

IEEE P802.3cw D1.0 400 Gb/s over DWDM systems 1st Task Force review comments

CI **FM** SC **FM** P124 L20 # 81

Dawe, Piers Nvidia
 Comment Type **E** Comment Status **D** bucket

Missing tab in the format for some contents entries?

SuggestedRemedy

Fix or re-apply the template?

Proposed Response Response Status **W**

PROPOSED 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.

CI **1** SC **1.4.110c** P19 L9 # 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 Ethernet operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

CI **30** SC **30.5.1.1.2** P20 L17 # 25

Huber, Tom Nokia
 Comment Type **E** Comment Status **D** 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.

Proposed Response Response Status **W**

PROPOSED ACCEPT.

CI **116** SC **116.1.3** P28 L13 # 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 Ethernet operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

CI **116** SC **116.1.3** P28 L23 # 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 Ethernet operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct. See response to comment 82.

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CI 116 SC 116.2.3 P29 L47 # 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.

CI 116 SC 116.2.4 P30 L17 # 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.

CI 116 SC 116.2.5 P30 L21 # 86

Dawe, Piers Nvidia
 Comment Type E Comment Status D 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

Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 116 SC 116.2.5 P30 L25 # 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 Ethernet operation over DWDM systems, and 802.3ct and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

CI 116 SC 116.4 P30 L38 # 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.

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CI 116 SC 116.4 P30 L38 # 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.

CI 116 SC 116.5 P31 L9 # 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.

CI 155 SC 155 P33 L2 # 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 Ethernet operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

CI 155 SC 155.1.1 P33 L20 # 28
 Huber, Tom Nokia
 Comment Type E Comment Status D bucket
 Missing a / between 54B and 66B
 SuggestedRemedy
 Change 64B66B to 64B/66B
 Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 155 SC 155.1.2 P34 L3 # 1
 Bruckman, Leon Huawei
 Comment Type E Comment Status D 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
 Proposed Response Response Status W
 PROPOSED ACCEPT.

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Cl 155 SC 155.1.2 P34 L19 # 2 [REDACTED]
 Bruckman, Leon Huawei
 Comment Type E Comment Status D bucket
 400GAUI-n is not mentioned in the figure
 SuggestedRemedy
 Remove the 400GAUI-n definition from the Figure 155-1 text
 Proposed Response Response Status W
 PROPOSED ACCEPT.

Cl 155 SC 155.1.2 P34 L19 # 57 [REDACTED]
 Maniloff, Eric Ciena
 Comment Type E Comment Status D bucket
 400GAUI-n does not appear in this figure
 SuggestedRemedy
 Remove 400GAUI-n from the acronym definitions list
 Proposed Response Response Status W
 PROPOSED ACCEPT.

Cl 155 SC 155.1.3 P34 L38 # 94 [REDACTED]
 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 155 SC 155.1.4 P35 L1 # 3 [REDACTED]
 Bruckman, Leon Huawei
 Comment Type T Comment Status D 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"

Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.

See comment #29, which makes the case for expressing the rate in Gb/s since the DP-16QAM symbols are not formed by the PCS but by the PMA sublayer.

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 approximately 462.2414 Gb/s +/- 20 ppm."

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CI 155 SC 155.1.4 P35 L2 # 29

Huber, Tom

Nokia

Comment Type T Comment Status D 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.

Proposed Response Response Status W

PROPOSED 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 462.2414 Gb/s +/- 20 ppm."

CI 155 SC 155.1.4.1 P35 L11 # 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.

CI 155 SC 155.2.1 P36 L11 # 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."

CI 155 SC 155.2.1 P37 L47 # 32

Huber, Tom

Nokia

Comment Type T Comment Status D 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.

Proposed Response Response Status W

PROPOSED ACCEPT.

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CI 155 SC 155.2.2 P37 L51 # 33
 Huber, Tom Nokia
 Comment Type E Comment Status D bucket
 Missing a B in 64/66B
 SuggestedRemedy
 Change to "64B/66B".
 Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 155 SC 155.2.4.1 P38 L12 # 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."

CI 155 SC 155.2.4.3 P38 L28 # 34
 Huber, Tom Nokia
 Comment Type T Comment Status D 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..

Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 155 SC 155.2.4.3 P39 L4 # 4
 Bruckman, Leon Huawei
 Comment Type E Comment Status D bucket
 The "mapper" is referred 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"

Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 155 SC 155.2.4.3 P39 L5 # 35
 Huber, Tom Nokia
 Comment Type T Comment Status D 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."

Proposed Response Response Status W
 PROPOSED ACCEPT.

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CI 155 SC 155.2.4.4.3 P40 L26 # 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 multiframe 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.

CI 155 SC 155.2.4.4.3 P40 L29 # 5

Bruckman, Leon

Huawei

Comment Type E Comment Status D bucket

The "mapper" is referred 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"

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 155 SC 155.2.4.4.4 P40 L39 # 37

Huber, Tom

Nokia

Comment Type T Comment Status D 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."

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 155 SC 155.2.4.4.4 P40 L40 # 6

Bruckman, Leon

Huawei

Comment Type E Comment Status D 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"

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 155 SC 155.2.4.4.5 P40 L44 # 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.

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CI 155 SC 155.2.4.4.5 P41 L5 # 7 [REDACTED]
 Bruckman, Leon Huawei
 Comment Type E Comment Status D 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"
 Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 155 SC 155.2.4.4.5 P41 L5 # 59 [REDACTED]
 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.

CI 155 SC 155.2.4.4.6 P41 L14 # 39 [REDACTED]
 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."

CI 155 SC 155.2.4.4.6 P41 L15 # 8 [REDACTED]
 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..."

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CI 155 SC 155.2.4.5 P41 L27 # 9
 Bruckman, Leon Huawei
 Comment Type E Comment Status D 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" with : "119 x 10 280 / 5 bits = 244 664 bits"
 Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 155 SC 155.2.4.5 P41 L30 # 10
 Bruckman, Leon Huawei
 Comment Type E Comment Status D bucket
 Wrong plural
 SuggestedRemedy
 Replace "A 32-bit cyclic redundancy codes is calculated" with: "A 32-bit cyclic redundancy code is calculated"
 Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 155 SC 155.2.4.5 P41 L31 # 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."

CI 155 SC 155.2.4.6 P42 L12 # 11
 Bruckman, Leon Huawei
 Comment Type E Comment Status D bucket
 Unnecessary word (IMHO)
 SuggestedRemedy
 Replace "requires an additional 34 bits of padding" with : "requires additional 34 bits of padding"
 Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 155 SC 155.2.4.8 P44 L8 # 12
 Bruckman, Leon Huawei
 Comment Type E Comment Status D 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."
 Proposed Response Response Status W
 PROPOSED ACCEPT.

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CI 155 SC 155.2.5.1 P47 L5 # 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."

CI 155 SC 155.2.5.7.1 P48 L17 # 13

Bruckman, Leon

Huawei

Comment Type T Comment Status D 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"

Proposed Response Response Status W

PROPOSED ACCEPT.

CI 155 SC 155.2.5.7.2 P48 L41 # 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..."

CI 155 SC 155.2.5.7.2 P48 L48 # 15

Bruckman, Leon

Huawei

Comment Type E Comment Status D bucket

Wrong tense

SuggestedRemedy

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

Proposed Response Response Status W

PROPOSED ACCEPT.

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CI 155 SC 155.2.5.8 P49 L1 # 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."

CI 155 SC 155.3.1.3 P49 L44 # 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.

CI 155 SC 155.3.2 P50 L32 # 17
 Bruckman, Leon Huawei
 Comment Type E Comment Status D bucket
 Missing dot
 SuggestedRemedy
 Add dot after "400GBASE-ZR PCS"
 Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 155 SC 155.3.2 P51 L49 # 18
 Bruckman, Leon Huawei
 Comment Type T Comment Status D 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"
 Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.
 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..."

CI 155 SC 155.3.3.5 P58 L48 # 96
 Dawe, Piers Nvidia
 Comment Type T Comment Status D bucket
 PMA:IS_UNITDATA_0.indication to PMA:IS_UNITDATA_3.indication
 SuggestedRemedy
 PMD:IS_UNITDATA_0.indication to PMD:IS_UNITDATA_3.indication
 Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 155 SC 155.3.3.6 P59 L21 # 19
 Bruckman, Leon Huawei
 Comment Type E Comment Status D bucket
 Missing plural
 SuggestedRemedy
 Replace "into two stream" with: "into two streams"
 Proposed Response Response Status W
 PROPOSED ACCEPT.

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Cl 155 SC 155.3.3.6 P59 L41 # 20
 Bruckman, Leon Huawei
 Comment Type T Comment Status D 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.
 Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.
 Change:
 "Implementations are required to have a frame loss ratio (see 1.4.275) of less than 1.7 ??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 ??10-12 for 64-octet frames with minimum interpacket gap when additionally processed according to this clause."

Cl 155 SC 155.7 P60 L31 # 60
 Maniloff, Eric Ciena
 Comment Type T Comment Status D Delay constraints
 Delay listed as 892.16 ns is incorrect, actual delay is ~4.5 us.
 SuggestedRemedy
 Update delay with actual value.
 Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.
 For task force discussion.
 The value in this draft is incorrectly based on the sum of the 400GBASE-R PCS or 400GXS and the 400GBASE-R PMA,
 A contribution with recommended maximum (bit time), maximum (pause_quanta), and maximum (us) for the 400GBASE-ZR PCS and PMA is needed.
 We will need to add a new entry to Table 116-6 with the maximum values.
 As the commenter points out, the CFEC delay is of the order of 4.5 us, or ~ 1.8 million bit times at 400 Gb/s. This would correspond to 3515.625 pause_quanta. The actual value (TBD) will require calculation of all other delays between the PCS service interface (400GMII) and the 400GBASE-ZR PMD service interface.

Cl 156 SC 156.1 P64 L25 # 61
 Maniloff, Eric Ciena
 Comment Type E Comment Status D bucket
 ZR is incomplete name
 SuggestedRemedy
 Replace ZR with 400GBASE-ZR
 Proposed Response Response Status W
 PROPOSED ACCEPT.

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CI 156 SC 156.1.1 P64 L37 # 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.

CI 156 SC 156.2 P65 L19 # 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.

CI 156 SC 156.2 P65 L19 # 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."

CI 156 SC 156.2 P65 L23 # 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.

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CI 156 SC 156.5.1 P67 L7 # 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 Ethernet operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

CI 156 SC 156.5.1 P67 L16 # 77

Park, Charles Juniper Networks
 Comment Type E Comment Status D 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"

Proposed Response Response Status W
 PROPOSED ACCEPT.

CI 156 SC 156.6 P68 L37 # 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 Ethernet operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

CI 156 SC 156.6 P69 L32 # 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.

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CI 156 **SC 156.6** **P69** **L47** # **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 reasonable 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 reaffirmed by the IEEE P802.3cw task force on April 2nd interim teleconference meeting.

CI 156 **SC 156.7.1** **P72** **L12** # **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.

CI 156 **SC 156.7.1** **P72** **L17** # **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.

CI 156 **SC 156.7.1** **P72** **L18** # **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 definition of out-of-band OSNR. Values TBD.

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CI 156 SC 156.7.1 P72 L20 # 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.

CI 156 SC 156.7.1 P72 L20 # 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.

CI 156 SC 156.7.1 P72 L26 # 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.

CI 156 SC 156.7.1 P72 L28 # 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.

CI 156 SC 156.7.1 P72 L28 # 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.

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CI 156 SC 156.7.1 P72 L33 # 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.

CI 156 SC 156.7.2 P73 L14 # 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.

CI 156 SC 156.7.2 P73 L17 # 49

Zhang, Bo Marvell / Inphi
 Comment Type TR Comment Status D bucket
 Value in damage threshold is empty

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

Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.

Add TBD as value

CI 156 SC 156.7.2 P73 L24 # 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.

CI 156 SC 156.7.2 P73 L24 # 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.

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CI 156 SC 156.7.2 P73 L27 # 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.

CI 156 SC 156.7.2 P73 L28 # 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.

CI 156 SC 156.7.2 P73 L33 # 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.

CI 156 SC 156.7.2 P73 L33 # 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.

CI 156 SC 156.8 P74 L7 # 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 within the 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.

CI 156 SC 156.8 P74 L7 # 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.

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Cl 156 SC 156.8 P74 L9 # 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 P74 L12 # 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 P74 L11 # 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 P74 L17 # 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.

Cl 156 SC 156.8 P74 L12 # 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 P74 L19 # 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.

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CI 156 SC 156.8 P74 L25 # 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.

CI 156 SC 156.8 P74 L34 # 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.

CI 156 SC 156.9.5 P76 L13 # 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.

CI 156 SC 156.9.9 P76 L31 # 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 explicitly 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 inclusion 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.

CI 156 SC 156.9.12 P77 L3 # 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 Ethernet operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

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CI 156 SC 156.9.15 P77 L25 # 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 Ethernet operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

CI 156 SC 156.9.15 P77 L28 # 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"

CI 156 SC 156.9.22 P78 L17 # 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.

CI 156 SC 156.10.2 P78 L38 # 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 Ethernet operation over DWDM systems, and the stated intention is to ensure that 802.3cw is aligned with 802.3ct.

CI 156 SC 156.10.2 P78 L44 # 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.

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CI 156 SC 156.11 P79 L41 # 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 ACCEPT. Response Status C

CI 156A SC 156A.3 P87 L47 # 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 REJECT. Response Status C

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

CI 156A SC 156A.4 P88 L34 # 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 REJECT. Response Status C

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.

CI 156A SC 156A.4 P88 L54 # 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 REJECT. Response Status C

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