Cl **00** *SC* **0** *P* **1** *L* **1** # 54

Booth, Brad Microsoft

Comment Type **E** *Comment Status* **R**

Change bars seem to be shown for D2.0 in what is supposed to be a clean draft.

SuggestedRemedy

Watch for this when creating a clean draft.

Response *Response Status* **C**

REJECT.
The "clean" version has all text, figures, tables etc. as they would be for the published version without inserted or deleted text being shown. Leaving the change bars in this version is deliberate since it is helpful in showing the location of changes but does not disrupt the text, figures or tables of the draft.

Cl **00** *SC* **0** *P* **18** *L* **1** # 70

Booth, Brad Microsoft

Comment Type **E** *Comment Status* **R**

Insertion of blank pages is not required.

SuggestedRemedy

Change document formatting to eliminate blank pages.

Response *Response Status* **C**

REJECT.
The blank pages come from the IEEE sourced document template and are present in IEEE Std 802.3-2012 (e.g. Section 1 page 98) and published amendments e.g. IEEE Std 802.3bk-2013 page 12.

Cl **00** *SC* **0** *P* **75** *L* **42** # 63

Booth, Brad Microsoft

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

Need to be very careful in the use of 40GBASE-R. The 40GBASE-R family will include 40GBASE-LR4, 40GBASE-ER4 and 40GBASE-FR. If there needs to be distinction between 40GBASE-R and 40GBASE-R4, that should be highlighted.

SuggestedRemedy

Table 87-11 made me aware of this, but I believe it may occur in other places in the document and may require the definition of 40GBASE-R and 40GBASE-R4. I believe in this instance where the original text used 40GBASE-LR (which is not defined), the use may need to be 40GBASE-R4 (which would require a definition).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Follow the format used in Table 86-12 and change the text in Table 87-11 to:
3, 5, or valid 40GBASE-LR4 or 40GBASE-ER4 signal

Cl **01** *SC* **1.3** *P* **20** *L* **23** # 55

Booth, Brad Microsoft

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

IEC 61754-7-1 reference should not use 201x as its date as there is no IEC 61754-7-1:201x that can be found.

SuggestedRemedy

Change to be the current draft for IEC 61754-7-1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change the editor's note to: "IEC 61754-7-1 is currently in IEC approval process, expected publication May 2014. The connector types referenced here are currently described in IEC 61754-7." 201x will be replaced with the appropriate year (expected to be 2014) when the document is approved. If IEC 61754-7-1 is not approved in time to be referenced by this amendment then 95.11.3.2 will be revised to refer to IEC 61754-7.

Cl **01** *SC* **1.4** *P* **20** *L* **33** # 176

Law, David HP

Comment Type **E** *Comment Status* **A** *Bucket*

Once an amendment has been approved and published the 'P' in the designation is removed, hence IEEE Std P802.3bk-2013 should read IEEE Std 802.3bk-2013. Similarly, IEEE Std P802.3bj-201x should read IEEE Std 802.3bj-201x

SuggestedRemedy

Change 'IEEE Std P802.3bk-2013' to read 'IEEE Std 802.3bk-2013' and 'IEEE Std P802.3bj-201x' to read 'IEEE Std 802.3bj-201x' throughout the draft.

Response *Response Status* **C**

ACCEPT.

Cl **30** *SC* **30.5.1.1.2** *P* **23** *L* **11** # 110

Trowbridge, Steve — Alcatel-Lucent

Comment Type **E** *Comment Status* **R**

All clauses except clause 30 implemented the 802.3ba decision that the PMD nomenclature would just map a character string to a medium and reach and the characters themselves wouldn't stand for anything. Clause 30 seems to have retained an earlier "convention" where SR=short reach; LR=long reach; ER=extended reach. While the proposed addition for 40GBASE-ER4 using the words "extended reach" is consistent with others in clause 30, this is not consistent with the rest of the document.

SuggestedRemedy

Consider whether 40GBASE-ER4 should be described in clause 30 the same way as in Table 80-1 (four WDM lanes over single-mode fiber with reach up to at least 40km) rather than using the words "extended reach". The others in clause 30 could either be fixed by this project as a service to humanity or in maintenance.

Response *Response Status* **C**

REJECT.
The format used in P802.3bm D2.0 follows that for 100GBASE-ER4:
"100GBASE-R PCS/PMA over 4 WDM lane single mode fiber PMD, with extended reach, as specified in Clause 88".

If the format of all PHY types in 30.5.1.1.2 is to be changed, this should be done via maintenance and would need to be reflected in the IANA-maintained MAU-MIB module.
See:
http://www.iana.org/assignments/ianamau-mib

Cl **45** *SC* **45.2.1.12** *P* **30** *L* **16** # 25

Slavick, Jeff — Avago Technologies

Comment Type **ER** *Comment Status* **A** *Bucket*

Table 45-15 1.13.7 is missing the RO property

SuggestedRemedy

Add missing RO property to 1.13.7

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See response to comment #174

Cl **45** *SC* **45.2.1.12** *P* **30** *L* **16** # 174

Law, David — HP

Comment Type **E** *Comment Status* **A** *Bucket*

Bit 1.13.7 is missing an entry in the R/W column of Table 45-15.

SuggestedRemedy

Add 'RO' in the R/W column for bit 1.13.7.

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.12** *P* **30** *L* **18** # 33

Grow, Robert — RMG Consulting

Comment Type **E** *Comment Status* **A** *Bucket*

RO is on the wrong line of table.

SuggestedRemedy

Move RO up to 1.13.7

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In the base standard the Reserved row has "RO" in the "R/W" column.
See response to comment #174

Cl **45** *SC* **45.2.1.12.6b** *P* **30** *L* **43** # 175

Law, David — HP

Comment Type **E** *Comment Status* **A** *Bucket*

If the two new subclauses are being inserted after 45.2.1.12.5 shouldn't they be numbered 45.2.1.12.5a and 45.2.1.12.5b as indicated in the editing instructions.

SuggestedRemedy

Change '45.2.1.12.6b' to read '45.2.1.12.5b'.

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.3** *P* *L* # 31

Grow, Robert RMG Consulting

Comment Type **T** *Comment Status* **A**

This comment has also been submitted as a Revision Request but since this is the first PHY project that can be caught early on, I'm also submitting as an 802.3bm comment on behalf of the IEEE Registration Authority.

SuggestedRemedy

Add footnote (put footnote number at the end of the first paragraph of 45.2.1.3):
The use of only 22 bits of the OUI as described here has been deprecated by the IEEE Registration Authority, and therefore should not be used in new specifications.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

This request has also been submitted as Maintenance Request #1252. See: http://www.ieee802.org/3/maint/requests/maint_1252.pdf

Add a note to the end of 22.2.4.3.1 and 45.2.1.3 as suggested by the Maintenance Task Force (agreed January 20, 2014):
"NOTE - The use of only 22 bits of the OUI as described here has been deprecated by the IEEE Registration Authority. The definition of vendor specific device identifiers for other applications is expected to use the full 24 bits to accommodate the use of either an OUI or Company ID."

In both 22.2.4.3.1 and 45.2.1.3 also add the following Editor's note:
"Editor's Note (to be removed prior to publication): inserted based on maintenance request 1252.
See http://www.ieee802.org/3/maint/requests/maint_1252.pdf"

[Editor's note: Comment type set to "T"]

Cl **45** *SC* **45.2.1.6** *P* **26** *L* **8** # 177

Law, David HP

Comment Type **E** *Comment Status* **A**

There appears to be an additional set of unrecorded changes to the table - the word 'type' appended to all PMA/PMD type enumerations - with the exception of the EPON PMA/PMDs enumerations - has been deleted. As an example see see IEEE P802.3bj draft D3.0, page 39, line 16 which adds the enumerations '100GBASE-CR4 PMA/PMD type'.

SuggestedRemedy

I have no objection to doing this - but the text should be recorded as deleted through the use of strikeout text.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
IEEE Std 802.3-2012 does not have "type" at the end of any enumeration in Table 45-7.
IEEE Std 802.3bk-2013 did not add "type" to any of the enumerations.
IEEE P802.3bj D3.0 incorrectly shows the word "type" at the end of many of the base enumerations. These are not in underline font, so are not being added by 802.3bj. The three types being added by P802.3bj D3.0 have "type" at the end.

This situation has been corrected in D3.0 comment resolution.

Make no change to the P802.3bm draft.

Cl **45** *SC* **45.2.1.7.5** *P* **28** *L* **33** # 178

Law, David HP

Comment Type **E** *Comment Status* **A** *Bucket*

Any reason why 100GBASE-SR4 is added after 40GBASE-FR in Table 45-9 'Transmit fault description location' yet is added after 100GBASE-CR4 in Table 45-10 'Receive fault description location'.

SuggestedRemedy

Suggest that the same location should be used in both tables.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In Table 45-9, move the row for 100GBASE-SR4 to be after 100GBASE-CR4

Cl **45** *SC* **45.2.3** *P* **30** *L* **49** # 82

Barrass, Hugh Cisco

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

It seems strange that a draft which makes no substantial change to teh PCS should require changes to the PCS registers.

The ability to support fast wake is defined for a PCS and can be supported independently of PMA/PMD. Therefore it is redundant to indicate EEE fast wake support for specific 40GBASE-R or 100GBASE-R PHY types. For this reason, 802.3bj added indications for the PCS regarding EEE fast wake and indications for specific PHY types regarding EEE deep sleep.

The PCS implementation may support deep sleep for specific PHY types because some EEE parameters may be specific according to the PMA/PMD. This is not the case for fast wake, as it operates with no interaction with the PMA/PMD and naturally supports legacy PMA/PMD implementations that predate EEE.

SuggestedRemedy

Delete all changes to 45.2.3 and subclauses.

Also delete changes to 45.5.

Response *Response Status* **C**

ACCEPT.
See also comments 179 and 30

Cl **45** *SC* **45.2.3.9a** *P* **31** *L* **10** # 30

Marris, Arthur Cadence Design Syst

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

802.3bm only supports EEE fast wake operation (not deep sleep). EEE fast wake is transparent to the PMD so this register is redundant.

PHY fast wake support is indicated by the PCS bit 3.20.15 "100GBASE-R fast wake".

SuggestedRemedy

Delete subclause 45.2.3 and 45.5 for associated PICS item

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See response to comment #82

Cl **45** *SC* **45.2.3.9a** *P* **31** *L* **10** # 179

Law, David HP

Comment Type **T** *Comment Status* **A**

Register 3.21 'EEE capability 2 register' is a PCS register (MMD 3) therefore I'm not sure how the implementer of a PCS supporting register 3.21 would set bits 3.21.9 '100GBASE-ER4 EEE', 3.21.8 '100GBASE-LR4 EEE', 3.21.7 '100GBASE-SR4 EEE', 3.21.6 '100GBASE-SR10 EEE', 3.21.4 '40GBASE-ER4 EEE', 3.21.3 '40GBASE-LR4 EEE', 3.21.2 '40GBASE-FR EEE', 3.21.1 '40GBASE-SR4 EEE' since these are PHY types which would be dependent on the PMD which could potentially be pluggable.

I guess if the PCS supports 100GBASE-R fast wake then 100GBASE-LR4, 100GBASE-SR4 and 100GBASE-SR10 EEE is supported and all those bits can be set - however this seems to be redundant information based on the 100GBASE-R EEE fast wake supported (3.20.15). Similarly for the 40GBASE-ER4, 40GBASE-LR4, 40GBASE-FR and 40GBASE-SR4 there is already the 40GBASE-R EEE fast wake supported (3.20.10) bit.

SuggestedRemedy

Suggest that the bits in the EEE capability 2 (Register 3.21) are not required and therfore the register should not be added.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See response to comment #82

Cl **45** *SC* **45.2.3.9a** *P* **31** *L* **20** # 6

Marris, Arthur Cadence Design Syst

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

This should be indicating "deep sleep" capability

SuggestedRemedy

Change:
"EEE is"
To:
"EEE deep sleep is"

for all the port types and do id both for the "is" and "is not" lines

also change "EEE operation" to "EEE deep sleep operation" in the bit description sub clauses.

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **78** *SC* **78.1.3.3.1** *P* **37** *L* **24** # 56

Booth, Brad — Microsoft

Comment Type **ER** *Comment Status* **R**

Wording in this paragraph doesn't read well. While some of the text is not part of the modification being performed by 802.3bm, a service to humanity would make this text simpler.

Made this an ER so that it has a chance for review by a larger audience. Thanks.

SuggestedRemedy

Change to read:
For PHYs with an operating speed of 40 Gb/s or 100 Gb/s that implement the optional EEE capability, two modes of LPI operation may be supported: deep sleep and fast wake. Deep sleep refers to the mode for which the transmitter ceases transmission during Low Power Idle (as shown in Figure 78-3) and is only defined for PHYs with an operating speed less than 40 Gb/s. For 40 Gb/s and 100 Gb/s PHYs, deep sleep is optional, and exceptions are noted in Table 78-1. Fast wake refers to the mode for which the transmitter continues to transmit signals during Low Power Idle so that the receiver can resume operation with a shorter wake time (as shown in Figure 78-3a). Fast wake is mandatory for 40 Gb/s and 100 Gb/s PHYs that implement EEE.

Response *Response Status* **C**

REJECT.
The text that this comment proposes to change comes from the IEEE P802.3bj draft. The only modification being made by P802.3bm is to change:
"for those PHYs" to:
"for some of those PHYs (the exceptions are noted in Table 78-1)."
Since the text of IEEE P802.3bj is still in the balloting process, changes to this text should be made via comments on the P802.3bj draft.

Cl **78** *SC* **78.1.3.3.1** *P* **37** *L* **26** # 180

Law, David — HP

Comment Type **T** *Comment Status* **A**

The INITIALIZE state of the Figure 78-7 'EEE DLL Transmitter fast wake state diagram' of IEEE P802.3bj draft D3.0 (page 88) is entered based on an open arrow with the conditions (!tx_dll_enabled + !tx_dll_ready). Table 78-3 of IEEE Std 802.3-2012 (section 6, page 31) shows that the aLldpXdot3LocDllEnabled attribute maps to the tx_dll_enabled variable (aLldpXdot3LocDllEnabled => tx_dll_enabled) and subclause 30.12.2.1.29 of IEEE Std 802.3-2012 (section 2, page 506) defines the aLldpXdot3LocDllEnabled attribute as follows:

30.12.2.1.29 aLldpXdot3LocDllEnabled
ATTRIBUTE
APPROPRIATE SYNTAX:
A BOOLEAN value
FALSE: Local system has not completed auto-negotiation with a link partner that has indicated at least one EEE capability.
TRUE: Local system has completed auto-negotiation with a link partner that has indicated at least one EEE capability.
BEHAVIOUR DEFINED AS:
A GET operation returns the status of the EEE capability negotiation on the local system.;

Based on the above, the attribute aLldpXdot3LocDllEnabled, and hence the tx_dll_enabled variable, will remain false, holding the EEE DLL Transmitter fast wake state diagram in the INITIALIZE state, until auto-negotiation with a link partner that has indicated at least one EEE capability. This was not a problem for IEEE P802.3bj as all the PHYs that support EEE also support auto-negotiation, however with the addition of the PHYs in IEEE P802.3bm draft that do not support auto-negotiation, there is now no way for the EEE DLL Transmitter fast wake state diagram to exit the INITIALIZE state.

SuggestedRemedy

Potentially the simplest approach would seem to be to remove tx_dll_enabled as a condition in the open arrow equation leading to the INITIALIZE state. This however would leave tx_dll_ready as the only condition to exit the INITIALIZE state, meaning that EEE Fast Wake TLVs will be transmitted to the link partner once the local system is ready, to do so regardless of the ability of the link partner to process them. This may not be ideal from a diagnosis point of view - in this situation would the lack of response from the link partner indicate a fault in the link partner - or indicate the link partner is unable to support EEE.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
As EEE fast wake is being introduced to the 802.3 standard by P802.3bj, this comment was submitted as Rogue comment i-218 against P802.3bj D3.0. The Response to this comment was:
ACCEPT IN PRINCIPLE.
Removing tx_dll_enabled as a start condition will explicitly make fast wake compatible with optical interfaces and also with legacy copper PMA/PMDs that pre-date EEE. The latter was considered an advantage for fast wake when it was first adopted, so this change

restores a desirable feature. A station transmitting TLVs that aren't understood by a link partner is part of the normal behavior of LLDP as new capabilities are continuously being added.
Change figures 78-7 and 78-8 as follows:
Remove terms tx_dll_enabled and rx_dll_enabled, respectively, from entry condition into INITIALIZE state.

Make no change to the P802.3bm draft.

Cl **78** *SC* **78.1.4** *P* **37** *L* **49** # 83

Ran, Adee Intel

Comment Type **E** *Comment Status* **A**

The table mentions XLAUI/CAUI-n for which the only behavior relevant to EEE is shutdown. In addition it lists PHY types that do not support deep sleep. When XLAUI/CAUI-n is used in these PHY types, it cannot be shut down, so it has no EEE function. This is not explicitly mentioned anywhere.

SuggestedRemedy

Add a note or modify the existing note a, stating that XLAUI/CAUI-n shutdown is only supported when deep sleep is enabled.

Consider noting this in 78.1.3.3.1 as well.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Add note b to XLAUI/CAUI-10 and CAUI-4 to say:
XLAUI/CAUI-n shutdown is only supported when deep sleep is enabled.
See also comment #29

Cl **80** *SC* **80.4** *P* **43** *L* **45** # 57

Booth, Brad Microsoft

Comment Type **E** *Comment Status* **A** *Bucket*

Table 80-3 is placed on the next page in the middle of text for 80.5.

Same applies for Tables 80-4 and 80-5 in the middle of 80.7.

SuggestedRemedy

Change the table settings such that it is not inserted in the middle of the next subclause.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The default table format comes from the IEEE sourced document template and tables that are not within the section that first refers to them are common in IEEE Std 802.3-2012 (e.g. Section 4 Tables 45-7, 45-8).
However, the settings for some tables can be changed without introducing unacceptable gaps in the draft.
Change the settings for Table, 80-3, 80-4 and 80-5

Cl **82** *SC* **82.2.14** *P* **54** *L* **1** # 102

Ran, Adee Intel

Comment Type **T** *Comment Status* **R**

CAUI-4 receivers can introduce error bursts (e.g. if implemented with a DFE, or due to other reasons), which could compromise MTTFPA. Error burst detection is not currently defined, so links with high burst rates cannot be identified.

Bursts can be identified and counted using multi-lane BIP mismatch counting. This is suggested as an optional diagnostic feature, which extends the BER estimate provided by the per-lane BIP counters.

SuggestedRemedy

A detailed technical contribution will be supplied.

Response *Response Status* **C**

REJECT.
See ran_01a_0114_optx

There was no consensus to add MBMC as a new optional PCS feature.

Cl **83** *SC* **83.1.4** *P* **55** *L* **51** # 58

Booth, Brad Microsoft

Comment Type **E** *Comment Status* **A** *Bucket*

Figure 83-2 is inserted in the middle of the text for items b) and c).

SuggestedRemedy

Change figure settings so the figure is not inserted in the middle of text.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Figures that are not within the section that first refers to them are common in IEEE Std 802.3-2012 (e.g. Section 4 Figure 48-7).
However, the placement of some figures can be changed without introducing unacceptable gaps in the draft.
Move the option b) text to be below Figure 83-2

Cl **83** *SC* **83.5.6** *P* **60** *L* **5** # 112

Trowbridge, Steve — Alcatel-Lucent

Comment Type **T** *Comment Status* **A**

Clause 87.2 is extended in this draft to cover 40GBASE-ER4 in additoin to 40GBASE-ER4, but this is not reflected in this bullet.

SuggestedRemedy

Change "97.2, which specifies the PMD service interface for 40GBASE-LR4 PMDs" to "97.2, which specifies the PMD service interface for 40GBASE-LR4 and 40GBASE-ER4 PMDs"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change "87.2, which specifies the PMD service interface for 40GBASE-LR4 PMDs" to "87.2, which specifies the PMD service interface for 40GBASE-LR4 and 40GBASE-ER4 PMDs"

Cl **83** *SC* **83C.1a.2** *P* **138** *L* **20** # 168

Thaler, Pat — Broadcom

Comment Type **T** *Comment Status* **R** *Bucket*

In the lower PMA box, (4:4) should be (20:4)

SuggestedRemedy

Response *Response Status* **C**

REJECT.
The RS-FEC sublayer (defined in Clause 91 of P802.3bj D3.0) converts the 20 PCS lanes to 4 FEC lanes, so 4:4 is appropriate. See Figures 80-5a, 83C-2a, 83C-2b in P802.3bj D3.0.
[Editor's note: Comment type set to T]

Cl **83A** *SC* **83A** *P* **121** *L* **8** # 68

Booth, Brad — Microsoft

Comment Type **T** *Comment Status* **A**

Wording should be improved as ten-lane 100 Gb/s sounds like a terabit. :-)

Same applies to Annex 83B.

SuggestedRemedy

Change to read in title and annex:
100 Gb/s ten-lane attachment unit interface

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The titles of Annexes 83A and 83B were chosen to be in a similar format to those of Annexes 83D and 83E. If this change is agreed to be made then:
Change the title of Annex 83A to:
"40 Gb/s Attachment Unit Interface (XLAUI) and 100 Gb/s ten-lane Attachment Unit Interface (CAUI-10)"
Change the title of Annex 83B to:
"Chip-to-module 40 Gb/s Attachment Unit Interface (XLAUI) and 100 Gb/s ten-lane Attachment Unit Interface (CAUI-10)"
Change the title of Annex 83D to:
"Chip-to-chip 100 Gb/s four-lane Attachment Unit Interface (CAUI-4)"
Change the title of Annex 83E to:
"Chip-to-module 100 Gb/s four-lane Attachment Unit Interface (CAUI-4)"

In 69.1.2 f) and 80.1.3 c) change "four lane 100 Gigabit" to "100 Gigabit four-lane"
In 69.1.2 g) and 80.1.3 d) change "ten-lane 100 Gigabit" to "100 Gigabit ten-lane"

In Figures 80-5a, 83-2, 83A-1, 83C-2, 83C-4, 83C-5 change "TEN-LANE 100 Gb/s" to "100 Gb/s TEN-LANE"
In Figures 80-5a, 83-2, 83C-2b, 83C-5, 83D-1, 83E-1 change "FOUR-LANE 100 Gb/s" to "100 Gb/s FOUR-LANE"

In 83A.1, the title of 83A.7, 83A.7.1, 83A.7.2.2, 83B.1, the title of 83B.4, 83B.4.1, 83B.4.2.2, change "ten-lane 100 Gb/s" to "100 Gb/s ten-lane"

In 83D.1 change "four lane chip-to-chip 100 Gb/s" to "chip-to-chip 100 Gb/s four-lane"
In the titles of 83D.5 and 83D.5.4, in 83D.5.1, and 83D.5.2.2 change "Four lane 100 Gb/s" to "Chip-to-chip 100 Gb/s four-lane"
In 83E.1, the titles of 83E.5 and 83E.5.4, in 83E.5.1, and 83E.5.2.2 change "four lane chip-to-module 100 Gb/s" to "chip-to-module 100 Gb/s four-lane"

Cl **83A** *SC* **83A.3.2a** *P* **123** *L* **50** # 29

Marris, Arthur — Cadence Design Syst

Comment Type **T** *Comment Status* **A**

Why not support CAUI-4 shutdown as well as CAUI-10 shutdown? CAUI-4 may be used with PHYs that support deep sleep mode.

SuggestedRemedy

Change CAUI-10 to CAUI-n in this subclause.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
This subclause is in Annex 83A which is specific to CAUI-10. It is not appropriate to introduce requirements on a CAUI-4 implementation in this annex.

Make changes to Annex 83D equivalent to the changes made to Annex 83A in IEEE P802.3bj D3.0 ("XLAUI/CAUI-10 shutdown" becoming "CAUI-4 shutdown")

Cl **83A** *SC* **83A.5** *P* **126** *L* **15** # 91

Ran, Adee — Intel

Comment Type **T** *Comment Status* **R**

Normative statements should refer to measurement results rather than test equipment settings.

SuggestedRemedy

Change "shall be" to "is".

Response *Response Status* **C**

REJECT.
This text is part of the base standard and does not need to be changed due to any of the modifications being done by the P802.3bm project.

Cl **83B** *SC* **83B.1** *P* **13120** *L* **20** # 92

Ran, Adee — Intel

Comment Type **T** *Comment Status* **R**

"The purpose of this annex is to provide electrical characteristics and associated compliance points for pluggable module applications that use the XLAUI/CAUI-10 interface and shall use the same number of lanes and signaling rate defined in Annex 83A"

This sentence is malformed, and it creates an illegible normative statement.

SuggestedRemedy

Change "and shall use" to "with".

Response *Response Status* **C**

REJECT.
This text is part of the base standard and does not need to be changed due to any of the modifications being done by the P802.3bm project.

Cl **83B** *SC* **83B.2.3** *P* **133** *L* **40** # 93

Ran, Adee — Intel

Comment Type **T** *Comment Status* **R**

Normative statements should refer to measurement results rather than test equipment requirements and settings.

SuggestedRemedy

Change "shall be defined" to "are defined".

Change
"Random jitter is added to the test signal using an interference generator, which is a broadband noise source capable of producing white Gaussian noise with adjustable amplitude. The power spectral density shall be flat to ±3 dB from 50 MHz to 6 GHz with a crest factor of no less than 5"
to
"Random jitter is added to the test signal using an interference generator, which is a broadband noise source capable of producing white Gaussian noise with adjustable amplitude, a crest factor of no less than 5, and flat power spectral density (up to to ±3 dB) from 50 MHz to 6 GHz".

Change "random jitter injection shall meet the receiver eye mask" to "random jitter injection are adusted to meet the receiver eye mask".

Change "All XLAUI/CAUI-10 lanes shall be active" to "All XLAUI/CAUI-10 lanes are active".

Response *Response Status* **C**

REJECT.
This text is part of the base standard and does not need to be changed due to any of the modifications being done by the P802.3bm project.

Cl **83B** *SC* **83B.4.3** *P* **135** *L* **28** # 94

Ran, Adee Intel

Comment Type **E** *Comment Status* **R**

NOL and RATE refer to Annex 83A. The same items also exist in the PICS for Annex 83A.

SuggestedRemedy

Delete these items.

Response *Response Status* **C**

REJECT.
While these two items refer to Annex 83A in the Subclause column, they are mandatory features of the chip-to-module XLAUI and CAUI being defined in Annex 83B. This text is part of the base standard and does not need to be deleted due to any of the modifications being done by the P802.3bm project.

Cl **83C** *SC* **83C.1a.2** *P* **138** *L* **10** # 95

Ran, Adee Intel

Comment Type **T** *Comment Status* **A**

This figure originally had CAUI-10 between PCS and RS-FEC, which is a valid partitioning example. With the modification to CAUI-4 it is practically identical to Figure 83D-1, and is redundant.

SuggestedRemedy

Revert to original figure and change CAUI to CAUI-10 in the figure and the subclause title.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change the title of 83C.1a.2 to: "Single CAUI-10 with RS-FEC"
Change the title of Figure 83C-2b to: "Example single CAUI-10 with RS-FEC"
In Figure 83C-2b change:
PMA (20:4), CAUI-4, PMA (4:20) to:
PMA (20:10), CAUI-10, PMA (10:20)
and change the expansion of CAUI-4 to be for CAUI-10 (noting any effect due to Comment #68).

To maintain the balance between examples of CAUI-10 and CAUI-4 in Annex 83C, also:
Change the title of 83C.2.2 to: "Single XLAUI/CAUI-4 without FEC"
Change the title of Figure 83C-4 to: "Example single XLAUI/CAUI-4 without FEC"
In Figure 83C-4 change:
PMA (20:10), CAUI-10, PMA (10:4) to:
PMA (20:4), CAUI-4, PMA (4:4)
and change the expansion of CAUI-10 to be for CAUI-4 (noting any effect due to Comment #68).

Cl **83C** *SC* **83C.2.3** *P* **140** *L* **1** # 96

Ran, Adee Intel

Comment Type **E** *Comment Status* **R**

This subclause is titled "separate SERDES", but at least in the 40GBASE-R case, it is not a SERDES . A better title would be "XLAUI/CAUI extender for optical module interface". Compare to XGMII extender, figure 47-1.

SuggestedRemedy

Change subclause title and figure caption to "XLAUI/CAUI extender for optical module interface".

Response *Response Status* **C**

REJECT.
This text is part of the base standard and does not need to be changed due to any of the modifications being done by the P802.3bm project.

Cl **83D** *SC* **83D** *P* **141** *L* **6** # 69

Booth, Brad Microsoft

Comment Type **T** *Comment Status* **A**

Four lanes of 100G or 100G over 4 lanes.

Same applies to Annex 83E.

SuggestedRemedy

Change text in Annex to read:
100 Gb/s 4-lane attachment unit interface.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See comment #68

Cl **83D** *SC* **83D.1** *P* **141** *L* **10** # 52

Ghiasi, Ali — Independent

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

We are moving toward 20 dB C2C application for CAUI-4 with DFE there is also need for low power on-board ASIC to PIC

SuggestedRemedy

Suggest preserving current chapter D as 10-12 dB C2C with CTLE only then add new chapter F for C2C with 20 dB based on DFE, I will provide more detail remedies in ghiasi_02_0114

Response *Response Status* **U**

REJECT.
Adding another chip-to-chip annex would complicate the standard, fragment the market and go beyond the approved objective of:
Define re-timed 4-lane 100G PMA to PMA electrical interface for chip to chip applications
The commenter is invited to provide evidence for the Broad Market Potential and Distinct Identity for two CAUI-4 chip-to-chip solutions.

[Editor's note: Subclause changed from 1 to 83D.1]

A straw poll of the Task Force was taken.
Do you support the addition of a second CAUI-4 chip-to-chip interface for a 10 dB channel?
Yes 2
No 6

Cl **83D** *SC* **83D.1** *P* **141** *L* **18** # 97

Ran, Adee — Intel

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

This diagram includes two use cases of CAUI-4, but an often discussed use case, direct PCS-to-PCS connection (with no PMD), is absent. There is currently no guidance for technical discussions of this use case.

Assuming this use case is within the scope of this project, it should be documented.

SuggestedRemedy

Add the possible PCS-to-PCS connection to this diagramm or to a new separate one.

Response *Response Status* **C**

REJECT.

The 83D-1 diagram is for illustrative purposes and does not include all possible use cases. If certain blocks don't apply it is assumed that users of the document will be able to apply only appropriate blocks

Cl **83D** *SC* **83D.1** *P* **141** *L* **26** # 28

Slavick, Jeff — Avago Technologies

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

The two listed CAUI-4 in Figure 83D-1 are confusing if both are the CAUI-4 chip to chip being defined in 83D or just one of them.

SuggestedRemedy

Change the top CAUI-4 to be CAUI-4c and the bottom to be CAUI-4m and provide definitions that CAUI-4c is the chip to chip CAUI-4 and CAUI-4m is the chip to module.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add a "chip-to-chip" for the CAUI-4 interface between PMA 20:4 blocks. Add "chip-to-chip" for CAUI-4 interface between PMA 4:4 for the case where pluggable optics is not used.

Similarly add "chip-to-module" in figure 83E-1

Cl **83D** *SC* **83D.1** *P* **141** *L* **26** # 34

Mellitz, Richard — Intel Corporation

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

The following illustrates the market need for 20dB of insertion loss chip to chip CAUI-4

http://ieee802.org/3/bm/public/cuadhoc/meetings/sep30_13/SLi_01_300913_caui.pdf
http://ieee802.org/3/bm/public/cuadhoc/meetings/apr26_13/rabinovich_01_042613_caui4.pdf

change 15dB reference to 20dB

SuggestedRemedy

Change Equation (83D-1) factor 1.614 to 2.152 or change to a mathematically equivalent

Change Figure 83D-3 accordingly

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See comment 23

Cl **83D** *SC* **83D.1** *P* **141** *L* **50** # 98

Ran, Adee Intel

Comment Type **E** *Comment Status* **A**

Sentence should be re-structured for clarity.

SuggestedRemedy

Change
"Figure 83D-2 and Equation (83D-1) (illustrated in Figure 83D-3) depict a typical CAUI-4 application, and summarize the informative differential insertion loss budget associated with the chip-to-chip application"
to
"Figure 83D-2 depicts a typical CAUI-4 application, and Equation (83D-1) (illustrated in Figure 83D-3) summarizes the informative differential insertion loss budget associated with the chip-to-chip application".

Response *Response Status* **C**

ACCEPT.

Cl **83D** *SC* **83D.1** *P* **141** *L* **52** # 1

Anslow, Pete Ciena

Comment Type **E** *Comment Status* **A** *Bucket*

In "The CAUI-4 chip-to-chip interface is comprised of independent data paths ...", "is comprised of" is poor english.

Same issue in 83E.1, Page 164, line 4

SuggestedRemedy

Change:
"The CAUI-4 chip-to-chip interface is comprised of independent..." to:
"The CAUI-4 chip-to-chip interface comprises independent..."

In 83E.1, Page 164, line 4 change:
"The CAUI-4 chip-to-module interface is comprised of independent..." to:
"The CAUI-4 chip-to-module interface comprises independent..."

Response *Response Status* **C**

ACCEPT.

Cl **83D** *SC* **83D.1** *P* **142** *L* **14** # 108

Dudek, Mike QLogic

Comment Type **T** *Comment Status* **A**

The text says that the channel includes AC coupling but Figure 83D-2 doesn't show it.

SuggestedRemedy

Add AC coupling capacitors between the connector and the Rx to figure 83D-2. (or just show the channel without detailing the connector as in Figure 83A-2)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add AC coupling capacitors between the connector and the Rx in Figure 83D-2 (in addition to changes highlighted in latchman_01_121613_CAUI)

Cl **83D** *SC* **83D.1** *P* **142** *L* **2** # 99

Ran, Adee Intel

Comment Type **T** *Comment Status* **A**

Operation and control of any receiver, not just non-adaptive ones, is outside the scope of this standard.

SuggestedRemedy

Change "Operation and control of a non-adaptive receiver is outside the scope of this standard" to "Receiver operation and control is outside the scope of this standard".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change:
"Operation and control of a non-adaptive receiver is outside the scope of this standard" to:
"Operation and control of this receiver is outside the scope of this standard"

Cl **83D** *SC* **83D.1** *P* **142** *L* **8** # 23

Latchman, Ryan — Mindspeed

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

83D CAUI-4 chip to chip does not address 20dB link budgets.

SuggestedRemedy

Implement changes in latchman_01_121613_CAUI to enable this link class

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement changes on pages 3, 4 and 6 to 13 of latchman_01_121613_CAUI with the following exceptions:
Change Output waveform row in Table 83D-1 from:

Steady-state voltage vf (max.), ref 93.8.1.5, value 0.6
Steady-state voltage vf (min.), ref 93.8.1.5, value 0.4
Linear fit pulse peak (min.), ref 93.8.1.5, value 0.71 x vf
Normalized coefficient step size (min.), ref 93.8.1.5, value 0.0083
Normalized coefficient step size (max.), ref 93.8.1.5, value 0.05
Pre-cursor full-scale range (min.), ref 93.8.1.5, value 1.54
Post-cursor full-scale range (min.), ref 93.8.1.5, value 4
to:
Steady-state voltage vf (max.), ref 93.8.1.5.2, value 0.6
Steady-state voltage vf (min.), ref 93.8.1.5.2, value 0.4
Linear fit pulse peak (min.), ref 93.8.1.5.2, value 0.71 x vf
Pre-cursor equalization, ref 83D.3.1.6, value Table 83D-2
Post-cursor equalization, ref 83D.3.1.6, value Table 83D-3

Keep section: 83D.3.1.6 Transmitter equalization range with the text and tables 83D-2 and 83D-3 as per D2.0

Add jitter tolerance line item to Table 83D-3 in latchman_01_121613_CAUI "CAUI-4 receiver characteristics at TP5a" with the same value as 93.8.2

Update the values shown in Table 83D-3 in latchman_01_121613_CAUI with the values shown in Table 83D-3 on page 4 of latchman_01_010614_CAUI and add to note a:
"Maximum BER assumes errors are not correlated to ensure a sufficiently high mean time to false packet acceptance (MTTFPA) assuming 64B/66B coding. Actual implementation of the receiver is beyond the scope of this standard."

In Table 83D-4,
Add a 30 mm package type to both the transmitter and receiver package models as per Clause 93.
change:
"Normalized DFE coefficient magnitude limit", symbol bmax, value 0.3
to:
"Normalized DFE coefficient magnitude limit, for n = 1 to N_b" symbol bmax(n), value 0.3

Cl **83D** *SC* **83D.2** *P* **143** *L* **26** # 35

Mellitz, Richard — Intel Corporation

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

Reference for channel need to be TP0 to TP5

SuggestedRemedy

The electrical characteristics for the CAUI-4 chip-to-chip interface are defined at compliance points for the
transmitter (TP0a) and receiver (TP5a) respectively. The location of TP0a and electrical characteristics of
the test fixture used to measure transmitter characteristics are defined in Figure 93-4 and 93.8.1.1 respectively.
The location of TP5a and electrical characteristics of the test fixture used to measure the receiver are
defined in Figure 93-8 and 93.8.2.1 respectively.

to:
The electrical characteristics for the CAUI-4 chip-to-chip interface are defined at compliance points for the
transmitter (TP0a) and receiver (TP5a) respectively. The location of TP0a and electrical characteristics of
the test fixture used to measure transmitter characteristics are defined in Figure 93-4 and 93.8.1.1 respectively.
The location of TP5a and electrical characteristics of the test fixture used to measure the receiver are
defined in Figure 93-8 and 93.8.2.1 respectively.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Suggested remedy text appears to be the same as what is currently in the draft.
TP0 and TP5 have been added to Figure 83D-2 by Comment #23

Cl **83D** *SC* **83D.2** *P* **143** *L* **26** # 169

Li, Mike — Altera

Comment Type **ER** *Comment Status* **A**

Figure and section numbers are incorrect
CommentEnd: 32

SuggestedRemedy

Change Figure 93-4 to Figure 93-5

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Update figure number. Section numbers appear to be correct

See comment 71

Cl **83D** *SC* **83D.2** *P* **143** *L* **29** # 71

Hidaka, Yasuo — Fujitsu Laboratories of

Comment Type **E** *Comment Status* **A**

References to Figure 93-4 and Figure 93-8 seems incorrect with respect to P802.3bj Draft 2.3.

SuggestedRemedy

Change Figure 93-4 with Figure 93-5.
Change Figure 93-8 with Figure 93-10.

Response *Response Status* **C**

ACCEPT.

Cl **83D** *SC* **83D.3** *P* **143** *L* **35** # 7

Petrilla, John — Avago Technologies

Comment Type **ER** *Comment Status* **A**

Since it is not the intention to mandate specific tests and test methods but only to require specified results if tested according to the methods defined in the subclauses of 83D.3, such a statement should be included in 83D.3.

SuggestedRemedy

Insert the following as the first paragraph in 83D.3, "The tests and test methods defined in the subclauses of 83D.3 are not mandated to be applied to each CAUI-4 chip-to-chip transmitter and receiver, rather only that the defined results are realized if tested according to the defined method. Alternative test methods that generate equivalent results may be used."

In 83D.3.1 page 143 change, "A CAUI-4 chip-to-chip transmitter shall meet the specifications defined in Table 83D-1 when measured at TP0a." to "A CAUI-4 chip-to-chip transmitter shall meet the specifications defined in Table 83D-1 if measured at TP0a."

In 83D.3.2 page 150 change, "A CAUI-4 chip-to-chip receiver shall meet the specifications defined in Table 83D-4 when measured at TP5a." to "A CAUI-4 chip-to-chip receiver shall meet the specifications defined in Table 83D-4 if measured at TP5a."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In 83D.3.1 page 143 change, "A CAUI-4 chip-to-chip transmitter shall meet the specifications defined in Table 83D-1 when measured at TP0a." to "A CAUI-4 chip-to-chip transmitter shall meet the specifications defined in Table 83D-1 if measured at TP0a."

In 83D.3.2 page 150 change, "A CAUI-4 chip-to-chip receiver shall meet the specifications defined in Table 83D-4 when measured at TP5a." to "A CAUI-4 chip-to-chip receiver shall meet the specifications defined in Table 83D-4 if measured at TP5a."

While alternative test methods are regularly used in practice, explicit reference to them within a standard is uncommon

Cl **83D** *SC* **83D.3.1** *P* **143** *L* **37** # 104

Moore, Charles — Avago Technologies

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

In terms of project goals the 83D PMD has more in common with Clause 93 PMD than Annex 83B. The transmitter specification methods should reflect this.

SuggestedRemedy

Either copy or reference 93.8.1 to generate 83D.3.1. Use editorial licence where there are clear differences. This could include 20% lower RJ specs to deal with lower required BER, and different coefficient range and step size if appropriate.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See comment 23. Commenter is encouraged to provide additional details around modifications around RJ, coefficient range, and step size

Cl **83d** *SC* **83D.3.1** *P* **143** *L* **37** # 36

Mellitz, Richard — Intel Corporation

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

Reuse of clause 93 transmitter specification reduces the number of tests for configurable PHYs, etc. as well as providing a smoother meshing with COM.

SuggestedRemedy

Replace 83D.3.1 with 93.8.1 eliminating text about coefficient training 93.8.1.5.3, 93.8.1.5.4, 93.8.1.5.5; keep 93.8.1.5.1

Keep Tx settings in 83D.3.1.6

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 23

Cl **83D** *SC* **83D.3.1.2** *P* **146** *L* **18** # 72

Hidaka, Yasuo — Fujitsu Laboratories of

Comment Type **E** *Comment Status* **A**

Label of vertical axis of Figure 83D-5 is just "Return loss", whereas that of Figure 83D-6 is "Common-mode output return loss".
Caption of Figure 83D-5 is just "Transmitter differential return loss", whereas that of Figure 83D-6 is "Transmitter common-mode output return loss".
They are inconsistent.
They are also not consistent with text descriptions.

SuggestedRemedy

Change the label of vertical axis of Figure 83D-5 with "Differential output return loss".
Change the caption of Figure 83D-5 with "Transmitter differential output return loss".

Response *Response Status* **C**

ACCEPT.

Cl **83D** *SC* **83D.3.1.4** *P* **147** *L* **12** # 73

Hidaka, Yasuo — Fujitsu Laboratories of

Comment Type **T** *Comment Status* **A**

Test specification for the counter propagating lanes is not clear.
Where is the test point? Is it TP0a of the transmitter which sends the signal to the counter propagating lane?
Or, is it TP5a of a receiver on the same device as the transmitter under test?
Also, what is the "target" differential peak-to-peak amplitude of 800mV?
Is it different from differential peak-to-peak amplitude?
Is transition time of 8ps also "target"?

SuggestedRemedy

Define the test point of the counter propagating lanes.
Define the target differential peak-to-peak amplitude and transition time.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 23 and
latchman_01_121613_CAUI. This section will no longer be present.

Cl **83D** *SC* **83D.3.1.4** *P* **147** *L* **8** # 74

Hidaka, Yasuo — Fujitsu Laboratories of

Comment Type **T** *Comment Status* **A**

Transmitter output jitter is defined with TJ, DJ, and RJ in a traditional way, but it is not good at this high data rate because of many difficulties in actual measurements. (See zivny_3bj_01a_0713 in P802.3bj July meeting)
P802.3bj has now adopted a new definition using three components: even-odd jitter, effective bounded uncorrelated jitter, and effective random jitter.
P802.3bj now does not define TJ at all.
(See zivny_3bj_01a_0713 in P802.3bj July meeting materials for the detail.)

SuggestedRemedy

Rewrite the first paragraph of 83D.3.1.4 as described in 92.8.3.9 and add a reference to 92.8.3.9.
Remove subclauses 83D.3.1.4.1 and 83D.3.1.4.2.
Change the line 51 of page 147 as follows: The transmitter equalizer may be adjusted for optimum mask results for measurement of the transmitter output waveform, whereas the transmitter output jitter shall be met regardless of the transmitter equalization setting.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 23 and
latchman_01_121613_CAUI. Jitter methodology in this proposal leverages Clause 93

Cl **83D** *SC* **83D.3.1.4.2** *P* **147** *L* **46** # 109

Dudek, Mike — QLogic

Comment Type **T** *Comment Status* **A**

The Dj needs to be measured with optimal transmit equalizer setting.

SuggestedRemedy

Add at the beginning of the last sentence. "With the transmit equalizer setting that is optimal for Total jitter"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Overtaken by other events. See comment 23 and latchman_01_121613_CAUI. Jitter is measured using Clause 93 methodology

[Editor's note: Subclause changed from 83D/3/1/4/2 to 83D.3.1.4.2]

Cl **83D** *SC* **83D.3.1.5.1** *P* **148** *L* **4** # 4

Anslow, Pete — Ciena

Comment Type **E** *Comment Status* **A** *Bucket*

"low pass" should be hyphenated (when used as an adjective)

SuggestedRemedy

Change "low pass" to "low-pass"

Response *Response Status* **C**

ACCEPT.

Cl **83D** *SC* **83D.3.1.6** *P* **149** *L* **41** # 142

Dawe, Piers — Mellanox

Comment Type **T** *Comment Status* **R**

The disadvantage of no training is tolerancing the transmitter emphasis. As there can be a significant loss between IC and TP0a that is not under the silicon designer's control, these tolerances are a bit tight.

SuggestedRemedy

Increase to 15% (20% if feasible).

Response *Response Status* **C**

REJECT.
Loss to TP0a is relatively well controlled (between 1.2dB and 1.6dB) and package loss is under the control of the device vendor. Also see comment 36

Cl **83D** *SC* **83D.3.2** *P* **150** *L* **38** # 37

Mellitz, Richard — Intel Corporation

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

Reuse of clause 93 transmitter receiver reduces the number of tests for configurable PHYs, etc. as well as providing a smoother meshing with COM

SuggestedRemedy

replace with 93.8.2
with new table for
-Receiver interference tolerance parameters

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 23.

Cl **83D** *SC* **83D.3.2.2** *P* **152** *L* **23** # 105

Moore, Charles — Avago Technologies

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

In terms of project goals the 83D PMD has more in common with Clause 93 PMD than Annex 83B. Receiver interference tolerance method should reflect this.

SuggestedRemedy

Either copy or reference 93.8.2.3 and 93.8.2.4 to generate 83D.3.2.2. A new version of table 93-6 will be needed with 15dB insertion loss and BER instead of RS-FEC symbol error ratio.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 23.

Cl **83D** *SC* **83D.3.2.2.1** *P* **152** *L* **4** # 103

Moore, Charles — Avago Technologies

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

Equation 83D-8 is incorrect. It needs parentheses in the denominator to separate the poles. Also it is not in dB.

SuggestedRemedy

First wait to make sure that this is not overtaken by events.
Delete (dB) from equation. Add "(" at beginning of denominator of second expression.
In the same denominator add ")(" between P_1 and j2pi and ")" at the end.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Make the proposed changes and move equation and table into COM section since reference receivers are no longer used in interference tolerance testing

Also see comment 47, 170

Cl **83D** *SC* **83D.3.2.2.1** *P* **153** *L* **26** # 47

Ghiasi, Ali — Independent

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

CTE zero coefficient were not updated to higher decimal point per D1.2 comment

SuggestedRemedy

Adjust CTE zero per http://www.ieee802.org/3/bm/public/tools/index.html

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
There was no comment on the accuracy of the CTLE coefficients against D1.2.
Comment #85 against D1.1 changed the coefficients as per slide 9 of ghiasi_01_0913_optx "To make sure filter response is always passive G and Z were slightly adjusted and the new coefficient for G and Z have more significant digits"
The spreadsheet on the tools web page: http://www.ieee802.org/3/bm/public/tools/CTLE4.xlsx was, however, not updated with the version containing higher resolution coefficients.
As a result of this comment (and comment #50) the tools web page has been updated with: http://www.ieee802.org/3/bm/public/tools/CTLE5.xlsx which contains the same coefficient set as given in D2.0.
Make no change to the draft.

[Editor's note: Subclause changed from 3.2.2.1 to 83D.3.2.2.1]

Cl **83D** *SC* **83D.3.2.2.1** *P* **153** *L* **4** # 170

Li, Mike — Altera

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

Eq (83D-8) is incorrect
CommentEnd: 7

SuggestedRemedy

Change it to be the same as Eq. (83E-4)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comments 23 and 103
Reference CTLE is now used for COM

Cl **83D** *SC* **83D.4** *P* **155** *L* **36** # 75

Hidaka, Yasuo — Fujitsu Laboratories of

Comment Type **T** *Comment Status* **A**

It is defined as COM shall be greater than or equal to 2dB using "any" combination of discrete transmit equalizer and continuous time filter.
This is different from how COM is defined, because COM is calculated for the combination of values of c(-1), c(1), g_DC, and t_s which maximizes the FOM.
See page 346, line 46 of P802.3bj Draft 2.3.

SuggestedRemedy

Rewrite the first paragraph of 83D.4 similar to the second paragraph of 93.9.1 as follows:
The channel operating margin (COM) computed using the procedure in Annex 93A (with the exception that the continuous time filter (CTLE) is as defined in Equation (83D-8) and with coefficients given in Table 83D-6) and the parameters in Table 83D-7 shall be greater than or equal to 2dB. This minimum value allocates margin for practical limitations on the receiver implementation as well as the allowed transmitter equalizer coefficients.

Response *Response Status* **C**

ACCEPT.

Cl **83D** *SC* **83D.4** *P* **156** *L* **11** # 38

Mellitz, Richard — Intel Corporation

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

The follow shows realistic estimates if for package length greater than 12 mm or trace routing.
http://ieee802.org/3/bj/public/jul13/moore_3bj_02a_0713.pdf

Change to Tx and Rx Z_p to match clause 93.

SuggestedRemedy

Table 83D-7
change Z_pt and Z_pr to 12 mm, 30 mm

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 23.

Cl **83D** *SC* **83D.4** *P* **156** *L* **14** # 135

Dawe, Piers — Mellanox

Comment Type **T** *Comment Status* **A**

Zero package not realistic.

SuggestedRemedy

Include receiver package model.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 23

Cl **83D** *SC* **83D.4** *P* **156** *L* **14** # 39

Mellitz, Richard — Intel Corporation

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

receiver loading need to be limited but realistic
define C_dr and C_br

SuggestedRemedy

Set C_dr to 2e-4
set C_br to 1.8e-4

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 23 and
latchman_01_121613_CAUI.

Cl **83D** *SC* **83D.4** *P* **156** *L* **44** # 40

Mellitz, Richard — Intel Corporation

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

A minimum of a DFE5 is required to support 20dB loss.
http://ieee802.org/3/bm/public/cuadhoc/meetings/aug23_13/mellitz_01_082313_caui.pdf
http://ieee802.org/3/bm/public/cuadhoc/meetings/sep30_13/mellitz_01_093013.pdf
f

SuggestedRemedy

set N_b to 5

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 23 and
latchman_01_121613_CAUI.

Cl **83D** *SC* **83D.4** *P* **156** *L* **46** # 41

Mellitz, Richard — Intel Corporation

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

http://ieee802.org/3/bm/public/cuadhoc/meetings/sep30_13/mellitz_01_093013.pdf
suggest limiting DFE taps to 0.3 yield an acceptable MTTFPA

SuggestedRemedy

Change test for b_max to
"Normalized DFE coefficient magnitude limit, for n = 1 to N_b"
change b_max to b_max(n) and set to 0.3

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 23

Cl **83D** *SC* **83D.4.1** *P* **156** *L* **23** # 26

Slavick, Jeff — Avago Technologies

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

The Transmitter equalizer settings don't have any units assigned to them. Is the data in tables 83D-8,9 in mV, V, dB, %?

SuggestedRemedy

Assign Tables 83D-7,8,9 to have the appropriate unit.

Response *Response Status* **C**

REJECT.
COM TX EQ Coefficients are without units

Cl **83D** *SC* **83D.4.1** *P* **156** *L* **41** # 3

Anslow, Pete — Ciena

Comment Type **E** *Comment Status* **A** *Bucket*

"signal to noise" should be hyphenated

SuggestedRemedy

Change "signal to noise" to "signal-to-noise"

Response *Response Status* **C**

ACCEPT.

Cl **83D** *SC* **83D.4.1** *P* **156** *L* **51** # 48

Ghiasi, Ali — Independent

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

Wrong symbol DER

SuggestedRemedy

Replace DER with BER

Response *Response Status* **C**

REJECT.
DER is consistent with the COM parameter list in Table 93A-1 and refers to target detector error ratio
[Editor's note: Subclause changed from 4.1 to 83D.4.1]

Cl **83D** *SC* **83D.5.4.2** *P* **161** *L* **26** # 101

Ran, Adee — Intel

Comment Type **T** *Comment Status* **A**

The channel requirements are practically separate from the rest of the PICS, and conformance is not stated by the same vendor. They should be marked by a separate option similar to "CBL" in 92.14.3.

SuggestedRemedy

Add option "CHAN" in 83B.4.3 and make items in this table conditional on it.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
add a row to the table in 83D.5.3 that is:
"*CHAN", "Channel", "83D.4", "Items marked with CHAN include channel specifications not applicable to a PHY manufacturer", "O", "Yes [ ] No [ ]"
And then change the "Status" of PICS item CC1 from "M" to "CHAN:M"

Cl **83D** *SC* **83D.5.4.2** *P* **161** *L* **8** # 100

Ran, Adee — Intel

Comment Type **T** *Comment Status* **A**

Reference impedance for measurements is part of the test definitions and has no corresponding normative statement.

SuggestedRemedy

Delete item RC2.

Response *Response Status* **C**

ACCEPT.

Cl **83E** *SC* **83E** *P* **170** *L* **1** # 106

Dudek, Mike — QLogic

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

The existing specification requires the module to have an adaptive CTLE. In order to enable power saving in the module it would be good to enable the module to be set by management and still close the link budget.

SuggestedRemedy

I undertand that the CAUI-4 ad hoc report will provide a complete remedy based on the following. The host is required to provide a "Recommended CTLE setting" with a tolerance of +/-1dB. ie the Host must pass it's output specifications with one of the 3 settings, Recommended, Recommended -1dB, or Recommended +1dB. The module must meet its BER target with the stressed input with the "Recommended CTLE setting" provided to it being the "optimal CTLE setting" from the stressed signal calibration, and with this "optimal CTLE setting + 1dB", and with this "optimal CTLE setting -1dB" where the otpimal CTLE setting is that setting that provides the maximum value of EW15*EH15 for the stressed input signal.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 21 and latchman_01_120913_CAUI

Cl **83E** *SC* **83E.1** *P* **163** *L* **24** # 27

Slavick, Jeff — Avago Technologies

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

Figure 83E-1 is missing a layout that could exist.

100GPCS + PMA20:n ====> PMA n:20 + RS-FEC + PMA 20:4 ===> PMA 4:4 + PMD with the PMA n:20 and RS-FEC being conditional based on PHY TYPE.

In other words you could have a gearbox chip between the host that provides the CAUI-4_c2m on one end and a CAUI-10 or CAUI-4_c2c to the host. The missing configuration would be viable for all flavors of the PHY types listed.

SuggestedRemedy

Insert a 3rd stackup that includes an intermdiate PMA with optional RS-FEC.

Response *Response Status* **U**

REJECT.
The intent of this figure is to show example of use cases and are not intended to be exhaustive.

Cl **83E** *SC* **83E.1** *P* **164** *L* **6** # 5

Anslow, Pete — Ciena

Comment Type **E** *Comment Status* **A**

It would be helpful to add an informative reference to the OIF CEI-28G-VSR specification in 83E.1.

SuggestedRemedy

Insert a new sentence before the last sentence of 83E.1 (The nominal signaling rate for each lane is 25.78125 GBd.) to say:
"The chip-to-module interface is defined using a specification and test methodology that is similar to that used for CEI-28G-VSR defined in OIF-CEI-03.1 [Bx1]"

Also, add a bibliography entry for:
[Bx1] OIF-CEI-03.1, Common Electrical I/O (CEI) - Electrical and Jitter Interoperability agreements for 6G+ bps, 11G+ bps and 25G+ bps I/O

and if this is not published, add an appropriate editor's note e.g.:
[Editor's note (to be removed prior to publication) - The OIF CEI-28G-VSR specification is currently in the OIF approval process, and is expected to be published as OIF-CEI-03.1 in early 2014.]

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Insert a new sentence before the last sentence of 83E.1 (The nominal signaling rate for each lane is 25.78125 GBd.) to say:
"The chip-to-module interface is defined using a specification and test methodology that is similar to that used for CEI-28G-VSR defined in OIF-CEI-03.1 [Bx1]"

Also, add a bibliography entry for:
[Bx1] OIF-CEI-03.1, Common Electrical I/O (CEI) - Electrical and Jitter Interoperability agreements for 6G+ bps, 11G+ bps and 25G+ bps I/O

and if this is not published, add an appropriate editor's note e.g.:
[Editor's note (to be removed prior to publication) - The OIF CEI-28G-VSR specification is currently in the OIF publication process, and is expected to be published as part of OIF-CEI-03.1 in early 2014.]

Cl **83E** *SC* **83E.2** *P* **165** *L* **33** # 9

Petrilla, John — Avago Technologies

Comment Type **T** *Comment Status* **A**

In Figure 83E-5, the phrase, "Module insertion loss up to 1.5 dB" and associated dimension line look like a residue from Figure 83E-2, do not appear useful in Figure 83E-5 and may be a source of confusion as it may be interpreted as a requirement for the module.

SuggestedRemedy

In Figure 83E-5, delete the phrase, "Module insertion loss up to 1.5 dB" and associated dimension line.

Response *Response Status* **C**

ACCEPT.

Cl **83E** *SC* **83E.2** *P* **165** *L* **33** # 128

Dawe, Piers — Mellanox

Comment Type **ER** *Comment Status* **A**

MCB isn't the same shape as HCB: see e.g. Fig 83E-9 or 86-3.

SuggestedRemedy

Redraw MCB so it is different to HCB.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Make MCB rectangular instead of T shape

Cl **83E** *SC* **83E.3** *P* **165** *L* **49** # 8

Petrilla, John — Avago Technologies

Comment Type **ER** *Comment Status* **A**

Since it is not the intention to mandate specific tests and test methods but only to require specified results if tested according to the methods defined in the subclauses of 83E.3, such a statement should be included in 83E.3.

SuggestedRemedy

Insert the following as the first paragraph in 83E.3, "The tests and test methods defined in the subclauses of 83E.3 are not mandated to be applied to each CAUI-4 host and module, rather only that the defined results are realized if tested according to the defined method. Alternative test methods that generate equivalent results may be used."

In 83E.3.1 page 165 change, "A CAUI-4 host output shall meet the specifications defined in Table 83E-1 when measured at TP1a." to "A CAUI-4 host output shall meet the specifications defined in Table 83E-1 if measured at TP1a."

In 83E.3.2 page 171 change, "A CAUI-4 module output shall meet the specifications defined in Table 83E-3 when measured at TP4." to "A CAUI-4 module output shall meet the specifications defined in Table 83E-3 if measured at TP4."

In 83E.3.3 page 173 change, "A CAUI-4 host input shall meet the specifications defined in Table 83E-4 when measured at TP4a." to "A CAUI-4 host input shall meet the specifications defined in Table 83E-4 if measured at TP4a."

In 83E.3.4 page 177 change, "A CAUI-4 module input shall meet the specifications defined in Table 83E-7 when measured at TP1." to "A CAUI-4 module input shall meet the specifications defined in Table 83E-7 if measured at TP1."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In 83E.3.1 page 165 change, "A CAUI-4 host output shall meet the specifications defined in Table 83E-1 when measured at TP1a." to "A CAUI-4 host output shall meet the specifications defined in Table 83E-1 if measured at TP1a."

In 83E.3.2 page 171 change, "A CAUI-4 module output shall meet the specifications defined in Table 83E-3 when measured at TP4." to "A CAUI-4 module output shall meet the specifications defined in Table 83E-3 if measured at TP4."

In 83E.3.3 page 173 change, "A CAUI-4 host input shall meet the specifications defined in Table 83E-4 when measured at TP4a." to "A CAUI-4 host input shall meet the specifications defined in Table 83E-4 if measured at TP4a."

In 83E.3.4 page 177 change, "A CAUI-4 module input shall meet the specifications defined in Table 83E-7 when measured at TP1." to "A CAUI-4 module input shall meet the specifications defined in Table 83E-7 if measured at TP1."

Also see comment 7. While alternative test methods are regularly used in practice, explicit reference to them within a standard is uncommon.

Cl **83E** *SC* **83E.3.1** *P* **166** *L* **31** # 161

Dawe, Piers — Mellanox

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

My study in OIF a while back showed disappointing correlation between Eye Height / Eye Width and useful performance at the host Rx after a host channel. Among other factors (some of which have been improved), it seems that a lower observation bandwidth might improve this, being more like a real host channel and Rx. There are other benefits such as lower cost, lower noise measurements (or, more accurate results from a real-time scope with a set sampling rate).
There's a similar comment against P802.3bj.

SuggestedRemedy

Change 33 GHz to 25 GHz, or if feasible, 19.34 GHz = 0.75*fb. For consistency, do this throughout the document. Make small adjustments to the EH15 (and EH6) limits. Also review the VEC limits (any change would be very small, as high-VEC signals are already low bandwidth), EW15/EW6 and transition time limits.

Response *Response Status* **C**

REJECT.
Additional material required with respect to "disappointing correlation between Eye Height / Eye Width and useful performance at the host Rx after a host channel" and how a lower observation BW improves this.
Suggested remedy incomplete with respect to VEC limits, EW15/EH15

In the P802.3bj D3.0 comment resolution, the 33 GHz bandwidth was retained.

Cl **83E** *SC* **83E.3.1** *P* **166** *L* **33** # 160

Dawe, Piers — Mellanox

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

The host must provide the recommended CTLE peaking values, in case the module needs it (see other comments). Also, the recommended value must be not too far from the truth or the eye opening will collapse rapidly with CTLE tuning. There is more than one way to achieve this.

SuggestedRemedy

Add text: The recommended CTLE peaking value shall be within 1 dB of the optimum CTLE peaking value.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.
See comment 21 and latchman_01_120913_CAUI
The commenter is invited to provide measurement or simulation evidence to support the statement that "the recommended value must be not too far from the truth or the eye opening will collapse rapidly with CTLE tuning"

Cl **83E** *SC* **83E.3.1** *P* **166** *L* **7** # 122

Dawe, Piers Mellanox

Comment Type **E** *Comment Status* **A**

"Unit interval (UI) nominal" is not something to be conformed to, and isn't in the PICS, and is in text at 83E.3.1.1, so should not be in these tables.

SuggestedRemedy

Delete the row. Also in tables 83-3, 4, 7.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Delete the row. Also in tables 83E-3, 4, 7.

Cl **83E** *SC* **83E.3.1.2** *P* **166** *L* **42** # 137

Dawe, Piers Mellanox

Comment Type **T** *Comment Status* **R**

The apparent peak-to-peak differential output voltage of the host depends on the pattern used, because the host channel and HCB have loss and the signal is under-emphasised where observed. Also it is better to have a spec that relates consistently to voltage swing at the IC, so there is no need to set up the swing port by port.
PRBS9 is too short for consistent measurements across different host losses.

SuggestedRemedy

Define suitable patterns for peak-to-peak differential voltage: any of PRBS15, PRBS31, scrambled idle, RF, any other 100GBASE-R signal (FEC encoded or not).

Response *Response Status* **C**

REJECT.

See dawe_05_0114_optx

There was no consensus to change the draft.

Cl **83E** *SC* **83E.3.1.3** *P* **167** *L* **45** # 159

Dawe, Piers Mellanox

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

RLdc is too close to the mixed-mode reflection limit for the mated compliance boards (25 - 5f/14 above 14 GHz) such that the requirement on an IC behind the connector becomes increasingly stringent at higher frequencies, the opposite of reasonable. We should align with what CEI-28G-VSR has had since May 2013.

SuggestedRemedy

Change the limit for RLdc in the range 12.89 GHz to 25.78 GHz in Eq 83E-3 from 15 dB to 18-6f/25.78 dB.

Response *Response Status* **C**

ACCEPT.

Cl **83E** *SC* **83E.3.1.4** *P* **168** *L* **51** # 116

Dawe, Piers Mellanox

Comment Type **E** *Comment Status* **A**

This subclause is used for outputs as well as inputs.It is better not to mix up definitions and limits, and each limit is given in the relevant table.

SuggestedRemedy

Delete "Differential termination mismatch of the output is less than 10%.".

Response *Response Status* **C**

ACCEPT.

Cl **83E** *SC* **83E.3.1.6** *P* **169** *L* **10** # 10

Petrilla, John Avago Technologies

Comment Type **E** *Comment Status* **A** *Bucket*

It would be helpful if the term, "continuous time linear equalizer" is followed by the acronym "CTLE" that is used in the associated block diagram in Figure 83E-9.

SuggestedRemedy

Change "The host output eye is measured using a reference receiver with a continuous time linear equalizer defined in 83E.3.1.6.1." to "The host output eye is measured using a reference receiver with a continuous time linear equalizer (CTLE) defined in 83E.3.1.6.1."

Response *Response Status* **C**

ACCEPT.

Cl **83E** *SC* **83E.3.1.6** *P* **169** *L* **6** # 130

Dawe, Piers Mellanox

Comment Type **ER** *Comment Status* **A**

In this subclause we don't specify jitter, we specify eye width. The two are not quite complementary (one would not usually measure TJ with PRBS9) and even if they were, we have to use the same name for the same thing, every time. We might use jitter in "83E.4.2 Host / Module eye contour measurement method" to derive eye width, but the word has no place in 83E.3, as it happens.

SuggestedRemedy

Change "host output jitter" to "host eye width" 5 times.
Change "output jitter" to "eye width" once in 83E.3.1.6.1.
Change "module output jitter" to "module eye width" 5 times in 83E.3.2.1. Change "output jitter" to "eye width" once in 83E.3.2.1.1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change "host output jitter" to "host output eye width" 5 times (including the titles of 83E.3.1.6, 83E.3.1.6.1 and Figure 83E-9).
Change "output jitter" to "output eye width" once in 83E.3.1.6.1.
Change "module output jitter" to "module output eye width" 5 times in 83E.3.2.1 (including the titles of 83E.3.2.1, 83E.3.2.1.1 and Figure 83E-11).
Change "output jitter" to "output eye width" once in 83E.3.2.1.1.

Cl **83E** *SC* **83E.3.1.6** *P* **169** *L* **9** # 21

Latchman, Ryan Mindspeed

Comment Type **T** *Comment Status* **A**

Host output can be evaluated with any CTLE reference setting. Should use recommended CTLE setting communicated to the module

SuggestedRemedy

Implement changes in latchman_01_120913_CAUI to address this.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Implement changes on pages 3 to 7 of latchman_01_120913_CAUI and also make the change proposed in comment #134

[Editor's note: Comment type set to "T"]

Cl **83E** *SC* **83E.3.1.6.1** *P* **170** *L* **1** # 119

Dawe, Piers Mellanox

Comment Type **E** *Comment Status* **A** *Bucket*

Any of the 9 equalizer

SuggestedRemedy

Any of the nine equalizer

Response *Response Status* **C**

ACCEPT.

Cl **83E** *SC* **83E.3.1.6.1** *P* **170** *L* **26** # 50

Ghiasi, Ali Independent

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

CTE zero coefficient were not updated to higher decimal point per D1.2 comment

SuggestedRemedy

Adjust CTE zero per http://www.ieee802.org/3/bm/public/tools/index.html

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment #47
Make no change to the draft.
[Editor's note: Subclause changed from 3.1.6.1 to 83E.3.1.6.1]

Cl **83E** *SC* **83E.3.1.6.1** *P* **170** *L* **26** # 153

Dawe, Piers — Mellanox

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

CTLE consistency.
This OIF-like reference equalizer and the one used in 802.3bj differ: this like the one in 83D has poles at 14.1 and 15 to 19 GHz; that has poles at 6.4 and 26 GHz. The difference is an impediment to making and testing dual-purpose electrical receivers, and I have not seen a justification for the difference.

SuggestedRemedy

Can these two be made consistent enough? As the OIF equalizer was established earlier and has been studied more, is it preferable, and is it suitable for bj?

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

This issue was discussed in P802.3bj D3.0 comment resolution and there was no consensus to change the P802.3bj draft.

There was no consensus to change the CTLE in Annex 83E

Cl **83E** *SC* **83E.3.1.6.1** *P* **170** *L* **4** # 129

Dawe, Piers — Mellanox

Comment Type **ER** *Comment Status* **R**

This equation has P1, P2 and Z1 in Grad/s but the entries in Table 83E-2 are in GHz, and in P802.3bj, the equation (93A-20) is in GHz (or Hz, it doesn't matter) with the equivalents of P1, P2 and Z1 given in that equation, in GHz (or Hz). We can remove some clutter that makes the equation and table harder to understand than they need be.

SuggestedRemedy

H(f) = G*P1*P2*(jf+Z1) / (Z1 * (jf+P1) * (Jf+P2))
In Table 83E-2,s delete "/2pi", 3 times.
Change "in Grad/s" to "in GHz", twice.
Similarly in 83D.3.2.2.1.

Response *Response Status* **C**

REJECT.

Consistent with OIF equation. See comment 122, 212 from D1.0

Cl **83E** *SC* **83E.3.2** *P* **171** *L* **34** # 171

Li, Mike — Altera

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

DC Common Mode Voltage is missing
CommentEnd: 54

SuggestedRemedy

Add DC Common Mode Voltage -350 mv (min), 2850 mV (max)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In Table 83E-3, add DC Common mode voltage -350 mV (min), 2850 mV (max)
with a note "DC Common mode voltage is generated by the host. Specification includes effects of ground offset voltage."

Cl **83E** *SC* **83E.3.2.1** *P* **172** *L* **1** # 11

Petrilla, John — Avago Technologies

Comment Type **E** *Comment Status* **A**

Since Table 83E-3 defines Eye width and not jitter, it seems more accurate and less confusing to refer to eye width and not jitter in subsequent subclauses, e.g. "83E.3.2.1 Module output jitter and eye height" and "Figure 83E-11-Example module output jitter and eye height test configuration" as well as several instances within 83E.3.2.1

SuggestedRemedy

Change "83E.3.2.1 Module output jitter and eye height" and "Figure 83E-11-Example module output jitter and eye height test configuration" to "83E.3.2.1 Module output eye width and eye height" and "Figure 83E-11-Example module output eye width and eye height test configuration"

Within 83E.3.2.1 replace "output jitter" with "output eye width" two times.
Within 83E.3.2.1.1 replace "output jitter" with "output eye width" once.

Change "83E.3.1.6 Host output jitter and eye height" and "Figure 83E-9-Example host output jitter and eye height test configuration" to "83E.3.1.6 Host output eye width and eye height" and "Figure 83E-9-Example host output eye width and eye height test configuration"

Within 83E.3.1.6 replace "output jitter" with "output eye width" two times.
Within 83E.3.1.6.1 replace "output jitter" with "output eye width" once.

Response *Response Status* **C**

ACCEPT.
Also see comment 130

Cl **83E** *SC* **83E.3.2.1** *P* **172** *L* **11** # 143

Dawe, Piers Mellanox

Comment Type **T** *Comment Status* **R**

The transition time of 10 ps is the fastest a host is allowed. But the worst case for which we want the module's output to perform is with a high loss host trace, where the crosstalk transition time will be greater. Also, I don't think it's feasible to get 10 ps out of the mated compliance boards without using emphasis in the crosstalk generators, which is an unnecessary expense.

We keep the spec consistent by using the same crosstalk in output spec as in the corresponding stressed input spec.

SuggestedRemedy

Change 10 ps to what would be obtained from a reasonable pattern generator without emphasis, through the mated compliance boards and the usual observation filter.
Change the 10 ps in 83E.3.3.3.1 similarly.
For the 9.5 ps in 83E.3.1.6 - the module doesn't need emphasis to counteract the MCB and connector loss because the measurement CTLE does that for it. So to reduce test costs, change this also to what would be obtained from a reasonable pattern generator without emphasis, through the mated compliance boards and the usual observation filter.
Change the 9.5 ps in 83E.3.4.2.1 similarly.

Response *Response Status* **C**

REJECT.

Value to make the change is required in the suggested remedy. Commenter is encouraged build concensus around a specific value. (note these are "target" values)

Cl **83E** *SC* **83E.3.3** *P* **173** *L* **1** # 120

Dawe, Piers Mellanox

Comment Type **E** *Comment Status* **A**

This says "specifications defined in Table 83E-4 when measured at TP4a" but some table entries are measured at TP4, as noted.

SuggestedRemedy

Add a column "Test point" with entries TP4a and TP4 as appropriate. Delete "Subclause".
Delete "at TP4a" twice.
Similarly for module input.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Table 83E-4:
Add a column "Test Point" with TP4a and TP4 values (per note b).
Change column heading from "Subclause Reference" to "Reference"

Table 83E-7:
Add a column "Test Point" with TP1 and TP1a values (per note b).
Change column heading from "Subclause Reference" to "Reference"

also see comment 165

Cl **83E** *SC* **83E.3.3** *P* **173** *L* **6** # 121

Dawe, Piers Mellanox

Comment Type **E** *Comment Status* **A**

Table could be laid out better.

SuggestedRemedy

As it doesn't add anything, and would be questionable for a reference to an annex, delete "Subclause". Select table, resize column widths to contents, resize to full width.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change heading "Subclause Reference" to "Reference"
Grant editorial license to make other table consistent where appropriate.

Cl **83E** *SC* **83E.3.3.1** *P* **173** *L* **32** # 166

Dawe, Piers — Mellanox

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

Need two BERs (with and without FEC protection) per another comment.

SuggestedRemedy

Change
The CAUI-4 chip-to-module host input is defined to operate at a bit error ratio (BER) better than 1e-15 for an input signal defined by 83E.3.3.3.
to
When the host will provide FEC correction (CAUI-4p), the CAUI-4 chip-to-module host input is defined to operate at a bit error ratio (BER) better than 2.5e-6 for an input signal defined by 83E.3.3.3.
When the host will not always provide FEC correction (CAUI-4u), the CAUI-4 chip-to-module host input is defined to operate at a bit error ratio (BER) better than 1e-15 for an input signal defined by 83E.3.3.3.

Response *Response Status* **C**

REJECT.

See comment 154

Cl **83E** *SC* **83E.3.3.2** *P* **174** *L* **24** # 131

Dawe, Piers — Mellanox

Comment Type **ER** *Comment Status* **A**

Completing implementation of D1.1 comment 136.

SuggestedRemedy

Change
Receiver input return loss
to
Differential input return loss
Figure 83E-13, change
Receiver differential to common mode conversion input return loss
to
Differential to common mode conversion input return loss
Table 83E-5, change
Host stressed receiver parameters
to
Host stressed input parameters
Also, to avoid confusion and for consistency with figures 83E-9, 11 and 14, in Figure 83E-15, delete the inner box "Module Tx Module Rx", but show that it's AC coupled by indicating capacitors as in Figure 83E-11.

Response *Response Status* **C**

ACCEPT.

Cl **83E** *SC* **83E.3.3.2** *P* **175** *L* **10** # 51

Ghiasi, Ali — Independent

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

Receiver differential to common mode conversion should follow mated compliance board response as well as TP4a SDD11 response. Flat line specification unrealistic

SuggestedRemedy

Define SCDxx 6 dB better than SDD response defined by Eq 83E-5

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Align with OIF
RLdc>= -22+(14f/25.78) 0.01<=f<12.89
RLdc>= 18-(6f/25.78) 12.89<=f<=25.78

[Editor's note: Subclause changed from 3.3.2 to 83E.3.3.2]

Cl **83E** *SC* **83E.3.3.3** *P* **175** *L* **27** # 144

Dawe, Piers — Mellanox

Comment Type **T** *Comment Status* **A**

"test is characterized using the procedure" doesn't make sense. Use standards language.

SuggestedRemedy

Change "The host stressed input test is characterized using the procedure" to "Host stressed input tolerance is defined by the procedure". Similarly in 83E.3.4.2.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "The host stressed input test is characterized using the procedure" to "Host stressed input tolerance is measured using the procedure defined in...".

in 83E.3.4.2:

Change:
The module stressed input test is characterized using the procedure defined in...
To:
Module stressed input tolerance is measured using the procedure defined in...

Cl **83E** *SC* **83E.3.3.3** *P* **175** *L* **37** # 127

Dawe, Piers Mellanox

Comment Type **E** *Comment Status* **A** *Bucket*

Layout.

SuggestedRemedy

Make the left column wide enough for its contents. Also Table 83E-8.

Response *Response Status* **C**

ACCEPT.

Cl **83E** *SC* **83E.3.3.3.1** *P* **175** *L* **45** # 138

Dawe, Piers Mellanox

Comment Type **T** *Comment Status* **A**

CRU definition needs to define the order and be consistent with other 25G/lane 802.3 clauses and the jitter mask of Table 88-13 and, preferably, CEI-28G-VSR.

SuggestedRemedy

Change "with bandwidth of 10 MHz and peaking of less than 0.1 dB" to "with a [3 dB] [tracking] bandwidth [or corner frequency?] of 10 MHz and a slope of -20 dB/decade".
Similarly in 83E.3.4.2.1 and 83E.4.2.
Also 83D.3.1.5.1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change:
A reference CRU with bandwidth of 10 MHz and peaking of less than 0.1 dB is used...
to
A reference CRU with a corner frequency of 10 MHz and a slope of 20 dB/decade is used...

Make similar change in 83E.3.4.2.1 and 83E.4.2.

83D.3.1.5.1 section is overtaken by comment 23 and latchman_01_121613_CAUI to align with KR4.

A straw poll of the task force was taken:
Do you support changing to:
"a corner frequency of 10 MHz and a slope of 20 dB/decade"
Yes 18
No 2

Cl **83E** *SC* **83E.3.3.3.1** *P* **175** *L* **46** # 132

Dawe, Piers Mellanox

Comment Type **ER** *Comment Status* **R**

This says "Pattern 4 (PRBS9) as defined in Table 86-11" yet Table 86-11 doesn't define it: it says "Pattern defined in 83.5.10", and 83.5.10 says "a PRBS9 pattern (as defined in Table 68-6)".
Likewise in 83E.3.1.6, "Patterns 3 and 5 are defined in Table 86-11.", but Table 86-11 says they are defined in 83.5.10 and 82.2.10 (and that's not right for RS-FEC encoded Pattern 5 anyway): 83.5.10 says PRBS31 is defined in 49.2.8. Don't waste the reader's time.

SuggestedRemedy

Change
Pattern 4 (PRBS9) as defined in Table 86-11
to
Pattern 4 (PRBS9) as defined in Table 68-6 (see Table 86-11)
8 times.
Change
Patterns 3 and 5 are defined in Table 86-11.
to
Patterns 3 is defined in 49.2.8, Pattern 5 is defined in 82.2.10, and RS-FEC encoded Pattern 5 is defined in 91.5.2 (see Table 86-11).
6 times.
It would be better to put an improved version of Table 86-11-Test patterns in Clause 80 and refer to it from bj and bm clauses.
In Table 95-9, change the right hand column from 83.5.10; 83.5.10; 83.5.10; 82.2.10a to 83.5.10; 49.2.8; Table 68-6; 82.2.10a.

Response *Response Status* **U**

REJECT.

Suggested remedy still points to Table 86-11. Additonal text doesn't simplify the document for the user.

Cl **83E** *SC* **83E.3.3.3.1** *P* **175** *L* **46** # 145

Dawe, Piers — Mellanox

Comment Type **T** *Comment Status* **A**

Use measurement/standards language.

SuggestedRemedy

Change characterized ... characterize ... characterization (in Fig 83E-14) with calibrated ... calibrate ... calibration . Similarly in 83E.3.4.2.1

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change:
...characterized at TP4.
to
...calibrated at TP4

change:
...to characterize the stress.
...to calibrate the stress.

Change Figure 83E-14:
characterization
to
calibration
Similarly in 83E.3.4.2.1 and Figure 83E-15

Cl **83E** *SC* **83E.3.3.3.1** *P* **175** *L* **48** # 12

Petrilla, John — Avago Technologies

Comment Type **T** *Comment Status* **A**

Is the term, "deterministic sinusoidal jitter" used to mean something other that sinusoidal jitter? If so, it should be defined and the Sinusoidal Jitter block in Figure 83E-14 should be changed to Deterministic Sinusoidal Jitter. See also 83E.3.4.2.1. If there are two different types of SJ needed for this test procedure, then should there e another block in the block diagrams

SuggestedRemedy

If the term, "deterministic sinusoidal jitter" is used to mean something other that sinusoidal jitter, please provide a definition and change the Sinusoidal Jitter Blocks in figure 83E-14 and 83E-15 to Deterministic Sinusoidal Jitter and add another Sinusoidal Jitter block where appropriate. Otherwise change "deterministic sinusoidal jitter" to "sinusoidal jitter" in 83E.3.3.3.1 and 83E.3.4.2.1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
change "deterministic sinusoidal jitter" to "sinusoidal jitter" in 83E.3.3.3.1 and 83E.3.4.2.1.

Cl **83E** *SC* **83E.3.3.3.1** *P* **176** *L* **15** # 162

Dawe, Piers — Mellanox

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

This test setup takes effort to set up so, to contain costs, it should be consistent with CEI-28G-VSR where appropriate.
CEI-28G-VSR doesn't have the low pass filter or limiter but has a UBHPJ source.

SuggestedRemedy

Consider if UBHPJ is a lower cost and acceptable substitute for the low pass filter and limiter.
We may need a low pass filter after any limiter to adjust VEC anyway.

Response *Response Status* **C**

REJECT.
Incomplete suggested remedy. The method of creating UBHPJ is not well defined.
Commenter is encouraged to build concensus on a remedy with a specific proposal and without "consider if" or "may need"

Cl **83E** *SC* **83E.3.3.3.1** *P* **176** *L* **25** # 123

Dawe, Piers — Mellanox

Comment Type **E** *Comment Status* **A** *Bucket*

Inefficient layout.

SuggestedRemedy

Please move the dashed box with the key up and to the left, reduce the height of the figure. Also for Figure 83E-15.

Response *Response Status* **C**

ACCEPT.

Cl **83E** *SC* **83E.3.3.3.1** *P* **176** *L* **25** # 124

Dawe, Piers — Mellanox

Comment Type **E** *Comment Status* **A** *Bucket*

Two blank lines.

SuggestedRemedy

Remove them, or trim the top of the figure. Also for Figure 83E-15.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Trim top of figure of 83E-14 and 83E-15

Cl **83E** *SC* **83E.3.3.3.1** *P* **177** *L* **3** # 125

Dawe, Piers Mellanox

Comment Type **E** *Comment Status* **A** *Bucket*

There is no "minimum eye height" in Table 83E-5.

SuggestedRemedy

Delete "minimum". (83E.3.4.2.1 doesn't need fixing.)

Response *Response Status* **C**

ACCEPT.

Cl **83E** *SC* **83E.3.3.3.1** *P* **177** *L* **9** # 140

Dawe, Piers Mellanox

Comment Type **T** *Comment Status* **R**

We don't usually allow any valid signal for the signal (or lane) under test.
But, as asked before, shouldn't we allow Remote Fault, because that's what a port should transmit when receiving PRBS31 counter-propagating crosstalk signals?

SuggestedRemedy

Change
Pattern 5 (with or without FEC encoding), Pattern 3 or a valid 100GBASE-R signal
to
Pattern 5 (with or without FEC encoding) or Pattern 3
or
Pattern 5 (with or without FEC encoding), Remote Fault (with or without FEC encoding) or Pattern 3

Response *Response Status* **C**

REJECT.
Remote fault is a valid 100GBASE-R signal

Cl **83E** *SC* **83E.3.4** *P* **177** *L* # 165

Dawe, Piers Mellanox

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

Are these test points right?

SuggestedRemedy

Differential to common mode input return loss (min) should be at TP1 (no footnote b), Differential pk-pk input voltage tolerance (min) at TP1a (footnote b). OIF has Common Mode Voltage at TP1 but it would be more practical, and consistent with Table 83E-1 and nPPI, to define single-ended voltage and DC common-mode voltage at TP1a (footnote b). This might be better done with a test point column, as VSR Table 13-2 and nPPI Table 86A-2 do.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Modify so that:
- overload differential voltage pk-pk measured at TP1a
- Differential to common mode input return loss (min) measured at TP1.
- Single ended voltage tolerance (min and max) at TP1a

Also see comments 107 and 120

Cl **83E** *SC* **83E.3.4** *P* **177** *L* **17** # 172

Li, Mike Altera

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

DC Common Mode Voltage is missing
CommentEnd: 40

SuggestedRemedy

Add DC Common Mode Voltage -350 mv (min), 2850 mV (max)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See comment 163

Cl **83E** *SC* **83E.3.4** *P* **177** *L* **31** # 107

Dudek, Mike QLogic

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

The Differential to Mommon mode input return loss should be measured at TP1 (same as Differential input return loss). It isn't measureable at TP1a. However the Differential pk-pk input voltage tolerance should be defined at TP1a

SuggestedRemedy

Delete the footnote b reference for the differential to common mode input return loss parameter, and add it to the "Differential pk-pk input voltage tolerance" parameter.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See comment 165

[Editor's note: Clause changed from 177 to 83E]

Cl **83E** *SC* **83E.3.4** *P* **177** *L* **36** # 163

Dawe, Piers Mellanox

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

Table 83E-1 constrains the host DC common-mode output voltage as well as single-ended output voltage. Any test of module input must be within these constraints.

SuggestedRemedy

Add rows for DC common-mode input voltage (same limits as Table 83E-1, or consider the 50 mV insets that OIF uses).
Add footnote saying that DC common-mode input voltage is generated by the host.
Rename "Single-ended voltage tolerance" to "Single-ended voltage" twice.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In Table 83E-7, add DC Common mode voltage -350 mV (min), 2850 mV (max)
with a note "DC Common mode voltage is generated by the host. Specification includes effects of ground offset voltage."

See also comment 172

Cl **83E** *SC* **83E.3.4.1** *P* **178** *L* **45** # 167

Dawe, Piers Mellanox

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

Need two BERs (with and without FEC protection) per another comment.

SuggestedRemedy

Change
The CAUI-4 module input is defined to operate at a bit error ratio (BER) better than 1e-15 for an input signal defined by 83E.3.3.3.
to
When the link partner will provide FEC correction (CAUI-4p - e.g. when the PHY type is 100GBASE-SR4), the CAUI-4 module input is defined to operate at a bit error ratio (BER) better than 2.5e-6 for an input signal defined by 83E.3.4.2.
When the link partner will not always provide FEC correction (CAUI-4u - e.g. when the PHY type is 100GBASE-LR4), the CAUI-4 module input is defined to operate at a bit error ratio (BER) better than 10e-15 for an input signal defined by 83E.3.4.2.

Response *Response Status* **C**

REJECT.

See comment 154

Cl **83E** *SC* **83E.3.4.2** *P* **179** *L* **23** # 24

Latchman, Ryan Mindspeed

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

Module evaluated with only one frequency dependent loss. Stress test should cover min and max loss, and module should have loss information communicated to it.

SuggestedRemedy

Implement changes in latchman_01_120913_CAUI to address this.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment #21

Cl **83E** *SC* **83E.3.4.2.1** *P* **177** *L* **14** # 141

Dawe, Piers Mellanox

Comment Type **T** *Comment Status* **R**

This test setup takes effort to set up so, to contain costs, it should be consistent with CEI-28G-VSR.
CEI-28G-VSR doesn't have the low pass filter or limiter but has a UBHPJ source.

SuggestedRemedy

Consider if UBHPJ is a lower cost and acceptable substitute for the low pass filter and limiter.

Response *Response Status* **C**

REJECT.

The method of creating UBHPJ is not well defined. Commenter is encouraged to build concensus on a remedy with a specific proposal and without "consider if" or "may need"

Cl **83E** *SC* **83E.3.4.2.1** *P* **178** *L* **49** # 164

Dawe, Piers Mellanox

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

Need to explain the frequency dependent attenuator more (as OIF VSR has done since May 2013); a clean Bessel-Thomson filter would not be suitable.

SuggestedRemedy

Insert: The frequency-dependent attenuator represents the host channel, and may be implemented with PCB traces (a Bessel-Thomson filter would not be suitable).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change:
...variable gain function, and frequency dependent attenuation. The amount of applied peak-to-peak...

To:

...variable gain function, and frequency dependent attenuation. The frequency-dependent attenuator represents the host channel, and may be implemented with PCB traces. The amount of applied peak-to-peak...

Cl **83E** *SC* **83E.4.2** *P* **179** *L* **46** # 136

Dawe, Piers Mellanox

Comment Type **T** *Comment Status* **A**

This is called "Host / Module eye contour measurement method" yet there is nothing within to justify "eye contour" (and we don't need contours to find eye width and eye height).
This isn't the measurement method" as we have described that in 83E.3.1.6 and 83E.3.2.1.
Rogue capital?

SuggestedRemedy

Change to
"Host and module eye width and eye height calculation method"
or simply
"Eye width and eye height calculation method".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change:
"Host / Module eye contour measurement method"
to:
"Eye width and eye height measurement method".

Cl **83E** *SC* **83E.4.2** *P* **179** *L* **51** # 118

Dawe, Piers Mellanox

Comment Type **E** *Comment Status* **A** *Bucket*

The follow procedure

SuggestedRemedy

The following procedure

Response *Response Status* **C**

ACCEPT.

Cl **83E** *SC* **83E.4.2** *P* **179** *L* **53** # 139

Dawe, Piers — Mellanox

Comment Type **T** *Comment Status* **R**

Is it wise to use the same CRU bandwidth for host and module test? The host should start with a clean signal and clock, so its low frequency jitter should be in a low jitter bandwidth.

SuggestedRemedy

Consider if the Tx side jitter bandwidth should be reduced so that it is less than the Rx side jitter bandwidth. Also affects the applied SJ in Table 83E-8 module stressed input parameters, and 83D.

Response *Response Status* **C**

REJECT.

CRU bandwidth is intended to measure jitter in the frequencies of interest.
There will only be a few of these interfaces cascaded in a typical link so it is not believed that there will be an issue with jitter accumulation.
Lowering the bandwidth does not provide a benefit when considering how the optical interface is measured.

Cl **83E** *SC* **83E.4.2** *P* **180** *L* **17** # 154

Dawe, Piers — Mellanox

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

100GBASE-SR4 always uses FEC. In a new QSFP-based design, the FEC coding and checking will be in the host. 100GBASE-CR4 always has FEC in the host too. So we can use that FEC benefit in chip-to-module CAUI-4:
The module supports a particular PMD type which uses FEC or it doesn't. 100GBASE-SR4 goes with FEC-protected C2M CAUI-4 which doesn't need to work / be tested better than 2.5e-6, 100GBASE-LR4 goes with present draft 1e-15 C2M CAUI-4.
Host has much reduced requirements (if it doesn't support 100GBASE-LR4 on this port) which translates into cost and power benefits for high density 100G equipment (also, 4x more interesting with 16-lane 400G!).
I believe these with-FEC and without-FEC variants will exist in the market whatever, but it will reduce confusion if IEEE acknowledges that and provides the stability of a good standard.
The corrected BER for short packets for 2.5e-6 is [Tilde]3.4e-23. For more info see dawe_01_0913_optx.pdf.

SuggestedRemedy

Create two classes of C2M CAUI-4. The one without FEC as is (BER max 1e-15), and the FEC-protected one with:
EH6 and EW6 in place of EH15 and EW15, with same limits.
BER max 2.5e-6 (just 5% of the 5e-5 that delivers 1e-12 after FEC).
We could name the two flavours CAUI-4p for the RS-FEC protected interface and CAUI-4u for the unprotected interface.
At line 17, change "The eye width is then given by Equation (83E-7)" to "For CAUI-4p, the eye width is EW6 and for CAUI-4u, the eye width is given by Equation (83E-7)".
Similarly for eye height at line 34.

Response *Response Status* **C**

REJECT.

See dawe_01a_0114_optx and also comments 166 and 167

There was no consensus to make this change.
Also see latchman_02_0513_optx
Comment #219 against D1.0 proposed defining two options: one for non-RS-FEC use and the other for with-RS-FEC use. This was not supported by a straw poll of the Task Force.

[Editor's note: tilde character changed to [Tilde] in Comment text]

A straw poll of the Task Force was taken:
Do you support the creation of two classes of C2M CAUI-4, one for non-FEC operation and another for with-FEC operation?
Yes 10
No 18

Cl **83E** *SC* **83E.4.2** *P* **180** *L* **25** # 126

Dawe, Piers — Mellanox

Comment Type **E** *Comment Status* **A**

We don't want to make histograms of the signal's amplitude (its swing). We want histograms of the signal (its voltage). Aligning with CEI-28G-VSR.

SuggestedRemedy

Change amplitude to voltage, 3 times.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change:
Use the differential equalized signal from step 2 to construct the CDF of the signal amplitude in the middle 5% of the eye, for both logic 1 (CDF1) and logic 0 (CDF0), as a distance from the center of the eye. Calculate the eye height (EH6) as the difference in amplitude between CDF1 and CDF0 with a value of 10-6. CDF0 and CDF1 are calculated as the cumulative sum of histograms of the amplitude at the top and bottom of the eye normalized by the total number of sampled bits

to

Use the differential equalized signal from step 2 to construct the CDF of the signal voltage in the central 5% of the eye, for both logic 1 (CDF1) and logic 0 (CDF0), as a distance from the center of the eye. Calculate the eye height (EH6) as the difference in voltage between CDF1 and CDF0 with a value of 10-6. CDF0 and CDF1 are calculated as the cumulative sum of histograms of the
voltage at the top and bottom of the eye normalized by the total number of sampled bits

Cl **83E** *SC* **83E.4.2** *P* **180** *L* **3** # 22

Latchman, Ryan — Mindspeed

Comment Type **T** *Comment Status* **A**

host output should be evaluated with its recommended CTLE setting

SuggestedRemedy

Implement changes in latchman_01_120913_CAUI to address this.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment #21
[Editor's note: Comment type set to "T"]

Cl **83E** *SC* **83E.4.2** *P* **180** *L* **3** # 134

Dawe, Piers — Mellanox

Comment Type **T** *Comment Status* **A**

Apply respective reference receiver CTLE

SuggestedRemedy

Apply the appropriate reference receiver including CTLE

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Note this is a change to latchman_01_120913. See comment 21
In 83E.4.2 2), change:
"Apply respective reference receiver CTLE ..." to:
"Apply the reference receiver including the appropriate CTLE ..."

Cl **83E** *SC* **83E.5.4.1** *P* **183** *L* **37** # 117

Dawe, Piers — Mellanox

Comment Type **E** *Comment Status* **A**

PICS doesn't match main part of clause: there is no "shall" in 83E.3.1.4.

SuggestedRemedy

Make the PICS agree with the main part of the clause.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

For PICS item TH9 change the Subclause to 83E.3.1 with editorial license to fix any similar issues.

Cl **85** *SC* **85.3** *P* **65** *L* **27** # 59

Booth, Brad — Microsoft

Comment Type **ER** *Comment Status* **R**

This paragraph is talking about extension in relationship to auto-negotiation and the number of lanes; therefore, CR10 would be extended using only CAUI-10, not CAUI-n.

SuggestedRemedy

Change instances of CAUI-n to be CAUI-10.

Response *Response Status* **C**

REJECT.
This paragraph discusses the means by which "the AN_LINK(link_status).indication is relayed from the device with the PCS sublayer to the device with the AN sublayer". 100GBASE-CR10 can be extended using CAUI-4 as long as there is a 4:10 PMA sublayer below it. This means that it is appropriate to use "CAUI-n" here.

Cl **86** *SC* **86.1** *P* **67** *L* **37** # 111

Trowbridge, Steve — Alcatel-Lucent

Comment Type **E** *Comment Status* **R**

References to Annexes 83B and i3E explicitly say "Chip-to-module". Should References to Annexes 83A and 83D explicitly say "Chip-to-chip"?

SuggestedRemedy

Consider adding "Chip-to-chip" to the references to Annexes 83A and 83D in Table 86-1. Other occurrences of this throughout the clauses.

Response *Response Status* **C**

REJECT.
The titles of Annexes 83B and 83E include the text "chip-to-module". The title of Annex 83A does not contain "chip-to-chip" and the text of 83A.1 includes "The purpose of the optional XLAUI or CAUI-10 is to provide a flexible chip-to-chip and chip-to-module interconnect ..." so it is not appropriate to add "Chip-to-chip" to the rows for 83A.
Since the interface defined in Annex 83D could in principle be used for a chip-to-module application also, make no change to the draft.

Cl **86** *SC* **86.1** *P* **67** *L* **45** # 113

Dawe, Piers — Mellanox

Comment Type **E** *Comment Status* **R**

In this table the rows are in clause/annex number order, whether normative or not (this is also the order in the layer stack) - except 78 EEE. For 40GBASE-SR4 and 100GBASE-SR10, EEE is above the PMD.

SuggestedRemedy

Place 78 EEE in the correct place. As the first column heading is "Associated clause", it would be easier to go with strict clause/annex number order. However, other clauses have used layer stack order. Either way, EEE comes before/above PMD.

Response *Response Status* **C**

REJECT.
EEE is not a sublayer - it affects many sublayers in the stack, so it does not have a clear position in the list of sublayers in stack order.
The positioning at the bottom of P802.3bm D2.0 Tables 86-1, 87-1, 88-1, and 89-1 is consistant with that in Tables 84-1, 85-1, 92-1, 93-1, and 94-1 in P802.3bj D3.0

Cl **86** *SC* **86.1** *P* **67** *L* **50** # 77

Barrass, Hugh — Cisco

Comment Type **T** *Comment Status* **R**

The PMD sublayer has no choice in whether it supports EEE or not, as the PCS may decide to operate using fast wake without recourse to the PMD type. Therefore the additional paragraph in 86.1 is superflous.

SuggestedRemedy

Delete the additional paragraph at the end of 86.1

Response *Response Status* **C**

REJECT.
While it may be true that the PMD sublayer has no choice in whether it supports EEE fast wake or not, this is not contradicted by the added paragraphs in 86.1, 87.1, 88.1, 89.1, and 95.1.
The added text is helpful to the reader of these PMD clauses to clarify that the PHY may enter LPI mode but does not support deep sleep.
See also comments 78, 79, 80, 81 and also 60

Cl **86** *SC* **86.1** *P* **68** *L* **2** # 60

Booth, Brad — Microsoft

Comment Type **ER** *Comment Status* **A**

Optional may be optionally? EEE is defined as optional. The use of the word "may" also implies "may not". Correct wording to be succinct.

SuggestedRemedy

Change to read:
40GBASE-SR4 and 100GBASE-SR10 PHYs with Energy Efficient Ethernet (EEE) capability may enter the fast wake Low Power Idle (LPI) mode to conserve energy during periods of low link utilization (see Clause 78).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The first "optional" is useful to clarify the status of the EEE feature.
In 86.1, 87.1, 88.1, 89.1, 95.1 change:
"... may optionally enter the fast wake ..." to:
"... may enter the fast wake ..."
See also comments 61, 64, 65, 66 and also 77

Cl **87** *SC* **87.1** *P* **69** *L* **46** # 61

Booth, Brad Microsoft

Comment Type **ER** *Comment Status* **A**

Optional may optionally... bad wording.

SuggestedRemedy

40GBASE-LR4 and 40GBASE-ER4 PHYs with Energy Efficient Ethernet (EEE) fast wake capability may enter the Low Power Idle (LPI) mode to conserve energy during periods of low link utilization (see Clause 78).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See response to comment #60

Cl **87** *SC* **87.1** *P* **69** *L* **46** # 78

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **R**

The PMD sublayer has no choice in whether it supports EEE or not, as the PCS may decide to operate using fast wake without recourse to the PMD type. Therefore the additional paragraph in 87.1 is superflous.

SuggestedRemedy

Delete the inserted paragraph at the end of 87.1

Response *Response Status* **C**

REJECT.
See response to comment #77

Cl **87** *SC* **87.7.1** *P* **73** *L* **6** # 62

Booth, Brad Microsoft

Comment Type **T** *Comment Status* **R**

Paragraph could be shortened to be more succinct. (Technical because a shall is involved.)

Same applies to 87.7.2.

SuggestedRemedy

Change paragraph in 87.7.1 to read:
The 40GBASE-LR4 transmitter and the 40GBASE-ER4 transmitter shall meet the specifications defined in Table 87-7 per the definitions in 87.8.

Change paragraph in 87.7.2 to read:
The 40GBASE-LR4 receiver and the 40GBASE-ER4 receiver shall meet the specifications defined in Table 87-8 per the definitions in 87.8.

Response *Response Status* **C**

REJECT.
Comment #89 against D1.0 also proposed to merge these two sentences. This was rejected with the following justification:
This matches the equivalent sentences in 88.7.1. The two separate "shall" statements correspond with two separate PICS items:
XLLR1 in 87.12.4.3 for 40GBASE-LR4
XLER1 in 87.12.4.3a for 40GBASE-ER4

Cl **88** *SC* **88.1** *P* **83** *L* **40** # 64

Booth, Brad Microsoft

Comment Type **ER** *Comment Status* **A**

Optional may optionally... bad wording.

SuggestedRemedy

100GBASE-LR4 and 100GBASE-ER4 PHYs with the Energy Efficient Ethernet (EEE) fast wake capability may enter the Low Power Idle (LPI) mode to conserve energy during periods of low link utilization (see Clause 78).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See response to comment #60

Cl **88** *SC* **88.1** *P* **83** *L* **40** # 79

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **R**

The PMD sublayer has no choice in whether it supports EEE or not, as the PCS may decide to operate using fast wake without recourse to the PMD type. Therefore the additional paragraph in 88.1 is superflous.

SuggestedRemedy

Delete the additional paragraph at the end of 88.1

Response *Response Status* **C**

REJECT.
See response to comment #77

Cl **89** *SC* **89.1** *P* **85** *L* **35** # 80

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **R**

The PMD sublayer has no choice in whether it supports EEE or not, as the PCS may decide to operate using fast wake without recourse to the PMD type. Therefore the additional paragraph in 89.1 is superflous.

SuggestedRemedy

Delete the additional paragraph at the end of 89.1

Response *Response Status* **C**

REJECT.
See response to comment #77

Cl **89** *SC* **89.1** *P* **85** *L* **36** # 65

Booth, Brad Microsoft

Comment Type **ER** *Comment Status* **A**

Optional may optionally... bad wording.

SuggestedRemedy

40GBASE-FR PHYs with the Energy Efficient Ethernet (EEE) fast wake capability may enter the Low Power Idle (LPI) mode to conserve energy during periods of low link utilization (see Clause 78).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See response to comment #60

Cl **95** *SC* **95** *P* **95** *L* **4** # 152

Dawe, Piers Mellanox

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

We have found and corrected some items copied from Clause 87 that don't apply, and what's in 86 is preferable. We need to check if there are any more.

SuggestedRemedy

Compare Clause 95 against Clause 86. This is best done by the editor in FrameMaker. Correct unwanted discrepancies.

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

No specific remedy proposed.

Cl **95** *SC* **95.1** *P* **95** *L* **48** # 81

Barrass, Hugh Cisco

Comment Type **T** *Comment Status* **R**

The PMD sublayer has no choice in whether it supports EEE or not, as the PCS may decide to operate using fast wake without recourse to the PMD type. Therefore the additional paragraph in 95.1 is superflous.

SuggestedRemedy

Delete the penultimate paragraph of 95.1

Response *Response Status* **C**

REJECT.
See response to comment 77

Cl **95** *SC* **95.1** *P* **95** *L* **48** # 66

Booth, Brad Microsoft

Comment Type **ER** *Comment Status* **A**

Optional may optionally... bad wording.

SuggestedRemedy

Change to read:
100GBASE-SR4 PHYs with the Energy Efficient Ethernet (EEE) fast wake capability may enter the Low Power Idle (LPI) mode to conserve energy during periods of low link utilization (see Clause 78).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See response to comment 60

Cl **95** *SC* **95.11.1** *P* **110** *L* **7** # 20

Petrilla, John — Avago Technologies

Comment Type **T** *Comment Status* **R**

The values for skew, 79, and skew variation, 2.4, in table 95-11 are slightly different than the differences between SP3 and SP4 in 95.3.2, 80 & 2.8 respectively. While note a in Table 95-11 explains the difference for Skew Variation, there is no explanation for Skew. Please add a note explaining the difference, or if the difference is unintentional, correct the value.

SuggestedRemedy

Add a note explaining the difference between the difference between Skew values for SP3 and SP4 in 95.3.2 or, if the difference is unintentional, correct the value.

Response *Response Status* **C**

REJECT.
The treatment of skew and skew variation in Table 95-11 follows that of Table 86-13 which also has 79 ps for max Cabling Skew.
No specific remedy proposed.

Cl **95** *SC* **95.12.4.1** *P* **115** *L* **21** # 89

Ran, Adee — Intel

Comment Type **T** *Comment Status* **R**

CF6 and CF7 are two halves of one normative statement. Each one doesn't make sense on its own.

MDI carries optical signals, not bits. PMD converts them to bits.

SuggestedRemedy

Merge these two items into one with the comment "Converts four optical signals received from the MDI into separate bit streams and delivers them to the PMD service interface".

Response *Response Status* **C**

REJECT.
The current wording matches that used in several other clauses. The proposed remedy doesn't improve the text.

Cl **95** *SC* **95.12.4.2** *P* **116** *L* **16** # 90

Ran, Adee — Intel

Comment Type **T** *Comment Status* **A**

CM4 is a duplicate of CM3. There is only one optional feature (PMD_lane_by_lane_transmit_disable).

SuggestedRemedy

Delete CM4, and change CM3 status to MD:O.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Modify CM3 and CM4 to be equivalent to SM3 and SM4 in 86.11.4.2

Cl **95** *SC* **95.5.2** *P* **99** *L* **43** # 84

Ran, Adee — Intel

Comment Type **E** *Comment Status* **R**

"Bit streams" make sense. "Optical signal streams" don't. These are optical signals.

SuggestedRemedy

Change "optical signal streams" to "optical signals" (twice in 95.5.2 and once in 95.5.3).

change "each signal stream" to "each signal" (once in 95.5.2 and once in 95.5.3).

Response *Response Status* **C**

REJECT.
The current wording matches that used in other clauses. The proposed remedy doesn't improve the text.

Cl **95** *SC* **95.5.4** *P* **100** *L* **11** # 76

Szczepanek, Andre — Inphi

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

The sentence :

"The value of the SIGNAL_DETECT parameter shall be generated according to the conditions defined in Table 95-4. "

Applies a "Shall" to table 95-4, which states "AND (compliant 100GBASE-SR4 signal input)". But the following sentence then says "The PMD receiver is not required to verify whether a compliant 100GBASE-SR4 signal is being received".

So is compliance required or not ?

SuggestedRemedy

Remove "AND (compliant 100GBASE-SR4 signal input)" from Table 95-4

Response *Response Status* **C**

REJECT.
Compliance is required, but the PMD does not have to identify whether the incoming signal is 100GBASE-SR4 compliant or not to comply with Table 95-4.

Clause 95 follows the same format for this section as clauses 52, 86, 87, 88, and 89.
See also the response to comment #95 against D1.0

Cl **95** *SC* **95.5.7** *P* **101** *L* **3** # 49

Ghiasi, Ali — Independent

Comment Type **ER** *Comment Status* **R**

The way text reads "allows all of the optical transmitters to be 3 disabled. "

SuggestedRemedy

with "allows all transmit optical lanes to be 3 disabled. "

Response *Response Status* **C**

REJECT.

[Editor's note: Subclause changed from 5.7 to 95.5.7]
Suggested remedy degrades clarity. Switching off optical transmitters is unambiguous.

Cl **95** *SC* **95.7** *P* **102** *L* **16** # 173

Maki, Jeffery — Juniper Networks, Inc.

Comment Type **T** *Comment Status* **A**

There are low latency applications that will seek to operate a 100GBASE-SR4 link with FEC disabled. There is no stated operating range in Table 95-5 that can be achieved with FEC disabled.

SuggestedRemedy

Add footnote to Table 95-5 stating either "There is no required operating range with FEC disabled" or "With FEC disabled, the required operating range is <0.5 m to <TBD value> m for OM3 and <0.5 m to <TBD value> m for OM4."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The agreed link model showed no link distance could be guaranteed without the RS-FEC, (see petrilla_03_1112_mmf).
Add footnote to Table 95-1, RS-FEC row:
"The option of bypassing the Clause 91 RS-FEC correction function may not be used."
Add a footnote to Table 95-5 "Required operating range" stating:
"The RS-FEC correction function may not be bypassed for any operating distance."

Cl **95** *SC* **95.7.1** *P* **102** *L* **19** # 16

Petrilla, John — Avago Technologies

Comment Type **T** *Comment Status* **A**

Since SR4 is a multilane transceiver and the specifications in table 95-6 apply to each lane, to ensure that this is understood, it seems appropriate to cover this explicitly in the introductory sentence. At present some of the attributes have the phase, "each lane" in the Description column and some do not.

SuggestedRemedy

Change, "The 100GBASE-SR4 transmitter shall meet the specifications defined in Table 95-6 ..." to "Each lane of a 100GBASE-SR4 transmitter shall meet the specifications defined in Table 95-6 ...". If accepted, then the phrase, "each lane" can be deleted from specific attributes in the Description column of Table 95-6.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change, "The 100GBASE-SR4 transmitter shall meet the specifications defined in Table 95-6 ..." to "Each lane of a 100GBASE-SR4 transmitter shall meet the specifications defined in Table 95-6 ...".
See also comment 17.

Cl **95** *SC* **95.7.1** *P* **102** *L* **37** # 148

Dawe, Piers — Mellanox

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

The minimum OMA of -7.1 dB is based on the 0.9 dB TDP in footnote b, which is the same as for 40GBASE-SR4, although the maximum TDP is different. However, because of the way TDP is defined, a very good 100GBASE-SR4 transmitter is most unlikely to have a TDP below 1.4 dB (see dawe_02_0913_optx.pdf). We should rule out cases that just won't happen in a compliant situation so that the spec can be used for diagnostics.

SuggestedRemedy

Change the 0.9 dB TDP in footnote b to at least 1.4 dB.
Change minimum OMA of -7.1 dB to at least -6.6 dB.
Make consequent changes in receiver specs.
Increase the minimum average powers by the same amount.

Response *Response Status* **U**

REJECT.
As shown in dawe_03_0114_optx fast risetime transmitters can have a TDP below 0.9 dB. Low TDP transmitters should not be burdened.

Cl **95** *SC* **95.7.1** *P* **102** *L* **39** # 43

Ghiasi, Ali — Independent

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

Min TDP is referenced without stating what the min value is

SuggestedRemedy

Provide reference for min TDP

Response *Response Status* **C**

REJECT.
Duplicate of comment # 42
[Editor's note: Subclause changed from 7.1 to 95.7.1]
See response to comment 42

Cl **95** *SC* **95.7.1** *P* **102** *L* **39** # 42

Ghiasi, Ali — Independent

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

Min TDP is referenced without stating what the min value is

SuggestedRemedy

Provide reference for min TDP

Response *Response Status* **C**

REJECT.
[Editor's note: Subclause changed from 7.1 to 95.7.1]

The (min) refers to the minimum value of the difference between the OMA and the TDP, not the minimum TDP.
Similar format used in clauses 86, 87, and 88.

Cl **95** *SC* **95.7.1** *P* **102** *L* **39** # 19

Petrilla, John — Avago Technologies

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

If the comment to replace TDP with TxVEC is not accepted, then in Table 95-6 values for TDP attributes, Transmitter and dispersion penalty (TDP), each lane (max) and Launch power in OMA minus TDP (min), should be adjusted and in 95.8.5 item d), the value for the BT filter should also be adjusted. The present values are based on the inclusion of impairments due to chromatic dispersion in the set of penalties included in TDP. However, chromatic dispersion effects are not captured in the TDP test method. Recalculating TDP without the effects of chromatic dispersion lead to a max TDP of 4.08 dB versus the prior 4.96 dB and a filter BW of 16.21 GHz versus the prior 12.61 GHz.

SuggestedRemedy

In Table change the value for
Transmitter and dispersion penalty (TDP), each lane (max) from 5 to 4.1
Launch power in OMA minus TDP (min) from -8 to -7.1

In 95.8.5, item d) change 12.6 GHz to 16.2 GHz.

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

TDP vs a VEC spec has been (and continues to be) reviewed in the MMF ad hoc, no agreement to change the current draft has been reached.

See petrilla_01_0114.

Cl **95** *SC* **95.7.1** *P* **102** *L* **41** # 13

Petrilla, John — Avago Technologies

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

After calculating TDP for multiple worst case transmitters, ones that provide minimally acceptable link margin, i.e. zero, the ability of TDP to predict link margin for MMF links does not appear adequate. Another metric, TxVEC, based on vetrical eye closure measured at the Tx output, TP2, should be used instead. See petrilla_01_0114 for more details. Adoption of this metric will improve the balance of test-escapes vs false-positives that exists with the TDP metric and removes the problems associated with a reference Tx that's required for the TDP metric. The set of Tx attributes captured by TDP are also captured by TxVEC.

SuggestedRemedy

In Table 95-6, replace TDP with TxVEC; 3 times including footnote b. For Launch power in OMA minus TDP (min), change -8 to -8.1. For Transmitter and dispersion penalty (TDP), each lane (max) change 5 to 5.1. In footnote b, there's no need to change 0.9 dB.

In Table 95-8, change 'Power budget (for max TDP)' to 'Power budget (for max TxVEC)' and change 'Allocation for penalties (for max TDP)' to 'Allocation for penalties (for max TxVEC)'.

In Table 95-10, change 'Transmitter and dispersion penalty (TDP)' to 'Transmitter and dispersion penalty (TxVEC)'

In 95.8.11 change TDP (occurs twice) to TxVEC

Replace the subclause 95.8.5 Transmitter and dispersion penalty (TDP) with a new subclause 95.8.5 Transmitter Vertical Eye Closure found in petrilla_01_0114.

If any of the above values are updated they will be found in petrilla_01_0114.

In 95.12.4.4 replace "Transmitter and dispersion penalty" with "Transmitter vertical eye closure"

Response *Response Status* **U**

REJECT.
TDP vs a VEC spec has been (and continues to be) reviewed in the MMF ad hoc, no agreement to change the current draft has been reached. The commenter is invited to try to generate a consensus concerning this proposed change in the MMF Ad Hoc.

See petrilla_01_0114.

Cl **95** *SC* **95.7.1** *P* **102** *L* **41** # 146

Dawe, Piers — Mellanox

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

The TDP limit is much too high: we will use the TDP as defined and measured, which is lower than that calculated in the spreadsheet model. TDP of 5 is near to a "cliff" (see dawe_01_0513_optx.pdf and presentation for January).
We need to allow 0.2 dB more in the budget for modal noise (see mmfadhoc/meetings/nov6_13/ModalNoiseIn100GBASE-SR4v3a_mmf.pdf).

SuggestedRemedy

Change 5 dB to 4 dB TBC.
Consequent changes: change OMA-TDP from -8 dB to -7 dB TBC;
Change Average launch power, each lane (min)?
In receive specs, change Average receive power, each lane (min)?
In receive specs, change Stressed receiver sensitivity (OMA), each lane (max)?
In Table 95-8, 100GBASE-SR4 illustrative link power budget, change Power budget (for max TDP) from 8.2 dB to 7.4 dB TBC.
In Table 95-8, change Allocation for penalties (for max TDP) from 6.3 dB to 5.5 dB TBC.
Other consequent changes?
Revise the eye mask (see another comment).

Response *Response Status* **U**

REJECT.
TDP and modal noise specs have been (and continue to be) reviewed in the MMF ad hoc, no agreement to change the current draft has been reached. The commenter is invited to try to generate a consensus concerning this proposed change in the MMF Ad Hoc.

Cl **95** *SC* **95.7.1** *P* **102** *L* **50** # 15

Petrilla, John — Avago Technologies

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

Additional analysis of worst case transmitters, ones that provide just sufficient link margin, i.e. link margin = 0 according to the link model, found that the eye mask coordinates in Table 95-6 can lead to rejection of otherwise acceptable transmitters.

SuggestedRemedy

In Table 95-6, change Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3} from "{0.28, 0.34, 0.43, 0.36, 0.44, 0.4}" to "{0.31, 0.35, 0.43, 0.36, 0.44, 0.4}"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In Table 95-6, change Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3} from "{0.28, 0.34, 0.43, 0.36, 0.44, 0.4}" to "{0.3, 0.38, 0.45, 0.35, 0.41, 0.5}"

Cl **95** *SC* **95.7.1** *P* **102** *L* **50** # 156

Dawe, Piers — Mellanox

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

This eye mask may be suitable for the pure Gaussian waveforms in the spreadsheet model but fails some acceptable transmitters that pass TDP.
A 10 sided mask will provide a statistically better measurement (reduced false positives or negatives for the same mask margin) than a hexagon.

SuggestedRemedy

Revise the mask considering the range of acceptable transmitters that pass TDP:
E.g. increase Y1, increase Y3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See response to comment 15

Cl **95** *SC* **95.7.2** *P* **103** *L* **27** # 155

Dawe, Piers — Mellanox

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

Are the J2 and J4 values correct?

SuggestedRemedy

Review them in light of changes to TDP and VECP.

Response *Response Status* **U**

REJECT.
No specific remedy proposed.

Cl **95** *SC* **95.7.2** *P* **103** *L* **27** # 14

Petrilla, John — Avago Technologies

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

The value, 3.6, for the condition Vertical eye closure penalty (VECP),each lane is only sufficient to capture ISI effects and does include the effects of noise penalties that would be observed when setting this condition.

SuggestedRemedy

Change the condition Vertical eye closure penalty (VECP), each lane from 3.6 to 4.2.

Response *Response Status* **C**

ACCEPT.

Cl **95** *SC* **95.7.2** *P* **103** *L* **3** # 17

Petrilla, John — Avago Technologies

Comment Type **T** *Comment Status* **A**

Since SR4 is a multilane transceiver and the specifications in table 95-7 apply to each lane, to ensure that this is understood, it seems appropriate to cover this explicitly in the introductory sentence. At present some of the attributes have the phase, "each lane" in the Description column and some do not.

SuggestedRemedy

Change "The 100GBASE-SR4 receiver shall meet the specifications defined in Table 95-7 ..." to "Each lane of a 100GBASE-SR4 receiver shall meet the specifications defined in Table 95-7 ...". If accepted, then the phrase, "each lane" can be deleted from specific attributes in the Description column of Table 95-7

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Follow format adopted for comment 16

Cl **95** *SC* **95.7.2** *P* **103** *L* **30** # 44

Ghiasi, Ali — Independent

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

It is not clear how J2 and J4 are measured

SuggestedRemedy

Need to define reference receiver bandwidth suggest BW=18 GHz and suggest OMA sensitivity of -5.6 dBm

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
[Editor's note: Subclause changed from 7.2 to 95.7.2]

Give editor licence to add sub-section to 9.8 to define or reference J2 and J4, following the format of clause 86.

Cl **95** *SC* **95.7.2** *P* **103** *L* **41** # 45

Ghiasi, Ali — Independent

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

LRM introduced a flawed jitter tolerance methdology where you take credit for transmitter SJ which exist in real system with addition of other stress, but the receiver is only tested unstress SJ

SuggestedRemedy

Add note stress receiver sensitivity that it must be tested SJ as defined by the golden CRU with 10 MHz corner frequency see ghiasi_01_0114

Response *Response Status* **U**

REJECT.

[Editor's note: Subclause changed from 7.2 to 95.7.2]

Separating SRS and jitter tolerance tests is considered a test cost reduction without compromise to reliability. It is allowed in clause 86, and no issues have been reported.

A straw poll of the Task Force was taken:
Do you support removal of the separate Jitter Tolerance test and the addition of an SJ mask to the SRS test as per the suggested remedy?
Yes 1
No 6

Cl **95** *SC* **95.7.2** *P* **103** *L* **52** # 2

Anslow, Pete — Ciena

Comment Type **E** *Comment Status* **A** *Bucket*

low-frequency should be hyphenated

SuggestedRemedy

Change "low frequency" to "low-frequency"

Response *Response Status* **C**

ACCEPT.

Cl **95** *SC* **95.7.3** *P* **104** *L* **12** # 158

Dawe, Piers — Mellanox

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

With the change to allow a very low extinction ratio, we need to allow an additional 0.2 dB in the budget for modal noise (see mmfadhoc/meetings/nov6_13/ModalNoiseIn100GBASE-SR4v3a_mmf.pdf), but the TDP limit should be reduced anyway.

SuggestedRemedy

See other comments and presentations.

Response *Response Status* **U**

REJECT.
Initial analysis by Petar Pepeljugoski in the MMF ad hoc meeting of Dec 19th was not agreed to support an increase in allocated penalty for the modal noise. Further study was recommended to determine if an increase was needed.

See MMF ad hoc minutes for Dec 19th 2013.

Cl **95** *SC* **95.8** *P* **104** *L* **28** # 85

Ran, Adee — Intel

Comment Type **T** *Comment Status* **R**

Normative statements should refer to measurement results, but this subclause specifies methods, and it needs no normative statements.

PICS items in 95.12.4.4 don't make sense. Their expected results are already covered by the general items in table 95.12.4.3, so this table is redundant and can be deleted.

SuggestedRemedy

Change "shall be made" to "are made", and rephrase similarly for all normative statements in subclauses of 95.8.

Response *Response Status* **C**

REJECT.

The spec values are associated with test methods and/or parameter definitions. The use of a 2m to 5m patchcord is part of the test method. In many cases using a longer patchcord could invalidate test results.

A similar format has been used in clauses 87, 88, 52.

The current format for the PICS follows many other clauses. It allows specific non complainces to be easily identifiable, and may be helpful to the user.

Cl **95** *SC* **95.8** *P* **104** *L* **28** # 18

Petrilla, John — Avago Technologies

Comment Type **ER** *Comment Status* **R**

Since it is not the intention to mandate specific tests and test methods but only to require specified results if tested according to the methods defined in the subclauses of 95.8, such a statement should be included in 95.8. There is such a statement in 95.8.1.1 but it may not be understood as applying to all tests and test methods.

SuggestedRemedy

Insert the following as the first sentences in 95.8, "The tests and test methods defined in the subclauses of 95.8 are not mandated to be applied to each 100GBASE-SR4 transmitter and receiver, rather only that the defined results are realized if tested according to the defined method. Alternative test methods that generate equivalent results may be used." If inserted the sentence, "Alternative test methods that generate equivalent results may be used.", may be deleted from 95.8.1.1.

Response *Response Status* **U**

REJECT.

Each sub-section of 95.8 already includes either a parameter definition, or a reference to the spec value 'if measured using .' and a reference to the test definition. If this is not the case, then the commenter is invited to make specific comments to that effect.

No tests are mandated, but compliance to the spec value, if using the specified test method, is.

Whereas bit error ratios are unambiguous, other parameters (eg ER) when measured with different test methods could result in different numerical values; this would make checking spec compliance very complex.

Cl **95** *SC* **95.8** *P* **104** *L* **29** # 181

Dawe, Piers — Mellanox

Comment Type **E** *Comment Status* **R**

Discrepancy vs. 86.8.1

SuggestedRemedy

Add sentence: A patch cord that connects the MDI transmit side to four individual connectors may be suitable.

Response *Response Status* **C**

REJECT.

[Editor's note: This comment was sent after the close of the comment period.]

Specifying length is sufficient. Additional characteristics don't need to be mentioned, and doing so doesn't improve the document.

Cl **95** *SC* **95.8.1** *P* **104** *L* **40** # 115

Dawe, Piers — Mellanox

Comment Type **E** *Comment Status* **R**

In practice, Table 95-10, Test-pattern definitions and related subclauses, is our index of parameter definitions. And it doesn't address pattern definitions at all: Table 95-9, Test patterns, does

SuggestedRemedy

Change title of Table 95-10 to:
Parameter definitions and related test patterns
Consider adding new sentence at the end of 95.8:
Table 95-10 lists the parameters with a reference to their definition and the appropriate test patterns.
Add any parameters that don't have test patterns.

Response *Response Status* **C**

REJECT.
The current format is consistent with clauses 87, 88 and clause 52. A maintenance request may be more appropriate.

Cl **95** *SC* **95.8.1** *P* **105** *L* **18** # 151

Dawe, Piers — Mellanox

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

Table 95-10, Test-pattern definitions and related subclauses, has two rows for OMA:
Optical modulation amplitude (OMA) Square wave or 4 95.8.4; and
Calibration of OMA for receiver tests Square wave or 4 52.9.9.
95.8.4 says "OMA shall be as defined in 52.9.5 for measurement with a square wave (8 ones, 8 zeros) test pattern or 68.6.2.."; and
52.9.9.3 (part of 52.9.9) says "OMA is measured per the method in 52.9.5 using the square wave pattern."
So 95.8.4 is the preferred definition, and should be used for receiver tests as well as launch OMA.

SuggestedRemedy

In Table 95-10, Test-pattern definitions and related subclauses, delete the row "Calibration of OMA for receiver tests Square wave or 4 52.9.9" so that the earlier row "Optical modulation amplitude (OMA) Square wave or 4 95.8.4" applies.
In 95.8.8 a), insert as second sentence "Optical modulation amplitude (OMA) is defined in 95.8.4."

Response *Response Status* **U**

REJECT.
The section referenced is for further information on the relevant test (in this case calibration of the signal used to test SRS) so referenceing section 52.9.9 is probably more useful to the user.

Cl **95** *SC* **95.8.1** *P* **105** *L* **5** # 86

Ran, Adee Intel

Comment Type **T** *Comment Status* **A**

PMD can transmit "valid RS-FEC encoded 100GBASE-R signal".

SuggestedRemedy

Change "valid 100GBASE-R signal" to "valid RS-FEC encoded 100GBASE-R signal" in first two rows of this table.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change "valid 100GBASE-R signal" to "valid 100GBASE-SR4 signal" where occuring in this table.

Grant editorial licence to clean up any other occurences.

Cl **95** *SC* **95.8.1.1** *P* **105** *L* **29** # 87

Ran, Adee Intel

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

For the receiver tests, according to 52.9.9.1: The receiver of the system under test is tested for conformance by enabling the error counter on the receiving side.

For pattern 5 (RS-FEC encoded scrambled idle), the adequate error counters are in the RS-FEC sublayer, since errors are corrected before being delivered to the PCS. RS-FEC error counters are per lane so this allows lane-by-lane measurement just as in pattern 3. It can also work with any valid RS-FEC encoded 100GBASE-R signal.

It should be noted that the RS-FEC error counters count 10-bit symbol errors, while the specification in 95.1.1 is for bit errors. Since the counts are expected to be the same (assuming bit errors are independent), the per-lane symbol error counters should be used to measure the lane-by-lane BER.

It should also be noted that pattern 3 testing uses error counters at the PMA (85.3.10) - I couldn't find any reference to this in the text (receiver test methods refer to clause 52).

For the TDP test, using pattern 5 requires an error detector capable of decoding this pattern, which requires all lanes to be received in parallel. Assuming this is intended, it should be noted.

SuggestedRemedy

Change this paragraph to read:

Receiver BER measurements are performed on a lane-by-lane basis. Lanes can be stressed at the same time or separately. To find the interface BER, the BERs of all the lanes when stressed are averaged. All aggressor lanes are operated as specified.

If Pattern 3 is used, each lane can be tested separately, and BER is read from error counters at the PMA (85.3.10) when stress is applied. If Pattern 5 (RS-FEC encoded scrambled idle) or valid RS-FEC encoded 100GBASE-R signal is used, transmission is done on all lanes in parallel, and BER is read from the per-lane RS-FEC symbol error counters (91.6.10) when stress is applied. Bit error count is considered equal to RS-FEC symbol error count for the purpose of this measurement.

Add the following paragraph:

TDP measurement with Pattern 5 requires an error detector capable of receiving all lanes in parallel and decoding this pattern. To allow unstressed lanes for the error detector may be created by setting the power at the reference receivers well above their sensitivities, or by conveying the contents of the transmit lanes not under BER test to the error detector by other means.

Response *Response Status* **U**

REJECT.
A stand-alone pattern generator and error counter could be used, there is no need to

access the RS-FEC layer.

The specifics of how to measure BER for every possible measurement method and test pattern is beyond the scope of this document.

Cl **95** *SC* **95.8.3** *P* **106** *L* **3** # 182

Dawe, Piers Mellanox

Comment Type **T** *Comment Status* **R**

This "shall" duplicates the one in 95.7.1, which is bad practice. Also this text differs from 86.8.4.2.
Table 95-10 doesn't define test pattern, it merely selects the appropriate ones.
For average optical power, Table 95-10 has more than one test pattern.

SuggestedRemedy

Change
The average optical power of each lane shall be within the limits given in Table 95-6 if measured using the methods given in IEC 61280-1-1. The average optical power is measured using the test pattern defined in Table 95-10.
to
Average optical power is defined by the methods given in IEC 61280-1-1.
or to
Average optical power is defined by the methods given in IEC 61280-1-1 using one of the the test patterns specified in Table 95-10.

Response *Response Status* **C**

REJECT.
[Editor's note: This comment was sent after the close of the comment period.]
The current text follows the format in clauses 87 and 88.

Cl **95** *SC* **95.8.4** *P* **106** *L* **10** # 150

Dawe, Piers Mellanox

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

This says:
OMA shall be as defined in 52.9.5 for measurement with a square wave (8 ones, 8 zeros) test pattern or 68.6.2 (from the variable MeasuredOMA in 68.6.6.2) for measurement with a PRBS9 test pattern.
while
86.8.4.3 Optical Modulation Amplitude (OMA)
says
OMA shall be as defined in 52.9.5 for measurement with a square wave (8 ones, 8 zeros) test pattern or 68.6.2 (from the variable MeasuredOMA in 68.6.6.2) for measurement with a PRBS9 test pattern, with the exception that each optical lane is tested individually. See 86.8.2 for test pattern information.

(i.e. there is text at the end in 86 that's missing in 95). OMA should be consistently defined for such similar PMDs. The methods in 52.9.5 and 68.6.2 /68.6.6.2 scale with signalling rate. If you want a figure to illustrate OMA, it's Figure 68-4.

SuggestedRemedy

Options include:
Add the missing text to 95.8.4. Optionally change to "...test pattern (see Figure 68-4), or 68.6.2..."
Change 95.8.4 to "OMA shall be as defined in 86.8.4.3."
In Table 95-10, Test-pattern definitions and related subclauses, change the row "Optical modulation amplitude (OMA) Square wave or 4 95.8.4" to "Optical modulation amplitude (OMA) Square wave or 4 86.8.4.3.
The last option is attractive because it cuts out repetition (or almost-repetition, as the case may be), ensuring consistency and reducing time and cost.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change
"OMA shall be as defined in 52.9.5 for measurement with a square wave (8 ones, 8 zeros) test pattern or 68.6.2 (from the variable MeasuredOMA in 68.6.6.2) for measurement with a PRBS9 test pattern."

to

"OMA shall be as defined in 52.9.5 for measurement with a square wave (8 ones, 8 zeros) test pattern or 68.6.2 (from the variable MeasuredOMA in 68.6.6.2) for measurement with a PRBS9 test pattern, with the exception that each optical lane is tested individually. See 95.8.1 for test pattern information."

Cl **95** *SC* **95.8.5** *P* **106** *L* **25** # 147

Dawe, Piers Mellanox

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

This says "VECP, as defined in Equation (52-4)", but that equation defines it as 10 log10(OMA/AO) where AO is the amplitude of the eye opening from the 99.95th percentile of the lower histogram to the 0.05th percentile of the upper histogram, and OMA is the normal amplitude without ISI, as shown in Figure 52-11.
There are two problems with this.
More importantly, in spite of its name, VECP isn't a true penalty: as defined in Eq 52-4 it's a good estimate for the penalty at BER=1e-12 but significantly in error for BER=1e-5. This introduces a large error into TDP (the difference between its VECP and its transmitter penalty at 5e-5). See presentation. Also it ruins the calibration of the stressed receiver sensitivity test in 95.8.8.
Also, Figure 52-11 doesn't define OMA. As 52.9.5 says, "A method of approximating OMA is shown in Figure 52-11."

SuggestedRemedy

Define VECP for this clause in a new subclause 95.8.5, as 10 log10(OMA/AO) where AO is the amplitude of the eye opening from the Xth percentile of the lower histogram to the 1-Xth percentile of the upper histogram, and OMA is as defined in 95.8.4.
Refer to this VECP from 95.8.5 Transmitter and dispersion penalty (TDP), and from 95.8.8 Stressed receiver sensitivity.
In Table 95-10, Test-pattern definitions and related subclauses, change the row:
Vertical eye closure penalty calibration 3 or 5 52.9.9
to
Vertical Eye Closure Penalty (VECP) 3 or 5 [new subclause] 95.8.5
(See presentation for X. Note the capitals because this phrase doesn't have the common English meaning of the words: it is not a true penalty. Alternatively we could create a new name e.g. VEC2.)

Response *Response Status* **U**

REJECT.

Further supporting material is requested, for task force review, to show that VECP as defined in Eqn 52-4 is a poor estimate of penalty at BER=1e-5, and to support a change of value for X (other than that implied by the current draft value of 0.05).
TDP vs a VEC spec has been (and continues to be) reviewed in the MMF ad hoc, and the resolution of that issue is likely to affect this issue.

Note: the commenter proposed X = 0.5% during the presentation of dawe_02a_0114_optx

Cl **95** *SC* **95.8.6** *P* **106** *L* **46** # 114

Dawe, Piers Mellanox

Comment Type **E** *Comment Status* **A** *Bucket*

Wrong font.

SuggestedRemedy

Remove override.

Response *Response Status* **C**

ACCEPT.

Cl **95** *SC* **95.8.6** *P* **106** *L* **48** # 183

Dawe, Piers Mellanox

Comment Type **T** *Comment Status* **A**

This "shall" duplicates the one in 95.7.1, which is bad practice. Also this text differs from 86.8.4.5.
Table 95-10 doesn't define test pattern, it merely selects the appropriate ones.
For average optical power, Table 95-10 has more than one test pattern.

SuggestedRemedy

hange:
The extinction ratio of each lane shall be within the limits given in Table 95-6 if measured using the methods specified in IEC 61280-2-2. The extinction ratio is measured using the test pattern defined in Table 95-10.
to
Extinction ratio is defined by the methods of IEC 61280-2-2 using one of the test patterns specified in Table 95-10.
Add full stop at end of NOTE.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
[Editor's note: Page changed from 107 to 106 and this comment was sent after the close of the comment period.]
Change:
"The extinction ratio is measured using the test pattern defined in Table 95–10."
to:
"The extinction ratio is measured using one of the test patterns specified for extinction ratio in Table 95–10."

Add a full stop at the end of the note.

Cl **95** *SC* **95.8.7** *P* **107** *L* **7** # 157

Dawe, Piers Mellanox

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

A mask hit ratio limit of 5e-5 was found suitable for PMDs with spec BER of 1e-12. Therefore it would be remarkable if 5e-5 were the appropriate hit ratio limit for a BER of 5e-5. Improving this is expected to improve the correlation between the mask test and performance in the field, improve eye measurement accuracy and/or reduce test time (4x more interesting with 16-lane 400G!).

SuggestedRemedy

Optimise the mask hit ratio limit, make this, mask coordinates and TDP consistent.

Response *Response Status* **U**

REJECT.
No specific remedy proposed.

Cl **95** *SC* **95.8.8** *P* **107** *L* **20** # 46

Ghiasi, Ali Independent

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

Replacing 4th order BT low pass filter by low-pass filter makes no sense as the low pass filter can be another BT4 filter!

SuggestedRemedy

Replace with 2nd order Buttherworth low-pass filter

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

[Editor's note: Subclause changed from 8.8 to 95.8.8]
The commenter is refering to note c which is one of the exceptions for the SRS test:
"c) The fourth-order Bessel-Thomson filter is replaced by a low-pass filter and a limiter followed by a fourth-order Bessel-Thomson filter."

The effect of the note is to insert a low-pass filter and limiter directly before the 4th order BT filter, which gives the necessary functionality to introduce a controlled amount of DDJ (by changing the slice threshold of the limiter).

Replacing the BT4 filter with a 2nd order Butterworth wouldn't give the controllable DDJ function needed for SRS testing.

Cl **95** *SC* **95.8.8** *P* **107** *L* **25** # 149

Dawe, Piers Mellanox

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

The high TDP, lower VECP and use of non-FEC VECP mean that there is a large (1+ dB!) discrepancy between the situation in the SRS test and in service. This must be closed.

SuggestedRemedy

See other comments for new TDP limit and new VECP definition.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.
No specific remedy proposed here.
See comment #14

Cl **95** *SC* **95.8.8** *P* **107** *L* **36** # 88

Ran, Adee Intel

Comment Type **T** *Comment Status* **A**

100GBASE-R4 is not defined.

SuggestedRemedy

Change "100GBASE-R4" to "100GBASE-R RS-FEC encoded".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change "100GBASE-R4" to "100GBASE-SR4"

See comment #86

Cl **95** *SC* **95.9** *P* **108** *L* **13** # 133

Dawe, Piers — Mellanox

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

Safety, installation, environment, and labeling requirements had better be the same as for 40GBASE-SR4. Make it easy for the document user to establish that that is so.

SuggestedRemedy

Replace all the contents of 95.9 with:
Safety, installation, environment, and labeling requirements are the same as for 40GBASE-SR4 in 86.9.

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

It seems more useful to the reader to have safety, installation, environment, and labeling requirements explicitly referenced in each clause.

Cl **99** *SC* *P* **1** *L* **10** # 53

Booth, Brad — Microsoft

Comment Type **E** *Comment Status* **R**

802.3bj is also Amendment X. While X is supposed to be a number, there is nothing to indicate that X will be replaced with a number.

SuggestedRemedy

There are a few options:
1) replace X with Y
2) provide an editor's note or indication that X is to be replaced with a number, or
3) remove the X and leave it up to the IEEE-SA editorial staff to insert the correct number at a later date.

Response *Response Status* **C**

REJECT.
The "X" is part of the current IEEE 802.3 WG supplied boilerplate frontmatter. The "X" will be replaced by the appropriate number (expected to be 3) by the IEEE-SA editorial staff as part of the publication process in the same way as for the "x" in 201x used in the PICS for Clause 95.

Cl **99** *SC* *P* **1** *L* **37** # 32

Grow, Robert — RMG Consulting

Comment Type **E** *Comment Status* **A** *Bucket*

2014 is coming and I assume will be here when doing the next draft.

SuggestedRemedy

When you are updating the draft date, also remember to update copyright year on cover page copyright statement, and in all footers.

Response *Response Status* **C**

ACCEPT.

Cl **A** *SC* **A** *P* **119** *L* **1** # 67

Booth, Brad — Microsoft

Comment Type **E** *Comment Status* **A** *Bucket*

Annex A contains no information.

SuggestedRemedy

Delete page.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
If no changes to the bibliography entries are added, then remove Annex A from the draft.