*Cl* **00** *SC* **0** *P* **0** *L* **0** # 17

Nicholl, Gary Cisco

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

Several people have submitted minor editorial comments outside of the official comment review process.

*SuggestedRemedy*

Allow the editorial team to address the received editorial comments with editorial licence.

*Proposed Response* *Response Status* **O**

*Cl* **1** *SC* **1.4** *P* **17** *L* **26** # 20

Cole, Chris II-VI

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

LR in 400GBASE-LR4 has been associated with 10km reach at recent rates

*SuggestedRemedy*

Replace every instance of 400GBASE-LR4 throughout the document with 400GBASE-LR4-6

*Proposed Response* *Response Status* **W**

*Cl* **30** *SC* **30.5.1.1.2** *P* **19** *L* **44** # 21

Trowbridge, Steve Nokia

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

The normal order seems to be increasing MAC rate, then increasing reach for PHYs of the same MAC rate, then decreasing lane count for PHYs with the same reach

*SuggestedRemedy*

As the reach of 400GBASE-LR4 is 6km, it should go before rather than after 400GBASE-LR8 which has 10km reach

*Proposed Response* *Response Status* **O**

*Cl* **116** *SC* **116.1.4** *P* **33** *L* **3** # 16

Nicholl, Gary Cisco

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

Need to fill in TBD

*SuggestedRemedy*

Replace TBD with "IEEE Std 802.3cm-20xx"

*Proposed Response* *Response Status* **O**

*Cl* **116** *SC* **116.1.4** *P* **33** *L* **12** # 22

Trowbridge, Steve Nokia

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

The normal order seems to be increasing MAC rate, then increasing reach for PHYs of the same MAC rate, then decreasing lane count for PHYs with the same reach

*SuggestedRemedy*

As the reach of 400GBASE-LR4 is 6km, it should go before rather than after the 400GBASE-LR8 column which has 10km reach

*Proposed Response* *Response Status* **O**

*Cl* **140** *SC* **140.6.2** *P* *L* # 5

Stassar, Peter Huawei

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

As clarified in http://www.ieee802.org/3/cu/public/cu_adhoc/cu_archive/stassar_3cu_adhoc_102319.pdf the maximum average power into the 100GBASE-FR1 receiver is actually 0.5 dB too high for the 100GBASE-FR1 application. For interworking with a 100GBASE-LR1 transmitter the minimum loss in the link needs to be 0.3 dB. In order to meet an engineering desire to have a minimum loss of 0 dB in case of interworking this maximum power, also called overload, should be raised another 0.3 dB which may be technically challenging and impacting cost. Unless it wil be demonstrated that raising the overload by 0.3 dB will not impact cost, it is proposed to reduced the overload by 0.5 dB, as well as the damage threshold and increase the minimum loss for interworking between an LR1 transmitter and an FR1 receiver to 0.8 dB.

*SuggestedRemedy*

In Table 140-7:
Lower the 100GBASE-FR1 Receiver Average receive power (max) by 0.5dB to 4 dBm.
Lower the 100GBASE-FR1 damage threshold by 0.5 dB to 5dBm.
In Table 140-16:
Increase the 100GBASE-LR1 transmitter to 100GBASE-FR1 receiver minimum loss from 0.3 dB to 0.8 dB.

*Proposed Response* *Response Status* **O**

*Cl* **140** *SC* **140.10b** *P* *L* # 6

Stassar, Peter Huawei

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

When connecting 100GBASE-LR1 optics on one side of the link to 100GBASE-FR1 optics on the other side of the link, the link loss can be larger than the maximum of 4 dB for 100GBASE-FR1, without increasing the maximum distance of 2 km. In the link from an LR1 Tx to an FR1 Rx the transmitter power is 1.2 dB higher, allowing 5.2 dB loss in the link instead of 4 dB.
In the other direction from an FR1 Tx to an LR1 Rs the receiver is 1.6 dB more sensitive. Therefore the link can tolerate a maximum loss of 5.6 dB instead of 4 dB.

*SuggestedRemedy*

In Table 140-16:
For the "100GBASE-LR1 transmitter to 100GBASE-FR1 receiver" direction increase the maximum loss from 4 to 5.2 dB.
For the "100GBASE-FR1 transmitter to 100GBASE-LR1 receiver" direction increase the maximum loss from 4 to 5.6 dB.

*Proposed Response* *Response Status* **O**

*Cl* **140** *SC* **140.10b** *P* **49** *L* **21** # 14

Mazzini, Marco Cisco

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

Remove 'Attenuators may be used to achieve the required losses'.

*SuggestedRemedy*

Into mmazzini_3cu_adhoc_101519, a change into Table 140-7 was proposed, to align 100GBASE-FR1 to 100GBASE-LR1 and avoid the usage of an external attenuator of 0.3dB value.

*Proposed Response* *Response Status* **O**

*Cl* **140** *SC* **Table 140-6, 140-7** *P* **41** *L* # 9

Mazzini, Marco Cisco

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

Relax 100GBASE-LR1 transmitter Average launch power (min)

*SuggestedRemedy*

Into mmazzini_3cu_adhoc_101519, change 100GBASE-LR1 transmitter Average Launch power (min), has been proposed, to allow infinite transmitter's extinction ratio.

*Proposed Response* *Response Status* **O**

*Cl* **140** *SC* **Table 140-6, 140-7** *P* **41** *L* # 10

Mazzini, Marco Cisco

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

Relax 100GBASE-FR1 transmitter Average launch power (min)

*SuggestedRemedy*

Into mmazzini_3cu_adhoc_101519, a change 100GBASE-LR1 transmitter Average Launch power (min) has been proposed, to allow higher transmitter's extinction ratio and align with 100GBASE-DR minimum power requirement.

*Proposed Response* *Response Status* **O**

*Cl* **140** *SC* **Table 140-6, 140-7, 140** *P* **41** *L* # 8

Mazzini, Marco Cisco

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

Relax 100GBASE-LR1 transmitter characteristics by 0.1dB

*SuggestedRemedy*

Into mmazzini_3cu_adhoc_101519, a change of 0.1dB of 100GBASE-LR1 transmitter characteristics has been proposed, a reduction of 0.1dB of DGD penalty (from 0.3dB to 0.2dB) seems acceptable, given that two different and independent contributions are proposing 0.25dB and 0.2dB penalty.

*Proposed Response* *Response Status* **O**

*Cl* **140** *SC* **Table 140-7, Table 140-** *P* **41** *L* # 13

Mazzini, Marco Cisco

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

Align some 100GBASE-FR1 and LR1 receiver characteristics so to allow compatibility between 100GBASE-FR1 and 100GBASE-LR1.

*SuggestedRemedy*

Into mmazzini_3cu_adhoc_101519, a change into Table 140-7 was proposed, to align 100GBASE-FR1 to 100GBASE-LR1 and avoid the usage of an external attenuator of 0.3dB value.

*Proposed Response* *Response Status* **O**

*Cl* **151** *SC* **151.1** *P* **53** *L* **52** # 3

Stassar, Peter Huawei

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

The last paragraph on page 53 seems redundant. It seems to be reused from Clause 122, where there are both 4 lane and 8 lane PMDs. In other PMD clauses where WDM is used for 4 lane PMDs, 87 and 88, an equivalent paragraph has not been inserted.

*SuggestedRemedy*

Remove the last paragraph on page 53 in clause 151.1

*Proposed Response* *Response Status* **O**

*Cl* **151** *SC* **151.6** *P* *L* # 4

Stassar, Peter Huawei

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

In the text of clause 151.6 no reference is included to the lane assignments of 400GBASE-LR4.

*SuggestedRemedy*

Modify the first paragraph of 140.6 to:
The wavelength range for each lane of the 400GBASE-FR4 and 400GBASE-LR4 PMDs is defined in Table 151–5. The 400GBASE-FR4 and 400GBASE-LR4 center wavelengths are members of the CWDM wavelength grid defined in ITU-T G.694.2 and are spaced at 20 nm.

*Proposed Response* *Response Status* **O**

*Cl* **151** *SC* **151.7.1** *P* *L* # 7

Stassar, Peter Huawei

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

In Table 151-7 the value for "TDECQ – SECQ" is currently still labelled as TBD, which was agreed at the Indianapolis meeting in September 2019.
In line with the considerations in http://www.ieee802.org/3/cu/public/Sept19/stassar_3cu_01_0919.pdf it is proposed to replace "TBD" by "2.5".
An upper limit of 2.5 dB for TDECQ - SECQ should not be an overly conservative limit.
An associated presentation will be submitted to the November 2019 cu TF meeting.

*SuggestedRemedy*

In Table 151-7, for "TDECQ - SECQ", replace TBD by 2.5.

*Proposed Response* *Response Status* **O**

*Cl* **151** *SC* **151.7.1** *P* **61** *L* **20** # 19

Okabe, Ryo — Fujitsu Optical Components, Ltd.

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

This comment is related to Tx OMA and Rx sensitivity. Tx OMA and Rx sensitivity are depicted in the lower figure, simultaneously. Blue and green line show current 6-km spec in IEEE802.3cu and alternative plan for 10-km spec, respectively. Both specs should be discussed and aligned each other.
Though 2.0-dB headroom for Tx max is kept with 6-km spec, on the other hand 10-km spec has only 1.7-dB headroom which is not sufficient for the manufacturing margin and yeild. Headroom for 2.0 dB is nessesary at least.

*SuggestedRemedy*

To keep more than 2.0 dB margin for Tx spec, there would be possible solutions as below;
1) decrese Tx OMA(min) from +0.2 to -0.1 dB
2) increase Tx OMA(max) from 4.4 to 4.7 dB
Rx sensitivity should be changed for corrsponding the above change.

From a view point of power consumption, option-1) would have benefit of 0.2W/4-lane power saving according to our estimation.
Option-2) might lead over load issue for the Rx sensitivity.

In conclution, FOC would like to propose spec refinement for Tx OMA and Rx sensitivity to decrease by 0.3 dB in order to keep 2.0 dB headroom for Tx OMA spec.

*Proposed Response* *Response Status* **O**

*Cl* **151** *SC* **151.8.5.2** *P* **66** *L* **37** # 1

Kimber, Mark — Semtech

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

Due to S0 changing in Table 151-14 from 0.093 to 0.092, the dispersion values for FR4 in Table 151-12 need to be updated accordingly.

*SuggestedRemedy*

In the FR4 dispersion equation change 0.0465 to 0.046 for both minimum and maximum dispersion.

*Proposed Response* *Response Status* **O**

*Cl* **151** *SC* **151.8.5.2** *P* **66** *L* **37** # 18

Nicholl, Gary — Cisco

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

FR4 dispersion in Table 151-12 is based on slope of 0.093 whereas the LR4 value is based on 0.092. Need to align on 0.092.

*SuggestedRemedy*

Update FR4 dispersion values in Table 151-12 to be based on a slope of 0.092. Also update positive and negative dispersion values in Table 151-13 for 400GBASE-FR4 to be consistent with a dispersion slope of 0.092.

*Proposed Response* *Response Status* **O**

*Cl* **151** *SC* **151.10** *P* **73** *L* **34** # 2

Kimber, Mark — Semtech

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

Due to S0 changing in Table 151-14 from 0.093 to 0.092, the dispersion values for FR4 in Table 151-13 need to be updated accordingly.

*SuggestedRemedy*

Change FR4 negative (min) dispersion to -11.7 from -11.9. Change FR4 positive (max) dispersion to 6.6 from 6.7.

*Proposed Response* *Response Status* **O**

*Cl* **151** *SC* **Table 151-7** *P* **61** *L* # 11

Mazzini, Marco — Cisco

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

Relax Average launch power of OFF transmitter from -20 to -15dBm

*SuggestedRemedy*

As proposed into mmazzini_3cu_adhoc_101519, the average power of OFF transmitter can be implemented by laser shout down or by a SiP switch for this technology.
As already specified for 100GBASE PMDs, it would be good to relax this value to -15dBm too in consistency with 802.3bs and 802.3cd.

*Proposed Response* *Response Status* **O**

*Cl* **151** *SC* **Table 151-7** *P* **61** *L* # 15

Mazzini, Marco Cisco

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

Remove TDECQ-SECQ parameter from Table 151-7

*SuggestedRemedy*

Into mmazzini_3cu_adhoc_102319, the TDECQ-SECQ removal from Table 151-7 was proposed. This new parameter does not give any significant benefit to discriminate bad from good transmitters and add unwanted time and costs. To contraint distortion a reduction of TDECQ-10Log(Ceq) from 3.4dB to 3.3dB for 400GBASE-LR4 is also proposed.

*Proposed Response* *Response Status* **O**

*Cl* **151** *SC* **Table 151-7, 151-8, 151** *P* **61** *L* # 12

Mazzini, Marco Cisco

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

Relax 400GBASE-LR4 transmitter characteristics by 0.1dB

*SuggestedRemedy*

Into mmazzini_3cu_adhoc_101519, a change of 0.1dB of 100GBASE-LR4 transmitter characteristics has been proposed, a reduction of 0.1dB of DGD penalty (from 0.3dB to 0.2dB) seems acceptable, given that two different and independent contributions are forecasting 0.2dB and 0.1dB penalty for a link of 6kms with 4ps DGD.

*Proposed Response* *Response Status* **O**