*Cl* **155** *SC* **155.1.2** *P* **34** *L* **3** # 1

Bruckman, Leon Huawei

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

In following clauses the PCS and PMA are referred to as shaded, but in the figure they are not

*SuggestedRemedy*

Add shade to the PCS and PMA blocks in Figure 155-1

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.1.2** *P* **34** *L* **19** # 2

Bruckman, Leon Huawei

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

400GAUI-n is not mentioned in the figure

*SuggestedRemedy*

Remove the 400GAUI-n definition from the Figure 155-1 text

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.1.4** *P* **35** *L* **1** # 3

Bruckman, Leon Huawei

*Comment Type* **T** *Comment Status* **A** *data rate*

Better indicate the rate with its tolerance and use Gbd (instead of Gsymbol/s), also add the approximate nominal rate (as done in other clauses of this document). Refer for example to 802.3ct clause 153.3.2.2.2

*SuggestedRemedy*

Replace: "The 400GBASE-ZR PCS has a nominal rate at the PMA service interface of 59.84375 x (28/29) Gsymbol/s on each of two polarizations" with "The 400GBASE-ZR PCS has a rate at the PMA service interface of (28/29) x 59.84375 GBd ±20 ppm (~57.7802 GBd) on each of two polarizations"

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #29.

*Cl* **155** *SC* **155.2.4.3** *P* **39** *L* **4** # 4

Bruckman, Leon Huawei

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

The "mapper" is referrred to in the previous sentence as the "GMP mapper". Call it the same in this sentence for consistency.

*SuggestedRemedy*

Replace: "The mapper values" with: "The GMP mapper values"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.4.4.3** *P* **40** *L* **29** # 5

Bruckman, Leon Huawei

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

The "mapper" is referrred to in the previous sentence as the "GMP mapper". Call it the same in this sentence for consistency.

*SuggestedRemedy*

Replace: "The mapper values" with: "The GMP mapper values"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.4.4.4** *P* **40** *L* **40** # 6

Bruckman, Leon Huawei

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

The MFAS is a wrapping counter

*SuggestedRemedy*

Replace: "It counts from 0x00 to 0xFF" with "It is a wrapping counter from 00x00 to 0xFF"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.4.4.5** *P* **41** *L* **5** # 7

Bruckman, Leon Huawei

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

Redundant text

*SuggestedRemedy*

Replace "The 3-bit LDI field is defined to indicate to the downstream 400GBASE-ZR PHY to indicate the quality" with "The 3-bit LDI field is defined to indicate to the downstream 400GBASE-ZR PHY the quality"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.4.4.6** *P* **41** *L* **15** # 8

Bruckman, Leon Huawei

*Comment Type* **T** *Comment Status* **A** *GMP description*

JCn bytes are used to recover the data blocks from the payload.

*SuggestedRemedy*

Replace "which are then used by the receive path GMP de-mapper to re-time the received 257B blocks to the same..." with "which are then used by the receive path GMP de-mapper to recover the 275B data blocks and re-time them to the same..."

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace:

"..which are then used by the receive path GMP de-mapper to re-time the received 257B blocks to the same..."

with:

"..which are then used by the receive path GMP de-mapper to recover the 257B data blocks and re-time them to the same..."

*Cl* **155** *SC* **155.2.4.5** *P* **41** *L* **27** # 9

Bruckman, Leon Huawei

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

Unnecessary new line and missing chracter

*SuggestedRemedy*

Make "Each SC-FEC block has 119 x 10 280 / 5 244 664 bits." part of the previous paragraph (no new line) and replace: "119 x 10 280 / 5 244 664 bits" wih : "119 x 10 280 / 5 bits = 244 664 bits"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.4.5** *P* **41** *L* **30** # 10

Bruckman, Leon Huawei

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

Wrong plural

*SuggestedRemedy*

Replace "A 32-bit cyclic redundancy codes is calculated" with: "A 32-bit cyclic redundancy code is calculated"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.4.6** *P* **42** *L* **12** # 11

Bruckman, Leon Huawei

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

Unnecesary word (IMHO)

*SuggestedRemedy*

Replace "requires an additional 34 bits of padding" with :"requires additional 34 bits of padding"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.4.8** *P* **44** *L* **8** # 12

Bruckman, Leon Huawei

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

There seem to be a missing space after the dot

*SuggestedRemedy*

Add a space between the dot and the beging of the sentence "The operation."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.5.7.1** *P* **48** *L* **17** # 13

Bruckman, Leon Huawei

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

The MFAS is a wrapping counter

*SuggestedRemedy*

Replace: "It counts from 0x00 to 0xFF" with "It is a wrapping counter from 00x00 to 0xFF"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.5.7.2** *P* **48** *L* **41** # 14

Bruckman, Leon Huawei

*Comment Type* **T** *Comment Status* **A** *OH description*

The sentence defining the RPF bit, although identical to the one in G.709.1, is a little bit confusing.

*SuggestedRemedy*

Replace: "The RPF bit indicates that a signal fail status was detected by the remote 400GBASE-ZR receive function in the upstream direction" with: "The RPF bit indicates, in the upstream direction, that a signal fail status was detected by the remote 400GBASE-ZR receive function"

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.
Replace:
"The RPF bit indicates that a signal fail status was detected by the remote 400GBASE-ZR receive function in the upstream direction..."

with:

"The RPF bit indicates, in the upstream direction, that a signal fail status was detected by the remote 400GBASE-ZR receive function..."

*Cl* **155** *SC* **155.2.5.7.2** *P* **48** *L* **48** # 15

Bruckman, Leon Huawei

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

Wrong tense

*SuggestedRemedy*

Replace "define in Clause 118" with "defined in Clause 118"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.5.8** *P* **49** *L* **1** # 16

Bruckman, Leon Huawei

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

Missing clause

*SuggestedRemedy*

There is no clause that describes the GMP de-mapper, something like: "The GMP de-mapper uses the JC bytes to recover the 257B data blocks and re-time them"

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add the following at 155.2.5.8:

"The GMP de-mapper decodes the JC bytes and interprets them according to ITU-T G.709 Annex D. The values from the JC bytes are used to recover the 257B data blocks and to re-time them. The CRC8 value in JC1-3 and the CRC4 value in JC4-6 protect against errors in the JC bytes."

*Cl* **155** *SC* **155.3.2** *P* **50** *L* **32** # 17

Bruckman, Leon Huawei

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

Missing dot

*SuggestedRemedy*

Add dot after "400GBASE-ZR PCS"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.3.2** *P* **51** *L* **49** # 18

Bruckman, Leon Huawei

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

Sentence is not clear, and also the "SIL" acronym shall be called out here.

*SuggestedRemedy*

Replace "The PMA:IS_SIGNAL.indication primitive is generated through a set of signal indication logic that reports", with "The PMA:IS_SIGNAL.indication primitive is generated through a signal indication logic (SIL) that reports"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.3.3.6** *P* **59** *L* **21** # 19

Bruckman, Leon Huawei

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

Missing plural

*SuggestedRemedy*

Replace "into two stream" with: "into two streams"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.3.3.6** *P* **59** *L* **41** # 20

Bruckman, Leon Huawei

*Comment Type* **T** *Comment Status* **A** *cross reference*

Not clear which clause is referred here

*SuggestedRemedy*

"according to Clause 155", but this is clause 155, so either repalce with "according to this clause" or write the right clause.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change:

"Implementations are required to have a frame loss ratio (see 1.4.275) of less than 1.7 x 10-12 for 64-octet frames with minimum interpacket gap when processed according to Clause 155."

to:

"Implentations are required to have a frame loss ratio (see 1.4.275) of less than 1.7 x 10-12 for 64-octet frames with minimum interpacket gap when additionally processed according to this clause."

*Cl* **156** *SC* **156.2** *P* **65** *L* **19** # 21

Bruckman, Leon Huawei

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

According to clause 156.5.4 SIGNAL_DETECT is fixed to OK. This ahhl be reflected in thetext here

*SuggestedRemedy*

Tow options:
1 - Replace "The SIGNAL_DETECT parameter can take on one of two values: OK or FAIL." with "The SIGNAL_DETECT parameter value is fixed to OK." and remove the sentence: "When SIGNAL_DETECT = FAIL, the rx_symbol parameters are undefined."
2 - Just remove these two last sentences.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "The SIGNAL_DETECT parameter can take on one of two values: OK or FAIL. When SIGNAL_DETECT = FAIL, the rx_symbol parameters are undefined."
to
"The SIGNAL_DETECT parameter takes a fixed value of OK."

*Cl* **156** *SC* **156.2** *P* **65** *L* **23** # 22

Bruckman, Leon Huawei

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

SIGNAL_DETECT is not based on light received, it is fixed to OK

*SuggestedRemedy*

Remove from the note the sentence: "It is possible for a poor quality link to provide sufficient light for a SIGNAL_DETECT = OK indication and still not meet the BER defined in 156.1.1."

*Response* *Response Status* **C**

REJECT.

This text exactly matches the corresponding text in 802.3ct 154.2 and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

*Cl* **156** *SC* **156.10.2** *P* **78** *L* **44** # 23

Bruckman, Leon Huawei

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

Verb fix

*SuggestedRemedy*

Replace: "that the manufacturer of a laser product provide information" with: "that the manufacturer of a laser product provides information"

*Response* *Response Status* **C**

REJECT.

The existing text is consistent with multiple enforce clauses.

*Cl* **156** *SC* **156.9.9** *P* **76** *L* **31** # 24

Le Cheminant, Greg Keysight Technologies

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

The definition of error-vector-magnitude (EVM) is currently in TBD status. EVM requires a definition as well as a specification limit. Small changes in EVM can be seen as large changes in OSNR (see http://grouper.ieee.org/groups/802/3/cn/public/adhoc/18_1025/anslow_3cn_01_181025.pdf). A specification limit requires a known method of measurement. The complexity of the EVM measurement requires a specific analysis process to achieve consistent results. This process should be explcitly defined. See https://grouper.ieee.org/groups/802/3/cn/public/adhoc/19_0207/lecheminant_3cn_01_190207.pdf and https://grouper.ieee.org/groups/802/3/cn/public/adhoc/19_0509/lecheminant_3ct_01_190509.pdf

*SuggestedRemedy*

A method for computing EVM has been developed by Keysight Technologies and used in ITU and OIF standards. This is contained within a large Matlab script. The computation details need to be followed exactly to achieve consistent results. This script is available for use within the IEEE 802.3 standard. It is likely too large to be directly written into the standard document, so If used, guidance from the group is requested on the details for script management and inclusiion within the 802.3cw clauses. A presentation on the Keysight EVM script is planned to support this comment

*Response* *Response Status* **C**

REJECT.

Supporting test data to verify test methodology is not available.

*Cl* **30** *SC* **30.5.1.1.2** *P* **20** *L* **17** # 25

Huber, Tom Nokia

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

The term 'DWDM system' is not present in the corresponding text for 100GBASE-ZR in 802.3ct, and should not be present here.

*SuggestedRemedy*

Delete 'DWDM system', so the text reads 400GBASE-ZR PCS/400GBASE-ZR PMA over a PMD with reach up to at least 80 km as specified in Clause 156.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **116** *SC* **116.2.3** *P* **29** *L* **47** # 26

Huber, Tom Nokia

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

Probably best to split out 200G and 400G here, so that the 400G part can refer to both 119/120 and 155.

*SuggestedRemedy*

Revise the text to read as follows:
The term 200GBASE-R refers to a specific family of Physical Layer implementations based upon the 64B/66B coding method specified in clause 119 and the PMA specifications defined in clause 120. The term 400GBASE-R refers to a specific family of Physical Layer implementations based upon the 64B/66B coding method specified in clause 119 or 155 and the PMA specifications defined in Clause 120 or 155. 200GBASE-R and 400GBASE-R PCSs perform encoding (decoding) of data from (to) the 200GMII or 400GMII to 256B/257B code blocks, apply FEC, distribute the data to multiple lanes, and transfer the encoded data to
the PMA.

The 200GBASE-R PCS has almost the same functionality as the 200GXS, and therefore may be configured as a 200GXS in order to implement part of the optional 200GMII Extender (see Clause 118). The 400GBASE-R PCS has almost the same functionality as the 400GXS, and therefore may be configured as a 400GXS in order to implement part of the optional 400GMII Extender (see Clause 118).

*Response* *Response Status* **C**

ACCEPT.

*Cl* **116** *SC* **116.2.4** *P* **30** *L* **17** # 27

Huber, Tom Nokia

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

Since the 400GBASE-ZR PMA is different, it is perhaps easiest to just add a sentence in front of the existing text.

*SuggestedRemedy*

Change from: "The 200GBASE-R and 400GBASE-R PMAs are specified in Clause 120."
to
The 400GBASE-ZR PMA is specified in clause 155. The 200GBASE-R PMA and all other 400GBASE-R PMAs are specified in Clause 120.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

The 200GBASE-R PMA and all 400GBASE-R PMAs other than 400GBASE-ZR are specified in Clause 120. The 400GBASE-ZR PMA is specified in clause 155.

*Cl* **155** *SC* **155.1.1** *P* **33** *L* **20** # 28

Huber, Tom Nokia

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

Missing a / between 54B and 66B

*SuggestedRemedy*

Change 64B66B to 64B/66B

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.1.4** *P* **35** *L* **2** # 29

Huber, Tom Nokia

*Comment Type* **T** *Comment Status* **A** *data rate*

While it is true that the interface between PCS and PMA is ultimately related to two streams of 16QAM symbols, and that two polarizations are used, that seems too detailed and not really consistent with how the Tx path is subsequently described, where the PMA is what creates the 16QAM symbols.

*SuggestedRemedy*

State the nominal rate at the PMA service interface as ~462 Gbit/s rather than as a symbol rate per polarization.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change from:

"The 400GBASE-ZR PCS has a nominal rate at the PMA service interface of 59.84375 x (28/29) Gsymbol/s on each of two polarizations."

to:

"The 400GBASE-ZR PCS has a nominal rate at the PMA service interface of 8 x 59.84375 x (28/29) Gb/s +/- 20 ppm (~ 462.2414 Gb/s)"

*Cl* **155** *SC* **155.1.4.1** *P* **35** *L* **11** # 30

Huber, Tom Nokia

*Comment Type* **T** *Comment Status* **A** *MII description*

While clause 117 may specify both 200GMII and 400GMII the PCS service interface for 400GBASE-ZR is only the 400GMII.

*SuggestedRemedy*

Delete 200GMII from the parenthetical "(200GMII/400GMII)"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.1** *P* **36** *L* **11** # 31

Huber, Tom Nokia

*Comment Type* **T** *Comment Status* **A** *PMA inputs*

The text here describes the Tx interface between the PCS and PMA as two streams of 4-bit symbols. Figure 155-2 and other text in 155.2.x describes it as 8 bitstreams, and 155.3 describes how the PMA creates the 16QAM symbols and distributes them to the two polarizations.

*SuggestedRemedy*

It appears that the intent is that the interface between PCS and PMA in the Tx direction be described as 8 bitstreams, and the PMA is responsible for turning that into two streams of 16QAM symbols. Change "When communicating with the PMA in the transmit direction, the 400GBASE-ZR PCS provides two streams of 4-bit 16-state quadrature amplitude modulation (16QAM) symbols." to "When communicating with the PMA in the transmit direction, the 400GBASE-ZR PCS provides 8 digital lanes, which the PMA encodes into 2 streams of 16QAM symbols."

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.
The text to be changed is on page 37 line 11.

Change:
"When communicating with the PMA in the transmit direction, the 400GBASE-ZR PCS provides two streams of 4-bit 16-state quadrature amplitude modulation (16QAM) symbols."

to:

"When communicating with the PMA in the transmit direction, the 400GBASE-ZR PCS provides 8 digital lanes, which the PMA encodes into 2 streams of 16QAM symbols."

*Cl* **155** *SC* **155.2.1** *P* **37** *L* **47** # 32

Huber, Tom Nokia

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

This sentence would fit better as part of the earlier paragraph about the transmit channel being in test-pattern mode.

*SuggestedRemedy*

Move the sentence to the end of the paragraph on line 29.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.2** *P* **37** *L* **51** # 33

Huber, Tom Nokia

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

Missing a B in 64/66B

*SuggestedRemedy*

Change to "64B/66B".

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.4.3** *P* **38** *L* **28** # 34

Huber, Tom Nokia

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

The description of the frame is confusing. The text says the frame contains 10240 257B blocks, which are viewed as an array of 256 by 10280 bits, but the switch from blocks to bits is not clearly stated in the text (it is clear in the figure). Also, the overhead portion of the frame isn't organized into 257B blocks - it just occupies the space that 20 257B blocks would occupy.

*SuggestedRemedy*

Replace the second sentence of the first paragraph with these sentences:
The frame is illustrated as a structure with 256 rows of 10 280 bits with a logical transmission order of left to right, top to bottom. This frame contains 5140 bits of overhead and 10220 257B blocks of payload..

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.4.3** *P* **39** *L* **5** # 35

Huber, Tom Nokia

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

Since the details of the overhead are in 155.2.4.4.3, it would be better to just reference that clause here.

*SuggestedRemedy*

Revise list item 3) to read as follows: "The next 1280 bits carry OH bytes, as discussed in 155.2.4.4.3."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.4.4.3** *P* **40** *L* **26** # 36

Huber, Tom Nokia

*Comment Type* **T** *Comment Status* **A** *OH description*

It would be more clear if the specific overhead functions that are supported are mentioned first, and then the note that other OH defined in G.709.1 is not used. Also the value to be filled in for the unused bytes should be clearly specified (G.709.1 says unsourced overhead is set to zero, so that is suggested here as well), and the editor's note concerning interleaving needs to be addressed. The details of the JC OH being multiframed are better handled in the later clause that is specific to that overhead.

*SuggestedRemedy*

Replace the text with the following: The overhead is organized into 4 sets of 320 bits that are interleaved in groups of 10 bits to form the 1280 bit field. The contents of each group of 320 bits is described in ITU-T G.709.1 clauses 8.1 and 9.2. For 400GBASE-ZR, only the first set of 320 bits is used, and within those bits, only the multi-frame alignment signal (MFAS) byte, status byte, and six justification control bytes JC1 to JC6 are used. Other overhead defined in G.709.1 is not used and is set to 0.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace the text at 155.2.4.4.3 with:

"The overhead is organized into 4 sets of 320 bits that are interleaved in groups of 10 bits to form the 1280 bit field. The contents of each group of 320 bits is described in ITU-T G.709.1 clauses 8.1 and 9.2. For 400GBASE-ZR, only the first set of 320 bits is used, and within those bits, only the multi-frame alignment signal (MFAS) byte, status byte, and six justification control bytes JC1 to JC6 are used. Other overhead defined in G.709.1 is not used and is set to 0."

Remove the editor's note.

*Cl* **155** *SC* **155.2.4.4.4** *P* **40** *L* **39** # 37

Huber, Tom Nokia

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

There are only 4 320-bit instances in the overhead; the MFAS is only in the first one.

*SuggestedRemedy*

Change "The MFAS is in the first four 320-bit OH instances" to "The MFAS is in the first of the four 320-bit OH instances."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.4.4.5** *P* **40** *L* **44** # 38

Huber, Tom Nokia

*Comment Type* **T** *Comment Status* **A** *replacement signal*

LF is a reasonable replacement signal to insert (this is what ITU and OIF both specify)

*SuggestedRemedy*

Replace the first sentence of the clause and the editor's note with the following: In the case of a DSP framing or 400GBASE-ZR frame or multi-frame loss, the PCS receive path inserts a stream of 257B blocks carrying LF ordered sets.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.4.4.6** *P* **41** *L* **14** # 39

Huber, Tom Nokia

*Comment Type* **T** *Comment Status* **A** *GMP description*

It would be helpful to introduce the multiframed aspect of this overhead here and also indicate that the details are in the OIF 400ZR IA.

*SuggestedRemedy*

Insert this text at the start of the clause: The justification control information is spread across the second, third, and fourth frames of a four-frame multiframe (based on the two lowest order bits of the MFAS) as described in OIF 400ZR IA.Clause 8.9.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Insert the following at the beginning of 155.2.4.4.6:

"The justification control information is spread across the second, third, and fourth frames of a four-frame multiframe (based on the two lowest order bits of the MFAS) as described in OIF-400ZR-01.0, March 10, 2020, subclause 8.9."

*Cl* **155** *SC* **155.2.4.5** *P* **41** *L* **31** # 40

Huber, Tom Nokia

*Comment Type* **T** *Comment Status* **A** *CRC description*

The generator polynomial is clearly not described in 3.2.9 of 802.3. It is unclear what reference is intended.

*SuggestedRemedy*

Provide the correct cross-reference. The generator polynomial is discussed in 9.2 of OIF 400ZR IA; is that the intended reference?

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change:
"A 32-bit cyclic redundancy codes is calculated over 244 664 input bits using the generator polynomial described in 3.2.9 and is appended to the end of the sequence."

to:
"A 32-bit cyclic redundancy code is calculated over 244 664 input bits as described in the OIF-400ZR-01.0, March 10, 2020, subclause 9.2. The resulting 32-bit code is appended to the end of the 244 664 bit sequence."

*Cl* **155** *SC* **155.2.5.1** *P* **47** *L* **5** # 41

Huber, Tom Nokia

*Comment Type* **T** *Comment Status* **A** *SD-FEC description*

The text is difficult to parse.

*SuggestedRemedy*

Replace the first sentence with two sentences and modify the beginning of the (current) second sentence as shown: The Hamming SD-FEC decoder extracts 119 bits from an incoming 128-bit SD-FEC codeword. The incoming SD-FEC codeword is formed from a digitized representation of sixteen DP-16QAM symbols. The incoming DP-16QAM symbols are digitized to an m-bit resolution by the PMA...

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace:
"The Hamming decoder extracts 119 message bits from each incoming code word, represented by the digitized signals of 16 DP-16QAM symbols. The incoming symbols are digitized to an m-bit resolution by."

with:

"The Hamming SD-FEC decoder extracts 119 bits from an incoming 128-bit SD-FEC codeword. The incoming SD-FEC codeword is formed from a digitized representation of sixteen DP-16QAM symbols. The incoming DP-16QAM symbols are digitized to an m-bit resolution by."

*Cl* **156** *SC* **156.7.1** *P* **72** *L* **18** # 42

Zhang, Bo Marvell / Inphi

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

Side-mode suppression ratio (SMSR) is not a relevant Tx spec for 400GBASE-ZR

*SuggestedRemedy*

Replace SMSR spec with out-of-band OSNR (min) so that it's aligned with OIF 400ZR and OpenROADM

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace SMSR spec with out-of-band OSNR (min), as well as a defintion of out-of-band OSNR. Values TBD.

*Cl* **156** *SC* **156.7.1** *P* **72** *L* **28** # 43

Zhang, Bo Marvell / Inphi

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

address TBD for I-Q offset (max)

*SuggestedRemedy*

Adopt DC I-Q offset of -26dB and instantaneous I-Q offset of -20dB from OIF 400ZR spec to ensure interoperability between 400ZR and 400GBASE-ZR

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment 67.

*Cl* **156** *SC* **156.7.1** *P* **72** *L* **20** # 44

Zhang, Bo Marvell / Inphi

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

laser linewidth spec needs to be companioned with laser phase noise spec

*SuggestedRemedy*

Add laser phase noise spec from OIF published 400ZR IA - laser frequency noise mask (13.1.210)

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment 65.

*Cl* **156** *SC* **156.7.1** *P* **72** *L* **26** # 45

Zhang, Bo Marvell / Inphi

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

address TBD for EVM (max)

*SuggestedRemedy*

Replace TBD with 14.8% from way_3ct_01b_1119.pdf to stimulate some task force progress. Note that test methodology detailed in way_3ct_01b_1119.pdf might be different than that from pittala_3ct_01a_191205

*Response* *Response Status* **C**

REJECT.

See response to comment 24.

*Cl* **156** *SC* **156.7.2** *P* **73** *L* **24** # 46

Zhang, Bo Marvell / Inphi

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

Average receive power values called out in 'Receiver OSNR' are not aligned with the min Average receive power value in line 20

*SuggestedRemedy*

Replace -16dBm with -12dBm

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment 68.

*Cl* **156** *SC* **156.7.2** *P* **73** *L* **28** # 47

Zhang, Bo Marvell / Inphi

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

Average receive power value called out in 'Receiver OSNR tolerance' is not aligned with the min Average receive power value in line 20

*SuggestedRemedy*

Replace -16dBm with -12dBm

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment 69.

*Cl* **156** *SC* **156.7.2** *P* **73** *L* **33** # 48

Zhang, Bo Marvell / Inphi

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

footnote b says mandatory receiver OSNR tolerance spec is informative

*SuggestedRemedy*

Revise footnote b as 'b: Receiver sensitivity (max), for OSNR >=34dB (12.5GHz) is informative'

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment 70.

*Cl* **156** *SC* **156.7.2** *P* **73** *L* **17** # 49

Zhang, Bo Marvell / Inphi

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

Value in damage threshold is empty

*SuggestedRemedy*

Either remove this damage threshold spec or add a TBD in the value cell

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add TBD as value

*Cl* **156** *SC* **156.8** *P* **74** *L* **12** # 50

Zhang, Bo Marvell / Inphi

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

OSNR at TP3 value is not aligned with Transmitter in-band OSNR value

*SuggestedRemedy*

Replace 35dB with 34dB

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment 73.

*Cl* **156** *SC* **156.8** *P* **74** *L* **17** # 51

Zhang, Bo Marvell / Inphi

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

OSNR at TP3 value is not aligned with Transmitter in-band OSNR value

*SuggestedRemedy*

Replace 35dB with 34dB

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment 73.

*Cl* **156** *SC* **156.8** *P* **74** *L* **19** # 52

Zhang, Bo Marvell / Inphi

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

OSNR at TP3 value is not aligned with Transmitter in-band OSNR value

*SuggestedRemedy*

Replace 35dB with 34dB

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment 73.

*Cl* **156** *SC* **156.8** *P* **74** *L* **9** # 53

Zhang, Bo Marvell / Inphi

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

Address TBD for Average output power at TP3

*SuggestedRemedy*

Replace TBD with 0dBm per Receiver spec

*Response* *Response Status* **C**

ACCEPT.

*Cl* **156** *SC* **156.8** *P* **74** *L* **12** # 54

Zhang, Bo Marvell / Inphi

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

Address TBD for OSNR at TP3<35dB

*SuggestedRemedy*

Replace TBD with -12dBm per Receiver spec

*Response* *Response Status* **C**

ACCEPT.

*Cl* **156** *SC* **156.8** *P* **74** *L* **25** # 55

Zhang, Bo Marvell / Inphi

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

Address TBD for fiber chromatic dispersion slope

*SuggestedRemedy*

Replace TBD with 0.05ps/km/nm/nm per P802.3ct spec

*Response* *Response Status* **C**

ACCEPT.

*Cl* **156A** *SC* **156A.4** *P* **88** *L* **34** # 56

Zhang, Bo Marvell / Inphi

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

As the loss budget between TP2 to TP3 is less than 10dB, there is practically no usage for unamplified scenarios with Mux/dmux included

*SuggestedRemedy*

Suggest remove this whole 156A.4 section

*Response* *Response Status* **C**

REJECT.

The editor's note at the beginning annex 156A states "All values in this annex are placeholders from 802.3ct and are subject to change". Analysis defining which scenarios can be supported is necessary and is pending further development of the draft.

Contributions are welcome to address which scenarios can be supported.

*Cl* **155** *SC* **155.1.2** *P* **34** *L* **19** # 57

Maniloff, Eric Ciena

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

400GAUI-n does not appear in this figure

*SuggestedRemedy*

Remove 400GAUI-n from the acronym definitions list

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.2.4.1** *P* **38** *L* **12** # 58

Maniloff, Eric Ciena

*Comment Type* **T** *Comment Status* **A** *GMP description*

The statement that rate matching isn't required is correct, but not because of the GMP process. Rate matching is not needed because AM's are not inserted.

*SuggestedRemedy*

Clarify sentence to indicate that rate-matching is not needed because AM's are not inserted on the transcoded blocks.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change:

"Note that the rate matching described at 119.2.4.1 is not required for the 400GBASE-ZR PCS because the GMP mapping process takes care of any rate differences."

to:

"Note that the rate matching described at 119.2.4.1 is not required for the 400GBASE-ZR PCS because alignment markers are not inserted into the transcoded blocks."

*Cl* **155** *SC* **155.2.4.4.5** *P* **41** *L* **5** # 59

Maniloff, Eric Ciena

*Comment Type* **T** *Comment Status* **A** *OH description*

Need complete OH diagram to indicate LDI and RPF locations.

*SuggestedRemedy*

Add complete OH definitions/diagram including bit locations

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See the response to comment #36. That response references the OH description in ITU-T G.709.1 clauses 8.1 and 9.2, which is a superset of the OH bytes used in this clause.

No changes to the text in question.

*Cl* **155** *SC* **155.7** *P* **60** *L* **31** # 60

Maniloff, Eric Ciena

*Comment Type* **T** *Comment Status* **A** *Delay constraints*

Delay listed as 892.16 ns is incorrect, actual delay is ~4.5 us.

*SuggestedRemedy*

Update delay with actual value.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

In 155.7 change "shall be no more than 356 824 BT (697 pause_quanta or 892.16 ns)." to "shall be no more than TBD BT (TBD pause_quanta or TBD ns)."

Add entry to table 116-6 for "400GBASE-ZR PCS and PMA" before 400GBASE-ZR PMD. All values TBD.

Contributions invited to resolve the TBDs.

*Cl* **156** *SC* **156.1** *P* **64** *L* **25** # 61

Maniloff, Eric Ciena

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

ZR is incomplete name

*SuggestedRemedy*

Replace ZR with 400GBASE-ZR

*Response* *Response Status* **C**

ACCEPT.

*Cl* **156** *SC* **156.1.1** *P* **64** *L* **37** # 62

Maniloff, Eric Ciena

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

BER of 2.4E-4 is incorrect

*SuggestedRemedy*

Replace 2.4E-4 with correct value of ~1.26e-2

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace 2.4E-4 with correct value of 1.25e-2.

*Cl* **156** *SC* **156.6** *P* **69** *L* **32** # 63

Maniloff, Eric Ciena

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

TP2 and TP3 need to be indexed to in figure 156-3 to define intra and inter-channel impacts of the black link

*SuggestedRemedy*

Replace TP2 with TP2_i and TP3 with TP3_i

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change to TP2_i and TP3_i as suggested. The use of the _i labels is required to define the Adjacent DWDM channel spectral attenuation as stated in maniloff_3cw_01a_210429.

*Cl* **156** *SC* **156.7.1** *P* **72** *L* **17** # 64

Maniloff, Eric Ciena

*Comment Type* **T** *Comment Status* **A** *Interchannel cross talk*

Spectral excursion defines a single point on the transmit spectrum. To properly account for both filtering and inter-channel crosstalk penalties the full spectral shape needs to be specified.

*SuggestedRemedy*

Replace Spectral Excursion with a Maximum and minimum spectral mask. A supporting presentation will be available to define this.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

The Optical Crosstalk Ad Hoc was formed to discuss the different impairments to address 75 GHz spacing at 400Gb compared to 100 GHz spacing at 100Gb. The Ad Hoc output was captured in maniloff_3cw_01a_210429 and presented on 4/29. During the meeting a strawpoll was taken which showed clear consensus on the approach documented in the presentation.

I would support adopting the optical crosstalk proposal defined in maniloff_3cw_01a_210429

- Yes – 28
- No – 2
- Abstain - 6

Implement the recommendations stated in maniloff_3cw_01a_210429 with editorial license.

*Cl* **156** *SC* **156.7.1** *P* **72** *L* **20** # 65

Maniloff, Eric Ciena

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

A single value for the linewidth is insufficient for a coherent receiver.

*SuggestedRemedy*

Replace linewidth with a Laser Frequency Noise mask.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

In Table 156-8 replace "Laser linewidth (max)" with "Laser Frequency Noise mask". Values TBD. Update parameter definitions 156.9 with editorial license.

Implement laser phase noise spec consistent with OIF published 400ZR IA - laser frequency noise mask (13.1.210) with editorial license.

OIF IA available at https://www.oiforum.com/wp-content/uploads/OIF-400ZR-01.0_reduced2.pdf.

*Cl* **156** *SC* **156.7.1** *P* **72** *L* **33** # 66

Maniloff, Eric Ciena

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

Laser RIN is missing from table

*SuggestedRemedy*

Add an entry for RIN Average and an entry for RIN peak

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

In Table 156-6 add entries for "RIN Average" and "RIN peak". Use values consistent with the published OIF 400ZR IA "13.1.212". Update parameter definitions 156.9 with editorial license.

OIF IA available at https://www.oiforum.com/wp-content/uploads/OIF-400ZR-01.0_reduced2.pdf.

*Cl* **156** *SC* **156.7.1** *P* **72** *L* **28** # 67

Maniloff, Eric Ciena

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

I-Q Offset should include both a max instantaneous and mean value

*SuggestedRemedy*

Split I/Q offset into maximum instantaneous and mean values

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

In Table 156-6 replace "I-Q offset (max)" with "I-Q (max instantaneous)" and "I-Q (mean)". Use values consistent with the published OIF 400ZR IA "13.1.270a and 13.1.270b". Update parameter definitions 156.9, with editorial license.

OIF IA available at https://www.oiforum.com/wp-content/uploads/OIF-400ZR-01.0_reduced2.pdf.

*Cl* **156** *SC* **156.7.2** *P* **73** *L* **24** # 68

Maniloff, Eric Ciena

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

Receiver OSNR specs should be defined relative to -12dBm

*SuggestedRemedy*

Replace -16dBm with -12dBm

*Response* *Response Status* **C**

ACCEPT.

*Cl* **156** *SC* **156.7.2** *P* **73** *L* **27** # 69

Maniloff, Eric Ciena

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

Receiver OSNR tolerance should be defined for Average Power (min)

*SuggestedRemedy*

Replace -16dBm with -12dBm

*Response* *Response Status* **C**

ACCEPT.

*Cl* **156** *SC* **156.7.2** *P* **73** *L* **33** # 70

Maniloff, Eric Ciena

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

Tx OSNR min is 34dB, this should be used in note b

*SuggestedRemedy*

Replace 35 dB with 34 dB

*Response* *Response Status* **C**

ACCEPT.

*Cl* **156** *SC* **156.8** *P* **74** *L* **7** # 71

Maniloff, Eric Ciena

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

Ripple is used in ITU-T G698.2 to define both the allowable loss/gain variations within the passband and the passband. Ripple as used here should be used only to define the loss/gain variations within the passband.

*SuggestedRemedy*

Add a footnote to clarify that ripple is only defining the loss/gain variations withing th DWDM channel passband.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

In Table 156-8 add footnote to "Ripple (max)" stating "Only used to define the loss or gain variations within the DWDM channel passband" with editorial license.

*Cl* **156** *SC* **156.8** *P* **74** *L* **7** # 72

Maniloff, Eric Ciena

*Comment Type* **T** *Comment Status* **A** *Interchannel cross talk*

The specification needs to include a more detailed DWDM channel passband definition.

*SuggestedRemedy*

Add a passband definition for the DWDM channel. A supporting contribution will be presented.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment 64.

*Cl* **156** *SC* **156.8** *P* **74** *L* **11** # 73

Maniloff, Eric Ciena

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

References to 35 dB should all be to 34dB, since this is the minimum Tx OSNR

*SuggestedRemedy*

Replace all references (lines 11, 12, 16, 19) to 35dB (12.5GHz) with 34 dB (12.5GHz)

*Response* *Response Status* **C**

ACCEPT.

*Cl* **156** *SC* **156.8** *P* **74** *L* **34** # 74

Maniloff, Eric Ciena

*Comment Type* **T** *Comment Status* **A** *Interchannel cross talk*

Inter-Channel Crosstalk is not a meaningful specification for a coherent receiver. The spectral distribution of the crosstalk needs to be defined.

*SuggestedRemedy*

Inter-Channel crosstalk should be replaced with a spectrally resolved attenuation definition between adjacent ports on the DWDM Black Link. A supporting contribution will be presented.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment 64.

*Cl* **156** *SC* **156.9.5** *P* **76** *L* **13** # 75

Maniloff, Eric Ciena

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

Laser Linewidth defined as a single parameter is insufficient for a coherent receiver

*SuggestedRemedy*

A laser frequency noise mask should be included

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment 65.

*Cl* **156** *SC* **156.9.22** *P* **78** *L* **17** # 76

Maniloff, Eric Ciena

*Comment Type* **T** *Comment Status* **A** *Interchannel cross talk*

Inter-Channel Crosstalk is not a meaningful specification for a coherent receiver. The spectral distribution of the crosstalk needs to be defined.

*SuggestedRemedy*

156.9.22 should be modified to include an adjacent channel spectral attenuation for the DWDM black link, and describe how this is used along with Tx spectrum to calculate the worst-case inter-channel crosstalk.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment 64.

*Cl* **156** *SC* **156.5.1** *P* **67** *L* **16** # 77

Park, Charles Juniper Networks

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

Figure 156-2,
PMD service interfaces in Fig. 156-2 need to be corrected.

*SuggestedRemedy*

"PMD:IS_UNITDATA_0.request to PMD:IS_UNITDATA_3.request"

"PMD:IS_UNITDATA_0.indication to PMD:IS_UNITDATA_3.indication"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **156** *SC* **156.6** *P* **69** *L* **47** # 78

Park, Charles Juniper Networks

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

Table 156-4,
The channel number and corresponding optical frequency in Table 156-4 is reasonbale for 75GHz grid, but not representing the channel center frequency for 100GHz grid.

*SuggestedRemedy*

Add new table summarizing the channel index number and center frequency for 100GHz grid including description in the text.

Alternatively, refer the table 154-6 in IEEE802.3ct for 100GHz grid or refer ITU-T G.697.1 with description of channel index assignment for two different cases, 100G- and 75GHz grid.

*Response* *Response Status* **C**

REJECT.

The decision to replace 100GHz spacing with 75GHz spacing for the 400Gb Ethernet 80km objective was made by the IEEE P802.3ct task force at the January 2020 interim meeting, see motion #3. Note, this decision was made while the 400Gb 80km objective was part of the IEEE P802.3ct project.

This decision was then reafirmed by the IEEE P802.3cw task force on April 2nd interim teleconference meeting.

*Cl* **156** *SC* **156.7.1** *P* **72** *L* **12** # 79

Park, Charles Juniper Networks

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

In Table 156-6, nominal center frequency is referring Table 156-4, which indicating the center frequency of 75GHz grid spacing.

Center frequency for 100GHz grid is different from that of 75GHz grid.

Better to provide the channel index and corresponding optical frequency for 100GHz grid.

*SuggestedRemedy*

change context correspondingly

*Response* *Response Status* **C**

REJECT.

See response to comment 78.

*Cl* **156** *SC* **156.7.2** *P* **73** *L* **14** # 80

Park, Charles — Juniper Networks

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

In Table 156-7, nominal center frequency is referring Table 156-4, which indicating the center frequency of 75GHz grid spacing.

Center frequency for 100GHz grid is different from that of 75GHz grid.

Better to provide the channel index and corresponding optical frequency for 100GHz grid.

*SuggestedRemedy*

change context correspondingly

*Response* *Response Status* **C**

REJECT.

See response to comment 78.

*Cl* **FM** *SC* **FM** *P* **124** *L* **20** # 81

Dawe, Piers — Nvidia

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

Missing tab in the format for some contents entries?

*SuggestedRemedy*

Fix or re-apply the template?

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

There is no page 124 in the document so not clear on the specific issue raised. Some spacing and text wrap issues were noticed in the table contents and these will be resolved.

*Cl* **1** *SC* **1.4.110c** *P* **19** *L* **9** # 82

Dawe, Piers — Nvidia

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

Saying simply that 400GBASE-Z uses 400GBASE-R encoding is misleading the reader; this isn't just another BASE-R. A distinguishing feature is OTN-like GMP framing and clocking. Also, the next definition, for 400GBASE-ZR, says "using 400GBASE-Z encoding", phase and amplitude modulation and coherent detection, the same as this one. There has to be some difference between 400GBASE-R and 400GBASE-Z - and there is, the difference is GMP.

*SuggestedRemedy*

Change "using 400GBASE-R encoding, a combination of phase and amplitude modulation..." to "using 400GBASE-R encoding, GMP retiming and framing, a combination of phase and amplitude modulation...".

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "using 400GBASE-Z encoding" to "using 400GBASE-R encoding". No other changes to the text. This description aligns with the corresponding text in 802.3ct, which was the first project to define Etherent operation over DWDM systems, and the stated intention is to ensure that 802.3ct.

*Cl* **156** *SC* **156.2** *P* **65** *L* **19** # 83

Dawe, Piers — Nvidia

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

This says that the SIGNAL_DETECT parameter can take on one of two values: OK or FAIL, while 156.5.4 says that SIGNAL_DETECT is fixed to OK.

*SuggestedRemedy*

As this PMD can be used with non-amplified channels, it would be useful to change 156.5.4 to allow a conventional signal detect function with two values when used with non-amplified channels.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment 21. No change to 156.5.4.

*Cl* **116** *SC* **116.1.3** *P* **28** *L* **13** # 84

Dawe, Piers Nvidia

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

As 1.4.110c says that 400GBASE-Z is an "IEEE 802.3 family of Physical Layer devices", it's not 400GBASE-R and needs introduction here.

*SuggestedRemedy*

Add a sentence introducing the 400GBASE-Z family.

*Response* *Response Status* **C**

REJECT.

This text aligns with the corresponding text in 802.3ct, which was the first project to define Etherent operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

*Cl* **116** *SC* **116.1.3** *P* **28** *L* **23** # 85

Dawe, Piers Nvidia

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

This says that 400GBASE-ZR uses 400GBASE-R encoding, while 1.4.110d says it uses using 400GBASE-Z encoding. As the encoding is not regular 400GBASE-R encoding but GMP retimed and framed, 400GBASE-Z encoding is right and 400GBASE-R encoding is wrong (seriously incomplete).

*SuggestedRemedy*

Change "400GBASE-R encoding" to "400GBASE-Z encoding".

*Response* *Response Status* **C**

REJECT.

This text aligns with the corresponding text in 802.3ct, which was the first project to define Etherent operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct. See response to comment 82.

*Cl* **116** *SC* **116.2.5** *P* **30** *L* **21** # 86

Dawe, Piers Nvidia

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

P802.3ck is changing this subclause and comes before this project in the list of amendments.

*SuggestedRemedy*

Update the draft to include P802.3ck's changes as necessary

*Response* *Response Status* **C**

ACCEPT.

*Cl* **116** *SC* **116.2.5** *P* **30** *L* **25** # 87

Dawe, Piers Nvidia

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

Clause 156 is for 400GBASE-ZR which isn't a 400GBASE-R PMD, it's a 400GBASE-Z PMD.

*SuggestedRemedy*

Change "400GBASE-R" to "400GBASE" in this sentence.

*Response* *Response Status* **C**

REJECT.

The use of x00GBASE-R is consistent between 802.3ct, which was the first project to define Etherent operation over DWDM systems, and 802.3ct and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

*Cl* **116** *SC* **116.4** *P* **30** *L* **38** # 88

Dawe, Piers Nvidia

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

Need an entry for the delay of the 400GBASE-Z PMA

*SuggestedRemedy*

Add a row for the delay of the 400GBASE-Z PMA

*Response* *Response Status* **C**

REJECT.

There is no 400GBASE-Z PMA.

*Cl* **116** *SC* **116.4** *P* **30** *L* **38** # 89

Dawe, Piers Nvidia

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

As this table contains entries for both 400GBASE-R and 400GBASE-Z

*SuggestedRemedy*

For footnotes a and b, change 400GBASE-R to 400GBASE

*Response* *Response Status* **C**

REJECT.

There is no 400GBASE.

See response to comment 88.

*Cl* **116** *SC* **116.5** *P* **31** *L* **9** # 90

Dawe, Piers Nvidia

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

As this table contains entries for both 400GBASE-R and 400GBASE-Z

*SuggestedRemedy*

Change "400GBASE-R" to "400GBASE"

*Response* *Response Status* **C**

REJECT.

There is no 400GBASE.

See response to comment 88.

*Cl* **155** *SC* **155** *P* **33** *L* **2** # 91

Dawe, Piers Nvidia

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

type what?
This PHY called "400GBASE-ZR" in this draft is similar in intent to 10GBASE-LW: the output from a BASE-R PCS is transmitted in telecoms style framing. While Z in the first position as an alternative to S, L or E, is familiar from unofficial specs as meaning 80 km or similar.

*SuggestedRemedy*

Complete the title: 400GBASE-ZW. Change 400GBASE-ZR to 400GBASE-ZW throughout, change 400GBASE-Z to 400GBASE-W throughout.

*Response* *Response Status* **C**

REJECT.

This text aligns with the corresponding text in 802.3ct, which was the first project to define Etherent operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

*Cl* **156** *SC* **156.11** *P* **79** *L* **41** # 92

Dawe, Piers Nvidia

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

As we all know and Figure 156-2 shows, TP2 is not the MDI. Line 51 says see 156.5.1 which reminds us that "The optical transmit signal is defined at the output end of a single-mode fiber patch cord (TP2), between 2 m and 5 m in length". An equivalent sentence to this one in 156.11 has been deleted from 154.11.

*SuggestedRemedy*

Delete the sentence "At the transmitter output the MDI coincides with TP2 and at the receiver input with TP3, as shown in Figure 156–2.".

*Response* *Response Status* **C**

ACCEPT.

*Cl* **156A** *SC* **156A.3** *P* **87** *L* **47** # 93

Dawe, Piers Nvidia

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

It is not clear what if anything "application" means here. Sometimes it's the wrong word technically: see 1.4.309 link segment.

*SuggestedRemedy*

1. Here, change "Examples of DWDM black link applications with OSNR..." to "DWDM black link example with OSNR..." (there is only one example here);
2. Change "For any application over any DWDM black link distance and any number of channels" to "For a particular DWDM black link distance and number of channels";
3. Change "Specifically in an example application of 40 channels" to "Specifically in an example with";
In 156A.4:
4. In 156A.4, change "Example of DWDM black link applications with OSNR" to "DWDM black link examples with OSNR" (there are four examples here);
5. Change "four examples of DWDM black link applications" to "four examples";
6. Change "conventional point-to-point Ethernet application where the PMDs" to "conventional point-to-point Ethernet link segment where the PMDs";
7. Change Table 156A-2--40 channel example DWDM black link application with ...
to: Table 156A-2--40-channel example with ...
and similarly for the next three tables.

*Response* *Response Status* **C**

REJECT.

This text exactly matches the corresponding text in 802.3ct 156A.3, which was the first project to define Etherent operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

*Cl* **155** *SC* **155.1.3** *P* **34** *L* **38** # 94

Dawe, Piers Nvidia

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

This is so complicated and relies so heavily on references to a non-802.3 document that this definition by directive and reference risks ambiguity.

*SuggestedRemedy*

Add an annex with suitable examples (see Annex 119A for the idea). Large examples should can be made available separately on the web.

*Response* *Response Status* **C**

REJECT.

The suggested remedy does not provide any specific changes to the draft. Task force contributions are requested.

*Cl* **156** *SC* **156.9.12** *P* **77** *L* **3** # 95

Dawe, Piers Nvidia

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

This subclause is supposed to define transmitter in-band OSNR. It says "OSNR is defined in 156.9.11." but does not say what "transmitter in-band" means.

*SuggestedRemedy*

Complete the definition

*Response* *Response Status* **C**

REJECT.

This text exactly matches the corresponding text in 802.3ct 154.9.12, which was the first project to define Etherent operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

*Cl* **155** *SC* **155.3.3.5** *P* **58** *L* **48** # 96

Dawe, Piers Nvidia

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

PMA:IS_UNITDATA_0.indication to PMA:IS_UNITDATA_3.indication

*SuggestedRemedy*

PMD:IS_UNITDATA_0.indication to PMD:IS_UNITDATA_3.indication

*Response* *Response Status* **C**

ACCEPT.

*Cl* **155** *SC* **155.3.1.3** *P* **49** *L* **44** # 97

Dawe, Piers Nvidia

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

This isn't your grandfather's PMA. Frame alignment word (FAW), training sequence (TS), reserved symbols and pilot sequences (PS) are more like PCS functions, and complicated enough that definition by directive risks ambiguity.

*SuggestedRemedy*

As for a PCS: add an annex with suitable examples (see Annex 119A for the idea). Large examples should can be made available separately on the web.

*Response* *Response Status* **C**

REJECT.

The suggested remedy does not provide any specific changes to the draft. Task force contributions are requested.

*Cl* **156** *SC* **156.6** *P* **68** *L* **37** # 98

Dawe, Piers Nvidia

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

Channels aren't transported, they are transmission paths. Signals may be transported or transmitted over or on channels

*SuggestedRemedy*

Change "enable the transport of multiple DWDM channels over a single fiber" to "enable multiple DWDM channels over a single fiber" or "enable the transport of multiple DWDM signals over a single fiber".

*Response* *Response Status* **C**

REJECT.

This text exactly matches the corresponding text in 802.3ct 154.6, which was the first project to define Etherent operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

*Cl* **156** *SC* **156.9.15** *P* **77** *L* **28** # 99

Dawe, Piers Nvidia

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

Need to say whether transmitter impairments are included or not

*SuggestedRemedy*

Following 154.9.15 (P802.3ct), change "includes effects from impairments inside the DWDM black link." to "includes effects associated with impairments of the transmitter and inside the DWDM black link." Further, as the receiver should tolerate any compliant transmitter, not just its own transmitter, this would be better "includes effects associated with impairments of a transmitter and inside a DWDM black link.".

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "includes effects from impairments inside the DWDM black link" to "includes effects associated with impairments of the transmitter and inside the DWDM black link"

*Cl* **156** *SC* **156.9.15** *P* **77** *L* **25** # 100

Dawe, Piers Nvidia

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

This subclause "Receiver OSNR" says "The Receiver shall be able to tolerate an OSNR", which sounds like OSNR tolerance. Yet the next subclause is called "Receiver OSNR tolerance". The names are too similar.

*SuggestedRemedy*

Make changes to make it clear to the reader why there are two things and what the difference is. If possible, rename one of them. A reference to 156A.2 might help.

*Response* *Response Status* **C**

REJECT.

This text exactly matches the corresponding text in 802.3ct 154.9.15 and 154.9.16, which was the first project to define Etherent operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

*Cl* **156** *SC* **156.10.2** *P* **78** *L* **38** # 101

Dawe, Piers Nvidia

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

As the sentence above says, laser safety should apply at the Tx MDI also. As we know, TP2 is not at the MDI.

*SuggestedRemedy*

Change "to the single channel points at TP2 and TP3, as shown in Figure 156-3," to "where the signals are in separate fibers, such as TP2 and TP3 in Figure 156-3".

*Response* *Response Status* **C**

REJECT.

This text exactly matches the corresponding text in 802.3ct 154.10.2, which was the first project to define Etherent operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

*Cl* **156A** *SC* **156A.4** *P* **88** *L* **54** # 102

Dawe, Piers Nvidia

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

This says "the PMDs at TP2 and TP3" yet we know that the PMD and TP2 are separated by a patch cord between 2 m and 5 m in length (see 156.5.1).

*SuggestedRemedy*

Delete "at TP2 and TP3".

*Response* *Response Status* **C**

REJECT.

The use of TP2 and TP3 in annex 156A is the same as 802.3ct annex 154A, which was the first project to define Etherent operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

*Cl* **156** *SC* **156.5.1** *P* **67** *L* **7** # 103

Dawe, Piers
Nvidia

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

TP2 and TP3 are test points for the PMD. The way this clause uses TP2 as a specification point for the DWDM black link is causing problems, because the PMD and TP2 are separated by a patch cord between 2 m and 5 m in length (see 156.5.1).
There is no need to the test point for the transmitter and the input to the "DWDM black link" to be at the same point.
The input to the "Fiber optic cabling (channel)" (see Figure 38-7, Figure 151-7 or many others) is the MDI.
There are plenty of names for the output of the PMD (such as "MDI", "PMD" or "transmitter"), or a new one could be invented.

*SuggestedRemedy*

Define the "DWDM channel" as from MDI to MDI, same as "Fiber optic cabling (channel)" in so many clauses, and or "link segment" (see 1.4.309). Use a figure like Figure 151-7 if appropriate.
TP2 can be shown within the "DWDM channel", or the transmitter can be connected to TP2 for testing and to the "DWDM channel" for use, which is more realistic.

*Response* *Response Status* **C**

REJECT.

The use of TP2 and TP3 in clause 156 is the same as 802.3ct clause 154, which was the first project to define Etherent operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.