IEEE P802.3cw D1.1 400 Gb/s over DWDM systems 2nd Task Force review comments

D'Ambrosia, John Futurewei, US Subsidiary of Huawei

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

Given the potential different stack configurations, this annex should be used to illustrate different examples with the different PCS / PMA

**Suggested Remedy:**
Presentation illustrating different concepts will be provided

**Proposed Response**
**Response Status: W**
PROPOSED ACCEPT IN PRINCIPLE.

For task force discussion.

*Note, comment refers to annex 120A.*

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

Multiple definitions are being added, so the editing instruction should use plural forms.

**Suggested Remedy:**
Change "definition" to "definitions"

**Proposed Response**
**Response Status: W**
PROPOSED ACCEPT IN PRINCIPLE.

Change "Insert the following new definition" to "Insert the following two new definitions"

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

FEC is being used as both a noun and an adjective in the sentence describing CFEC. While the usage throughout 802.3 is not entirely consistent, within a single sentence we probably should be consistent.

**Suggested Remedy:**
Change "The transmit data is encoded with a concatenated forward error correction (CFEC) consisting of an inner SC-FEC code and an outer Hamming code SD-FEC." to "The transmit data is encoded with a concatenated forward error correction (CFEC) code consisting of an inner SC-FEC code and an outer Hamming SD-FEC code."

**Proposed Response**
**Response Status: W**
PROPOSED ACCEPT.
<table>
<thead>
<tr>
<th>CI</th>
<th>155 SC 155.2.1</th>
<th>P37</th>
<th>L29</th>
<th># 9</th>
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<tr>
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<td>E</td>
<td>Comment Status</td>
<td>D</td>
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</tbody>
</table>

The description of the test pattern is grammatically awkward. The first sentence of the paragraph has already established that a test pattern is transmitted when the transmit channel is in test pattern mode. The second sentence is intended to indicate what the test pattern is.

**Suggested Remedy**

Change the second sentence: "The PCS shall provide transmit test-pattern mode for the scrambled idle pattern (see 119.2.4.9)." to "The transmitted test pattern shall be the scrambled idle pattern (see 119.2.4.9)."

**Proposed Response**

PROPOSED ACCEPT.

<table>
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<tr>
<th>CI</th>
<th>155 SC 155.2.2</th>
<th>P37</th>
<th>L50</th>
<th># 11</th>
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<td>E</td>
<td>Comment Status</td>
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</tbody>
</table>

Multiplication should be indicated with a multiplication symbol rather than an x.

**Suggested Remedy**

Replace 510 x 512 with 510 × 512

**Proposed Response**

PROPOSED ACCEPT.

<table>
<thead>
<tr>
<th>CI</th>
<th>155 SC 155.2.3</th>
<th>P38</th>
<th>L4</th>
<th># 12</th>
</tr>
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<td>Nokia</td>
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<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
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</tr>
</tbody>
</table>

It would be more clear to say "mapped into a 400GBASE-ZR frame using GMP" than "GMP mapped"

**Suggested Remedy**

Change:
The 64B/66B codestream is then transcoded into a 256B/257B stream, GMP mapped and FEC bits added in this PCS before transmission to The 400GBASE-ZR frame using GMP, and FEC bits are added in this PCS before transmission.

**Proposed Response**

PROPOSED ACCEPT.

<table>
<thead>
<tr>
<th>CI</th>
<th>155 SC 155.2.4.3</th>
<th>P39</th>
<th>L4</th>
<th># 13</th>
</tr>
</thead>
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<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>D</td>
<td></td>
</tr>
</tbody>
</table>

It would be more clear to say "mapped into a 400GBASE-ZR frame using GMP" than "GMP mapped", the word 'payload' is missing from the description of the area of the frame into which the 257b blocks are mapped, and the multiplication symbol should be used rather than x to indicate multiplication.

**Suggested Remedy**

Change item 5 from:
The 400GBASE-ZR PCS payload is GMP mapped into the area of the 400GBASE-ZR frame starting at column 5141 of row 0 and ending at column 10280 of row 255. The payload size is 10220 x 257B.to The 400GBASE-ZR PCS payload is mapped into the payload area of the 400GBASE-ZR frame, starting at column 5141 of row 0 and ending at column 10280 of row 255, using GMP. The payload size is 10220 × 257B.

**Proposed Response**

PROPOSED ACCEPT.
The AMs are used to locate the row that is the start of the frame, not the row number. There is also a stray comma before the parenthetical phrase.

**Suggested Remedy**

Change:

AM alignment is processed post-FEC decode, after descrambling, to locate the row corresponding to the start of the 400GBASE-ZR frame, (SC-FEC being already 10 970 bit row aligned).

to

AM alignment is processed post-EC decode, after descrambling, to locate the row corresponding to the start of the 400GBASE-ZR frame (SC-FEC being already 10 970 bit row aligned).

**Response**

**Response Status**: C

ACCEPT IN PRINCIPLE.

There are a couple of typos in the suggested remedy.

Change:

AM alignment is processed post-FEC decode, after descrambling, to locate the row number corresponding to the start of the 400GBASE-ZR frame, (SC-FEC being already 10 970 bit row aligned).

to

AM alignment is processed post-EC decode, after descrambling, to locate the row corresponding to the start of the 400GBASE-ZR frame (SC-FEC being already 10 970 bit row aligned).

**Response**

**Response Status**: C

ACCEPT.

The generator polynomial $G(x)$ is not defined anywhere in the text, which makes the detailed description of how to compute the CRC that was copied from the referenced OIF document not useful.

**Suggested Remedy**

The computation is fully specified in the referenced OIF document. Delete the second sentence of the second paragraph and the entire third paragraph and bullet list, so the text reads:

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 32 bits of the CRC value are.....

**Response**

**Response Status**: C

ACCEPT.

The reference to G.709.1 at the end of the paragraph should be preceded by ITU-T.

**Suggested Remedy**

Insert "ITU-T" before "G.709.1".

**Response**

**Response Status**: W

PROPOSED ACCEPT.

Missing a ‘d’ in ‘placed’ in the description of where the CRC goes.

**Suggested Remedy**

Change "The 32 bits of the CRC value are place with..." to "The 32 bits of the CRC value are placed with."

**Proposed Response**

**Response Status**: W

PROPOSED ACCEPT.
The last two paragraphs would be better combined, with the clause in the first sentence of the final paragraph concerning the location of the MBAS field removed (that information is already provided in the first sentence of the next-to-last paragraph).

**Suggested Remedy**

Replace the last two paragraphs with:

Following the CRC-32 a 6-bit MBAS is added. The MBAS is used by the SC-FEC encoder and decoder to synchronize the state of the error de-correlator controllers between the receiver and the transmitter. The staircase FEC implementation uses a 7-bit MBAS which provides a 128-block sequence. The six most significant bits of the 7-bit MBAS are transferred between source and sink in the 6-bit MBAS overhead. The numerical value represented in the six MBAS overhead bits is incremented every two SC-FEC blocks and provides a 128-block multi-block.

**Response**

ACCEPT.

**Comment Type** E  **Comment Status** A  **MBAS description**

Capital B is used as the abbreviation for 'bit' in the rest of the document.

**Suggested Remedy**

Change 119b/128b to 119B/128B

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

PROPOSED ACCEPT.

**Comment Type** E  **Comment Status** D  **5 x SC-FEC blocks** is awkward

**Suggested Remedy**

Change to "five SC-FEC blocks"

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

PROPOSED ACCEPT.
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Cl 155 SC 155.2.4.9 P44 L20 #24
Huber, Tom Nokia

Comment Type: E, Comment Status: D

bits should be spelled out, and no need to describe the size of the padding again here since it is already clearly described in 155.2.4.7

Suggested Remedy

Change the first sentence from:
"The scrambled output from the SC-encoder plus 6x119b padding is organized as 10 976 rows of 119b,"

to:
"The scrambled output from the SC-encoder plus padding is organized as 10 976 rows of 119 bits,"

Proposed Response: Response Status: W
PROPOSED ACCEPT.

Cl 155 SC 155.2.4.9 P44 L20 #24
Huber, Tom Nokia

Comment Type: E, Comment Status: D

Multiplication should be indicated with a multiplication symbol rather than an x.

Suggested Remedy

Replace the x's here and elsewhere on the page, including the end of 155.2.5.6 on the next page, with multiplication symbols.

Proposed Response: Response Status: W
PROPOSED ACCEPT.

Cl 155 SC 155.3.2 P50 L41 #26
Huber, Tom Nokia

Comment Type: E, Comment Status: D

Multiplication should be indicated with a multiplication symbol rather than an x.

Suggested Remedy

Replace the x's here and elsewhere on the page, including the end of 155.2.5.6 on the next page, with multiplication symbols.

Proposed Response: Response Status: W
PROPOSED ACCEPT.

Cl 156 SC 156.1 P63 L12 #1
Maniloff, Eric Ciena

Comment Type: E, Comment Status: A

PHY shows 400GBASE-R PCS instead of 400GBASE-ZR PCS

Suggested Remedy

Replace 400GBASE-E with 400GBASE-ZR

Response: Response Status: C
ACCEPT IN PRINCIPLE.

Location is page 64 not 63. Replace "400GBASE-R PCS" with "400GBASE-ZR PCS".

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Clause, Subclause, page, line
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**D'Ambrosia, John**
Futurewei, US Subsidiary of Huawei

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

400GBASE-R PCS (119) and 400GBASE-R PMA (120) are not noted

**Suggested Remedy:**
update table to include clauses 119 and 120 as optional

**Response**
ACCET.

** Issenhuth, Tom**
Huawei

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

Clause 155 should not be an external cross references for PCS for 400GBASE-ZR and PMA for 400GBASE-ZR

**Suggested Remedy:**
Correct the clause 155 cross references

**Response**
ACCET.

**Manillof, Eric**
Ciena

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

Comment on FLR references being processed by Clause 119 PCS, but should actually only reference the clause 155 PCS.

**Suggested Remedy:**
Change "additionally processed by the FEC (Clause 155) and PCS (Clause 119)." to "processed by the Clause 155 400GBASE-ZR PCS.".

**Response**
ACCET IN PRINCIPLE.

Change first paragraph in 156.1.1 from "The bit error ratio (BER) when processed by the PMA (Clause 155) shall be less than 1.25 × 10–2 provided that the error statistics are sufficiently random that this results in 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 by the FEC (Clause 155) and PCS (Clause 119)." to

"The bit error ratio (BER) when processed by the 400GBASE-ZR PMA (Clause 155) shall be less than 1.25 × 10–2 provided that the error statistics are sufficiently random that this results in 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 by the CFEC (Clause 155)."

**Huber, Tom**
Nokia

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

Since the value of SIGNAL_DETECT is fixed to OK, and therefore not dependent on the amount of light being received, the NOTE needs to be revised.

**Suggested Remedy:**
Change

NOTE—SIGNAL_DETECT = OK does not guarantee that the rx_symbol parameters are known to be good. 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.

Note - SIGNAL_DETECT = OK does not guarantee that the rx_symbol parameters are known to be good or that the BER defined in 156.1.1 will be met.

**Response**
REJECT.

Wording is identical to the wording in recently published 802.3ct.
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Comment Type: E  Comment Status: A
Sentence does not contain location of definitions.
Suggested Remedy: Add location of definitions.
Response: ACCEPT.

Comment Type: E  Comment Status: A
Sentence does not contain location of definitions.
Suggested Remedy: Add location of definitions.
Response: ACCEPT.

Comment Type: E  Comment Status: A
Sentence does not contain location of definitions.
Suggested Remedy: Add location of definitions.
Response: ACCEPT.

Comment Type: TR  Comment Status: D
Receiver Sensitivity for an unamplified link should not be part of the same PMD as receiver sensitivity for an amplified link. This is a distinct application, and a receiver should not be burdened with a requirement to support both applications. Although the sensitivity spec in Table 156-7 is informative, other aspects of this application are normative. If this is a required application it should be defined as a separate PMD.
Suggested Remedy: Remove sensitivity spec from Table 156-7, or modify to define a separate PMD supporting this.
Proposed Response: Proposed reject. Insufficient justification provided to remove the specification or define a new PMD.

Comment Type: ER  Comment Status: D
Agreed upon language from 802.3ct, which is a ratified standard should be used in appropriate situations.
Suggested Remedy: Under Value in Table 156-7, change:
The frequency in Table 156-4 corresponding to the variable Rx_optical_channel_index to
The frequency in Table 156-4 where the channel index number equals the variable Rx_optical_channel_index
Proposed Response: Proposed accept.

Comment Type: T  Comment Status: D
Optical path power penalty for OSNR at TP3 ≥ 34dB is a separate application, and should be removed or applied to a separate PMD.
Suggested Remedy: Remove power penalty from Table 156-8, or modify to indicate that this is applied to a separate PMD.
Proposed Response: Proposed reject. Insufficient justification provided to remove the specification or define a new PMD.
### Comment 37
**Cl 156 SC 156.9.4 P77 L15 # 37**
Issenhuth, Tom Huawei

**Comment Type:** E  **Comment Status:** A  
Figure 156-4 is an imported pdf and appears fuzzy.

**SuggestedRemedy**
Update figure in native FrameMaker format to improve quality

**Response**  
Response Status: C  
ACCEPT.

### Comment 38
**Cl 156 SC 156.9.6 P78 L42 # 38**
Issenhuth, Tom Huawei

**Comment Type:** E  **Comment Status:** A  
Figure 156-5 is incomplete.

**SuggestedRemedy**
Complete figure 156-5 to be consistent with the figure in the published OIF 400ZR IA 13.1.210

**Response**  
Response Status: C  
ACCEPT.

### Comment 39
**Cl 156 SC 156.9.10 P79 L18 # 39**
Issenhuth, Tom Huawei

**Comment Type:** T  **Comment Status:** D  
EVM definition in incomplete.

**SuggestedRemedy**
Update EVM definition based on output from EVM ad hoc

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

For task force discussion.

### Comment 40
**Cl 156A SC 156A.2 P89 L37 # 31**
D’Ambrosia, John Futurewei, US Subsidiary of Huawei

**Comment Type:** TR  **Comment Status:** A  
The stated average receive power (min) is incorrectly stated as -16 dBm, when it should be -12 dBm.

**SuggestedRemedy**
The operating ranges in Figure 156A–3 can be roughly divided into 2 areas, one where the OSNR is between TBD dB (12.5 GHz) and TBD dB (12.5 GHz) together with an average optical power at TP3 between 0 dBm and –16 dBm

**Response**  
Response Status: C  
ACCEPT IN PRINCIPLE.  
Make the modifications as proposed and modify figure 156A-3 to reflect the change in value.

### Comment 41
**Cl 156A SC 156A.3 P91 L5 # 32**
D’Ambrosia, John Futurewei, US Subsidiary of Huawei

**Comment Type:** TR  **Comment Status:** A  
Stated channel output power range is incorrect

“should be amplified to a channel output range of –16 dBm to 0 dBm.”

As noted in Table 156A-1, the range is -12 dBm to 0 dBm

**SuggestedRemedy**
modify noted -16 dBm to -12 dBm
also modify -16 dBm to -12 dBm throughout the rest of the subclause as appropriate

**Response**  
Response Status: C  
ACCEPT.