, Richard Intel Corporation

Comment Type **TR** *Comment Status* **D**

Its not clear how to perform Tx and Rx compliance testing without details of context.

SuggestedRemedy

Define test fixtures and coordinate test point through out document.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The commenter makes a valid point but the task force will need to agree on a solution.

Cl **83A** *SC* **83A.2.2** *P* **282** *L* **20** # 555
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Transmitt and Receive function are missing from Fig 83A

SuggestedRemedy

Please add transmitt and receive function to Fig 83A

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Additional clarity required on suggested remedy

Cl **83A** *SC* **83A.3.2** *P* **282** *L* **53** # 556
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Missing definition of loss between transmitt and receive complinace points, add definition for transmitt and receive compliance points

SuggestedRemedy

Transmitt Compliance Point - Any interconnect may be used between the XLAUI/CAUI transmitt funciton and Transmitt Compliance Point as long as transmitter parameters of Table 83A-1 are met.

Receive Compliance Point - The interconnect from the Receive Compliance Point to the XLAUI/CAUI receive function including AC coupling SDD21 response shall be
SDD21(dB) >= (-0.007 - 0.1684*SQRT(f) - 0.0617*f)
f is given in GHz.
SDD21 loss a Nyquist is 0.7 dB and 0.2 larger than SFP+ loss.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The transmit remedy maintains implementation flexibility so long as the transmitter characteristics are met.

Can we use the same style of wording for receive compliance?

Receive Compliance Point - Any interconnect may be used between the XLAUI/CAUI Receive funciton and Receive Compliance Point as long as receiver parameters of Table 83A-2 are met

Cl **83A** *SC* **83A.3.2** *P* **283** *L* **37** # 562
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D** *Jitter*

PWS (Pulse Width Shrinkage) a critical parameter on transmitter high frequncy performance is missing from lis tof parameters in table 83A-1.

SuggestedRemedy

Puropose to add PWS (Pulse Width Shrinkage) with 0.12 UI value.
PWS is measured per FC-PI-4 Annex A.1.3.2 using PRBS9 pattern

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected Clause number from 83 to Annex 83A as this comment refers to Annex 83A]

Agreement on definition and values needed.

Cl **83A** *SC* **83A.3.3** *P* **282** *L* **27** # 567
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

With faster processes 24 ps transition time starting to be an issue

SuggestedRemedy

Suggest to change 24 ps to 20 ps

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **83A.3.3** *P* **283** *L* **11** # 652
Li, Mike Altera

Comment Type **TR** *Comment Status* **D**

Jitter transfer function (JTF) is not defined for Tx jitter definition/testing. This will grossly oversetimate the jitter, leaving the jitter margin created by clock and data receovery (CDR) unused, resulting in expensive nXAUI specification.

SuggestedRemedy

Technical proposal for JTF asscoated with CDR is needed and approved.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Jitter transfer function is not within the scope of XLAUI / CAUI.

Cl **83A** *SC* **83A.3.3** *P* **283** *L* **11** # 215
Mellitz, Richard Intel Corporation

Comment Type **T** *Comment Status* **D**

Jitter not consistent with electrical characteristics of 10GBASE-KR/ 40GBASE-KR

SuggestedRemedy

Add:

Max output jitter (peak-to-peak)
Random jitter
Deterministic jitter
Duty Cycle Distortion

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The commenter makes a valid point but the task force will need to agree on a solution

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Cl **83A** *SC* **83A.3.3** *P* **283** *L* **12** # 599
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Transmitt compliance not yet defined

SuggestedRemedy

Puropose to use ghiasi_01_0708 min and max loss channel for transmitter compliancesubset of s4p file cn be included in the draft for either soft testing or buidling actual boards

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Ghiasi_01_07_08 max loss channel has the following comment:

The 10 dB channel was created by cascading 2nd PCB with 2 dB loss at Nyquist with the 8" Fr48 channel which is adding some ripple

If the task force chooses this method to verify compliance, use more appropriate channel

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Cl **83A** *SC* **83A.3.3** *P* **283** *L* **14** # 601
Ghiasi, Ali Broadcom

Comment Type **ER** *Comment Status* **D**

please replace +- with symbol

SuggestedRemedy

Replace with the frame symbol

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **83A.3.3** *P* **283** *L* **14** # 74
Chung, Hwan Seok ETRI

Comment Type **T** *Comment Status* **D**

Across the entire document D1.0, the usual descrption of signaling speed per lane (range) in table is 10.3125 +- 100 ppm. So, to maintain consistency, the signaling speed per lane in Table 83A-1 should be "10.3125 +- 100 ppm" not "10.3125 GBd +- 100 ppm". In addition, the +- sign should be changed to mathmatical symbolic font style.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

So, to maintain consistency, the signaling speed per lane in Table 83A-1 should be "10.3125 +- 100 ppm" not "10.3125 GBd +- 100 ppm". In addition, the +- sign should be changed to mathmatical symbolic font style.

Cl **83A** *SC* **83A.3.3** *P* **283** *L* **16** # 181
Alping, Arne Ericsson AB

Comment Type **ER** *Comment Status* **D**

96.96969697 (too many significant numbers)

SuggestedRemedy

Change to: 96.9697 ps

(compare to, e.g, Table 85-4 on page 181)

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: Corrected / replaced table number in subclause field with 83A.3.3]

See comment # 362

Cl **83A** *SC* **83A.3.3** *P* **283** *L* **21** # 361
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **D**

Table too narrow

SuggestedRemedy

Resize LH column to contents

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **83A.3.3** *P* **283** *L* **28** # 514
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

In table 83A-1 it would be good to reference the rise/fall test methodology as with a Tx with pre-emphasis the value depends greatly on the exact methodology.

SuggestedRemedy

Add footnote d to the Rise/fall time row. Footnote d to say "Rise and Fall times are defined in 83A.4.4

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Add foot note which says "Rise/Fall time measurement methodology defined in 83A.4.4

Cl **83A** *SC* **83A.3.3** *P* **283** *L* **29** # 279
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

In table 83A-1 the specification for the Differential Output S-parameters is "(see "Equation 83A-1")". This should refer to the clause defining the requirement not just the equation. This also applies to the next row in this table and also two places in Table 83A-2

SuggestedRemedy

Change "(see "Equation 83A-1")" to "see 83A.3.3.3"
in the next row change "(see "Equation 83A-2")" to "see 83A.3.3.4"
in Table 83A-2 change "(see "Equation 83A-3")" to "see 83A.3.4.4"
in Table 83A-2 change "(see "Equation 83A-4")" to "see 83A.3.4.5"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **83A.3.3** *P* **283** *L* **32** # 295

Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

In Table 86-6 There are two jitter parameters "Maximum Total Jitter" and "Maximum Deterministic Jitter" where it is not clear if this is UI peak to peak or not.
Also applies to:
Table 83A-2 "Maximum Total Jitter"
Table 83A-2 "Maximum non-EQ Jitter (TJ - ISI)"

SuggestedRemedy

Either change the parameter names to include "(pk-pk)" or change the units to be UIptp

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Add "(pk-pk)" to parameter names

Cl **83A** *SC* **83A.3.3** *P* **283** *L* **33** # 596

Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Error rate for the Total jitter not defined

SuggestedRemedy

Add note TJ defined at BER 1E-15

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **83A.3.3** *P* **283** *L* **35** # 566

Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

The classical DJ and RJ measured jitter are jitter PDF dependent and not valid for jitter distribution which are not dual-dirac.

SuggestedRemedy

To limit the uncorrelated jitter add UJ of 0.025 UI (RMS) per IEEE CL 68.6.8 method
Replace DJ with DDJ of 0.17 UI per method of FC-PI4 A.1.3.1 with PSBS 9 pattern

Proposed Response *Response Status* **W**

PROPOSED REJECT.

not consistent with other ba clauses

Cl **83A** *SC* **83A.3.3** *P* **283** *L* **7** # 513

Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

Spurious precision in the Baud period. The tolerance of the signaling rate is +/-100ppm and is only listed to 6 significant digits

SuggestedRemedy

Round the Baud period to 6 significant figures here and in tables 83A-1 and 83A-2

Proposed Response *Response Status* **W**

PROPOSED REJECT.

See comment 362

Cl **83A** *SC* **83A.3.3** *P* **283** *L* **7** # 362

Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

If you have stated the signalling rate there is no need to give the unit interval, and 'Baud period' is slang.

SuggestedRemedy

Delete 'The corresponding Baud period is nominally 96.96969697 ps.' and the similar row in Table 83A-1.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **83A.3.3** *P* **283** *L* **8** # 180

Alping, Arne Ericsson AB

Comment Type **ER** *Comment Status* **D**

...is nominally 96.96969697 ps... (to many significant numbers)

SuggestedRemedy

Change to: ...is nominally 96.9697 ps...

(compare to, e.g, Table 85-4 on page 181)

Proposed Response *Response Status* **W**

PROPOSED REJECT.

See comment # 362

Cl **83A** *SC* **83A.3.3.1** *P* **284** *L* **19** # 280
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

The title of Figure 83A-3 is "Figure 83A-3-Driver output voltage limits and definitions [SLi<P> and SLi<N> are the positive and negative sides of the differential signal pair for lane i (i = 0, 1, 2, 3 for XLAUI. For CAUI i = 0:9)]". The text within the square brackets should not be part of the figure title.

SuggestedRemedy

Move this text to be a note under the figure as is done for Figure 85-2 and 85-9

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **83A.3.3.2** *P* **284** *L* **22** # 492
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

Transition time appears to be the same as rise/fall time. If they are the same they should be called the same thing here and in table 83A-1, and 83A.4.4

SuggestedRemedy

Change "Transition time" to "Rise/fall time" in the title of this subclause and in the first sentence.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **83A.3.3.3** *P* **284** *L* **37** # 211
Mellitz, Richard Intel Corporation

Comment Type **ER** *Comment Status* **D**

Avoid s-parameter designations and keep loss definition consistent in document.

SuggestedRemedy

Make loss positive dB

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Changes also required in PPI. Require suggestion to avoid s-parameter designations.

Cl **83A** *SC* **83A.3.3.3** *P* **284** *L* **41** # 611
Ganga, Ilango Intel

Comment Type **T** *Comment Status* **D**

Update the the Return loss definition and plots to be consistent with the definition and plots in the base standard (IEEE Std 802.3-2008, Annex 69B)

The Return Loss limits in Figure 83A-4 and Figure 83A-7 to be plotted in log linear scale with loss being positive (See 69B.4.5)

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Require values for return loss definition and plots which are consistent with Annex 69B

Cl **83A** *SC* **83A.3.3.3** *P* **284** *L* **42** # 363
Dawe, Piers Avago Technologies

Comment Type **ER** *Comment Status* **D**

Editor's note says 'The Return Loss limits in Figure 83A-4 and Figure 83A-7 may have to be plotted in log linear scale with loss being positive. The definition or formatting to be reconciled similar to the definition or plots in base spec 802.3-2008 Annex 69B'.
Just because another clause did or didn't use a log frequency scale does not tie our hands. Just because another clause didn't use S-parameters doesn't preclude us from using S-parameters.

SuggestedRemedy

Do the right thing for our circumstances. S-parameters are good. Vertical grid lines would be welcome.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Although I am always up for doing the right thing, I think the group is leaning towards reusing Annex 69B

Cl **83A** *SC* **83A.3.3.3** *P* **285** *L* **1** # 212
Mellitz, Richard Intel Corporation

Comment Type **ER** *Comment Status* **D**
Avoid s-parameter designations and keep loss definition consistent in document.

SuggestedRemedy
Make loss positive dB in Figure 83a-4

Proposed Response *Response Status* **W**
PROPOSED ACCEPT IN PRINCIPLE.

Input required on how to avoid s-parameter designations.

SDD21 for PPI also in (-)

See Figure 86-4

Cl **83A** *SC* **83A.3.3.4** *P* **284** *L* **50** # 603
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**
The reference impedance for differential return loss measurement is 100 ohms in the common mode section

SuggestedRemedy
please change to "The reference impedance for common mode s-parameters measurement is 25 ohms.

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Cl **83A** *SC* **83A.3.3.4** *P* **285** *L* **9** # 139
D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**
Fig 83A-4 is inconsistent with similar diagrams in 802.3

SuggestedRemedy
correct figure. Updated figure to be provided.

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Cl **83A** *SC* **83A.3.3.5** *P* **286** *L* **18** # 493
Dudek, Mike JDSU

Comment Type **E** *Comment Status* **D**
misalignment of label

SuggestedRemedy
Move the labels X2 and 1-X2 to line up with the dotted lines.

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Cl **83A** *SC* **83A.3.4** *P* **286** *L* **1225** # 600
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**
Inteference tolerance test not yet defined

SuggestedRemedy
Puropose to use ghiasi_01_0708 min and max loss channelas the frequency dependent attenuator in 69A.2 test setup followed by a limiting Amplifier prior to inteference injection. TP1 must have maximum jitter as defiend in table 83A-1. Pre-emhasais can be adjusted to reach the TP4 J2=0.42 UI, Inteference generator then adjsuted to increase the total jitter to value listed in table 83A-2

Proposed Response *Response Status* **W**
PROPOSED ACCEPT IN PRINCIPLE.

An interference tolerance test is required and intended for section 83A.4.3.

TP4 J2 is not defined

Cl **83A** *SC* **83A.3.4** *P* **286** *L* **25** # 216
Mellitz, Richard Intel Corporation

Comment Type **T** *Comment Status* **D**
Receiver compliance not consistent with electrical characteristics of 10GBASE-KR/ 40GBASE-KR

SuggestedRemedy
Use section 69A (Interference tolerance testing)

Proposed Response *Response Status* **W**
PROPOSED ACCEPT IN PRINCIPLE.

Receiver compliance may not be exactly the same as 10GBASE-KR. Request input on values for use in compliance test

Cl **83A** *SC* **83A.3.4** *P* **286** *L* **34** # 182
Alping, Arne Ericsson AB

Comment Type **ER** *Comment Status* **D**

96.96969697 (too many significant numbers)

SuggestedRemedy

Change to: 96.9697 ps

(compare to, e.g, Table 85-4 on page 181)

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: Corrected / replaced table number in subclause field with 83A.3.4]

See comment # 362

Cl **83A** *SC* **83A.3.4** *P* **286** *L* **41** # 494
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

In table 83A-2 it would be good to reference the rise/fall test methodology

SuggestedRemedy

Add footnote d to the Rise/fall time row. Footnote d to say "Rise and Fall times are defined in 83A.4.4

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **83A.3.4** *P* **286** *L* **4647** # 648
Li, Mike Altera

Comment Type **TR** *Comment Status* **D**

The frequency spectrum content needs to be specified. Otherwise one may use a easy spectrum jitter input (e.g., low frequency dominanted) to pass the receiver tolerance test, while such a receiver will fail in the presence of worst case jitter input spectrum (e.g., high-frequency DCD, ISI, Xtalk, or RJ) in real-world.

SuggestedRemedy

A technical proposal is needed and approved to address this important aspect for Rx.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Receiver characteristics can define the jitter values. The compliance test will provide information on how the stress is generated.

Cl **83A** *SC* **83A.3.4** *P* **286** *L* **48** # 650
Li, Mike Altera

Comment Type **TR** *Comment Status* **D**

Non-Eq jitter is NOT (TJ-ISI) and needs to be well-defined, and (TJ-ISI) needs to be removed.

SuggestedRemedy

remove TJ-ISI for non-EQ jitter and spell-out and exactly what is No-EQ jitter e.g., DCD, PJ, BUJ, RJ).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Agreement on definition and values needed.

Cl **83A** *SC* **83A.3.4.1** *P* **287** *L* **8** # 238
Gustlin, Mark Cisco

Comment Type **TR** *Comment Status* **D**

Currently the BER target is TBD. Change this to a BER of 10-15. The PMD BER target is 10-12, but if you have two CAUI/XLAUI interfaces in series with a PMD interface, all with a BER of 10-12, you won't meet the overall goal of 10-12. In addition this is a chip to chip interface which typically requires a higher BER target. 10-15 seems to be a reasonable and achievable target.

SuggestedRemedy

Change: "The receiver shall operate with a BER of better than TBD in the presence of a reference input signal as
defined in 83A.3.4.2"

To:
"The receiver shall operate with a BER of better than 10^-15 in the presence of a reference input signal as
defined in 83A.3.4.2"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Editor's note: corrected Clause number from 83 to Annex 83A as this comment refers to Annex 83A]

Cl **83A** *SC* **83A.3.4.4** *P* **287** *L* **52** # 495
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

There is still a lot of energy at frequencies below 50MHz. Having an unconstrained return loss at one end of the trace and only 12dB return loss at the other end can lead to large signal distortion.

SuggestedRemedy

Change 50MHz to 10MHz here and in equation 83A-3 (page 288 line 4)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **83A.3.4.5** *P* *L* # 140
D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**

Fig 83A-7 is inconsistent with similar diagrams in 802.3

SuggestedRemedy

correct figure. Updated figure to be provided.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **83A.3.4.5** *P* **286** *L* **48** # 365
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

'non-EQ Jitter (TJ - ISI)' There's no definition of what 'non-EQ Jitter' means in this document, nor this usage of 'ISI'. I suspect if I saw one I would not agree with it ;-)

SuggestedRemedy

Find a better metric, or explain these terms.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Proposal required.

Cl **83A** *SC* **83A.3.4.5** *P* **288** *L* **16** # 213
Mellitz, Richard Intel Corporation

Comment Type **ER** *Comment Status* **D**

Avoid s-parameter designations and keep loss definition consistent in document.

SuggestedRemedy

Make loss positive dB in Figure 83a-7

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Input required on how to avoid s-parameter designations.

SDD21 for PPI also in (-)

See Figure 86-4

Cl **83A** *SC* **83A.3.4.5** *P* **288** *L* **23** # 364
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

As one of these lines is the same as a line in Fig 83A-4

SuggestedRemedy

Remove this figure and put the four limits (three traces) on Fig 83A-4 (extending the vertical scale to -16).

Proposed Response *Response Status* **W**

PROPOSED REJECT.

I would like to keep input and output return loss separate.

Cl **83A** *SC* **83A.3.4.5** *P* **288** *L* **8** # 496
Dudek, Mike JDSU

Comment Type **TR** *Comment Status* **D**

This section is describint SCD11 which is not common mode input return loss

SuggestedRemedy

Change the title of the section to "Reflected differential to common mode conversion.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Reconcile with comments relating to making similar to Annex 69B

Cl **83A** *SC* **83A.3.4.8** *P* **289** *L* **14** # 329
Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **D**

It's not clear that these jitter specs allow the two concatenated CDRs and an optical link, XFP style, that will be wanted when connecting e.g. a 40GBASE-LR4 module.

SuggestedRemedy

Modify the jitter specifications to be sure they do. This may mean that the specs on the transmit side and receive side differ. See presentation.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

It is not necessary for XAUI / CAUI specifications to spell this out. nAUI needs to ensure the nAUI link works properly. TP2/3 needs to make sure the optical link works properly

Cl **83A** *SC* **83A.3.5** *P* **289** *L* **40** # 498
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

The Interconnect characteristics deserve their own section, not a subsection of the receiver (and partly in measurement methods) and are missing return loss

SuggestedRemedy

Make 83A.3.5 into 83A.4 (and relabel 83A.4)
Move present section 83A.4.1 and Figure 83A-9 into this new section.
Rename present 83A.4.1 to "Interconnect Loss"

Add to the Characteristic Impedeance editors note (page 289 line 49) "and return loss specifications"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **83A.4** *P* **290** *L* **7** # 217
Mellitz, Richard Intel Corporation

Comment Type **T** *Comment Status* **D**

Interconnect definetion not consistent with electrical characteristics of 10GBASE-KR/ 40GBASE-KR Annex 69b.

SuggestedRemedy

Utilize style of IL, A, ILD, RL, and ICR in Annex 69b if parameters are applicable.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

XLAUI / CAUI channel is less challenging than KR, reducing the need for some of the interconnect definitions used in KR

Cl **83A** *SC* **83A.4.1** *P* **290** *L* **11** # 214
Mellitz, Richard Intel Corporation

Comment Type **ER** *Comment Status* **D**

Avoid s-parameter designations and keep loss definition consistent in document.

SuggestedRemedy

Make similar to Annex 69b

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Additional material required on actual values

Cl **83A** *SC* **83A.4.2** *P* **290** *L* **43** # 497
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

An eye mask that does not state at what probability it is to be met has led to confusion in the past.

SuggestedRemedy

Add to the editors note here "This section should include at what probability the eye mask has to be met"

or state the probabilities in Sections 83A.4.2 and 83A.3.3.5

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Add editors note

Cl **83A** *SC* **83A.4.3** *P* **291** *L* **28** # 199
SUZUKI, TOSHIHIRO ANRITSU

Comment Type **T** *Comment Status* **D**

For XLAUI/CAUI should be tested under the worst condition.
So jitter tolerance test should be executed with MLD pattern not PRBS.

SuggestedRemedy

So jitter tolerance test should be executed with MLD pattern not PRBS.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

PRBS31 is defined as a PMA test pattern in 83.6.7

Cl **83A** *SC* **83A.5** *P* **291** *L* **36** # 366
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Like a PMA or PCS clause, nAUI is completely on a single line card or similar, so the draft doesn't need environmental specifications for it.

SuggestedRemedy

Delete the subclause

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **83A** *SC* **83A3.3.3** *P* **283** *L* **11** # 647
Li, Mike Altera

Comment Type **TR** *Comment Status* **D** *Jitter*

Pulse width jitter (PWJ) is needed at about 8Gbps or above to aviod jitter amplification (JA) due to the lossy channel. If PWJ is not defined and bounded, nXAUI link will break in the presence of large PWJ.

SuggestedRemedy

PWJ needs to be defined and specified. I suggest that 802.3ba adopt the definition and vaule similiar to these of Fibre Channel 8X and PCIe Gen 3.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: commenter used tilde character to indicate "about or approx", this has been replaced with "about 8Gbps" since tilde is a special character used as delimiter by the comment tool"]

Additional information on “similar” definition and values.

Cl **84** *SC* **84.1** *P* **159** *L* **12** # 62
Sun Hyok, Chang Electronics and Teleco

Comment Type **T** *Comment Status* **D**

'40GBASE-KR' is wrong in the title of Table 84-1.

SuggestedRemedy

'40GBASE-KR' has to be replaced by '40GBASE-KR4'

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[added 84 to subclause number in comment]

Cl **84** *SC* **84.1** *P* **159** *L* **14** # 197
Gu, Yuan ZTE Corporation

Comment Type **E** *Comment Status* **D**

In table 84-1,
Change the 2nd column sub-title "10GBASE-KR" to "40GBASE-KR4"

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Also see comment # 63

Cl **84** *SC* **84.1** *P* **159** *L* **14** # 63
Sun Hyok, Chang Electronics and Teleco

Comment Type **T** *Comment Status* **D**

It is wrong that '10GBASE-KR' is written at line 14 of Table 84-1.

SuggestedRemedy

'10GBASE-KR' has to be replaced by '40GBASE-KR4'

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[added 84 to subclause number in comment]

Also see comment # 197

Cl **84** *SC* **84.2** *P* **160** *L* **51** # 45
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

The service primitives in clause 84 are not in the same format (e.g. PMD_UNITDATA.request<0:3>) as for clauses 85 through 88

SuggestedRemedy

Change the format of the service primitives in clause 84 to be in the same format (e.g. PMD_UNITDATA.request<0:3>) as for clauses 85 through 88

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The service interface definition will be reconciled to what will be adopted for the other clauses.

Cl **84** *SC* **84.7.4** *P* **164** *L* **49** # 46
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

This says "Upon completion of training, SIGNAL_DETECT shall be set to OK" but it is not clear that training must be completed on all lanes.
The same issue for clause 85.7.4

SuggestedRemedy

Change "Upon completion of training, SIGNAL_DETECT shall be set to OK" to "Upon completion of training on all lanes, SIGNAL_DETECT shall be set to OK"

Do the same in clause 85.7.4

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **84** *SC* **84.7.4** *P* **165** *L* **2** # 205
Marris, Arthur Cadence

Comment Type **T** *Comment Status* **D**

Change "1 or 0" to "one or zero" to match nomenclature in 45.2.1.9.5

SuggestedRemedy

as above

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **84** *SC* **84.7.6** *P* **165** *L* **24** # 47
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

When in loopback mode this says "When loopback mode is selected, transmission requests passed to the transmitter are shunted directly to the receiver, overriding any signal detected by the receiver on its attached link. Note, this bit does not affect the state of the transmitter." This text is not entirely clear whether the transmitter continues to send data?.

This also applies to 85.7.8

SuggestedRemedy

Change "are shunted directly" to "are sent directly"
Change "Note, this bit does not affect the state of the transmitter." to "Note that this bit does not affect the state of the transmitter which continues to send data (unless disabled)."

Also make these changes in 85.7.8

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **84** *SC* **84.7.6** *P* **165** *L* **33** # 287
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

Two very minor editorial issues in clause 84 collected in to one comment.

SuggestedRemedy

Note 2 is in 10 point font rather than the usual 9 point page 165 line 33
External references to clause 21 should be blue page 168 lines 15 and 48

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **84** *SC* **84.8** *P* *L* **166** # 470
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

There is likely to be more crosstalk in a KR4 system than in a KR system.

SuggestedRemedy

Evaluate the effects of additional crosstalk and include them in changed specs. In the meantime add an editors note saying "Editors note to be removed prior to pulication. The effect of additional crosstalk in the KR4 system is under investigation.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See comment # 167

Cl **84** *SC* **84.8** *P* **166** *L* **12** # 64
Sun Hyok, Chang Electronics and Teleco

Comment Type **T** *Comment Status* **D**

'40GBASE-KR' is wrong in the title of Subclause 84.8.

SuggestedRemedy

'40GBASE-KR' has to be replaced by '40GBASE-KR4'

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[added 84 to subclause number in comment]

Cl **84** *SC* **84.8** *P* **166** *L* **16** # 374
Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **D**

84.8 refers to 72.7, which says '...the PMD sublayer is standardized at test points TP1 and TP4 as shown in Figure 72-1. The electrical path from the transmitter block to TP1, and from TP4 to the receiver block, will affect link performance and the measured values of electrical parameters used to verify conformance to this standard. Therefore, it is recommended that this path be carefully designed.' In other words, there is no expectation that a board from vendor A, a backplane from B and another board from C can be expected to interoperate reliably, because each of them can spend as much of the shared channel budget as he pleases. This is not an interoperability spec, it's just an advertisement for some ICs. Is this what we want?

SuggestedRemedy

Discuss. Options are: make it into a proper interoperability spec with test points related to the connectors (Clause 86 will have to do much of that work anyway), delete the clause, move it to an annex, or accept that it's not a proper spec.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The 802.3ap project specified the backplane interconnect characterisitcs to be informative.

Cl **84** *SC* **84.8.2.1** *P* **167** *L* **1** # 271
Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **D**

Receiver interference tolerance requirement is unclear. Annex 69A defines a test for a 10GBASE-KR receiver in isolation.

Does this requirement imply that a single 40GBASE-KR4 lane is tested in isolation? If so, should the unused lanes be terminated by the reference impedance, and what is their operational state (active or quiescent)?

If all lanes are to be tested in parallel, are parallel instances of the Annex 69A set-up required, or does a new multi-lane test apparatus need to be defined?

SuggestedRemedy

A supporting presentation will be provided to compare several approaches to this problem and suggest a direction.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See comment # 166

Cl **84** *SC* **84.8.2.1** *P* **167** *L* **1** # 166
D'Ambrosia, John Force10 Networks

Comment Type **TR** *Comment Status* **D**

This section needs clarification, as it is ambiguous as to whether a single isolated lane is being tested or are all channels as an aggregate being tested.

SuggestedRemedy

test on a single lane basis, (joint) presentation to be provided

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Needs discussion and agreement in the task force.

Also see comment # 271

Cl **84** *SC* **84.8.2.1** *P* **167** *L* **3** # 552
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Learning KR specifications weakness the current interference tolerance test is not comprehensive since there is no group delay or phase info in the channel

SuggestedRemedy

For 40GBase-KR4 replace magnitude response of Fig 69B.2 with pulse response of the channel

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[added 84 to subclause number in comment]

Please provide more detailed remedy

Cl **84** *SC* **84.9** *P* **167** *L* **7** # 553
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Lnformative channel in 69B has no phase or group delay, this is major weakness when KR specifications are proposed to be used for CR4 and CR10

SuggestedRemedy

Please fix the problem as KR is not the gold standard, either provide group delay info for Fig 69B.2 or better provide pulse response for the channel

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[added 84 to subclause number in comment]

Please provide a more detailed explanation and remedy.

The backplane channel is informative and was specified by the 802.3ap project. The CR4/CR10 channel is specified in Clause 85.

Cl **84** *SC* **84.9** *P* **167** *L* **8** # 167
D'Ambrosia, John Force10 Networks

Comment Type **TR** *Comment Status* **D**

Informative interconnect characteristics are specified, "Crosstalk requirements Informative interconnect characteristics for 40GBASE-KR4 are provided in Annex 69B." However, the crosstalk requirements for 10GBASE-KR were specified under the assumption that all crosstalk was uncorrelated. For a multilane approach crosstalk will come from correlated and uncorrelated sources.

SuggestedRemedy

provide a multi-lane xtalk specification that takes into account correlated & uncorrelated crosstalk sources. Presentation to be provided.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Needs discussion and agreement in the task force.

Also see comment # 470

Cl **85** *SC* **85.1** *P* **171** *L* **10** # 288

Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

Several very minor editorial issues in clause 85 collected in to one comment.

SuggestedRemedy

Reference to Clause 45 should be cross-reference page 171 line 10
The dash between 81 and RS should be an em-dash page 171 line 18
The dash between 73 and Auto-Negotiation should be an em-dash page 171 line 30
Change "interface for these" to "interfaces for these" page 172 line 45
Reference to Clause 45 should be cross-reference page 174 line 49
Space missing in "disable 9to" page 175 line 17
The word "Global_" is in 10 point font right side of page 175 line 33
Force the second "PMD" to next line on left side of page 175 line 35
Change ".." to "." page 177 line 10
Remove space between "PMD_SIGNAL.indication" and "(SIGNAL_DETECT)" in two places page 178 lines 38 and 39
Change "When a Global_PMD_..." to "When Global_PMD_..." page 179 line 24
Change "NOTES
1" to "NOTE1" page 179 line 51
Change "2" to "NOTE2" page 180 line 3
It would be useful to colour external equation references blue (see comment on front matter) page 181 lines 28, 29, 30, 31 also page 183 lines 18 an 19
Set pagination to "Anywhere" to remove blank half page for heading 85.9.1 page 185 line 1
Do Special, Equations, Equations, "shrink wrap" on equation 85-6 to fix cropping page 187 line 26
External reference to clause 21 should be blue page 197 line 11

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.1** *P* **171** *L* **22** # 471

Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

There is a problem in Table 85-1. XLAUI isn't applicable to 100GBASE-CR, but CAUI is optional

SuggestedRemedy

Either label the 83A row as XLAUI/CAUI or insert an additional row for CAUI and make the appropriate changes.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Suggested remedy comment #159

Cl **85** *SC* **85.1** *P* **171** *L* **23** # 159

D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**

Reference only to XLAUI is made, and then 40G and 100G PMDs list XLAUI as optional.

SuggestedRemedy

Add another row for 83A CAUI
for row 83A XLAUI, mark 100GBASE-CR10 not applicable
for row 83A CAUI, mark 40GBASE-CR4 not applicable

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.1** *P* **171** *L* **30** # 341

Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **D** *AN*

Auto-negotiation is an unnecessary burden on the host. It is not necessary for these copper links, and should not appear on front-panel ports.

SuggestedRemedy

Delete Auto-negotiation from Clause 85. Remove the Note at Clause 73, but provide a table showing which port types could use Auto-negotiation proper, which could use Parallel Detection (see below), and which could use Training.
Formalize and extend 'Parallel Detection' (73.7.4.1 Parallel Detection function) as a properly specified Link Negotiation based on the principles of Fibre Channel's Link Speed Negotiation.
See presentation.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Draft 1 reflects consensus for AN usage for negotiating FEC capability (commanality with KR/KR4) and parallel detection function to detect legacy 10GBASE-CX4.

Presentation to be reviewed by sub-task force.

Cl **85** *SC* **85.1** *P* **171** *L* **32** # 370
Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **D** *FEC*

The copper-cable receivers are expected to rely even more on long DFE than Backplane Ethernet, and so when errors happen, moderately long error bursts are very probable. This overwhelms the CRC's error-detecting guarantee. These port types do not go into closed systems as Backplane Ethernet ports do, so the standard has to take responsibility for avoiding false packet acceptance rather than the system implementer.

SuggestedRemedy

FEC encoding and error detection must be mandatory, to provide adequate error detection. This is significantly less onerous than requiring mandatory full FEC error correction (correcting errors is a step beyond detecting them) which can remain optional.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Supporting presentation to be reviewed in sub-task force.

Cl **85** *SC* **85.1** *P* **171** *L* **35** # 48
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

Table 85-1 Note b contains two instances of "XLGMII" which should be "CGMII"

SuggestedRemedy

Change "XLGMII" to "CGMII" in two places

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.1** *P* **171** *L* **35** # 198
Gu, Yuan ZTE Corporation

Comment Type **E** *Comment Status* **D**

Change "XLGMII" to "CGMII"

also in line 36
the same change

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.1** *P* **171** *L* **7** # 168
D'Ambrosia, John Force10 Networks

Comment Type **TR** *Comment Status* **D**

A normative statement for the combination of sublayers is needed.

In order to form a complete PHY (Physical Layer device), a PMD is combined with the appropriate sublayers (see Table 85-1) and with the management functions, which are optionally accessible through the management interface defined in Clause 45, or equivalent.

SuggestedRemedy

change noted sentence to

In order to form a complete PHY, the desired PMD shall be combined with the appropriate sublayers (see Table 85-1) and with the management functions that are optionally accessible through the management interface defined in Clause 45, or equivalent.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.10** *P* **191** *L* # 547
Fogg, Michael Tyco Electronics

Comment Type **T** *Comment Status* **D**

Replace Trace Loss (TBD from Nicholl_01_0708.pdf) with specific values

SuggestedRemedy

Provide values to discuss with Diminico Subgroup

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: Corrected missing subclause number 85.10 to subclause field]

Remedy provided in comment #448

Cl **85** *SC* **85.10** *P* **191** *L* **16** # 448
DiMinico, Christopher MC Communications

Comment Type **TR** *Comment Status* **D**

Provide TBD values for 85.10 Transmitter and receiver diferential printed circuit board trace loss equation (85-10). Add TBD to equation as contributions from IL and power sum crosstalk to ICR under consideration.

SuggestedRemedy

The maximum insertion loss (in dB with f in MHz) for the transmitter and receiver differential controlled
impedance printed circuit boards for each differential lane shall be:
Insertion Loss(f)</=(0.2032)*[20*log(e)*(2.00E-05*sqrt(f*10^6)+1.1E-10*(f*10^6)+3.2E-20*((f*10^6)^2+-1.2E-30*(f*10^6)^3)] TBD dB

for all frequencies from 100 MHz to 6000 MHz.

Insertion Loss(f) represents 8 inches (0.2032 m) of the maximum fitted attenuation (Amax) due to trace skin effect and dielectric properties as defined in Annex 69B.4.2.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Editor's note: Added missing Clause and subclause numbers (85.10) to clause/subclause number fields]

Cl **85** *SC* **85.10** *P* **191** *L* **16** # 460
Chalupsky, David Intel Corp.

Comment Type **E** *Comment Status* **D**

typo: "differential" is misspelled as "diferential" in 85.10 section heading.

SuggestedRemedy

Change "diferential" to "differential"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.10** *P* **191** *L* **17** # 420
Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**

line 17: typo, change to "differential"
line 24: typo, change to "transmitter"

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.11** *P* **192** *L* # 536
Fogg, Michael Tyco Electronics

Comment Type **T** *Comment Status* **D**

Figures 85-10 and 85-11
Add Figure

SuggestedRemedy

Figures to be provided on supporting documents

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.11 to subclause field]

Supporting documentation to be reviewed by sub-task force.

Figure 85-10 and 85-11 shall be Style-1 40GBASE-CR4 MDI connectors plug and receptacle referenced in
small form factor pluggable (QSFP), SFF-8436.

Cl **85** *SC* **85.11** *P* **196** *L* # 549
Fogg, Michael Tyco Electronics

Comment Type **T** *Comment Status* **D**
Add lane to MDI connector pin mapping

SuggestedRemedy
Table to be provided in supporting documentation

Proposed Response *Response Status* **W**
PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.11 to subclause field]

More details on comment and suggested remedy required.
Supporting documentation to be reviewed by sub-task force.

Cl **85** *SC* **85.11.1** *P* **191** *L* **42** # 473
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**
Connectors can't meet the requirements of both style 1 and style 2.

SuggestedRemedy
Change "(Style 1) and 85.11.1.2 (Style 2)" to "(Style 1) or 85.11.1.2 (Style 2)"

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Cl **85** *SC* **85.11.1** *P* **191** *L* **43** # 53
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**
This says "between the PMD of 85.7.1 and" but 85.7.1 is the link block diagram

SuggestedRemedy
change "between the PMD of 85.7.1 and" to "between the PMD of 85.8 and"

Proposed Response *Response Status* **W**
PROPOSED ACCEPT IN PRINCIPLE.

Change: "between the PMD of 85.7.1 and"
To: "between the PMD of 85.7 and"

Cl **85** *SC* **85.11.2** *P* **195** *L* # 548
Fogg, Michael Tyco Electronics

Comment Type **T** *Comment Status* **D**
Add Figures 85-14 and 85-15

SuggestedRemedy
Add mating face views from the SFF-8632 (referenced by 8092)
Figure 6.2 (Plug) and 6.3 (Receptacle)

Proposed Response *Response Status* **W**
PROPOSED REJECT.

[Editor's note: Added missing Clause number and subclause numbers to clause/subclause number fields]

IBTA has selected the CXP connector (SFF-8642) . Per (diminico_02_0708.pdf) the intent is to reference IBTA selected connector.

Cl **85** *SC* **85.11.2** *P* **195** *L* **6** # 421
Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**
typo, change to "considered"

SuggestedRemedy

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Cl **85** *SC* **85.11.2** *P* **195** *L* **6** # 447
DiMinico, Christopher MC Communications

Comment Type **T** *Comment Status* **D**
IBTA has selected the CXP connector currently specified as
Version 0.3 - Oct. 2, 2008 "120 Gb/s 12x Small Form-factor
Pluggable (CXP) Interface Specification for Cables, Active
Cables, & Transceivers". Replace SFF-8092 with the IBTA selected connector
SFF-8642 which has been the stated intent (diminico_02_0708.pdf).

SuggestedRemedy
Page 195 line 6 replace SFF-8092 with SFF-8642.

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Cl **85** *SC* **85.7** *P* **177** *L* # 538
Fogg, Michael Tyco Electronics

Comment Type **T** *Comment Status* **D**

Figure 85-2
Location of TP-1 and TP-4

SuggestedRemedy

Recommend either placing two new test points TP-0 and TP-5 located 4" from connector (per nicholl_01_0708.pdf) or to move TP-1 and TP-4 a specified amount of loss (possibly 2dB @ 5.1625GHz)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.7 to subclause field]

SuggestedRemedy in comment#451

Cl **85** *SC* **85.7** *P* **189** *L* # 546
Fogg, Michael Tyco Electronics

Comment Type **T** *Comment Status* **D**

Remove MDELFEXT - Use ICR specification
Remove Figure 85-7
Remove Figure 85-8

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.7 to subclause field]

Suggested Remedy in comment#454

Cl **85** *SC* **85.7** *P* **193** *L* # 537
Fogg, Michael Tyco Electronics

Comment Type **T** *Comment Status* **D**

Table 85-7
Add values

SuggestedRemedy

Add values from QSFP Specification, to be provided in supporting documentation

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.11 to subclause field]

Supporting documentation to be reviewed by sub-task force.
Table 85-7-Style-1 40GBASE-CR4 lane to MDI connector pin mapping shall be plug and receptacle referenced in
small form factor pluggable (QSFP), SFF-8436.

Cl **85** *SC* **85.7.1** *P* **177** *L* **10** # 419
Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**

double period (..). delete a period

Line 14, typo: change to "transmitter"

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.7.1** *P* **177** *L* **15** # 273
Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **D**

Clause 85 references Clause 72 in multiple places, yet uses a definition of TP1 and TP4 that is inconsistent with definition in Clause 72. This will inevitably lead to confusion.

SuggestedRemedy

Define TP1 and TP4 in a manner consistent with their use in Clause 72, or add a note explaining the mapping.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Sugessted remedy comment #450

Cl **85** *SC* **85.7.1** *P* **177** *L* **20** # 574
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

802.3ap backplanes support KX, KX4 and KR. CR4/CR10 are based on the 802.3ap and has the full provision to support another IEEE803.3ak (CX4)

SuggestedRemedy

Add badrate of 3.125 GBd to line 22. Duplicate Transition time line for CX4 with min value of 20 ps and max value of 130 ps .
Add differential output voltage p-p 800 mV to 1200 mV for CX4

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.7.1 to subclause field]

The provisions to support IEEE803.3ak (CX4)
are embodied in compatability at the MDI and and auto-negotiation.

Cl **85** *SC* **85.7.1** *P* **177** *L* **22** # 450
DiMinico, Christopher MC Communications

Comment Type **TR** *Comment Status* **D** *channel*

Add channel test/reference points TP0 and TP5 to
Figure 85-2 to provide channel definition demarcation points for tests and/or references.

SuggestedRemedy

Add channel test/reference points TP0 and TP5 to
Figure 85-2.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Editor's note: Corrected/replaced figure number in subclause field to 85.7.1]

Cl **85** *SC* **85.7.1** *P* **177** *L* **30** # 586
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Max and min loss between PMA IC and TP1a and TP4a are not defined, the link will not work if there is 10 dB loss on the PCB

SuggestedRemedy

Loss from PMA function to TP1a and loss from TP4a to PMA function is SDD21<=(-0.0788 -0.6169*SQRT(f) - 0.5855*f)
Min loss
SDD>=(2/6 - 2*f/6)
Where is in GHz
The maximum SDD21 assumes the HCB PCB loss at Nyquist is <=1.0 dB

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.7.1 to subclause field]

Suggested Remedy in comment #448

Cl **85** *SC* **85.7.1** *P* **177** *L* **33** # 554
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

There is no definition of TP1 or TP4, Please provide definition for TP1 and TP4

SuggestedRemedy

TP1 definition - Any interconnect may be used between the SR4 or SR10 transmit function and TP1 as long as transmitter parameters of Table 85-4 are met.

TP4 definition - The interconnect from TP4 to SR4 or SR10 receive function shall be SDD21(dB) >= (-0.007 - 0.1684*SQRT(f) - 0.0617*f)
f is given in GHz.
SDD21 loss a Nyquist is 0.7 dB and 0.2 larger than SFP+ loss.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.7.1 to subclause field]

Clause 85 is for CR4 and CR10. TP1 and TP4 are specified for the cable assembly measurements.

See page 177 line 15-18
"All cable assembly measurements are to
be made between TP1 and TP4 as illustrated in Figure 85-2. Two mated connector pairs have been included
in the cable assembly specifications defined in 85.9."

Cl **85** *SC* **85.7.1** *P* **177** *L* **33** # 581
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

AC coupling in CR4/CR10 are between TP4 and Chip which comes from leagacy KR, specially with SR4/S10 defining the AC coupling in the module.

SuggestedRemedy

AC coupling need to be between TP3 and MDI

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.7.1 to subclause field]

TP3 is specified for receiver measurements
defined in 85.8.4 and otherwise TP3 is referencing a location on the cable assembly at the input end of the mated connector.

Cl **85** *SC* **85.7.1** *P* **177** *L* **5** # 451
DiMinico, Christopher MC Communications

Comment Type **TR** *Comment Status* **D** *channel*

Add text for inclusion of TP0 and TP5 in subclause 85.7.1.

SuggestedRemedy

Delete text: The 40GBASE-CR4 and 100GBASE-CR10 channel is defined between the transmitter and receiver blocks
to include the transmiter and receiver differential controlled impedance printed circuit board insertion loss
and the cable assembly insertion loss as illustrated in Figure 85-2.

Add text:The 40GBASE-CR4 and 100GBASE-CR10 channel is defined between the transmitter (TP0) and receiver blocks (TP5)
to include the transmiter and receiver differential controlled impedance printed circuit board insertion loss
and the cable assembly insertion loss as illustrated in Figure 85-2.
TP0 and TP5 are reference points that may not be testable in an implemented system.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.7.2** *P* **178** *L* **4** # 49
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

The format of the messages PMD_UNITDATA.request and PMD_UNITDATA.indication in clauses 85.72 and 85.7.3 do not match the definitions in 85.2

SuggestedRemedy

change "message PMD_UNITDATA.request (tx_bit<0:3>)" to "messages PMD_UNITDATA.request<0:3>" in two places.
change "message PMD_UNITDATA.request(tx_bit<0:9>)" to "messages PMD_UNITDATA.request<0:9>" in two places (Note, the first one has 0:3 where it should be 0:9).
change "message PMD_UNITDATA.indication (rx_bit<0:3>)" to "messages PMD_UNITDATA.indication<0:3>" in two places (clause 85.7.3)
change "message PMD_UNITDATA.indication (rx_bit<0:9>)" to "messages PMD_UNITDATA.indication<0:9>" in two places (clause 85.7.3)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.7.4** *P* **178** *L* **37** # 109

Marris, Arthur Cadence

Comment Type **T** *Comment Status* **D**

Reword first two paragraphs to be similar to subclause 84.7.4 for clarity.

SuggestedRemedy

Change:
"The Global PMD signal detect function shall report to the PMD service interface, using the message PMD_SIGNAL.indication (SIGNAL_DETECT) for 40GBASE-CR4 and PMD_SIGNAL.indication (SIGNAL_DETECT) for 100GBASE-CR10, which is signaled continuously. SIGNAL_DETECT in 40GBASE-CR4 and 100GBASE-CR10 indicates the successful completion of the start-up protocol on all
four or ten lanes.

SIGNAL_DETECT, while normally intended to be an indicator of signal presence, is used by 40GBASECR4 and 100GBASE-CR10 to indicate the successful completion of the start-up protocol on each lane."

to
"The Global PMD signal detect function shall continuously report the message PMD_SIGNAL.indication (SIGNAL_DETECT) to the PMD service interface. SIGNAL_DETECT, while normally intended to be an indicator of signal presence, is used by 40GBASE-CR4 and 100GBASE-CR10 to indicate the successful completion of the start-up protocol on all lanes."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.7.4** *P* **178** *L* **44** # 472

Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

Cables are removable (not like backplanes). What will cause Signal Detect to become Fail if the link is broken.

SuggestedRemedy

If a broken link will create system reset then an informative note to that effect would be good. If it won't then change the function to include a signal present detection in addition to successful completion of start up protocol.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

For sub-task force review.

Cl **85** *SC* **85.7.4** *P* **178** *L* **54** # 206

Marris, Arthur Cadence

Comment Type **T** *Comment Status* **D**

Change "1 or 0" to "one or zero" to match nomenclature in 45.2.1.9.5

SuggestedRemedy

as above

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.7.7** *P* **179** *L* **30** # 50

Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

Clause 85.7.7 is about lane-by-lane transmit disable function, but the text discusses "Global_PMD_transmit_disable function". This needs to be changed along the lines of clause 86.4.8

SuggestedRemedy

Change the first two sentences from "The Global_PMD_transmit_disable function is optional. It allows the electrical transmitters in each lane to be selectively disabled." to "The PMD_transmit_disable_i function (where i represents the lane number in the range 0:3 or 0:9) is optional and allows the optical transmitter in each lane to be selectively disabled."

in item a) change "the Global_PMD_transmit_disable variable" to "a PMD_transmit_disable_i variable" and change "the transmitter such that" to "the transmitter associated with that variable such that"

in item b) change "may turn off the electrical transmitter." to "may set each PMD_transmit_disable_i to ONE, turning off the electrical transmitter in each lane."

in item c) change "Global_PMD_transmit_disable" to "PMD_transmit_disable_i"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.8.2** *P* **18** *L* **3** # 342

Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **D**

I understand that 10 m is extremely challenging. A link like this if it fails will create error bursts not just single errors, endangering mean time to false packet acceptance.

SuggestedRemedy

Do investigations to quantify the level of difficulty. First, can a reasonable 10 m cable with reasonable lengths of PCB traces give a channel within the high confidence region as defined for 10GBASE-KR in 802.3ap Annex 69B? Second, is that an adequate or complete condition for as low-BER link?
Define a length and cable electrical spec above which FEC is mandatory, and/or reduce the distance objective for Clause 85.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Many of the steps in the suggested remedy have been performed. Yes, a reasonable 10 m cable with reasonable lengths of PCB traces gives a channel within the high confidence region as defined for 10GBASE-KR in 802.3ap Annex 69B; please see diminico_02_0708.pdf "802.3ba copper cable assembly baseline proposal".

What's reasonable in PCB trace length is subjective; the baseline includes guidance to use nicholl_01_0708.pdf.

A length and electrical specification is embodied in draft 1 for review and comment.

Cl **85** *SC* **85.8.3** *P* **181** *L* **14** # 51

Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

This says "with the exception of the transmitter specified in 85.8.3.3." but 85.8.3.3 is the "Signaling speed range" and does not specify a transmitter.

SuggestedRemedy

Change this cross-reference to the intended subclause

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Suggested remedy

Change: "with the exception of the transmitter specified in 85.8.3.3."

To:" with the exception of the transmitter characteristics specified in 85.8.3.3."

Also see comment #144

Cl **85** *SC* **85.8.3** *P* **181** *L* **15** # 144

D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **D**

Reference in following sentence is unclear.

The specifications are summarized in Table 85-4 and detailed in 72.7.1.1 through 72.7.1.11 with the exception of the transmitter specified in 85.8.3.3.

85.8.3.3 is for signaling speed range, and is same for -KR.

SuggestedRemedy

Corrrect reference from 85.8.3.3 to correct reference.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Refer response to comment # 51

Cl **85** *SC* **85.8.3** *P* **181** *L* **22** # 52
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

The nominal unit interval is given in Table 85-4 as "96.9697" but in clause 83A it is given as "96.96969697". Since the UI is the same for these two clauses, the number of significant figures quoted should be the same. Considering the 100 ppm tolerance, somewhere between these two seems appropriate.

SuggestedRemedy

Change all ocurrences of "96.9697" and "96.96969697" to "96.969697" (four places in clause 85 and three places in clause 83A)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.8.3** *P* **181** *L* **25** # 564
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D** *testing*

To gurantee interoperablity a transmitter compliance test method is required.

SuggestedRemedy

Purpose to use software method of IEEE 802.3 CL 68 TWDP which uses cable impulse response.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.8.3 to subclause field]

Transmitter characteristics are tested at TP2. Subclause 85.8.3.1 specifies test fixtures, or functional equivalence, to measure the transmitter specifications described in 85.8.3. Contributions to improve 85.8.3.1 welcome.

Cl **85** *SC* **85.8.3** *P* **181** *L* **25** # 568
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Currently table 85-4 only has transmitter off level which is 30 mV and you wouldn't go that far with it!

SuggestedRemedy

Please add VMA per defintion of IEEE CL 68.6.2 with min value of 360 mV

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.8.3 to subclause field]

Don't understand the basis for the "and you wouldn't go that far with it!" and the need to add another definition. Differential peak-to-peak output voltage (max.) with TX disabled is sufficient to characerize this parameter.

Cl **85** *SC* **85.8.3** *P* **181** *L* **28** # 569
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Differential Output return loss is TBD

SuggestedRemedy

Purpose to use SDD11 per equation 83A-1

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: Added missing subclause number 85.7.1 to subclause field]

The draft reflects the consensus to utilize 10GBASE-KR (Clause 72) for 4x and 10x KR transmit and receive functions.

The TBD is applied to either utilize the Differential output return loss (min.) in 72.7.1.5 [See Equation (72-4) and
Equation (72-5)] (TBD) or if deemed insufficient create new requirement in 85.9.x

Cl **85** *SC* **85.8.3** *P* **181** *L* **31** # 570
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Common mode Output return loss is TBD

SuggestedRemedy

Purpose to use SCC11 per equation 83A-2

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.8.3 to subclause field]

The draft reflects the consensus to utilize 10GBASE-KR (Clause 72) for 4x and 10x KR transmit and receive functions.

The TBD is applied to either utilize the Common-mode voltage limits 72.7.1.4 or if deemed insufficient create new requirement in 85.9.x.

Cl **85** *SC* **85.8.3** *P* **181** *L* **31** # 572
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Differential input return loss is TBD

SuggestedRemedy

Purpose to use SDD22 per equation 83A-1

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.8.3 to subclause field]

The draft reflects the consensus to utilize 10GBASE-KR (Clause 72) for 4x and 10x KR transmit and receive functions.

The TBD is applied to either utilize the Differential input return loss (minimum) 72.7.2.5
[See Equation (72-4)
and Equation (72-5) or if deemed insufficient create new requirement.

Cl **85** *SC* **85.8.3** *P* **181** *L* **33** # 563
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

With faster processes 24 ps transition time starting to be an issue

SuggestedRemedy

Suggest to change 24 ps to 20 ps

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.8.3 to subclause field]

Recommend submitting supporting presentation for sub-task force review..

Cl **85** *SC* **85.8.3** *P* **181** *L* **36** # 558
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D** *jitter*

The classical DJ and RJ measured jitter are jitter PDF dependent and not valid for jitter distribution which are not dual-dirac.

SuggestedRemedy

Repalce RJ with UJ of 0.025 UI (RMS) per IEEE CL 68.6.8 method
Replace DJ with DDJ per method of FC-PI4 A.1.3.1 with PSBS 9 pattern

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.8.3 to subclause field]

Recommend submitting supporting presentation for sub-task force review.

Cl **85** *SC* **85.8.3** *P* **181** *L* **38** # 559
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Duty Cycle distortion is classified to be 0.035 UI and is part of deterministic jitter, except the current definition of DCD does not capture pattern dependent component of DCD.

SuggestedRemedy

Puropose to repalace DCD with PWS (Pulse Width Shrinkage) with 0.1 UI value.
PWS is measured per FC-PI-4 Annex A.1.3.2 using PRBS9 pattern

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.8.3 to subclause field]

Recommend submitting supporting presentation for sub-task force review.

Cl **85** *SC* **85.8.4** *P* **182** *L* **50** # 604
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

KR can not operate over 10 m of 24 AWG cable which is the largest pratical size with max host PCB loss. KR standard was devloped 3 years ago and with improved process and technology we should not limit the application to shorter than 10m or have unreasonable PCB trace loss.

SuggestedRemedy

Assuming PMA IC loss to TP1a and TP4a to PMA IC loss are Nyquist is 4.5 dB then based on diminico results the KR refrence channel loss at Nyquist need to be increasaed to 27 dB. This will allow 4" of FR4-6 on each end or about 6" of improved FR4.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.8.4 to subclause field]

See suggested remedy in comment#456.

Cl **85** *SC* **85.8.4** *P* **182** *L* **50** # 590
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D** *testing*

There is no definition how to test the receiver for compliance

SuggestedRemedy

Puropose to use the pulse response from the 10 m cable assembly as the frequency dependent attenuator in the Fig 69A-1. In Fig 69A-1 TP1 must have maximum jitter as defined by table 85-4.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.8.3 to subclause field]

85.8.4.1 Bit error ratio
The receiver shall operate with a BER 10-12 or better when receiving a compliant transmit signal, as defined
in 85.8.3, through a compliant cable assembly as defined in 85.9 exhibiting the maximum insertion loss of 85.9.2. The cable assembly is normative. This approach is consistent with CX4.

In addition, Receiver characteristics are summarized in Table 85-5 and as detailed in 72.7.1.1 through 72.7.2.5 with the
exception of the receiver characteristics specified in 85.8.4.1, 85.8.4.2, and 85.8.4.3.

Cl **85** *SC* **85.8.4** *P* **183** *L* **1** # 169
D'Ambrosia, John Force10 Networks

Comment Type **TR** *Comment Status* **D**

This clause points to receiver characteristics detailed in 72.7.1.1 through 72.7.2.5, which includes Rx interference tolerance testing specified in 72.7.2.1. This is ambiguous, as it does not indicate whether a single isolated lane is being tested or are all channels as an aggregate being tested.

SuggestedRemedy

test on a single lane basis, (joint) presentation to be provided

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Text needs to be provided to clearly identify receiver characteristics detailed in 72.7.1.1 through 72.7.2.5 as related to CR4 and CR10 including Rx interference tolerance testing specified in 72.7.2.1.

Presentation to be reviewed by sub-task force.

Cl **85** *SC* **85.8.4** *P* **183** *L* **1** # 165

D'Ambrosia, John Force10 Networks

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

This clause points to receiver characteristics detailed in 72.7.1.1 through 72.7.2.5, which includes Rx interference tolerance testing specified in 72.7.2.1. There are potential differences in rx interference tolerance testing between backplane and cabling testing.

SuggestedRemedy

Create an annex 85A, which details tests for -c4 testing. Presentation to be provided.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Considertaion for the need for Rx tolerance for CR4 and CR10 need to be considered by the sub-task force as unlike backplane CR4 and CR10 specify a normative channel and therefore receiver shall operate with a BER 10-12 or better when receiving a compliant transmit signal, as defined
in 85.8.3, through a compliant cable assembly as defined in 85.9 exhibiting the maximum insertion loss of 85.9.2.

Presentation to be reviewed by sub-task force.

Cl **85** *SC* **85.8.4** *P* **183** *L* **1** # 272

Healey, Adam LSI Corporation

Comment Type **T** *Comment Status* **D**

"Receiver characteristics are summarized in Table 85-5 and as detailed in 72.7.1.1 through 72.7.2.5 with the exception of the receiver characteristics specified in 85.8.4.1, 85.8.4.2, and 85.8.4.3."

Subclause 71.7.2.1, Receiver interference tolerance, which references Annex 69A, defines a test for a 10GBASE-KR receiver in isolation.

At the same time, subclause 85.8.4.1 states that "the receiver shall operate with a BER 10^(-12) or better when receiving a compliant transmit signal, as defined in 85.8.3, through a compliant cable assembly as defined in 85.9 exhibiting the maximum insertion loss of 85.9.2."

This implies that all lanes as tested as an aggregate using a cable assembly model spanning TP2 to TP3.

Which requirement applies?

SuggestedRemedy

A supporting presentation will be provided to compare several approaches to this problem and suggest a direction.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Considertaion for the need for Rx tolerance for CR4 and CR10 need to be considered by the sub-task force as unlike backplane CR4 and CR10 specify a normative channel and therefore receiver shall operate with a BER 10-12 or better when receiving a compliant transmit signal, as defined
in 85.8.3, through a compliant cable assembly as defined in 85.9 exhibiting the maximum insertion loss of 85.9.2.

Presentation to be reviewed by sub-task force.

Cl **85** *SC* **85.8.4** *P* **183** *L* **16** # 591
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

There is no requirement on the min receive signal

SuggestedRemedy

Purpose to use min receive VMA of 180 mV diff p-p per definition of IEEE CL68.6.2.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.8.3 to subclause field]

Receiver characteristics are summarized in Table 85-5 and as detailed in 72.7.1.1 through 72.7.2.5 with the exception of the receiver characteristics specified in 85.8.4.1, 85.8.4.2, and 85.8.4.3.

Provide text to clearly identify receiver characteristics detailed in 72.7.1.1 through 72.7.2.5 as related to CR4 and CR10 including signal amplitude requirements.

Cl **85** *SC* **85.8.4** *P* **183** *L* **17** # 573
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Max input differential p-p level of of 1200 mV is not compatible with the SR4 and SR10, where both SRxx and CRxx serve the front panel market and some time on the same port!

SuggestedRemedy

Reduce max input level to 850 mV

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.8.4 to subclause field]

Proposal inconsistent with Differential peak-to-peak output voltage (max.) 72.7.1.4 1200 mV.

Receiver specifications are
summarized in Table 85-4 and detailed in 72.7.1.1 through 72.7.1.11 with the exception of the transmitter specified in 85.8.3.3

Cl **85** *SC* **85.8.4** *P* **183** *L* **21** # 575
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Since CR4/CR10 does not interface with KX there is not no reason to have 1600 mV damage threshold

SuggestedRemedy

Remove 1600 mV damage threshold

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.8.4 to subclause field]

Not sure why this isn't usefull guidance.

For sub-task force discussion.

Cl **85** *SC* **85.8.4** *P* **183** *L* **9** # 576
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Support for CX4 is missing from the table. 802.3ap already has support for KX4 operation which is simialr to CX4.

SuggestedRemedy

Add Signaling rate of 3.125 GBd to table 85-5.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.8.3 to subclause field]

Not necessary in specifying the
40GBASE-CR4 and 100GBASE-CR10 PMD.

Cl **85** *SC* **85.9** *P* **183** *L* **49** # 452
DiMinico, Christopher MC Communications

Comment Type **TR** *Comment Status* **D** *Channel*

Add channel subclause before cable assembly subclause and move 85.10 (Tx_pcb and Rx_pcb IL) under channel subclause to provide hierichical structure to specification consistent with channel/link topology.

SuggestedRemedy

(1)Add channel subclause before cable assembly subclause- Page 183, Line 49;
>>85.x Channel
The 40GBASE-CR4 and 100GBASE-CR10 channel is defined between the transmitter and receiver blocks to include the transmitter and receiver differential controlled impedance printed circuit board insertion loss and the cable assembly insertion loss as illustrated in Figure 85-2.
(2)Delete page 191, line 16-34 and move deleted text as new subclause under new channel subclause 85.x

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Editor's note: added missing subclause number 85.9 to subclause field]

Cl **85** *SC* **85.9** *P* **184** *L* # 539
Fogg, Michael Tyco Electronics

Comment Type **T** *Comment Status* **D**

Figure 85-6
Replace TBD values with actual limit numbers, and remove ELFEXT and MDELFEXT as they are redundant

SuggestedRemedy

Values to be supplied with supporting documents

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.9 to subclause field]

Suggested remedy comment #453 and comment #454

Cl **85** *SC* **85.9** *P* **184** *L* **2** # 343
Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **D**

It is very good that TP1, TP2 TP3 TP4 are positioned in relation to the connector, but not clear enough where they are exactly with respect to the connector. While for some measurements like S-parameter measurements on a passive cable, de-embedding can be used to infer the performance right next to the connector, For measurements of nonlinear active elements like transmitters and receivers, in general this cannot be done.

SuggestedRemedy

Use the same defined reference losses between each TP and the connector as in Clause 86: this includes specifying the loss between PMD and TP2 in 85.8.3.1 Fig 85-3. For the S-parameter specs, where de-embedding is viable, give the equivalent de-embedded specs also so that the cables can be assessed using either approach.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Consistent with CX4, all cable assembly measurements are to be made between TP1 and TP4 as illustrated in Figure 85-2. Two mated connector pairs have been included in the cable assembly specifications defined in 85.9.

TP1 and TP4 are not test points for the measurements of nonlinear active elements like transmitters and receivers.

Measurements between TP1 and TP4 are for cable assembly specifications defined in 85.9.

Cl **85** *SC* **85.9** *P* **184** *L* **6** # 449
DiMinico, Christopher MC Communications

Comment Type **T** *Comment Status* **D**

Update Table 85-6-Cable assembly differential characteristics based on accepted cable assembly TBD values and additions/deletions of cable assembly parameters.

SuggestedRemedy

Editor to update Table 85-6-Cable assembly differential characteristics' summary with accepted cable assembly TBD values and additions/deletions of cable assembly parameters.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Editor's note: added missing subclause number 85.9 to subclause field]

Cl **85** *SC* **85.9** *P* **185** *L* # 540

Fogg, Michael Tyco Electronics

Comment Type **T** *Comment Status* **D**

Figure 85-4 - Provide specific values for cable assembly (TP-1 to TP-4), and for cable assembly including fixturing (TP-0 to TP-5?)

SuggestedRemedy

Add values from supporting document

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.9 to subclause field]

All cable assembly measurements are to
be made between TP1 and TP4 as illustrated in Figure 85-2. Two mated connector pairs have been included
in the cable assembly specifications defined in 85.9.

Cl **85** *SC* **85.9** *P* **185** *L* **50** # 457

DiMinico, Christopher MC Communications

Comment Type **TR** *Comment Status* **D**

Add cable assembly ILD specifications to limit cable assembly ILD.Add TBD to equation as contributions from IL and power sum crosstalk to ICR under consideration.

SuggestedRemedy

Add subclause page 185 line 50 85.9.x Cable assembly insertion loss deviation
Insert text under subclause
The cable assembly insertion loss deviation is the difference between the cable insertion loss and the fitted insertion loss determined using Equation (85-x).

ILD(f) = IL(f) - ILfitted(f) (85-x)

The fitted insertion loss is determined using Equations (85.xx)-(85.xx); use 69B-1 to 69B-5 for (85.xx)-(85.xx)replacing A(f) with ILfitted(f). Add TBDs beside equations to indicate that an alternate to the least mean square line fit to the cable assembly IL is under consideration.

The ILD shall be within the region bounded by the following equations:

ILDmax= 0.7(TBD)+0.2(TBD)*10^-9*(f*10^6) TBD dB
ILDmin= -0.7(TBD)+0.2(TBD)*10^-9*(f*10^6) TBD dB

1000 MHz</=f</= 6000 MHz

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: added missing subclause number 85.9 to subclause field]

Accept suggested remedy with fixed typo.

Fixed typo in equation:
From: ILDmin= -0.7(TBD)+0.2(TBD)*10^-9*(f*10^6) TBD dB

To: ILDmin= -0.7(TBD)-0.2(TBD)*10^-9*(f*10^6) TBD dB

Cl **85** *SC* **85.9** *P* **186** *L* # 541
Fogg, Michael Tyco Electronics

Comment Type **T** *Comment Status* **D**
Add specific values for cable assembly and cable assembly with fixturing for return loss

SuggestedRemedy
Values to be provided in supporting document

Proposed Response *Response Status* **W**
PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.9 to subclause field]

Suggested remedy comment #459

Cl **85** *SC* **85.9** *P* **187** *L* # 543
Fogg, Michael Tyco Electronics

Comment Type **T** *Comment Status* **D**
Replace TBD values on MDNEXT with specific values

SuggestedRemedy
Values to be provided from supporting documents

Proposed Response *Response Status* **W**
PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.9 to subclause field]

Suggested remedy comment #453.

Cl **85** *SC* **85.9** *P* **187** *L* # 542
Fogg, Michael Tyco Electronics

Comment Type **T** *Comment Status* **D**
Replace TBD values for NEXT with specific values

SuggestedRemedy
Values to be provided from supporting documents

Proposed Response *Response Status* **W**
PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.9 to subclause field]

Suggested remedy comment #453.

Cl **85** *SC* **85.9** *P* **188** *L* # 545
Fogg, Michael Tyco Electronics

Comment Type **T** *Comment Status* **D**
Remove ELFEXT values (Use ICR)

SuggestedRemedy

Proposed Response *Response Status* **W**
PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.9 to subclause field]

Suggested remedy comment #454.

Cl **85** *SC* **85.9** *P* **188** *L* # 544
Fogg, Michael Tyco Electronics

Comment Type **T** *Comment Status* **D**
Figure 85-6
Remove or add specific values

SuggestedRemedy
Add values from supporting documents

Proposed Response *Response Status* **W**
PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.9 to subclause field]

Suggested remedy comment #453.

Cl **85** *SC* **85.9** *P* **190** *L* **45** # 455
DiMinico, Christopher MC Communications

Comment Type **TR** *Comment Status* **D**

Define total power sum crosstalk to be used in the ICR calculation.

SuggestedRemedy

Add subclause line 45 page 190 85.9.x Cable assembly power sum differential crosstalk

Add text below new subclause: The combined multi-disturber FEXT and multi-disturber NEXT, specified as the power sum of MDFEXT and MDNEXT, is determined using Equation (85-XX).

Add power sum equation (85-XX) for total power sum crosstalk calculated from MDFEXT and MDNEXT.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Editor's note: Added missing Clause and subclause numbers (85.9) to clause/subclause number fields]

Cl **85** *SC* **85.9.1** *P* **185** *L* **16** # 577
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

3.125 GBd operation insertion loss missing

SuggestedRemedy

Add insertion loss limit from from 54-3.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.9.1 to subclause field]

Not necessary in specifying the
40GBASE-CR4 and 100GBASE-CR10
PMD.

Cl **85** *SC* **85.9.2** *P* **185** *L* **10** # 588
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Cable assembly is missing common mode return loss parameter.

SuggestedRemedy

Propose the following SCC22/SCC11 mask
SCC22<= (-12 + 2.8*f) from 0.01 to 2.5 GHz and (-5.2+0.08*f) from 2.5 to 11.1 GHz.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.9.2 to subclause field]

Recommend submitting supporting presentation for sub-task force review.

Cl **85** *SC* **85.9.2** *P* **185** *L* **14** # 458
DiMinico, Christopher MC Communications

Comment Type **TR** *Comment Status* **D**

Provide values for TBDs in cable assembly insertion loss (85-1) for sqrt(f) and f. Remove 1/sqrt(f) term. Add TBD cable assembly insertion loss equation as contributions from IL and power sum crosstalk to ICR are still under consideration.

SuggestedRemedy

Replace TBDs with values in (85-1) Add TBD to equation as contributions from IL and power sum crosstalk to ICR under consideration.

Insertion Loss (f) = 0.192749*sqrt(f)+0.001494*f TBD dB

Remove 1/sqrt(f) term. Given the CR4 and CR10 bandwidth compared to CX4 the 1/sqrt(f) loss function term is not necessary as a regression term.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.9.2** *P* **185** *L* **15** # 571
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Group delay information are necessary to gurantee cable interoperablity

SuggestedRemedy

Either add cable group delay or the cable pulse response

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.9 to subclause field]

Add editor's note in 85.9.x : [Editor's note (to be removed prior to publication) - subclause to specify group delay (TBD)]

Cl **85** *SC* **85.9.2** *P* **185** *L* **15** # 244
Meyer, Jeffrey Centellax

Comment Type **T** *Comment Status* **D**

Why is there a term for 1/sqrt(f) in the insertion loss formula. The coefficient will most likely be 0.000 becuase it blows up at low frequencies. Read and microwave transmission line book and you see that the loss approaches a constant a low frequencies. Instead you need a constant term for the DC loss.

SuggestedRemedy

Insertion loss (d) <= TBD + TBD * sqrt(f) + TBD * f

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Suggested remedy comment #458

Cl **85** *SC* **85.9.2** *P* **185** *L* **17** # 340
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Specification range for cable insertion loss is not adequate at either end. SFP+ Annex E cable S-parameter specs go from 10 MHz to 11.1 GHz.

SuggestedRemedy

Extend the range of Cable assembly insertion loss, Cable assembly return loss, Near-End Crosstalk, MDNEXT, FEXT and MDELFEXT to at least 10 MHz to 10 GHz.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

SFP+ "SFF-8431 Specifications for
Enhanced 8.5 and 10 Gigabit Small Form Factor Pluggable Module" defines the electrical interface specifications for 8.5 and 10 Gigabit/s Small Form Factor Pluggable (SFP+) modules and hosts and optionally support lower signaling rates as well.

Per baseline agreement channel parameters to be consistent with 10GBASE-KR in 802.3ap Annex 69B.

Cl **85** *SC* **85.9.3** *P* **186** *L* **10** # 589
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Cable assembly return loss does not specify if it is SCC or SDD but I am assuming it is Differential return loss.

SuggestedRemedy

Propose to use SDD22/SDD11 per equation 83A-1

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.9.3 to subclause field]

Suggested remedy comment#459

Cl **85** *SC* **85.9.3** *P* **186** *L* **6** # 459
DiMinico, Christopher MC Communications

Comment Type **TR** *Comment Status* **D**

Provide TBD values for 85.9.3 Cable assembly return loss.

SuggestedRemedy

85.9.3 Cable assembly return loss
The return loss (in dB with f in MHz) of each pair of the 40GBASE-CR4 and 100GBASE-CR10 cable
assembly shall be:

Return_loss(f)= 10 dB

for 100 MHz </= f < 4000 MHz

Return_loss(f)=10-10*log(f/4000)

for 4000 MHz </= f </= 10000 MHz

Figure 85-5-Minimum cable assembly return loss (informative) to be provided in attachment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.9.3** *P* **186** *L* **9** # 557
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Cable return loss is missing, please add cable return loss

SuggestedRemedy

Purpose to use SDD22 as defined by EQ 83A-1
and SCC22 as defined by EQ 83A-2

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.9 to subclause field]

Suggested remedy comment #459

Cl **85** *SC* **85.9.4** *P* **186** *L* **46** # 453
DiMinico, Christopher MC Communications

Comment Type **TR** *Comment Status* **D**

Define NEXT and MDNEXT to be used in the ICR calculation and remove individual limit specifications The use of independent limit lines for each disturber is unnecessary as the individual impairments are not uniquely distinguished i.e., they are combined on a power sum basis to limit crosstalk in relation to insertion loss.

SuggestedRemedy

(1)Delete lines 48-54 page 186. (2)Delete equation (85-4) page 187. delete lines 4-5 page 187. (3) Add text under 85.9.4.1 Differential Near-End Crosstalk: Since four or ten transmit and four or ten receive lanes are used to transfer data between PMDs, the NEXT that is coupled into a receive lane will be from the four or ten transmit lanes. (4) Delete lines 8-9 page 187
Since four or ten transmit and four or ten receive lanes are used to transfer data between PMDs, the NEXT that is coupled into a receive lane will be from the four or ten transmit lanes.(5)Delete lines 13-20 page 187.(6) Delete lines 1-28 page 188.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.9.4.2** *P* **187** *L* **26** # 245
Meyer, Jeffrey Centellax

Comment Type **T** *Comment Status* **D**

In equation (85-6) the power of the NEXT loss is denoted NL(f)i. This is poor notation. Subscripts should not appear after function arguments.

SuggestedRemedy

More appropriate notation would be NLi(f).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.9.4.2** *P* **187** *L* **5** # 561
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

NEXT has large high frequncy component but the NEXT frequncy is limited 6 GHz.

SuggestedRemedy

Increase NEXT frequncy range to 11 GHz or show there is no impact limiting NEXT to 6 GHz.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected missing subclause number 85.9.4.2 to subclause field]

Recommend supporting presentation that shows impact requireing increase of NEXT frequency range to 11 GHz.

Cl **85** *SC* **85.9.5** *P* **188** *L* **30** # 454
DiMinico, Christopher MC Communications

Comment Type **TR** *Comment Status* **D**

Define FEXT and MDFEXT to be used in the ICR calculation and remove individual limit specifications The use of independent limit lines for each disturber is unnecessary as the individual impairments are not uniquely distinguished i.e., they are combined on a power sum basis to limit crosstalk in relation to insertion loss. In addition, ELFEXT is unnecessary as ICR enables crosstalk to insertion loss tradeoff.

SuggestedRemedy

(1)Delete lines 30-54 page 188. (2)Delete lines 1-5 page 189.

(3)Add text line 31 page 188>> Since four lanes or ten lanes are used to transfer data between PMDs, the FEXT that is coupled into a data
carrying lane will be from the three other lanes or nine other lanes in the same direction.

(4)Remove equal level line 6 page 189 in subclause title.
(5)Replace ELFEXT with FEXT 85.9.5.2 Multiple Disturber Far-End Crosstalk (MDFEXT) loss and globally.
(6)Delete lines 8-9 page 189. (7)Delete lines 13-54 page 189.(7)Delete lines 15-43 page 190.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **85** *SC* **85.9.x** *P* **190** *L* **45** # 456
DiMinico, Christopher MC Communications

Comment Type **TR** *Comment Status* **D**

Add cable assembly ICR specification to limit the total multi-disturber
cable assembly crosstalk noise. Add TBD to equation as contributions from IL and power sum crosstalk to ICR under consideration.

SuggestedRemedy

Add new subclause below 85.9.x Cable assembly power sum differential crosstalk
>>85.9.x Cable assembly insertion loss to crosstalk ratio (ICR)

The cable assembly insertion loss to crosstalk ratio (ICR) is the ratio of the cable assembly insertion loss to the total cable assembly crosstalk loss determined using Equation (89.xx).

ICR(f) = -IL(f) + PSXT(f) (TBD) dB

100MHz</=f</=5156.25 MHz

Add text: Assuming ICR is computed at N uniformly-spaced frequencies fn spanning the frequency range 100 MHz to 5156.25 MHz,
ICRfit may be computed using Equations (85-x) through (85-x); utilize Equations (69B-19) through (69B-23.

Add text: ICRfit shall be greater than or equal to ICRmin as defined by the following equation:Add TBD to equation as contributions from IL and power sum crosstalk to ICR under consideration.

Add equation: ICRfit(f)>/=ICRmin(f)=23.3-18.7*LOG((f*10^6)/(5*10^9))-2.5 (TBD) dB

Add Figure to illustrate insertion loss to crosstalk ratio limit.

Note: 2.5 dB of the 3 dB signal-to-noise ratio penalty related to insertion loss deviation embodied in 802.3ap ICRmin is applied as 2.5 dB ICRmin margin to account for reduction in ILD penalty for CR4 and CR10

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Suggested remedy applies to channel ICR.
Add new subclause below 85.9.x for channel insertion loss to crosstalk ratio (ICR)
>>85.9.x Channel insertion loss to crosstalk ratio (ICR)

The channel insertion loss to crosstalk ratio (ICR) is the ratio of the channel insertion loss to the total channel crosstalk loss determined using Equation (89.xx).

ICR(f) = -IL(f) + PSXT(f) (TBD) dB
100MHz</=f</=5156.25 MHz

Add text: Assuming ICR is computed at N uniformly-spaced frequencies fn spanning the frequency range 100 MHz to 5156.25 MHz,
ICRfit may be computed using Equations (85-x) through (85-x); utilize Equations (69B-19) through (69B-23.
Add text: ICRfit shall be greater than or equal to ICRmin as defined by the following equation:Add TBD to equation as contributions from IL and power sum crosstalk to ICR under consideration.

Add equation: ICRfit(f)>/=ICRmin(f)=23.3-18.7*LOG((f*10^6)/(5*10^9))-2.5 (TBD) dB
Add Figure to illustrate insertion loss to crosstalk ratio limit.
Note: 2.5 dB of the 3 dB signal-to-noise ratio penalty related to insertion loss deviation embodied in 802.3ap ICRmin is applied as 2.5 dB ICRmin margin to account for reduction in ILD penalty for CR4 and CR10

Add new subclause below 85.9.x Cable assembly power sum differential crosstalk
>>85.9.x Cable assembly insertion loss to crosstalk ratio (ICR)
The cable assembly insertion loss to crosstalk ratio (ICR) is the ratio of the cable assembly insertion loss to the total cable assembly crosstalk loss determined using Equation (89.xx).
ICR(f) = -IL(f) + PSXT(f) (TBD) dB
100MHz</=f</=5156.25 MHz
Add text: Assuming ICR is computed at N uniformly-spaced frequencies fn spanning the frequency range 100 MHz to 5156.25 MHz,
ICRfit may be computed using Equations (85-x) through (85-x); utilize Equations (69B-19) through (69B-23.

Add text: ICRfit shall be greater than or equal to ICRmin as defined by the following equation:Add TBD to equation as contributions from IL and power sum crosstalk to ICR under consideration.

Add equation: ICRfit(f)>/=ICRmin(f)=23.3-18.7*LOG((f*10^6)/(5*10^9)) (TBD) dB

Add Figure to illustrate insertion loss to crosstalk ratio limit.

Cl **85** *SC* **9.3** *P* **186** *L* **3** # 580

Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

It is not clear how the HOST NEXT is accounted for in current draft and there is nothing that prevents the host having excessive NEXT. If the amount of NEXT and FEXT for the host is equal to the test board the cable are tested with then the curent methodology hold. I can see case there will be double counting of NEXT and FEXT in the case of a low noise host but in the cases of noisy noisy host NEXT and FEXT can be under-estimated under estimated.

SuggestedRemedy

To eliminated the case of noisy host, the host NEXT and FEXT must also meet 85-4, 85-5, and 85-6 equations.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected missing subclause number 85.9.3 to subclause field]

Add editor's note in 85.9.x channel ICR: [Editor's note (to be removed prior to publication) - (TBD) considerations for crosstalk contributions from Tx_pcb and Rx_pcb need to be considered in the channel ICR]

Cl **86** *SC* **86.1** *P* **199** *L* **16** # 630

CHANG, Frank Vitesse

Comment Type **TR** *Comment Status* **D**

To make Fiber type OM3 clear.

SuggestedRemedy

Suggest to be consistent with Clause 52.5 10GBASE-S definition, indicating 2000MHz.km Minimum modal BW @850nm.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

This table is a summary, and the modal bandwidth is given in Table 86-18. Extend footnote 'See 86.10.2.1.'

Cl **86** *SC* **86.1** *P* **199** *L* **16** # 260
Vanderlaan, Paul Nexans

Comment Type **E** *Comment Status* **D**

Change from:
Table 86-1
Type A1a.2a (50/125 ìm multimode) "OM3"

SuggestedRemedy

Change to:
Table 86-1
Type A1a.2a (50/125 ìm multimode) "OM3 or better"

Indicates higher performing fibers will be suitable

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected subclause number to 86.1 in subclause number field]

One is always allowed to use better; no need to say it.

Cl **86** *SC* **86.1** *P* **199** *L* **21** # 583
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

In some applications products will be developed dual purpose, 40GbE or 4 10GbE per CL 52. These products will be able to operate longer and on leacy OM1 and PM2 fibres. A note should be added to the reach with Ref to CL 52

SuggestedRemedy

Note. If the transmitter and receiver are compliant to IEEE 10GBase-S CL 52.5 the reach on OM3 fibre would be 300 m.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected subclause number to 86.1 in subclause number field]

Duplicates comment 582.

Cl **86** *SC* **86.1** *P* **199** *L* **21** # 582
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

In some applications products will be developed dual purpose, 40GbE or 4 10GbE per CL 52. These products will be able to operate longer and on leacy OM1 and PM2 fibres. A note should be added to the reach with Ref to CL 52

SuggestedRemedy

Note. If the transmitter and receiver are compliant to IEEE 10GBase-S CL 52.5 the reach on OM3 fibre would be 300 m.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected subclause number to 86.1 in subclause number field]

4 or 10 x 10GBASE-S is not the same PMD as 40GBASE-SR4 or 100GBASE-SR10 and this clause would not apply in that scenario.

Cl **86** *SC* **86.1** *P* **199** *L* **22** # 54
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

In Table 86-1 the abbreviation "Gbd" should be "GBd"

SuggestedRemedy

change "Gbd" to "GBd"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **86** *SC* **86.1** *P* **199** *L* **22** # 73
Chung, Hwan Seok ETRI

Comment Type **T** *Comment Status* **D**

At Table 86-1, the unit for signaling rate should be 'GBd', not 'Gbd'.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **86** *SC* **86.1** *P* **199** *L* **23** # 302
Oulundsen III, George OFS

Comment Type **E** *Comment Status* **D**

Footnote to Table 86-1: Should we add reference to the TIA-492AAAC-A standard. The IEC standard is currently referenced.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED REJECT.

See response to comment #305.

Cl **86** *SC* **86.1** *P* **199** *L* **32** # 55
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

This says "The purpose of each PHY sublayer is summarized in 82.1.4. 40 Gb/s and 100 Gb/s Ethernet is introduced in Clause 80." which would be better re-arranged

SuggestedRemedy

Change to "40 Gb/s and 100 Gb/s Ethernet is introduced in Clause 80 and the purpose of each PHY sublayer is summarized in 82.1.4."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **86** *SC* **86.1** *P* **199** *L* **34** # 289
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

Several very minor editorial issues in clause 86 collected in to one comment.

SuggestedRemedy

Clause 1 should be an internal cross-reference page 199 line 34
Annex A should be an internal cross-reference page 199 line 35
Clause 45 should be an internal cross-reference page 199 line 40
Clause 45 should be an internal cross-reference page 203 line 21
"." missing at the end of the sentence page 209 line 54
Seperator too thick below "Nominal core diameter" page 219 line 22

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **86** *SC* **86.1** *P* **199** *L* **8** # 137
D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D** *Review*

Overview is done in a manner that is inconsistent with other PMD clauses in 802.3ba

SuggestedRemedy

Put text below and Table 86-2 in front of current "Overview" intro text.
This clause specifies the 40GBASE-SR4 PMD and 100GBASE-SR10. In order to form a complete PHY, the desired PMD shall be connected to the appropriate sublayers (see Table 86-1) and with the management functions that are optionally accessible through the management interface defined in Clause 45, or equivalent.

Renumber current Table 86-1 to 86-2.

Label new Table 86-1 as
Table 86-1-PHY (Physical Layer) clauses associated with the 40GBASE-SR4 and 100GBASE-SR10 PMDs

add row in new table 86-1 for Annex 83A-XLAUI - mark optional under 40G and "na" under 100G
add row in new table 86-1 for Annex 83A-CAUI - mark optional under 100G and "na" under 40G

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

It is consistent (can see that by reading lines 31-40 first) although it looks like clauses 58, 59, and it provides an overview to help first-time readers. Add nAUI to table but explain that it's not applicable next to the PMD.
As to ' In order to form a complete PHY, the desired PMD shall be connected to the appropriate sublayers (see Table 86-1)...', see line 37. The preferred first words are now 'When forming a complete PHY' (e.g. Clause 72; acknowledging that a PMD can still be compliant even if not connected). Strictly, the PMD is connected to only three things; PMA, management, and medium through MDI. It cannot be asked about higher sublayers - if that is desired it should be done in Clause 80. As to 'management functions that are optionally accessible through the management interface defined in Clause 45, or equivalent.', 86, 87 and 88 have has 'management functions that may be accessible through the management interface defined in Clause 45.' In general management is optional as well as the form of its interface (for some clauses in e.g. BP Ethernet this is not the case). Change all three or none.
As to table 'PHY (Physical Layer) clauses associated with the 40GBASE-SR4 and 100GBASE-SR10 PMDs', this table exists in 86, 87 and 88 as 'PMD type and associated clauses'. The RS is not part of the PHY although it is part of the Physical Layer. Change all three table titles to 'Physical Layer clauses associated with the xxx PMD(s)', or change none. Try to adjust pagination so this table does not float two pages down the document.

Cl **86** *SC* **86.1** *P* **201** *L* **22** # 75
Sun Hyok, Chang Electronics and Teleco

Comment Type **T** *Comment Status* **D**

'XLMII' is written at line 22 below Table 86-2.

SuggestedRemedy

'XLMII' has to be replaced by 'XLGMII'

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **86** *SC* **86.1** *P* **201** *L* **23** # 76
Sun Hyok, Chang Electronics and Teleco

Comment Type **T** *Comment Status* **D**

'XLMII' is written at line 23 below Table 86-2.

SuggestedRemedy

'XLMII' has to be replaced by 'XLGMII'

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Editor's note: correct subclause number to 86.1 in subclause number field]

Cl **86** *SC* **86.1** *P* **208** *L* **12** # 560
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

PWS (Pulse Width Shrinkage) a critical parameter is missing from table 86-6 list of parameters.

SuggestedRemedy

Puropose to add PWS (Pulse Width Shrinkage) with 0.1 UI value.
PWS is measured per FC-PI-4 Annex A.1.3.2 using PRBS9 pattern

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This proposal needs more justification. 0.1 UI is twice as much as SFP+: seems a big difference.

Cl **86** *SC* **86.1** *P* **217** *L* **44** # 146
D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D** *Review*

organization of 86.10 is not done in a manner consistent with 87.12 and 88.13 (which is consistent with 52.14).

SuggestedRemedy

organize and name in manner consistent with 87.12 and 88.13.
Change title of 86.10 to "Characteristics of the fiber optic cabling (channel)
Change title of 86.10.1 to "Optical Fiber Cable"
change 86.10.2 to 86.11
Add 86.10.2 Optical fiber connection - An optical fiber connection, as shown in Figure 86-5 consists of a mated pair of optical connectors for the appropriate number of fibers for the PMD type.
change 86.10.2.2 to 86.10.2.1 - Connection insertion loss
change 86.10.2..2.1 to 86.10.2.2 - Maximum discrete reflectance
change 86.10.2.3 to 86.10.3

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The organisation is consistent with other clauses. The subclauses have been grouped together under 86.10 Optical channel to distinguish them from the electrical channel.
There is no Maximum discrete reflectance subclause or spec; determine if there should be and if so, add -20dB spec

Cl **86** *SC* **86.1** *P* **219** *L* **3** # 357
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

A question and two editor's notes on this page

SuggestedRemedy

Consult the experts and clear up.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Cl **86** *SC* **86.10.1** *P* **218** *L* **1** # 210
Mellitz, Richard Intel Corporation

Comment Type **ER** *Comment Status* **D** *Review*

Avoid s-parameter designations and keep loss definition consistent in document. Figure 86-5

SuggestedRemedy

Make loss positive dB
Channel loss is IL not SDD21

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected subclause number to 86.10.1 in subclause number field]

S-parameters are very well established and are a good way of presenting the information; see e.g. diminico_02_0708.pdf slide 22.

Cl **86** *SC* **86.10.1** *P* **218** *L* **45** # 308
Oulundsen III, George OFS

Comment Type **T** *Comment Status* **D** *Skew*

Table 86-17: Currently, there are a lot of TBDs regarding skew constraints. The 802.3ba Task Force adopted "kolesar_02_0508.xls" as the MMF cable skew spreadsheet model. At that time we understood that the values could change, but the concept of the model spreadsheet was adopted. Should we use the values proposed in "kolesar_02_0508.xls" as a starting point and replace the TBD with the model values where we can? Better values can be entered when discovered.

SuggestedRemedy

Replace the TBD for "Cabling Skew Max" value with the value of 45.4 ps/m or 4.54 ns for 100-m of MMF cable given in "kolesar_02_0508.xls". See the presentation "kolesar_01_0508.pdf" for reference.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See comments # 355, 517.

Cl **86** *SC* **86.10.1** *P* **218** *L* **45** # 355
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D** *Skew*

Skew of medium per Gustlin is 45 UI (4.5 ns).

SuggestedRemedy

If this seems high, revisit the stress assumptions in the skew model.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

45 UI is not exactly the same as 4.5 ns. Also relative wavelength assumption is pessimistic.

See also comments # 308, 517.

Cl **86** *SC* **86.10.1** *P* **218** *L* **46** # 517
Kolesar, Paul CommScope

Comment Type **T** *Comment Status* **D** *Skew*

Cabling skew value is presently TBD and needs to be defined.

SuggestedRemedy

Replace TBD with 4.5. This value is consistent with the worst-case value for a 100 m link as determined using the MM skew model kolesar_02_0508.xls.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See comments # 355, 308.

Cl **86** *SC* **86.10.2** *P* **219** *L* **2** # 518
Kolesar, Paul CommScope

Comment Type **T** *Comment Status* **D**

The insertion loss measurment referenced in under revision and has passed CVD ballot and is entering FDIS stage. The methods have been renamed. Method 2 is becoming the method of Annex A.

SuggestedRemedy

Replace "Method 2" with "Annex A".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Better to add this information as an editor's note and adopt it when the new IEC 61280-4-1 is published. Commenter please provide reference for the FDIS document.

Cl **86** *SC* **86.10.2.1** *P* **210** *L* **29** # 520

Kolesar, Paul CommScope

Comment Type **TR** *Comment Status* **D**

The dispersion characteristics quoted have been superseded. The third edition of IEC 60793-2-10 published in 2006 adjusted the characteristics to more closly reflect that actual dispersion characteristics of 50um fibers. Requiring the fiber to meet IEC 60793-2-10 makes repeating the dispersion characteristic in table 86-18 redundant. But if these specs must be repeated, then they should be in harmony with the IEC spec.

SuggestedRemedy

Replace the zero dispersion wavelength value with:
1295 < lambda0 < 1340

Replace the dispersion slope value with:
< 0.105 for 1295 nm < lambd0 < 1310
< 0.000375(1590 - lambda0) for 1310 nm < lambda0 < 1340 nm

Note: All the above < symbols should be "less than or equal to" symbols.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Page 219. It's well worth keeping the table here. Need to address the status of pre-2006 fibres.

See comment # 486 which proposes different numbers.

Cl **86** *SC* **86.10.2.1** *P* **219** *L* **10** # 519

Kolesar, Paul CommScope

Comment Type **TR** *Comment Status* **D** *Fibre specs*

The present specification references a fiber specification as if it were a cabling specification. This can be remedied by referencing the cabling specifications for ribbon and multifiber cable forms, and also stating that the fiber contained within these cable shall meet the OM3 fiber performance code. The presently referenced cable specs are inappropriate, as the first is for simplex and duplex indoor cable, and the second for premises outdoor cable.

SuggestedRemedy

Replace:
The 40GBASE-SR4 and 100GBASE-SR10 fiber optic cabling shall meet the requirements of IEC 60793-2-10 and the requirements given in Table 86-18, where they differ. Multimode cables chosen from [Editor's note (to be removed prior to publication) - Insert additional reference for multiway cable if appropriate], IEC 60794-2-11 or IEC 60794-3-12 may be suitable.
With:
The 40GBASE-SR4 and 100GBASE-SR10 fiber optic cabling shall meet the requirements of IEC 60794-2-21 or IEC 60794-2-31. The fiber contained within these cables shall meet the requirements of IEC 60793-2-10 type A1a.2.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

40GBASE-SR4 and 100GBASE-SR10 can operate over duplex cables (using several pairs); special ribbon cable is not required. The presently referenced cable specs are not inappropriate. Change first two sentences of 86.10.2.1 to:
The fiber contained within the 40GBASE-SR4 and 100GBASE-SR10 fiber optic cabling shall meet the requirements of IEC 60793-2-10 type A1a and the requirements given in Table 86-18, where they differ. Type A1a.1 provides for TBD m operation and type A1a.2, 100 m. Multimode cables chosen from IEC 60794-2-11, IEC 60794-3-12, IEC 60794-2-21 or IEC 60794-2-31 may be suitable.
Commenter please provide details of IEC 60794-2-21 and IEC 60794-2-31; add to 1.3.

Cl **86** *SC* **86.10.2.1** *P* **219** *L* **12** # 68

Chung, Hwan Seok ETRI

Comment Type **T** *Comment Status* **D** *Fibre specs*

As editor recomended, it will be better to insert addtional reference for multimode fiber. So, change from "Multimode cables chosen from IEC 60792-2-11 or IEC 60794-3-12 may be suitable," to "Multimode cables chosen from TIA/EIA-492AAAC,ISO/IEC-11801,IEC 60792-2-11 or IEC 60794-3-12 may be suitable."

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TIA/EIA-492AAAC is a fibre spec not a cable spec, and should be replaced by the IEC equivalent if appropriate. ISO/IEC-11801 is too wide; contains cable types that will not support 100 m operation, although we could add a reach for OM2.

See comment # 519

Cl **86** *SC* **86.10.2.1** *P* **219** *L* **27** # 356

Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D** *Fibre specs*

3.5 dB/km for fibre cable loss seems pretty gross, much higher than the uncabled fibre loss. Is it still that bad?

SuggestedRemedy

?

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

What values are used in new references mentioned in other comments?

Cl **86** *SC* **86.10.2.1** *P* **219** *L* **29** # 486

Dudek, Mike JDSU

Comment Type **TR** *Comment Status* **D** *Fibre specs*

I understand that the chromatic specifications for OM3 fiber are now tighter than listed here.

SuggestedRemedy

Change the max value of the zero disperions wavelength from 1320nm to 1316nm.
Change the Chromatic dispersion slope max line to 0.1028 for 1300<=lambda <= 1316 and .....

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Need to consider the status of pre-2006 fibres.

See comment # 520 which proposes different numbers.

Cl **86** *SC* **86.10.2.1** *P* **219** *L* **34** # 306

Oulundsen III, George OFS

Comment Type **E** *Comment Status* **D** *Fibre specs*

Footnote to Table 86-18: Reference is made to TIA-492AAAC-2002 and the question is asked if there is an IEC equivalent. The answer is yes. The IEC equivalent is IEC 60793-1-49:2006.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Add IEC 60793-1-49:2006 to 1.3. Consider using it here. Add editor's note here explaining and/or qualifying the equivalence so reviewers of D1.1 understand why TIA/EIA-492AAAC-2002 has disappeared.

See comment #520.

Cl **86** *SC* **86.10.2.2.1** *P* **219** *L* **43** # 382
King, Jonathan Finisar

Comment Type **TR** *Comment Status* **D**

The TBDs in 86.10.2.2.1 are inconsistent with the standard cabling model shown in Fig 86-5

SuggestedRemedy

Make text consistent with other SR applications. Paragraph should become:
The maximum link distances for multimode fiber are calculated based on an allocation of 1.5 dB total connection
and splice loss. For example, this allocation supports 2 connections with an average insertion
loss per connection of 0.75 dB. Connections with different loss characteristics may be used provided the
requirements of Table 86-17 and Table 86-18 are met.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

If this PMD type is expected to see more or worse connections, a difference would be justified.

See also comment # 348.

Cl **86** *SC* **86.10.2.3** *P* **220** *L* **4** # 163
D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**

no connectors waere proposed in baseline for BASE-SR PMDs.

SuggestedRemedy

Replace references to IEC 61753-1-1 and IEC 61753-022-2 with TBD.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Check what these references actually are; if they are performance specs and appropriate, keep them. Titles are: IEC 61753-1-1:2000, Fibre optic interconnecting devices and passive components performance standard - Part 1-1: General and guidance - Interconnecting devices (connectors). and IEC 61753-022-2, Performance standard - Part 022-2: Fibre optic connectors terminated on multimode fibre for Category C - Controlled environment, performance Class M. If they are dimensional, specifying a particular connector, remove.

But see comment # 515.

Cl **86** *SC* **86.10.2.3** *P* **220** *L* **6** # 515
Kolesar, Paul CommScope

Comment Type **TR** *Comment Status* **D**

The MPO connector is the form of choice on cabling infrastructure supporting array connectivity. It is also the connector selected in MSAs like the QSFP and SNAP12. Unlike past standardization periods where two-fiber connector forms were hotly debated, the MPO is virtually uncontested in the array connectivity space. This permits straight forward specification of the MPO to terminate the cabling at the MDI. Note that the proposed interface type 7-4 permits from 2 to 24 fibers. It is expected that this may be further defined to be fiber-count specific. This specificity is already possibel in the cans of 40GBASE-SR4 as the 12 fiber type. It may be either 12 or 24 fibers as the MSA for 100GBASE-SR10 is defined.

SuggestedRemedy

Add the following:
The connector type terminating the cabling at the MDI shall meet the specifications of IEC 61754-7 interface 7-4 (MPO female plug connector with flat interface).

Proposed Response *Response Status* **W**

PROPOSED REJECT.

If the choice is obvious it's not worth the hint of a connector war and the change in policy from not specifying optical connectors at the module. Also restricting the connector to one type would (if honoured) restrict future developments as we have seen in that past with the transition from SC to LC.

Cl **86** *SC* **86.2.1** *P* **202** *L* **44** # 344
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Accepting the proposed delay limits.

SuggestedRemedy

Accept the proposed delay limits. If we continue to specify delay in BT, change 'bit-times' to 'MAC bit-times' twice. Now that reviewers have had a chance to read the editor's note, delete it.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accept 25.6 ns or 2 PQ for 40G and 4 PQ or 20.48 ns at 100G. Don't mention bit-times. Coordinate with other clauses on use of UI (if any) for delay specification. If delay through PMA matters, check it is defined in PMA clause. Delete editor's note.

Cl **86** *SC* **86.2.2** *P* **203** *L* **10** # 393

Petrilla, John Avago Technologies

Comment Type **T** *Comment Status* **D** *Skew*

The attribute skew is not defined nor does there appear a defined measurement. While this may not be essential in the logical domain, where dynamic skew is being considered and the signals are electrical or optical it appears important to define skew such that jitter is not included.

SuggestedRemedy

Add a skew measurement sub-clause to clause 86.7 such that jitter is not captured in the skew measurement.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

There is a definition in 82.2.9 PMA Interface, but nothing in 80 or 82.1 Overview. Need something applicable to all interfaces. Add brief definitions of skew (maybe called lane-to-lane skew) and Dynamic Skew (OIF's 'Relative Wander') to 1.4, referring to fuller definition elsewhere. Mention at least deskew both in 80 and 82.1. Add a definition by measurement, but make it work for any relevant clause (I note that there are no measurement procedures in Clause 83: this is one thing that would still apply if a non-nAUI non-83A instantiation of a PMA were used). It may be that jitter IS included in Dynamic Skew, but make clear in any jitter definition that Dynamic Skew is not included in jitter.

Cl **86** *SC* **86.2.2** *P* **203** *L* **10** # 345

Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D** *Skew*

Proposing skew limits

SuggestedRemedy

For overall skew, see Gustlin presentation. For dynamic skew: 200 ps from PMA, 100 ps PMD Tx add, 700 ps medium add, 200 ps PMD Rx add, giving 1200 ps returned to PMA. Remove editor's note.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

But consider that trace length mismatch will be better for 40G (4 pairs of traces, three gaps) than 100G (9 gaps) by e.g. 20 to 40 ps.

Check for consistency across clauses.

Cl **86** *SC* **86.2.2** *P* **203** *L* **13** # 516

Kolesar, Paul CommScope

Comment Type **T** *Comment Status* **D** *Skew*

The maximum skew and dynamic skew for the multimode fiber medium are TBDs that require values. The values suggested are calculated using the skew model adopted by the TF in May 2008 found in kolesar_02_0508.xls with the default worst-case parameters at a link length of 300 m to allow for the possibility of extended reach technologies. Engineering the de-skew circuits to handle this amount of skew will permit support for possible future enhancements. Note that the skew value suggested here three times larger than that suggested in another comment submitted against line 46 of page 218 (table 86-17) wherein the channel distance is explicitly defined as a 100 m maximum.

SuggestedRemedy

Replace the existing sentence with:
The delays through the medium shall match to within 13.6 ns and do not change by more than 20.3 ns including the effects of varying launch conditions and operating wavelength.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Editor does not agree that allowing 300 m using multiple MMF fibres is desirable. Also these calculations seem very pessimistic; they include impractical wavelength combinations and seemingly high mechanical stress levels.

See comment # 345

Cl **86** *SC* **86.2.2** *P* **203** *L* **817** # 307

Oulundsen III, George OFS

Comment Type **T** *Comment Status* **D** *Skew*

Currently, there are a lot of TBDs regarding skew constraints. The 802.3ba Task Force adopted kolesar_02_0508.xls as the MMF cable skew spreadsheet model. At that time we understood that the values could change, but the concept of the model spreadsheet was adopted. Should we use the values proposed in kolesar_02_0508.xls as a starting point and replace the TBD with the model values where we can? Better values can be entered when discovered.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Discuss after presentation(s).

See comments # 345 and 516.

Cl **86** *SC* **86.4.1** *P* **204** *L* **30** # 346
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Editor's note

SuggestedRemedy

See Anslow presentation and comment, remove editor's note

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

See also comment # 298.

Cl **86** *SC* **86.4.2** *P* **204** *L* **47** # 392
Petrilla, John Avago Technologies

Comment Type **E** *Comment Status* **D**

The phrase, the four or ten, is introduced and used in several places. Previously, page 199, line 30, the term, n + 1, is used and is more succinct.

SuggestedRemedy

Except for page 199, replace all instances of the phrase, the four or ten, with n + 1.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

It's not much more succinct.

Cl **86** *SC* **86.4.2** *P* **204** *L* **51** # 578
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Transmit function is missing AC coupling

SuggestedRemedy

Transmit function include AC coupling.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Follow QSFP practice, whatever that is. Make any change to allow, require or forbid AC coupling at 86.6.1.

Cl **86** *SC* **86.4.2** *P* **205** *L* **1** # 298
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

During the review of version 0.9 of the draft, some issues were raised concerning the block diagrams in clauses 86, 87 and 88. These diagrams should be clear and also consistent with each other and with Figure 86-3 for the symbols used for optical and electrical connectors

SuggestedRemedy

Replace Figures 86-1, 87-1 and 88-1 with those shown in anslow_05_1108.pdf

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

For Fig 86-2, this is same as comment # 346.

Cl **86** *SC* **86.4.3** *P* **205** *L* **29** # 579
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

AC coupling are missing from receive function

SuggestedRemedy

Receive function include AC coupling.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Follow QSFP practice, whatever that is. Make any change to allow, require or forbid AC coupling at 86.6.5.

Cl **86** *SC* **86.5** *P* **207** *L* **18** # 347
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Note to clause editor: check that 'There are no lane assignments' is compatible with e.g. lane by lane signal detect function.

SuggestedRemedy

Per comment

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Also see comment # 474.

Cl **86** *SC* **86.5** *P* **207** *L* **21** # 303

Oulundsen III, George OFS

Comment Type **E** *Comment Status* **D**

Remove the word "with". This appears to be a typographical error.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

It wasn't, but the sentence works without it.

Cl **86** *SC* **86.5** *P* **207** *L* **21** # 474

Dudek, Mike JDSU

Comment Type **TR** *Comment Status* **D**

Although there are no requirements on the physical location of the various lanes within the group of lanes there is a requirement for knowing which fibers in the MTP are used for Tx, which are used for Rx and which are not used.

SuggestedRemedy

insert the word "electrical" so that the sentence becomes ".... where the electrical lanes are physically....."

insert two subsections.
"86.5.1 Optical lane assignments for 40GBASE-SR4
Although the location of lanes within the group of Tx lanes is not required, it is necessary to define the positions of the Tx lanes and Rx lanes within the ribbon fiber connector. Figure xxx shows the location.
86.5.2 Optical lane assignments for 100GBASE-SR10
Although the location of lanes within the group of Tx lanes is not required, it is necessary to define the positions of the Tx lanes and Rx lanes within the ribbon fiber connector. Figure yyy shows the location."

Figure xxx to be as in INF-8438i figure 20 with the following changes. Title becomes 40GBASE-SR MDI optical receptacle and channel orientations. Replace the row saying Fiber number with "Fiber positions xxxxxxxxxxxxx (12 x's). Replace the numbers in the Transmit and recieve Channel rows with xxxx . Add an additional row with "Unused positions" and place XXXX in the middle 4 positions.

Figure yyy to say "TBD. Editors note to be removed prior to publication The figure will show the fibers at the edge of a 12 fiber ribbon as unused positions (ie fiber numbers 1 and 12 are unused.) "

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

While distinguishing between transmit and receive fibres is important, we have not chosen a connector type. Should the definition of which positions are unused go in QSFP for the module optical connector and the cabling specs for connectors further within the channel?

Cl **86** *SC* **86.6** *P* **207** *L* # 138
D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D** *Review*

Recommend creating Annex 86A and moving PPI electrical specifications, as the PPI might eventually be used with PMDs.

SuggestedRemedy

Move all PPI electrical specifications into Annex 86A.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

At present, only n0GBASE-SRn uses PPI although we hope to achieve some level of compatibility with Clause 83A and Clause 85, and we are more likely to do a good job of making PPI consistent with the rest of Clause 86 where it is. Best to develop it in place and then revisit this question when we go to WG ballot.

Cl **86** *SC* **86.6.1** *P* **208** *L* **1** # 475
Dudek, Mike JDSU

Comment Type **E** *Comment Status* **D**

It would be good to label Table 86-6 with "at TP1a" at the end of the title.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Editor's note: Added missing Clause, subclause (86.6.1), page and line numbers to appropriate fields]

Cl **86** *SC* **86.6.1** *P* **208** *L* **10** # 293
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D** *DJ*

In Table 86-6 There are two jitter parameters "TP1a Total Jitter output" and "TP1a Deterministic Jitter output" where it is not clear if this is UI peak to peak or not.
Also applies to:
Table 86-7 "Total Jitter tolerance at TP1a"
Table 86-11 "Total Jitter output at TP4"
Table 86-12 "Total Jitter tolerance"

SuggestedRemedy

Either change the parameter names to include "(pk-pk)" or change the units to be UIptp

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Do not wish to refer to DJ in particular as 'peak-to-peak'. If we stay with either or both of DJ and TJ, add definitions in the appropriate place.

Cl **86** *SC* **86.6.1** *P* **208** *L* **11** # 349
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D** *DJ*

Deterministic Jitter spec or 99% jitter spec? Also at PPI receive side.

SuggestedRemedy

?

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This proposal needs more justification.

Cl **86** *SC* **86.6.1** *P* **208** *L* **11** # 477
Dudek, Mike JDSU

Comment Type **TR** *Comment Status* **D**

In order to ensure that reflections don't overally degrade performance, the differential return loss of the host needs to be specified. To control EMI the common mode return loss of the host also needs to be specified.

SuggestedRemedy

Add rows to Table 86-6 after AC common mode.

"Differential output reflection coefficient, SDD22 Max see 86.6.1.1
Differential Output common mode reflection coefficient, SCC22 Max -6dB 10MHz to 2.5GHz, -3dB 2.5GHZ to 11.1GHz"

Change title and text of 86.6.1.1 to say "SDD11 at TP1 and SDD22 at TP1a" (ie 2 places)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected subclause number to 86.6.1 in subclause number field]

Values for discussion.

Cl **86** *SC* **86.6.1** *P* **208** *L* **11** # 290
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

In Table 86-6 The "TP1a Deterministic Jitter output" min and max values are blank
Same issue for Table 86-7 "AC common mode input voltage tolerance" max

SuggestedRemedy

Make the "TP1a Deterministic Jitter output" min "-" and the Max "TBD" if no values are available
Make the "AC common mode input voltage tolerance" max "-"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **86** *SC* **86.6.1** *P* **208** *L* **11** # 476
Dudek, Mike JDSU

Comment Type **TR** *Comment Status* **D** *DJ*

Dj in the Tx has been shown by the SFF8431 committee to be a poorer predictor of link performance than DDPWS and DDJ

SuggestedRemedy

Replace the Deterministic Jitter Output rows in Table 86-6 and Table 86-7 with two rows.
"TP1a Data Dependent Jitter Output Max TBD
"TP1a Data Dependent Pulse Width Shrinkage Output Max TBD
Add "editors note to be removed prior to publication. Max values of DDJ and DDPWS are TBD, however for comparison SFF8431 has DDJ max 0.1UI and DDPWS max 0.05UI."

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This proposal needs more justification.

Cl **86** *SC* **86.6.1** *P* **208** *L* **11** # 402
Petrilla, John Avago Technologies

Comment Type **TR** *Comment Status* **D** *DJ*

Table 86-6, has blank entries for TP1a Deterministic Jitter output and units of UI. There are several other instances of units for TJ and DJ shown as UI

SuggestedRemedy

For Table 86-6, TP1a Deterministic Jitter output, enter 0.15 in the Max column and change the Units column entry to UI pk-pk. Check other TJ and DJ entries in Tables 86-6, 7, 11 & 12 and, where appropriate, change UI to UI pk-pk.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Do not wish to refer to DJ in particular as 'peak-to-peak'. If we stay with either or both of DJ and TJ, add definitions in the appropriate place, don't call them 'peak-to-peak'.

Cl **86** *SC* **86.6.1** *P* **208** *L* **12** # 565
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D** *DJ*

The classical DJ and RJ measured jitter are jitter PDF dependent and not valid for jitter distribution which are not dual-dirac.

SuggestedRemedy

Repalce RJ with UJ of 0.025 UI (RMS) per IEEE CL 68.6.8 method
Replace DJ with DDJ of 0.15 UI per method of FC-PI4 A.1.3.1 with PSBS 9 pattern

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This proposal needs more justification. DJ and RJ are just as valid (a lot or a little, depending on your point of view) for a non dual-Dirac jitter distribution.

Cl **86** *SC* **86.6.1** *P* **208** *L* **14** # 403
Petrilla, John Avago Technologies

Comment Type **TR** *Comment Status* **D**

In Table 86-6, there's a TBD for eye mask coordinate X2 and another in the Conditions column.

SuggestedRemedy

In Table 86-6, replace the TBD for eye mask coordinate X2 with 0.25 and delete the TBD in the Conditions column or replace it with a reference to subclause 86.7.4.7.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Listen to presentation for value, refer to 86.7.4.7.

See also comments # 389, 390, 404.

Cl **86** *SC* **86.6.1** *P* **208** *L* **14** # 389
King, Jonathan Finisar

Comment Type **TR** *Comment Status* **D**

Table 86-6
Eye mask coordinates: X1,X2,Y1,Y2 and conditions contain TBDs.

Use SFP+MSA mask and coordinates for TP1

SuggestedRemedy

Use SFP+MSA mask and coordinates for TP1

Eye mask coordinates: X1,X2,Y1,Y2 become 0.12, 0.33, 95, 350
Condition becomes <5e-5 hit rate.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The suggested X2 and hit ratio limits allow slow, noisy eyes: needs quantitative review.

See also comments 403, 390, 404.

Cl **86** *SC* **86.6.1** *P* **208** *L* **36** # 56
Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

In table 86-7 the parameter "Total Jitter tolerance at TP1a" is at TP1a wheras the table title says "at TP1"

SuggestedRemedy

change table title from "PPI electrical transmit signal input specifications at TP1" to "PPI electrical transmit signal input specifications at TP1 and TP1a"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

If we did this would we have to qualify all the other rows 'at TP1'?

Cl **86** *SC* **86.6.1** *P* **208** *L* **37** # 394

Petrilla, John Avago Technologies

Comment Type **T** *Comment Status* **D**

In Table 86-7 the min entry for Total Jitter tolerance at TP1a has a value of 0.3. This has insufficient precision for jitter since it permits a range of 0.25 to 0.349. All jitter entries should have, at least, two significant digits.

SuggestedRemedy

In Table 86-7, change the min entry for Total Jitter tolerance at TP1a from 0.3 to 0.30.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Editor believes a standard doesn't use the significant digits convention; it takes things at face value. Insert new subclause in 1.2 'Limits of analog quantities' Specified limits are precise, irrespective of any trailing zeros.'

Cl **86** *SC* **86.6.1** *P* **208** *L* **38** # 584

Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D** *DJ*

The classical DJ and RJ measured jitter are jitter PDF dependent and not valid for jitter distribution which are not dual-dirac.

SuggestedRemedy

Repalce RJ with UJ of 0.025 UI (RMS) per IEEE CL 68.6.8 method
Replace DJ with DDJ of 0.15 UI per method of FC-PI4 A.1.3.1 with PSBS 9 pattern

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This proposal needs more justification. DJ and RJ are just as valid (a lot or a little, depending on your point of view) for a non dual-Dirac jitter distribution.

Cl **86** *SC* **86.6.1** *P* **208** *L* **42** # 390

King, Jonathan Finisar

Comment Type **TR** *Comment Status* **D**

Table 86-7
Eye mask coordinates: X1,X2,Y1,Y2 and conditions contain TBDs.

Use SFP+MSA mask and coordinates for TP1

SuggestedRemedy

Use SFP+MSA mask and coordinates for TP1

Eye mask coordinates: X1,X2,Y1,Y2 become 0.12, 0.33, 95, 350
Condition becomes <5e-5 hit rate.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The suggested X2 and hit ratio limits allow slow, noisy eyes: needs quantitative review.

See also comments # 403, 389, 404.

Cl **86** *SC* **86.6.1** *P* **208** *L* **42** # 404

Petrilla, John Avago Technologies

Comment Type **TR** *Comment Status* **D**

In Table 86-7 there's a TBD for Eye mask coordinate X2 and another in the Conditions column.

SuggestedRemedy

In Table 86-7, replace the TBD for eye mask coordinate X2 with 0.25 and delete the TBD in the Conditions column or replace it with a reference to subclause 86.7.4.7.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Listen to presentations.

See also comment # 389, 390, 403.

Cl **86** *SC* **86.6.2** *P* **209** *L* # 309
Dallesasse, John Emcore Corporation

Comment Type **TR** *Comment Status* **D**

Given the target distance of 100 meters, we need to evaluate the possibility of eliminating the encircled flux specification. This will likley be a challenging specification to meet over temperature (or even at a single temperature on all lanes) for a parallel optical module. General discussions on the expected impairment in modal bandwidth for an overfilled as opposed to restricted launch into OM3 fiber suggest that eliminating encircled flux may be possible, but further analysis of this question by an ad-hoc group may be necessary.

SuggestedRemedy

Eliminate the encircled flux specification from Table 86-8 and any other places referenced in these clauses.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected subclause number to 86.6.2 in subclause number field]

Would expect that if it can be relaxed it cannot be eliminated.

Cl **86** *SC* **86.6.2** *P* **209** *L* **15** # 631
CHANG, Frank Vitesse

Comment Type **TR** *Comment Status* **D**

Table 86-8 need more rows, lack parameters.

SuggestedRemedy

Suggest to edit the following
- Extra row for signaling speed as 4/10 x 10.3125GBd +/-100ppm.
- Add Average lanch power, each lane MIN specs as TBD
- ORL tolerance should be MAX, not min, specs.
- RIN12OMA should set to -128dB/HZ (-132dB/Hz would affect cost/yield)
- Add TDP specs as TBD.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected subclause number to 86.6.2 in subclause number field]

Signalling rate is already covered in Table 86-1. Discuss merits of average launch min spec. Change ORL tolerance to max (a tolerance to 11 dB is more than compliant, a tolerance of 15 is not compliant). For RIN and TDP, listen to presentation on aggregate signal parameter

and see comment # 405.

Cl **86** *SC* **86.6.2** *P* **209** *L* **23** # 395
Petrilla, John Avago Technologies

Comment Type **T** *Comment Status* **D**

In Table 86-8, values for entries Average launch power, Optical Modulation Amplitude (OMA) and Extinction ratio show only one significant digit. These have insufficient precision and should have two significant digits.

SuggestedRemedy

In Table 86-8, change the entries for Average launch power, Optical Modulation Amplitude (OMA) and Extinction ratio to show two significant digits.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

See response to comment # 394.

Cl **86** *SC* **86.6.2** *P* **209** *L* **23** # 478
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D** *Optical Power*

Optical receivers are in general limited by the peak power of the input signal (Average power is less important). As the spec stands the receiver has to cope with the maximum input average power at infinite extinction ratio with the allowed eye mask overshoot. This is much more than is likely to happen in practice. We should limit the peak power explicitly.

SuggestedRemedy

Add extra rows to Tables 86-8, 86-9, 86-10.

Peak Power Max 3dBm. (no min)

To this row in table 86-8 add a footnote. Peak Power is the maximum value of the power as measured on the eye diagram see 86.7.4.7

Proposed Response *Response Status* **W**

PROPOSED REJECT.

For discussion.

See also comment # 406.

Cl **86** *SC* **86.6.2** *P* **209** *L* **24** # 405

Petrilla, John Avago Technologies

Comment Type **TR** *Comment Status* **D** *Aggregate*

In Table 86-8, the characteristics, Optical Modulation Amplitude (OMA), Optical Modulation Amplitude(OMA), Aggregate signal parameter, and RIN12OMA can be replaced by using the Transmitter eye mask as the aggregate signal parameter.

SuggestedRemedy

In Table 86-8, delete or label as informative the characteristics, Optical Modulation Amplitude (OMA), Aggregate signal parameter, and RIN12OMA and use the Transmitter eye mask as the aggregate signal parameter.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Listen to presentation and debate.

Cl **86** *SC* **86.6.2** *P* **209** *L* **36** # 406

Petrilla, John Avago Technologies

Comment Type **TR** *Comment Status* **D**

In Table 86-8, the entry for Transmitter eye mask definition calls for X3, Y2 and Y3 coordinates which are not required, does not label the coordinates as Specification values and has TBD as entries in the Type and Value columns and no entry in the Unit column.

SuggestedRemedy

In Table 86-8, add a header row to label the Transmitter eye mask coordinates as Specification values (See Tables 86-6 & 7 as examples.), delete X3, Y2 and Y3 coordinates, split the remaining coordinates into two rows, one for X1 & X2 and the other for Y1 (againing using Tables 86-6 & 7 as examples), replace the TBD and enter 0.225 as the value for X1, 0.355 as the value for X2 and 176 as the value for Y1, enter UI as units for X1 & X2 and uW as units for Y1 and add a reference to subclause 86.7.4.7. Since there is no applicable figure in subclauses 86.6.2 or 86.7.4.7 (nor 83A.3.3.5) for Tx eye masks where Y1 is an absolute value, create a new figure and insert in subclause 86.6.2, 86.7.4.7 or where otherwise appropriate.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change 'TBD' in 'Type' column to 'Spec. value'. Two rows for two units. Would a 10-sided mask do the job better? Need quantitative analysis of effect on statistical significance of an 'absolute mask'.

See also comment # 478 re getting rid of Y3, Y3.

Cl **86** *SC* **86.6.3** *P* **209** *L* **52** # 396

Petrilla, John Avago Technologies

Comment Type **T** *Comment Status* **D** *Aggregate*

Including the phrase, "power in OMA" in the sentence, "A signal with power in OMA and average power not within the ranges given cannot be compliant." is not applicable if OMA is deleted from Table 86-8 or is changed to informative.

SuggestedRemedy

Change the sentence, A signal with power in OMA and average power not within the ranges given cannot be compliant, to, A signal with average power not within the ranges given cannot be compliant.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Address this after comment # 405.

Cl **86** *SC* **86.6.3** *P* **209** *L* **53** # 57

Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

This says "A signal with power in OMA and average power not within the ranges given cannot be compliant.". However either condition makes the signal non-compliant so it should be "or" not "and"

SuggestedRemedy

change "in OMA and average" to "in OMA or average"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

(maybe) Depends on outcome to comment # 396.

Cl **86** *SC* **86.6.3** *P* **210** *L* **11** # 397
Petrilla, John Avago Technologies

Comment Type **T** *Comment Status* **D** *Aggregate*

In Table 86-9, the characteristic, "Optical Modulation Amplitude (OMA), each lane", is not applicable if OMA is deleted from Table 86-8 or is changed to informative.

SuggestedRemedy

In Table 86-9, delete the characteristic, "Optical Modulation Amplitude (OMA), each lane", if OMA is deleted from Table 86-8 or is changed to informative.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Decide after comment # 405.

There must be some implied minimum OMA; would be useful to know for diagnostic purposes. If aggregate metric accepted, change to OMA limits that are the consequence of other specs.

Cl **86** *SC* **86.6.3** *P* **210** *L* **6** # 348
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Have we allowed enough for connector loss?

SuggestedRemedy

Check that we have allowed enough for 100 m of fibre and a reasonable number of connectors, remembering that with a restricted launch, the actual connector loss is less than the measured connector loss. Reduce the numbers in the minimum column by 0.1 dB if appropriate, and adjust Table 86-13, fill in TBDs in 86.10.2.2.1. Remove the footnote here.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See also comment # 382.

Cl **86** *SC* **86.6.4** *P* **210** *L* # 398
Petrilla, John Avago Technologies

Comment Type **T** *Comment Status* **D**

In Table 86-10 Value entries for "Damage threshold" and "Average power at receiver input" show only a single significant digit and lack sufficient precision.

SuggestedRemedy

In Table 86-10 change Values entries for "Damage threshold" and "Average power at receiver input" to show at least two significant digits as needed for the desired precision.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

See response to comment # 394.

Cl **86** *SC* **86.6.4** *P* **210** *L* **35** # 407
Petrilla, John Avago Technologies

Comment Type **TR** *Comment Status* **D** *Optical Power*

In Table 86-10, Value column entries are TBD for attributes, Stressed receiver sensitivity in OMA, Vertical eye closure penalty, and Stressed eye jitter J.

SuggestedRemedy

In Table 86-10, change Value column TBD for Stressed receiver sensitivity in OMA to -5.4, Vertical eye closure penalty to 1.67, and Stressed eye jitter J to 0.37.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Listen to presentation first.

Cl **86** *SC* **86.6.5** *P* **211** *L* **19** # 587
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

With stacked connector -6 dB SCC can not be met which could eliminated SR10

SuggestedRemedy

Propose the following SCC2 mask
SCC22<= (-12 + 2.8*f) from 0.01 to 2.5 GHz and (-5.2+0.08*f) from 2.5 to 11.1 GHz.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Can commenter show us the existing and proposed as graphs? Also more justification for stacked connector performance.

Cl **86** *SC* **86.6.5** *P* **211** *L* **24** # 605
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D** *DJ*

Total jitter at TP4 is 0.7 UI which is the same as SFP+ single channel. The SR4/SR10 optics are more relax than SR optics but the SerDes tolerance is the same.

SuggestedRemedy

The Total Jitter at TP4 for SR4 and SR10 should be 0.65 UI. Since CR4/CR10 TJ are 0.28 UI if the optical link does not close then TJ in table 86-6 and 86-7 are suggested to be reduced to 0.28 UI

Proposed Response *Response Status* **W**

PROPOSED REJECT.

SFP+ has a more relaxed TJ at TP4 than Gigabit Ethernet (0.749 UI). Do not see why the IC AFTER the connector should be worse here than in SFP+. Do not believe that 10^-12 TJ is a good metric anyway.

Cl **86** *SC* **86.6.5** *P* **211** *L* **27** # 592
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D** *DJ*

MJSQ method of DJ and RJ breakdown is only valid for dual-Dirac jitter pdf, the DJ reported can even be 0 for cases the actual high freq jitter is very large.

SuggestedRemedy

Replace DJ with 99% probability jitter with symbol J2

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The observation that ' the DJ reported can even be 0 for cases the actual high freq jitter is very large' does not invalidate the spec.

Cl **86** *SC* **86.6.5** *P* **211** *L* **29** # 408
Petrilla, John Avago Technologies

Comment Type **TR** *Comment Status* **D**

In Table 86-11, there's a TBD for Eye mask coordinate X2 and another in the Conditions column.

SuggestedRemedy

In Table 86-11, change the TBD for Eye mask coordinate X2 from TBD to 0.50 and either delete the TBD in the Conditions column or change to reference subclause 86.7.4.7.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Believe that a diamond mask makes valueless demands on limiting amplifier, although X2 should be close to 0.5. Change the TBD in the Conditions column to reference subclause 86.7.4.7.

Cl **86** *SC* **86.6.5** *P* **211** *L* **41** # 479
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

It is good to be explicit at what test point the specifications apply

SuggestedRemedy

Add at TP4a to the title of Table 86-12

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Editor believes all currently in Table 86-12 applies at TP4a (after the connector).

Cl **86** *SC* **86.6.5** *P* **211** *L* **49** # 304
Oulundsen III, George OFS

Comment Type **E** *Comment Status* **D**

Table 86-12: I believe that the footnote superscript "a" should be added to the "Deterministic Jitter tolerance (pk-pk)" value of 0.40 in the "Min" column of the table. I believe that this is a typographical error.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **86** *SC* **86.6.5** *P* **211** *L* **49** # 593
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D** *DJ*

MJSQ method of DJ and RJ breakdown is only valid for dual-Dirac jitter pdf, the DJ reported can even be 0 for cases the actual high freq jitter is very large.

SuggestedRemedy

Replace DJ with 99% probability jitter with symbol J2

Proposed Response *Response Status* **W**

PROPOSED REJECT.

See response to 592.

Cl **86** *SC* **86.6.5** *P* **211** *L* **50** # 480
Dudek, Mike JDSU

Comment Type **TR** *Comment Status* **D**

In order to ensure that reflections don't overally degrade performance, the differential return loss of the host needs to be specified. To control EMI the differential to common mode reflection coefficient of the host also needs to be specified.

SuggestedRemedy

Add rows to Table 86-12 after Deterministic jitter tolerane

"Differential input reflection coefficient, SDD11 Max see 86.6.5.1
Reflected Differential to common mode conversion, SCD11 Max -10dB 10MHz - 11.1GHz

Change title and text of 86.6.5.1 to say "SDD22 at TP4 and SDD11 at TP4a" (ie 2 places)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Cl **86** *SC* **86.6.5** *P* **211** *L* **52** # 409
Petrilla, John Avago Technologies

Comment Type **TR** *Comment Status* **D**

In Table 86-12, there's a TBD for Eye mask coordinate X2 and another in the Conditions column.

SuggestedRemedy

In Table 86-12, change the TBD for Eye mask coordinate X2 from TBD to 0.50 and either delete the TBD in the Conditions column or change to reference subclause 86.7.4.7.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See response to comment # 408.

Cl **86** *SC* **86.6.5.1** *P* **212** *L* **37** # 305
Oulundsen III, George OFS

Comment Type **E** *Comment Status* **D**

Footnote to Table 86-13: Should we add the TIA-492AAAC-A standard to footnote a. The IEC standard is already referenced.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED REJECT.

No; if international standards are available, we should use them. Now if TIA documents were free and IEC ones paid for, there would be an incentive.

Cl **86** *SC* **86.6.6** *P* **212** *L* **26** # 261
Vanderlaan, Paul Nexans

Comment Type **E** *Comment Status* **D**

Change From
"Effective modal bandwidth at 850 nm"

SuggestedRemedy

Change to:
"Minimum Effective modal bandwidth at 850 nm"

Indicates higher performing fibers will be suitable

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: corrected subclause number to 86.6.6 in subclause number field]

This is an example, with 'worst allowed' fibre. See 86.10 for the actual specs. In Table 86-18, make Effective modal bandwidth a minimum.

Cl **86** *SC* **86.6.6** *P* **212** *L* **34** # 632
CHANG, Frank Vitesse

Comment Type **TR** *Comment Status* **D** *Optical Power*

Allocation for penalty state TBD, which should be 8.3-1.9=6.4dB, the difference as compared with 10GABSE-SR should come related to the contribution from channel-to-channel xtalk.

SuggestedRemedy

Pls clarify.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The o/e is not the same as 10GBASE-SR anyway.

See comment # 410.

Cl **86** *SC* **86.6.6** *P* **212** *L* **34** # 410
Petrilla, John Avago Technologies

Comment Type **TR** *Comment Status* **D** *Optical Power*

In Table 86-13 there's a TBD for Allocation for penalties.

SuggestedRemedy

In Table 86-13 change the TBD for Allocation for penalties to 6.8.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Listen to presentation first.

And see comment # 632.

Cl **86** *SC* **86.7.2** *P* **214** *L* **34** # 481
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

For consistency and to ensure reproducible measurements the square test pattern with a fixed number of ones and zeros should be used for the measurements of OMA, and RIN.

The budgeting for the link assumes that the difference between the OMA for the Tx and the OMA for the Rx is the optical loss (average power). If the prbs9 is used to measure OMA for the Tx while square wave is used for the Rx this may no longer be true as the prbs9 pattern and square wave pattern will not always give the same answer. (If a vendor wishes to use prbs9 for production test the vendor should guard band his measurements for the differences the guard band being based on his own product characteristics.)

SuggestedRemedy

Make the measurements of OMA and RIN patterns Square eight ones and eight zeros for all three rows in standard font. Remove the editor preference note. Change the footnote to say "The items in italics" instead of "The second column"

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Need to consider pattern generation strategy before deciding; it may not be simple to get the variety of PMA combinations to produce 8+8. There are CRU locking problems with slow square waves. Suspect that the difference between square OMA and PRBS9 OMA is same before and after fibre.

Cl **86** *SC* **86.7.3** *P* **215** *L* **1** # 350
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

For AC common mode voltage, Termination mismatch and Transition time, copy text from SFF-8431 D3.1 with appropriate modifications (this is not issued at time of writing but will be issued before the P802.3ba co-located interim)

SuggestedRemedy

Use text from SFF-8431 D3.1 with appropriate modifications (this is not issued at time of writing but will be issued before the P802.3ba co-located interim)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

And see comments # 482, 483.

Cl **86** *SC* **86.7.3.1** *P* **215** *L* **3** # 482
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

Missing definition of AC common mode voltage

SuggestedRemedy

Copy the section from SFF8431 D.15 with editorial changes to remove SFP+ references.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

And see comments # 350, 483.

Cl **86** *SC* **86.7.3.2** *P* **215** *L* **8** # 483
Dudek, Mike JDSU

Comment Type **TR** *Comment Status* **D**

Missing Test procedure for Termination mismatch.

SuggestedRemedy

Copy the section from SFF8431 D.16

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

And see comments # 350, 482.

Cl **86** *SC* **86.7.4.1** *P* **215** *L* **20** # 484
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

It is bad practice to specify things in two places.

SuggestedRemedy

Delete the test pattern description "appropriate portion.....to end of sentence" and replace with "pattern defined in Table 86-15.

Do the equivalent at line 39.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

'using the pattern defined in Table 86-15, the appropriate portion of a valid 40GBASE-R4 or 100GBASE-R10 signal, or with a valid 10GBASE-R signal.' At line 39, 'using the pattern defined in Table 86-15 or a valid 40GBASE-R4 or 100GBASE-R10 signal.'

Cl **86** *SC* **86.7.4.3** *P* **215** *L* **28** # 399
Petrilla, John Avago Technologies

Comment Type **T** *Comment Status* **D** *Aggregate*

There is a proposal for Table 86-8 to replace OMA with an aggregate test. If accepted subclause 86.7.4.3 can be deleted or labeled as informative.

SuggestedRemedy

If the proposal for Table 86-8 to replace OMA with an aggregate test is accepted, deleted or labeled subclause 86.7.4.3 as informative.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Even with an aggregate transmitter spec, we may need normative received average power and OMA numbers for the signal detect specs.

Cl **86** *SC* **86.7.4.6** *P* **215** *L* **43** # 391
Petrilla, John Avago Technologies

Comment Type **T** *Comment Status* **D** *Aggregate*

There is a proposal for Table 86-8 to use the Tx eye mask as the aggregate test. If accepted subclause 86.7.4.6 can be deleted.

SuggestedRemedy

If proposal for Table 86-8 to use the Tx eye mask as the aggregate test is accepted, delete subclause 86.7.4.6.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Decide after hearing presentation.

Cl **86** *SC* **86.7.4.6** *P* **215** *L* **45** # 485
Dudek, Mike JDSU

Comment Type **TR** *Comment Status* **D**

We need to say what test pattern is on the channels not under test

SuggestedRemedy

Add the sentence. "The pattern on the lanes not under test should be prbs31 or valid 40GBASE-R encoded data.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

' The signal on the lanes not under test should be Pattern 3 (PRBS31) or a valid 40GBASE-R or 100GBASE-R signal.'

Cl **86** *SC* **86.7.4.7** *P* **215** *L* **50** # 385
King, Jonathan Finisar

Comment Type **T** *Comment Status* **D** *Optical Mask*

Generic eye mask measurement details missing.

SuggestedRemedy

Use text from 802.3aq (Clause 68.6.5) describing fionite hit rate eye mask measurements.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Better to refer to 68.6.5 and note any differences (our mask coordinates may differ). And also note comments to use mask as an aggregate transmit metric.

Cl **86** *SC* **86.7.4.7.1** *P* **216** *L* **1** # 292
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

Clause 86.7.4.7.1 "Eye mask for TP1a and TP4" should be a subclause of 86.7.3 "Electrical parameters" and not 86.7.4 "Optical parameter definitions"

SuggestedRemedy

Move the "Eye mask for TP1a and TP4" clause to 86.7.3

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Also move 86.7.4.7 Eye diagrams to after of 86.7.2 and before 86.7.3, or delete it.

Cl **86** *SC* **86.7.4.7.1** *P* **216** *L* **3** # 401
Petrilla, John Avago Technologies

Comment Type **T** *Comment Status* **D** *Aggregate*

There is a proposal for Table 86-8 to use the Tx eye mask as the aggregate test. Since this mask has an absolute values for the vertical coordinate, the sentence "Unlike the optical eye mask, the vertical dimensions are fixed rather than scaled to the signal." is no longer applicable

SuggestedRemedy

If proposal for Table 86-8 to use the Tx eye mask as the aggregate test is accepted, delete the sentence "Unlike the optical eye mask, the vertical dimensions are fixed rather than scaled to the signal."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

On the other hand, there is an argument for a relative mask here also. Follow other comments.

Cl **86** *SC* **86.7.7.4** *P* **215** *L* **32** # 400
Petrilla, John Avago Technologies

Comment Type **T** *Comment Status* **D** *Aggregate*

There is a proposal for Table 86-8 to use the Tx eye mask as the aggregate test. If accepted subclause 86.7.4.4 can be deleted.

SuggestedRemedy

If proposal for Table 86-8 to use the Tx eye mask as the aggregate test is accepted, delete subclause 86.7.4.4.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Follow other comments.

Cl **86** *SC* **86.9** *P* **217** *L* **28** # 353
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**

Need a channel S-parameter equation

SuggestedRemedy

One way to develop one would be to scale the SFP+ channel by the ratio of recommended trace lengths, but the SFP+ equations don't have f^3 terms.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Take care not to scale the connector effect, and make any allowance for a worse '10-way' connector.

See also comment # 585.

Cl **86** *SC* **86.9** *P* **217** *L* **28** # 209
Mellitz, Richard Intel Corporation

Comment Type **ER** *Comment Status* **D** *Review*

Avoid s-parameter designations and keep loss definition consistent in document. Figure 86-5

SuggestedRemedy

Use A for attenuation.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: corrected subclause number to 86.9 in subclause number field]

S-parameters are very well established and are a good way of presenting the information; see e.g. diminico_02_0708.pdf slide 22.

Cl **86** *SC* **86.9** *P* **217** *L* **30** # 585
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

Max and min loss between PMA IC and TP1a and TP4a are listed as TBD

SuggestedRemedy

SDD21<=(-0.0788 -0.6169*SQRT(f) - 0.5855*f)
Min loss
SDD>=(2/6 - 2*f/6)
Where is in GHz
The maximum SDD21 assumes the HCB PCB loss at Nyquist is <=1.0 dB

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Would like to see this proposal in graphical format, comparing it with SFP+ and other proposals. No f^2 term?

See also comment # 353.

Cl **86** *SC* **86.9** *P* **218** *L* # 162
D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**

the equations driving Figure 86-4 use variables that are TBD, therefore the figure should be blank.

furthermore, Note Figure 86-4 is inconsistent with similar figures in 802.3. Loss is a positive number.

SuggestedRemedy

remove curves in Figure 86-4

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Page 218. The frequency breaks are in the equations. Will turn the y axis 0 -2 etc to TBD until the equations have parameters, then will redraw the figure. The figure shows dB(SDD21) which is the negative of dB(loss). This is chosen so that all S-parameters; through, reflection and crosstalk, can be shown on a consistent scale.

Cl **87** *SC* **87.1** *P* **223** *L* **12** # 160
D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**

Table 87-1 does not include reference to Annex 83A, XLAUI.

SuggestedRemedy

add row for Annex 83A, XLAUI and mark optional.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Cl **87** *SC* **87.1.1.2.3** *P* **225** *L* **23** # 276
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

It would be helpful to indicate where in clause 83 the effect of receipt is defined.
Also applies to 88.1.1.2.3

SuggestedRemedy

Change "in Clause 83" to "in 83.3.1.3"
Also make this change in 88.1.1.2.3

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **87** *SC* **87.1.1.3.3** *P* **225** *L* **47** # 277

Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

It would be helpful to indicate where in clause 83 the effect of receipt is defined.
Also applies to 88.1.1.3.3

SuggestedRemedy

Change "in Clause 83" to "in 83.3.3.3"
Also make this change in 88.1.1.3.3

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **87** *SC* **87.11** *P* **239** *L* **14** # 91

Sun Hyok, Chang Electronics and Teleco

Comment Type **T** *Comment Status* **D** *Optical*

In Table 87-13, 'DGD_max' is represented to describe the PMD (polarization mode dispersion) specification. But 'DGD_max' is not sufficient to give the PMD specification of the fiber link. Parameter of P(DGD_tot > DGD_max) is needed.(from the Method 2 of IEC 61282-3). P(DGD_tot > DGD_max) is the probability that a system DGD value, DGD_tot, exceeds DGD_max.

SuggestedRemedy

Parameter of P(DGD_tot > DGD_max) per each lane is needed in Table 87-13.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: added missing subclause number 87.11 to subclause field]

See proposed response to comments 93

802.3 specifies only the DGD_max that the system must tolerate for BER within specified limits . See clause 52.13. This is consistent with ITU specifications for optical systems (eg G.691, G.959.1). Different users are able to tolerate different probabilities of the actual DGD exceeding DGD_max, so it inappropriate to specify this value.

Cl **87** *SC* **87.11** *P* **239** *L* **15** # 296

Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D** *Optical*

In Table 87-13 the value of DGD_max is "TBD". The DGD_max value for 10GBASE_LR in Table 52-24 is 10 ps. This equates to a link PMD coefficient of 0.8 ps/sqrt(km) (assuming S = 3.75) and is expected to give only a small penalty at 10.3125 GBd.

SuggestedRemedy

In Table 87-13 set the value of DGD_max to 10 ps
See anslow_04_1108.pdf for more detail.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **87** *SC* **87.11** *P* **239** *L* **16** # 381

King, Jonathan Finisar

Comment Type **TR** *Comment Status* **D** *Optical Reflections*

In Table 87-13, Optical return loss is TBD dB
Limiting factor here is round trip reflections leading to coherent interference at the receiver. Optical return loss 26dB or greater is consistent with Clause 52 10GBASE-ER Fibre optic cabling channel characteristics; with a transmitter reflectance of -12dB max, this would keep penalties due to cround trip coherent interference down to approx 0.25dB
.....
also applies to Table 88-176

SuggestedRemedy

Last row of Table 87-13 becomes

Optical return loss (min) 26 dB
.....

Last row of Table 87-13 becomes

Optical return loss (min) 26 26 26 dB

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

But use 21dB, consistent with Clause 52.7.1

Cl **87** *SC* **87.11** *P* **239** *L* **21** # 92

Sun Hyok, Chang Electronics and Teleco

Comment Type **T** *Comment Status* **D** *Optical*

In line 21, it is written that 'DGD_max is the maximum differential group delay that the system must tolerate'. It is wrong. 'DGD_max' is defined in the Method 2 of IEC 61282-3. 'DGD_max' is defined with P(DGD_tot > DGD_max), which is the probability that a system DGD value, DGD_tot, exceeds DGD_max. 'DGD_max' and 'P(DGD_tot > DGD_max)' give the DGD specification of the fiber link.

SuggestedRemedy

The sentence 'DGD_max is the maximum differential group delay that the system must tolerate' is needed to be replaced by "DGD_max is defined in the Method 2 of IEC 61282-3'

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: added missing subclause number 87.11 to subclause field

See proposed response to comments 93

802.3 specifies only the DGD_max that the system must tolerate for BER within specified limits . See clause 52.13. This is consistent with ITU specifications for optical systems (eg G.691, G.959.1). Different users are able to tolerate different probabilities of the actual DGD exceeding DGD_max, so it inappropriate to specify this value.

Cl **87** *SC* **87.12** *P* **239** *L* **18** # 500

Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D** *Channel*

The channel characteristics for max channel insertion loss, and Positive and negative dispersion are a function of wavelength it would be good to note the wavelength range for which the values in table 87-13 apply.

SuggestedRemedy

Add a footnote to Channel insertion loss (max), Positivie dispersion (max), and negative dispersion (min). The footnote to say. Over the wavelength range 1264.5nm to 1337.5nm.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **87** *SC* **87.13** *P* **239** *L* **15** # 207

Chung, Hwan Seok ETRI

Comment Type **T** *Comment Status* **D** *Optical*

In Table 87-13, we propose DGD_max characteristics as "10 ps"

SuggestedRemedy

The datails of DGD_max for 40GBASE-LR4 will be presented in November plenary.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

See proposed response to comment 296

Cl **87** *SC* **87.4.4** *P* **228** *L* **27** # 594

Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

PMD loopback function is missing

SuggestedRemedy

Please add PMD loopback function

Proposed Response *Response Status* **W**

PROPOSED REJECT.

For same reasons given in response to comment 595

Cl **87** *SC* **87.5** *P* *L* # 310
Dallesasse, John Emcore Corporation

Comment Type **TR** *Comment Status* **D** *Optical*

The lane wavelengths used for the 40GBASE-LR4 PMD should be the same as the wavelengths used for the Clause 53 10GBASE-LX4 PMD. This will allow maximum re-utilization of laser and optical demultiplexer technologies developed for 10GBASE-LX4. Reducing development costs have a direct impact on the economic feasibility of this project. It would be a mistake to walk away from a technology investment that has been paid for and proven over years of manufacturing. Additionally, the proposed reduction of the channel bandwidth from 13.4 nm (10GBASE-LX4) to 13 nm (40GBASE-LR4) would have some impact on laser yields and consequently cost. In order to allow a 0-70 C module operating range, the lasers need to be in spec from -5 to +85C. Assuming 0.1 nm/C, 9 nm of the band is taken by temperature. Approximately 1.5 nm is allocated for guard bands. Consequently, the window that is being targeted for laser operation at a given temperature is 2.5 nm for the proposed 40GBASE-LR4 versus 2.9 nm for 10GBASE-LX4.

SuggestedRemedy

Change all references for L0, L1, L2, and L3 to match the wavelength specifications in Clause 53 (10GBASE-LX4).

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Editor's note: added missing subclause number 87.5 to subclause field

Baseline proposal wavelengths were selected to minimize worst case dispersion penalty and loss.

Cl **87** *SC* **87.5** *P* **230** *L* **11** # 69
Chung, Hwan Seok ETRI

Comment Type **T** *Comment Status* **D** *Edit*

correct typo and insert space between 20 and nm. Change from "20nm" to "20 nm"

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Cl **87** *SC* **87.6** *P* **230** *L* **34** # 80
Sun Hyok, Chang Electronics and Teleco

Comment Type **T** *Comment Status* **D** *Optical*

In line 34, 'operational range' is written. The term 'operating range' is used in line 32 and in the title of Table 87-6. So, 'operational range' needs to be changed to 'operating range'.

SuggestedRemedy

'operational range' has to be replaced by 'operating range'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Editor's note: added missing subclause number 87.6 to subclause field]

Cl **87** *SC* **87.6** *P* **230** *L* **41** # 77
Sun Hyok, Chang Electronics and Teleco

Comment Type **T** *Comment Status* **D** *Optical*

In Table 87-6, I think 'Minimum range' is confusing expression. Because '2m to 10 km' is not 'minimum'.

SuggestedRemedy

'Operating range' is easier to be understood. 'Minimum range' has to be replaced by 'Operating range'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Editor's note: added missing subclause number 87.6 to subclause field]

Cl **87** *SC* **87.6.1** *P* **231** *L* **13** # 488
Dudek, Mike JDSU

Comment Type **TR** *Comment Status* **D** *Optical Power*

Optical receivers are in general limited by the peak power of the input signal (Average power is less important). As the spec stands the receiver has to cope with the maximum input average power at infinite extinction ratio with the allowed eye mask overshoot. This is much more than is likely to happen in practice. We should limit the peak power explicitly. (The suggested value equates to the Maximum average power at 9dB ER without overshoot).

SuggestedRemedy

Add extra rows to Tables 87-7, and 87-8,

Peak Power Max 4.5dBm. (no min)

To this row in table 87-7 add a footnote. Peak Power is the maximum value of the power as measured on the eye diagram see 86.7.4.7

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

To be discussed in task force

Cl **87** *SC* **87.6.1** *P* **231** *L* **30** # 487
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D** *Optical Reflections*

With a specification for the receiver reflection of -26dB there is no need to require the Transmitter to tolerate a 12dB reflection. The cable is limited to 26dB return loss at any discrete reflection. A tolerance to 20dB reflection would appear adequate.

SuggestedRemedy

Change optical return loss tolerance from 12dB to 20dB on line 30. Change RIN12 to RIN20 on line 28. Change RIN12 to RIN20 in 87.7.7 page 236 line 20 and insert "that the reflection is 20dB and" between "exception" and "that" on page 236 line 21, change 12db to 20dB for optical retun loss in table 87-11 on page 235 line 17, and change from TBD to 21 for the optical retun loss in table 87-13 page 239 line 17.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Cl **87** *SC* **87.6.1** *P* **231** *L* **33** # 185
Cole, Chris Finisar

Comment Type **T** *Comment Status* **D** *Optical Mask*

Table 87-7-40GBASE-LR4 transmit characteristics
Transmit eye mask definition {X1, X2, X3, Y1, Y2, Y3} TBD
The adopted 40GBASE-LR4 baseline (cole_01_0908) also had a footnote which stated "Tx eye mask spec to be specified as per eye mask methodology discussions." This specifically referred to using the results of the Statistical Eye discussions, which have now been formalized in the Statistical Eye Ad Hoc.
Since there is no final concensus recommendation from the Statistical Eye Ad Hoc, the specification TBD can not be completed.

SuggestedRemedy

Replace TBD in Table 87-7 with eye mask coordinates as in Clause 52, Table 52.12. Add Transmitter Optical Waveform measurement procedure as in Clause 52 Section 52.9.7. Remove references to 10GBASE-L and 10GBASE-W, from second and third sentence, respectively.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Proposed response to follow anslow_07_1108

Cl **87** *SC* **87.6.3** *P* **232** *L* **17** # 633
CHANG, Frank Vitesse

Comment Type **TR** *Comment Status* **D** *Optical*

edits in table 87-8,

SuggestedRemedy

Suggest the change:
- Feel Rx reflectance should be MAX, not min specs.
- Add Stress eye jitter specs as conition for SRS.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: Note Page number and line corrected to point to Table 87-8]

Change to 'Receiver reflectance (max)'
Add note to refer to Stressed eye conditions in section 87.7.11

Cl **87** *SC* **87.6.3** *P* **233** *L* **2** # 634
CHANG, Frank Vitesse

Comment Type **TR** *Comment Status* **D** *Optical*

In Table 87.9, Allocation for penalties sound too optimistic. 10GBase-L allocate 3.2dB while LR4 is only 2.3dB with xtlk.

SuggestedRemedy

Suggest to consider 4-4.2dB, and change RX parameters in Table 87-8 accordingly.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The allocation for penalties was part of baseline proposal adopted by the task force. The commenter is invited to present evidence to the task force to support a change in values.

Cl **87** *SC* **87.7.1** *P* **233** *L* **31** # 384
King, Jonathan Finisar

Comment Type **T** *Comment Status* **D** *Test Patterns*

No Table of Test Patterns
.....

also applies to Clause 88

SuggestedRemedy

Insert table similar to Table52-21-Test patterns in clause 52

into section 87.7.1 and 88.8.1

with:
Pattern 1 TBD
Pattern 2 TBD
Pattern 3 PRBS31b PRBS31c

and notes under table as:

aThis pattern is defined in TBD.
bThis is the test-pattern checker defined in 49.2.12.
cThis is the test-pattern checker defined in 50.3.8.2.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Cl **87** *SC* **87.7.1** *P* **233** *L* **36** # 387
King, Jonathan Finisar

Comment Type **T** *Comment Status* **D** *Test Patterns*

NOTE has unnecessary TBD, this is a general statement about test patterns used for testing optical parameters

also applies to 88.8.2

SuggestedRemedy

New text for Note

NOTE- Although test patterns are designed to emulate system operation, they do not form valid 40GBASE-R signals.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **87** *SC* **87.7.1** *P* **233** *L* **36** # 422
Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**

double period (..), Delete one period at the end of the Note.

SuggestedRemedy

per comment

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **87** *SC* **87.7.2** *P* **233** *L* **42** # 490
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D** *Testing*

It is bad practice to specify things in two places.

SuggestedRemedy

Change "using a valid 40GBASE-R signal" with "using the test pattern defined in table 87-10."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See also comment 383, 499

Cl **87** *SC* **87.7.2** *P* **233** *L* **42** # 388
King, Jonathan Finisar

Comment Type **TR** *Comment Status* **D** *Testing*

OSA resolution is TBD
Suggest use 0.1nm
This value is small enough to allow accurate wavelength measurement, and is readily achievable with currently available OSAs
.....

Also applies to 88.8.2

SuggestedRemedy

replace TBD with 0.1nm

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Cl **87** *SC* **87.7.2** *P* **233** *L* **42** # 383
King, Jonathan Finisar

Comment Type **T** *Comment Status* **D** *Test Patterns*

paragraph requires a valid 40GBASE-R signal; should also allow an appropriate test pattern to be used.
(the note in 87.7.1 says test patterns are not valid 40GBASE-R signals)

also applies to 88.8.2

SuggestedRemedy

add text to end of paragraph:

'... valid 40GBASE-R signal, or test pattern referenced in Table 87-10.'

similar remedy for 88.8.2

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See also comment 490, 499

Cl **87** *SC* **87.7.5** *P* **234** *L* **37** # 386
King, Jonathan Finisar

Comment Type **T** *Comment Status* **D** *Testing*

The optical filter is undefined

also applies to 88.8.5

SuggestedRemedy

Add wording extracted from Editors note (p234 line 42ff), and reference to G959.1 :

The optical filter passband ripple shall be limited to 0.5 dB and the isolation is chosen such that the ratio of the power in the lane being measured to the sum of the powers of all of the other lanes is greater than 20 dB (See G959.1 Annex B).

and remove Editors note

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Cl **87** *SC* **87.7.5.1** *P* **235** *L* **4** # 491
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D** *Testing*

There are multiple different jitter measurements.

SuggestedRemedy

Change "Jitter less than 0.2UI" to "Total Jitter less than 0.2UI".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Cl **87** *SC* **87.7.5.4** *P* **236** *L* **7** # 423
Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**

typo, change to "seperate"

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change to 'separate', see 489

Cl **87** *SC* **87.7.5.4** *P* **236** *L* **7** # 489
Dudek, Mike JDSU

Comment Type **E** *Comment Status* **D**

wrong spelling

SuggestedRemedy

change sererate to separate.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **87** *SC* **87.7.6** *P* **236** *L* **14** # 499
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D** *Test Patterns*

It is bad practice to specify things in two places.

SuggestedRemedy

Change "using TBD test pattern or a valid 40GBASE-R signal" with "using the test pattern defined in table 87-10."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
See comments 383, 490

Cl **88** *SC* **88.1** *P* **243** *L* **12** # 161
D'Ambrosia, John Force10 Networks

Comment Type **T** *Comment Status* **D**

Table 88-1 does not include reference to Annex 83A, CAUI.

SuggestedRemedy

add row for Annex 83A, CAUI and mark optional.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **88** *SC* **88.1** *P* **243** *L* **21** # 367
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D** *FEC*

Won't 100GBASE-ER4 suffer from SOA noise and will benefit from FEC to achieve a suitably low BER reliably?

SuggestedRemedy

Add FEC to Table 88-1, at least as an option, and I suspect mandatory for 100GBASE-ER4. Do more investigation to find out if it needs be mandatory: maybe only for the longest links.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The optical power budgets in the adopted baseline were chosen to enable a BER of 10^-12 withiout the use of FEC. See for instance slide 17 of cole_02_0508.pdf

Cl **88** *SC* **88.12** *P* **262** *L* **14** # 93
Sun Hyok, Chang Electronics and Teleco

Comment Type **T** *Comment Status* **D**

In Table 88-17, 'DGD_max' is represented to describe the PMD (polarization mode dispersion) specification. But 'DGD_max' is not sufficient to give the PMD specification of the fiber link. Parameter of P(DGD_tot > DGD_max) is needed.(from the Method 2 of IEC 61282-3). P(DGD_tot > DGD_max) is the probability that a system DGD value, DGD_tot, exceeds DGD_max.

SuggestedRemedy

Parameter of P(DGD_tot > DGD_max) per each lane is needed in Table 88-17.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Subclause changed from 12 to 88.12]

See comment #94 for justification
See also comments #91 and #92

Cl **88** *SC* **88.12** *P* **262** *L* **15** # 208

Chung, Hwan Seok ETRI

Comment Type **T** *Comment Status* **D**

In Table 87-17, we propose DGD_max characteristics for 100GBASE-LR4 and 100GBASE-ER4 as "10 ps" and "7.6 ps", respectively.

SuggestedRemedy

The datails of DGD_max for 100GBASE-LR4 and 100GBASE-ER4 will be presented in November plenary.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[This comment taken to refer to Table 88-17]
[Subclause changed from 88-17 to 88.12]

Proposed resolution for 100GBASE-LR4 is 10 ps as proposed by both comments. Competing values of 7.6 ps and 10.3 ps for 100GBASE-LR4 need to be resolved by Task Force discussion.

See also comment #297

Cl **88** *SC* **88.12** *P* **262** *L* **15** # 297

Anslow, Peter Nortel Networks

Comment Type **T** *Comment Status* **D**

In Table 88-17 the values of DGD_max for 100GBASE-LR4 and 100GBASE-ER4 are "TBD".

SuggestedRemedy

Set DGD_max for 100GBASE-LR4 to 10 ps
Set DGD_max for 100GBASE-ER4 30 km to 10.3 ps
Set DGD_max for 100GBASE-ER4 40 km to 10.3 ps
See anslow_04_1108.pdf for detailed justification.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Proposed resolution for 100GBASE-LR4 is 10 ps as proposed by both comments. Competing values of 7.6 ps and 10.3 ps for 100GBASE-LR4 need to be resolved by Task Force discussion.

See also comment #208

Cl **88** *SC* **88.12** *P* **262** *L* **20** # 94

Sun Hyok, Chang Electronics and Teleco

Comment Type **T** *Comment Status* **D**

In line 20, it is written that 'DGD_max is the maximum differential group delay that the system must tolerate'. It is wrong. 'DGD_max' is defined in the Method 2 of IEC 61282-3. 'DGD_max' is defined with P(DGD_tot > DGD_max), which is the probability that a system DGD value, DGD_tot, exceeds DGD_max. 'DGD_max' and 'P(DGD_tot > DGD_max)' give the DGD specification of the fiber link.

SuggestedRemedy

The sentence 'DGD_max is the maximum differential group delay that the system must tolerate' is needed to be replaced by 'DGD_max is defined in the Method 2 of IEC 61282-3'

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[subclause changed from 12 to 88.12]

IEEE 802.3 has chosen to specify only the DGD_max that the system has to tolerate with the BER remaining within the specified limit. See 802.3 clause 52.13. This is also in line with ITU-T specifications for optical systems (e.g. G.691, G.959.1). Different users are able to tolerate a range of probabilities of the actual DGD exceeding the DGD_max value. (see anslow_01_0308.pdf slides 8 and 9). For a user to determine what average DGD his link should have the DGD_max value should be divided by the value of "S" corresponding to the probability acceptable to that user. Because of the wide range of probabilities that are acceptable for different Ethernet applications it is inappropriate to specify this value.

See also comments #91, #92 and #93

Cl **88** *SC* **88.12** *P* **262** *L* **21** # 511

Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

The channel characteristics for max channel insertion loss, and Positive and negative dispersion are a function of wavelength it would be good to note the wavelength range for which the values in table 87-13 apply.

SuggestedRemedy

Add a footnote to Channel insertion loss (max), Positivie dispersion (max), and negative dispersion (min). The footnote to say. "Over the wavelength range 1294.53nm to 1310.19nm."

Remove the editors note.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **88** *SC* **88.3** *P* **246** *L* **17** # 595
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **D**

PMD loopback function is missing

SuggestedRemedy

Please add PMD loopback function

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Subclause changed from 3 to 88.3]

Providing an optical loopback is not really practical. Providing an electrical loopback function will constrain the implementation options for the PMD circuitry as it requires a 100 Gbit/s path from the Tx side to the Rx side.

See also comment #594

Cl **88** *SC* **88.4** *P* **246** *L* **44** # 174
Alping, Arne Ericsson AB

Comment Type **E** *Comment Status* **D**

...and Receive functions which convey... (comma is missing)

SuggestedRemedy

Change to: ...and Receive functions, which convey...

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Subclause changed from 4 to 88.4]

Comma should also be added to 87.4

Cl **88** *SC* **88.4.1** *P* **247** *L* **26** # 501
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

It would be helpful to the reader to explicitly point out that there are no electrical specs for the 25G PMD service interface in this document. (See also Anslow_05_1108.pdf)

SuggestedRemedy

Change the first part of the note on figure 88-2 to "Specification of the retimer function and the electrical implementation of the PMD service interface is beyond the scope of this standard".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

This is done in the proposed diagram on slide 5 of anslow_05_1108.pdf

Cl **88** *SC* **88.4.4** *P* **248** *L* **45** # 502
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

The Signal Detect does not need to be guaranteed to be OK when the input signal is less than a valid link will supply. This level is the stressed sensitivity not the sensitivity.

SuggestedRemedy

Insert the word "stressed" in front of receiver on line 44 in table 88-4.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Only requiring SIGNAL_DETECT to be OK for powers above the stressed receiver sensitivity would mean that a link that is within specification could have SIGNAL_DETECT = FAIL. For 100GBASE-LR4 a transmitter could have a Tx OMA of -0.8 dBm and the channel insertion loss could be 6.3 dB. This would result in -7.1 dBm at the receiver which is below the stress sensitivity value and SIGNAL_DETECT could be set to FAIL.

Cl **88** *SC* **88.4.5** *P* **249** *L* **11** # 175
Alping, Arne Ericsson AB

Comment Type **E** *Comment Status* **D**

...of the Signal Detect function... (upper case letter for Signal Detect)

SuggestedRemedy

Change to: ...of the SIGNAL_DETECT function...

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Subclause changed from 4.5 to 88.4.5]

The parameter is "SIGNAL_DETECT" but the function that generates it is "Signal Detect"

Cl **88** *SC* **88.6** *P* **250** *L* **34** # 81
Sun Hyok, Chang Electronics and Teleco

Comment Type **T** *Comment Status* **D**

In line 34, 'operational range' is written. The term 'operating range' is used in line 32 and in the title of Table 88-6. So, 'operational range' in line 34 needs to be changed to 'operating range'.

SuggestedRemedy

'operational range' has to be replaced by 'operating range'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Subclause changed from 6 to 88.6]
See also comments #80 and #82

Cl **88** *SC* **88.6** *P* **250** *L* **41** # 78
Sun Hyok, Chang Electronics and Teleco

Comment Type **T** *Comment Status* **D**

In Table 88-6, I think 'Minimum range' is confusing expression. Because '2m to 10 km' is not 'minimum'.

SuggestedRemedy

'Operating range' is easier to be understood. 'Minimum range' has to be replaced by 'Operating range'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Subclause changed from 6 to 88.6]

Change "Minimum range" to "Required operating range" in Table 88-6.
Also change "operating at 12.5 km meets the minimum range requirement of 2 m to 10 km" to "operating at 12.5 km meets the operating range requirement of 2 m to 10 km" on page 250 line 35.

See also comments #77 and #79

Cl **88** *SC* **88.6.1** *P* **251** *L* **13** # 84
Hirotaka , Oomori Sumitomo Electric

Comment Type **T** *Comment Status* **D** *Optical Power*

The range between Max and Min transmitter launch OMA seems to be too narrow to have good yield.
The root cause is located at the low launch OMA max and the low receive OMA sensitivity.

Several numbers in Table.88-7 and 88-8 need to be modified.
A full justification is given in the attached file Oomori_01_1108.pdf

SuggestedRemedy

1) Change Transmitter launch OMA max from 4.0dBm to 4.5dBm
2) Change Transmitter average launch power (max) from 4.0dBm to 4.5dBm
3) Change Reciever OMA sensitivity from -8.1dBm to -8.6dBm

Other parameters are required to change as a consequence of this. For a full list see slide 13 of attached file Oomori_01_1108.pdf

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Page changed from 250 to 251]

Comment #505 proposes the Maximum OMA to be 5.5 dBm. To be resolved by the Task Force.

Cl **88** *SC* **88.6.1** *P* **251** *L* **19** # 505
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D** *Optical Power*

Optical receivers are in general limited by the peak power of the input signal (Average power or OMA is less important). As the spec stands the receiver has to cope with the maximum input average power with the maximum OMA and the allowed eye mask overshoot. This is much more than is likely to happen in practice and is also restricting the maximum OMA at lower average powers. We should limit the peak power explicitly, and relax the maximum OMA value. (The suggested value equates to a maximum OMA of 4.5dBm with a maximum Average power of 4.5dBM, or an ER of 4.7 at 4.5dBm average power).

SuggestedRemedy

Add an additional row in tables 88-7,88-8, with

Peak Power Max 6.3dBm. (no min)
Increase the Maximum OMA to 5.5dBm.

To the peak power row in table 87-7 add a footnote. Peak Power is the maximum value of the power as measured on the eye diagram see 88.8.8

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The need for this to be reviewed by the Task Force.

Comment #84 proposes the Maximum OMA to be 4.5 dBm. To be resolved by the Task Force.

Cl **88** *SC* **88.6.1** *P* **251** *L* **24** # 176
Alping, Arne Ericsson AB

Comment Type **E** *Comment Status* **D**

Transmitter and dispersion penalty, each lane (max) (acronyme is missing)

SuggestedRemedy

Cgange to: Transmitter and Dispersion Penalty (TDP), each lane (max)

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Subclause changed from "Table 88-7" to 88.6.1]

The current version is consistent with Table 87-7 and Table 52-12 of the base standard.

Cl **88** *SC* **88.6.1** *P* **251** *L* **3** # 621
CHANG, Frank Vitesse

Comment Type **T** *Comment Status* **D**

What is the inherent reason to use ER of 4dB, which seems ovioulsy odd?

SuggestedRemedy

suggest to change ER as 3.5dB or 6dB which look more realistic. (need to re-calculate the launch power numbers accordingly).

Also RIN to be -132dB/Hz is tough, suggest -128dB/Hz.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The ER of 4 dB was in the adopted baseline proposal. The suggested remedy has values that are both higher and lower than the current value suggesting that there is no good technical justification for the change.
The RIN value of -132 dB/Hz comes from the 128 dB/Hz requirement for 10GBASE-LR scaled by the relative receiver bandwidths. Using a value of 128 dB/Hz would significantly increase the penalty due to this effect.

Cl **88** *SC* **88.6.1** *P* **251** *L* **32** # 503
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

With a specification for the receiver reflection of -26dB there is no need to require the Transmitter to tolerate a 12dB reflection. The cable is limited to 26dB return loss at any discrete reflection. A tolerance to 20dB reflection would appear adequate.

SuggestedRemedy

Change optical return loss tolerance from 12dB to 20dB on line 32 table 88-7. Change RIN12 to RIN20 on line 30. Change RIN12 to RIN20 in 87.8.7 page 259 line 16 and insert "that the reflection is 20dB and" between "exception" and "that" on page 259 line 18, Also change the Optical return loss (min) for LR4 in Table 88-15 to 20dB.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

In addition to the changes proposed in this comment, in Table 88-17 change "Optical return loss" to "Optical return loss (min)" and set the value for 100GBASE-LR4 to 21 dB.

See also comment #381

Cl **88** *SC* **88.6.1** *P* **251** *L* **35** # 183
Cole, Chris Finisar

Comment Type **T** *Comment Status* **D** *Optical Mask*

Table 88-7-100GBASE-LR4 transmit characteristics
Transmit eye mask definition {X1, X2, X3, Y1, Y2, Y3} TBD
The adopted 100GBASE-LR4 baseline (cole_01_0708) also had a footnote which stated "Tx eye mask spec to be specified as per eye mask methodology discussions." This specifically referred to using the results of the Statistical Eye discussions, which have now been formalized in the Statistical Eye Ad Hoc.
Since there is no final concensus recommendation from the Statistical Eye Ad Hoc, the specification TBD can not be completed.

SuggestedRemedy

Replace TBD in Table 88-7 with eye mask coordinates as in Clause 52, Table 52.12. Add Transmitter Optical Waveform measurement procedure as in Clause 52 Section 52.9.7. Remove references to 10GBASE-L and 10GBASE-W, from second and third sentence, respectively.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

In Table 88-7 set {X1, X2, X3, Y1, Y2, Y3} to {0.25, 0.40, 0.45, 0.25, 0.28, 0.40} with editor's note that the numbers are provisional.
Replace clause 88.8.8 with text as proposed in anslow_07_1108.pdf

See also comments #184, #185, #385

Cl **88** *SC* **88.6.1** *P* **251** *L* **48** # 281
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

The second Editors Note underneath Table 88-7 beginning "The adopted baseline for 100GBASE-LR4 in anslow_01_0708.pdf had a value of 3.2 dBm" was only relevant before the draft was accepted by the Task Force and should now be deleted.

SuggestedRemedy

Delete this Editors Note

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **88** *SC* **88.6.2** *P* **252** *L* **24** # 635
CHANG, Frank Vitesse

Comment Type **TR** *Comment Status* **D**

In Table 88-8, RX reflectance should not be MIN specs. Also need Stress eye jitter specs as condition for SRS test.

SuggestedRemedy

- Change RX reflectance as MAX specs.
- Also Stress eye jitter specs as condition for SRS test.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **88** *SC* **88.6.2** *P* **252** *L* **26** # 644
Nicholl, Gary Cisco

Comment Type **T** *Comment Status* **D**

Do we need to specify what BER the Receiver sensitivity (OMA) paramter is specified for ? I am assuming that it is BER=10-12 (same as stressed receiver sensitivity) ?

We also need to clarify is this is the raw BER on the line or whether it is the effective BER after the error multiplication of the scrambler is taken into consideration (in which case the BER on the line is a factor of 3 less than specified). If it is indeed the former then we need to specify a way that it can be tested as this was an issue that came up in 10GE testing.

SuggestedRemedy

One possible solution would be to define an unframed PRBS test mode with no 64/66B encoding or scrambling enabled, to be used for testing all of the PMD optical parameters. However I am not sure how this would work for a MLD based interface (which needs the 64/66B encoding and MLD lane markers to operate) ?

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Subclause changed from 6.2 to 88.6.2]

Clause 88.8.10 starts "Receiver sensitivity, which is defined for an ideal input signal, is informative and testing is not required."

Cl **88** *SC* **88.6.3** *P* **253** *L* **13** # 622

CHANG, Frank Vitesse

Comment Type **T** *Comment Status* **D**

In Table 88-9, Allocation for penalties is too optimistic, which is not conparable to even 10Gbase-LR signal channel specs.

SuggestedRemedy

Suggest to consider adding the extra xtalk spenalty, which should let the total penalties to fall within 3.5 to 4dB.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The penalty due to crosstalk is entirely within the receiver. It is not necessary (or desirable) to specify the crosstalk penalty. This penalty is taken in to account when a realistic value is set for the required sensitivity.

Cl **88** *SC* **88.7** *P* **253** *L* **26** # 82

Sun Hyok, Chang Electronics and Teleco

Comment Type **T** *Comment Status* **D**

In line 26, 'operational range' is written. The term 'operating range' is used in line 23 and in the title of Table 88-10. So, 'operational range' in line 26 needs to be changed to 'operating range'.

SuggestedRemedy

'operational range' has to be replaced by 'operating range'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

[Subclause changed from 7 to 88.7]

See also comments #80 and #81

Cl **88** *SC* **88.7** *P* **253** *L* **33** # 79

Sun Hyok, Chang Electronics and Teleco

Comment Type **T** *Comment Status* **D**

In Table 88-10, I think 'Minimum range' is confusing expression. Because '2m to 30 km' or '2m to 40 km' is not 'minimum'.

SuggestedRemedy

'Operating range' is easier to be understood. 'Minimum range' has to be replaced by 'Operating range'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Subclause changed from 7 to 88.7]

Change "Minimum range" to "Required operating range" in Table 88-10.
Also change "operating at 42.5 km meets the minimum range requirement of 2 m to 30 km" to "operating at 42.5 km meets the operating range requirement of 2 m to 30 km" on page 253 line 26.
See also comments #77 and #78

Cl **88** *SC* **88.7.1** *P* **254** *L* **19** # 506
Dudek, Mike JDSU

Comment Type **TR** *Comment Status* **D** *Optical Power*

Optical receivers are in general limited by the peak power of the input signal (Average power or OMA is less important). As the spec stands the receiver has to cope with the maximum input average power with the maximum OMA and the allowed eye mask overshoot. This is much more than is likely to happen in practice and is also restricting the maximum OMA at lower average powers. We should limit the peak power explicitly, and relax the maximum OMA value. (The suggested value equates to a maximum OMA of 4.0dBm with a maximum average power of 2.4dBM without overshoot,

SuggestedRemedy

Add an additional row in tables 88-11 and 88-12 with

Peak Power Max 4.8dBm. (no min)
Increase the Maximum OMA to 5.0dBm.

To the peak power row in table 87-11 add a footnote. Peak Power is the maximum value of the power as measured on the eye diagram see 88.8.8

Proposed Response *Response Status* **W**

PROPOSED REJECT.

It is not clear what benefit this extra requirement brings to an application that is expected to implement the receiver with an SOA which has its gain controlled to meet the overload specification.
OMA is defined in clause 1.4.251 as "The absolute difference between the optical power of a logic one level and the optical power of a logic zero level." It is difficult to see why the OMA limit is proposed to be higher than the Peak power limit since the one level cannot be above the peak power and the zero level cannot be less than zero.

Cl **88** *SC* **88.7.1** *P* **254** *L* **25** # 623
CHANG, Frank Vitesse

Comment Type **T** *Comment Status* **D**

ER=8dB sound odd as compare with prevailing TX specs.

SuggestedRemedy

As EML at 1310nm is assumed, suggest ER=8.2d or 6dB, which is more popular in ITU or IEEE specs. Also change RIN <-132dB/Hz to -128dB/Hz for std specs.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The ER of 8 dB was in the adopted baseline proposal. The suggested remedy has values that are both higher and lower than the current value suggesting that there is no good technical justification for the change.
The RIN value of -132 dB/Hz comes from the 128 dB/Hz requirement for 10GBASE-LR scaled by the relative receiver bandwidths. Using a value of 128 dB/Hz would significantly increase the penalty due to this effect.

Cl **88** *SC* **88.7.1** *P* **254** *L* **33** # 184
Cole, Chris Finisar

Comment Type **T** *Comment Status* **D** *Optical Mask*

Table 88-11-100GBASE-ER4 transmit characteristics
Transmit eye mask definition {X1, X2, X3, Y1, Y2, Y3} TBD
The adopted 100GBASE-ER4 baseline (cole_02_0708) also had a footnote which stated "Tx eye mask spec to be specified as per eye mask methodology discussions." This specifically referred to using the results of the Statistical Eye discussions, which have now been formalized in the Statistical Eye Ad Hoc.
Since there is no final concensus recommendation from the Statistical Eye Ad Hoc, the specification TBD can not be completed.

SuggestedRemedy

Replace TBD in Table 88-11 with eye mask coordinates as in Clause 52, Table 52.12. Add Transmitter Optical Waveform measurement procedure as in Clause 52 Section 52.9.7. Remove references to 10GBASE-L and 10GBASE-W, from second and third sentence, respectively.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

In Table 88-11 set {X1, X2, X3, Y1, Y2, Y3} to {0.25, 0.40, 0.45, 0.25, 0.28, 0.40} with editor's note that the numbers are provisional.

Replace clause 88.8.8 with text as proposed in anslow_07_1108.pdf

See also comments #183, #185, #385

Cl **88** *SC* **88.7.2** *P* **254** *L* **30** # 504
Dudek, Mike JDSU

Comment Type **TR** *Comment Status* **D**

With a specification for the receiver reflection of -26dB there is no need to require the Transmitter to tolerate a 12dB reflection. The cable is limited to 26dB return loss at any discrete reflection. A tolerance to 20dB reflection would appear adequate.

SuggestedRemedy

Change optical return loss tolerance from 12dB to 20dB on line 30 Table 88-11. Change RIN12 to RIN20 on line 28. And if my comment 35 is not accepted Change RIN12 to RINx in 87.8.7 page 259 line 16 and insert "that the reflection is xdB and" between "exception" and "that" on page 259 line 18. Also add a sentence at the end of this sentence. The value of x is given in the relevant table. Also change the optical return loss (min) for ER4 to 20dB in Table 88-15

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

In addition to the changes proposed in this comment, in Table 88-17 change "Optical return loss" to "Optical return loss (min)" and set the value for 100GBASE-ER4 to 21 dB for both the 30km and 40km operating distances.

See also comment #381

Cl **88** *SC* **88.7.2** *P* **255** *L* **1** # 83
Cole, Chris Finisar

Comment Type **T** *Comment Status* **D** *Optical Power*

Table 88-12

A comment has been submitted for Table 88-7 and 88-8 (10GBASE-LR4 transmit characteristics) to increase the max optical power by 0.5dB. The purpose of this comment for Table 88-12 is to align the 10GBASE-ER spec (40km) with the changes proposed to the 10GBASE-LR (10km) spec. This will make the 40km spec consistent with the intent of 802.3ba when it adopted it as baseline, specifically that it have interoperable overload characteristics with the 10km spec.

SuggestedRemedy

The following three changes are proposed for table 88-12-100GBASE-ER4 receive characteristics:

Receive power, per lane OMA (max): 4.0dBm => 4.5dBm
Average receive power, per lane (max): 4dBm => 4.5dB
Damage threshold: 5.0dBm -> 5.5dBm

The SOA overload data presented in 802.3ba during this year fully supports increasing overload by 0.5dB.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **88** *SC* **88.7.2** *P* **255** *L* **21** # 636
CHANG, Frank Vitesse

Comment Type **TR** *Comment Status* **D**

In Table 88-12, RX reflectance should not be MIN specs.

SuggestedRemedy

Change RX reflectance as MAX specs. Add Stress eye jitter as condition to SRS test.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **88** *SC* **88.7.3** *P* **256** *L* **12** # 637

CHANG, Frank Vitesse

Comment Type **TR** *Comment Status* **D**

In Table 88-13, the penalties for 40km sound too optimistic, which should show larger penalty than 30km.

SuggestedRemedy

The penalties for 40km should be 0.5dB higher than 30km, also suggest to change 40km IL as 16dB, as the IL is too pessimistic, keeping in mind ER4 has very tight link budget.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The allocation for penalties for the 40 km case has been supported by various contributions to the Task Force. Reducing the penalties for the 30 km case achieves little as it simply increases the additional insertion loss allowed.

If we assume 1.5 dB for connector loss, then the 18 dB insertion loss gives 16.5 dB for the loss of the fibre and splices. From the data used to produce slide 10 of anslow_01_0307.pdf referred to 1295 nm this covers about 70% of installed 40 km links. If we reduce the insertion loss from 18 dB to 16 dB, then we only get 14.5 dB for the loss of the fibre and splices. From the same data set as above, this only covers 6% of real installed links. Even reducing the connector loss to 1 dB results in a coverage of only 16% of links.

Cl **88** *SC* **88.8.1** *P* **256** *L* **34** # 424

Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**

double period (..). Delete a period at end of note.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **88** *SC* **88.8.10** *P* **259** *L* **43** # 177

Alping, Arne Ericsson AB

Comment Type **E** *Comment Status* **D**

...jitter and RIN... (missing comma)

SuggestedRemedy

Change to: ...jitter, and RIN...

Proposed Response *Response Status* **W**

PROPOSED REJECT.

[Subclause changed from 8.10 to 88.8.10]
[Page change from 250 to 259]

In a list, for example "Monday, Tuesday, Wednesday and Thursday" it is not usual to put a comma before the "and".

Cl **88** *SC* **88.8.2** *P* **256** *L* **40** # 507

Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**

It is bad practice to specify things in two places.

SuggestedRemedy

Change "using a valid 40GBASE-R signal" with "using the test pattern defined in table 88-14."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change "modulated using a valid 100GBASE-R signal." to "modulated using the test pattern defined in Table 88-14 or a valid 100GBASE-R signal."

See also comments #383, #484, #490, #499 and #510

Cl **88** *SC* **88.8.5.1** *P* **257** *L* **51** # 508
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**
There are multiple different jitter measurements.

SuggestedRemedy
Change "Jitter less than 0.2UI" to "Total Jitter less than 0.2UI".

Proposed Response *Response Status* **W**
PROPOSED ACCEPT IN PRINCIPLE.

Change from "Jitter less than 0.20 UI peak-peak" to "Total jitter less than 0.20 UI peak-peak"

See also comment #491

Cl **88** *SC* **88.8.5.4** *P* **259** *L* **4** # 509
Dudek, Mike JDSU

Comment Type **E** *Comment Status* **D**
spelling error

SuggestedRemedy
Change sereate to separate.

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

[Clause number changed from 87 to 88]

Cl **88** *SC* **88.8.5.4** *P* **259** *L* **4** # 179
Alping, Arne Ericsson AB

Comment Type **ER** *Comment Status* **D**
...filter to sererate the lane... (spelling error)

SuggestedRemedy
Change to: ...filter to separate the lane...

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

[Subclause changed from 8.5.4 to 88.8.5.4]

See also comment #425

Cl **88** *SC* **88.8.5.4** *P* **259** *L* **6** # 425
Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**
typo, change to "seperate"

SuggestedRemedy
per comment

Proposed Response *Response Status* **W**
PROPOSED REJECT.

Changed to "separate" as per comment #179

Cl **88** *SC* **88.8.6** *P* **259** *L* **11** # 510
Dudek, Mike JDSU

Comment Type **T** *Comment Status* **D**
It is bad practice to specify things in two places.

SuggestedRemedy
Change "using aTBD test pattern or a valid 40GBASE-R signal" with "using the test pattern defined in table 88-14."

Proposed Response *Response Status* **W**
PROPOSED ACCEPT IN PRINCIPLE.

Change "measured using TBD test pattern or a valid 100GBASE-R signal." to "measured using the test pattern defined in Table 88-14 or a valid 100GBASE-R signal."

See also comments #383, #484, #490, #499 and #507

Cl **99** *SC* *P* *L* # 641
Ganga, Ilango Intel

Comment Type **T** *Comment Status* **D**
Add Protocol implementation conformance statement (PICS) proforma to the end of the Clauses 82 to 88 and annex 83A.

SuggestedRemedy

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Affects clauses 81 through 88 and annex 83A

Cl **99** *SC* *P* **11** *L* # 125
D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**

Global - multiple instances where there are wrap-around issues with ToC. also multiple instances where there is no space between the clause # and the title of the clause or sub-clause.

SuggestedRemedy

Fix wraparound issues and add a space between the Clause # and title text.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Fix formatting where possible, some of this is tool issue in generating ToC.

Cl **99** *SC* *P* **16** *L* **22** # 127
D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**

Clause 86.8.2 - Laser Safety does not show up in ToC. Not sure if this is related to the fact that in the bookmarks that 86.8.2 shows up as a subclause under 86.8.1.

SuggestedRemedy

Correct ToC to show 86.8.2
correct bookmark in pdf file

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Check and fix any paragraph heading formatting issue in 86.8.2

Cl **99** *SC* *P* **18** *L* **52** # 126
D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**

The annex and the title of the annex are listed as separate entries in the ToC. Annex 30A - GDMO Specification for IEEE 802.3 Managed Object Classes
Annex 30B - GDMO and ASN.1 definitions for Management
Annex 69A - Interference Tolerance Testing
Annex 69B - Interconnect Characteristics
Annex 83A - 40 Gb/s Attachment Unit Interface (XLAUI) and 100 Gb/s Attachment Unit Interface (CAUI)

SuggestedRemedy

in ToC list Annex # and title on same line

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Check and update formatting of Annex title or ToC as appropriate

Cl **99** *SC* *P* **2** *L* **8** # 122
D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**

PPI is not listed as a keyword.

SuggestedRemedy

Add PPI to Keywords.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **99** *SC* *P* **21** *L* **43** # 282
Anslow, Peter Nortel Networks

Comment Type **E** *Comment Status* **D**

It would be useful to add external equations to the list of references marked in dark blue

SuggestedRemedy

Change "NOTE- Cross references that refer to clauses, tables, or figures not covered by this amendment are highlighted in dark blue." to "NOTE- Cross references that refer to clauses, tables, figures or equations not covered by this amendment are highlighted in dark blue."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **99** *SC* *P* **6** *L* **16** # 123

D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**

Listing of Editorial Team and Officers is incomplete.

SuggestedRemedy

Complete list provided below.

John D'Ambrosia
Task Force Chair

Ilango Ganga
Task Force Editor-in-Chief,
Editor, Clauses 1, 4, 80, Annexes A, 4A

Mark Gustlin
"Logic" Sub-task Force Chair
Editor, Clauses 81& 82

Chris DiMinico
"Cu" Sub-task Force Chair
Editor, Clause 85

Pete Anslow
"Optical" Sub-task Force Chair
Editor, Clause 88

Hugh Barrass
Editor, Clauses 30, 45, Annexes 30A, 30B

Piers Dawe
Editor, Clause 86

Jonathan King
Editor, Clause 87

Ryan Latchman
Editor, Annex 83A

Arthur Marris
Editor, Clauses 69, 73, 74, 84, Annexes 69A, 69B

Steve Trowbridge
Editor, Clause 83

George Oulundsen
Task Force Secretary

Frank Chang
Task Force Web Master

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **99** *SC* *P* **9** *L* **17** # 124

D'Ambrosia, John Force10 Networks

Comment Type **E** *Comment Status* **D**

Approval of standards is listed as 15 September 200x. Schedule for standard approval at June standards board meeting.

SuggestedRemedy

Change "15 September 200x" to "xx June 2010"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **99** *SC* **99** *P* **10** *L* **49** # 373

Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **D**

There is a newer version of this page

SuggestedRemedy

Ask P802.3av for it

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Check and update if appropriate

Cl **99** *SC* **99** *P* **14** *L* **30** # 72

Chung, Hwan Seok ETRI

Comment Type **T** *Comment Status* **D**

In page 14, line 30, the title 40GBASE-KR should be changed to 40GBASE-KR4.

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Fix the paragraph heading in 84.8. (ToC will get updated)

This comment can be considered as editorial

Cl **99** *SC* **99** *P* **3** *L* **8** # 371
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **D**
conciously

SuggestedRemedy
consciously

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Cl **99** *SC* **99** *P* **4** *L* **49** # 369
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **D**
I doubt that errata for all the world's standards are available at this URL.

SuggestedRemedy
Change 'all other standards' to 'all other IEEE standards'

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Cl **99** *SC* **99** *P* **4** *L* **5** # 372
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **D**
.Section

SuggestedRemedy
Section
Line 12, 10 split from Gb/s over a line break. Use non-breaking space and if necessary, the Frame option to stop s being split from Gb/.
Line 18, change 'of the IEEE Std 802.3 standard with' to 'of IEEE Std 802.3 with'
Line 23, use new .3av clause numbers (75 to 77, 75A, 75B, 75C, 76A)
Line 24, change 'operation point-to-multipoint' to 'operation on point-to-multipoint'

Proposed Response *Response Status* **W**
PROPOSED ACCEPT IN PRINCIPLE.

Fix typos as suggested

Update clause numbers for .3av as suggested

Check and update formatting as appropriate

Cl **A** *SC* *P* **265** *L* **12** # 426
Ganga, Ilango Intel

Comment Type **E** *Comment Status* **D**
Line 12, typo change to "Alphabetical"
Line 19, extra space, change to "2008."

SuggestedRemedy
per comment

Proposed Response *Response Status* **W**
PROPOSED ACCEPT.

Cl **A** *SC* **A** *P* **265** *L* **14** # 354
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **D**
As we are not doing the maintenance work to remove all references to ANSI/EIA/TIA-455-127-1991, we can't do this by a 'change'. But we should add the new TIA-455-127-A to the normative references, so no point adding it here also. Nothing to do.

SuggestedRemedy
Delete 'Change B8 as follows... Lasers Diodes.'

Proposed Response *Response Status* **W**
PROPOSED REJECT.

See response to comment # 351

Cl **A** *SC* **A** *P* **265** *L* **21** # 358
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **D**
SFP+ D3.1 should be available

SuggestedRemedy
Update reference Bx2

Proposed Response *Response Status* **W**
PROPOSED REJECT.

Provide reference to latest specification when available.

Cl **A** *SC* **A** *P* **266** *L* **1** # 359

Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **D**

Blank page

SuggestedRemedy

Continue learning how to stop Frame from doing this!

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Check and update frame options in Annex A