IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl: FM SC FM P 1 L 2 # 151
Grow, Robert RMG Consulting

Comment Type E Comment Status A bucket
IEEE Std 802.3-2022 is both approved and published.

SuggestedRemedy
Change all instances of 802.3-202x to 802.3-2022 (headers and draft text).

Response Response Status C
ACCEPT IN PRINCIPLE.
See response to comment 1

Cl: FM SC FM P 1 L 10 # 152
Grow, Robert RMG Consulting

Comment Type E Comment Status A bucket
I think P802.3cw is currently identified as Amendment 8.

SuggestedRemedy
Fill in assigned amendment number.

Response Response Status C
ACCEPT IN PRINCIPLE.
See response to comment 21

Cl: FM SC FM P 1 L 23 # 21
Marris, Arthur Cadence Design Systems

Comment Type E Comment Status A bucket
Change 802.3-202x to 802.3-2022 and correct list of amendments

SuggestedRemedy
Change to "This draft is an amendment of IEEE Std 802.3-2022 as amended by IEEE Std 802.3dd-2022, IEEE Std 802.3cs-202x, IEEE Std 802.3db-202x, IEEE Std 802.3ck-202x, IEEE Std 802.3de-202x, IEEE Std 802.3cx-202x, and IEEE Std 802.3cz-202x."

Response Response Status C
ACCEPT IN PRINCIPLE.
Make the amendment order consistent with the order prescribed by the Working Group chair and update their descriptions as required. See response to comment 1. With editorial license.

Cl: FM SC FM P 1 L 25 # 153
Grow, Robert RMG Consulting

Comment Type E Comment Status A bucket
List of amendments is not current. IEEE Std 802.3dd-2022 is approved and can be referenced by year; and cs, db, ck, and de are all at RevCom and depending on when your D2.1 is produced might also be able to be listed with approval year of 2022. Amendment 6 is cs, Amendment T is cz.

SuggestedRemedy
Update list order and years as appropriate. Make the same edits to the list of amendments in the introduction starting on page 10.

Response Response Status C
ACCEPT IN PRINCIPLE.
See response to comment 21

Cl: FM SC FM P 1 L 25 # 1
Hajduczenia, Marek Charter Communications

Comment Type E Comment Status A bucket
"IEEE Std 802.3-202x" is no longer correct - we know it will be 2022 release

SuggestedRemedy
Change all dated references to 802.3 from 202x to 2022

Response Response Status C
ACCEPT.

Cl: FM SC FM P 1 L 3 # 410
Dawe, Piers Nvidia

Comment Type T Comment Status R bucket
for operation over DWDM systems - not. Figure 156-1 has it right: "PMD FOR DWDM CHANNEL OVER A DWDM BLACK LINK"

SuggestedRemedy
Change "for operation over DWDM systems" to "for DWDM operation"

Response Response Status C
REJECT.
There was no consensus to make a change. The approved project title per the PAR is "Standard for Ethernet Amendment: Physical Layers and Management Parameters for 400 Gb/s Operation over DWDM (dense wavelength division multiplexing) systems". The same language is used 802.3ct-2021 amendment title and abstract.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl FM SC FM P 3 L 18 # 154
Grow, Robert RMG Consulting

Comment Type ER Comment Status A bucket
This is not the current mandatory front matter. Because it contains legal disclaimers and notices it should be current.

SuggestedRemedy
Replace mandatory frontmatter with that in the current IEEE SA templates.

Response Response Status W
ACCEPT.

Cl FM SC FM P 7 L 18 # 155
Grow, Robert RMG Consulting

Comment Type E Comment Status A bucket
The P802.3cw ballot group is now in use, and can be inserted so participants can review their names for proper presentation.

SuggestedRemedy
Populate list with the P802.3cw ballot group (removing the officer names already listed in lines 5 through 16.

Response Response Status C
ACCEPT.

Cl FM SC FM P 10 L 34 # 22
Marris, Arthur Cadence Design Systems

Comment Type E Comment Status A bucket
Section 9 goes up Clause 160

SuggestedRemedy
Change to "Section Nine—Includes Clause 141 through Clause 160 and Annex 142A through Annex 154A. Clause 141 through Clause 144 and associated annexes specify symmetric and asymmetric operation of Ethernet passive optical networks over multiple 25 Gb/s channels. Clause 145 and associated annexes specify increased power delivery using all four pairs in the structured wiring plant. Clause 146 through Clause 149 and associated annexes specify Physical Layers for 10 Mb/s, 2.5 Gb/s, 5 Gb/s, and 10 Gb/s operation over a single balanced pair of conductors. Clause 150 and Clause 151 include additional 400 Gb/s Physical Layer specifications. Clause 153 and Clause 154 specify 100 Gb/s operation over DWDM channels. Clause 157 through Clause 160 include 10 Gb/s, 25 Gb/s, and 50 Gb/s bidirectional Physical Layer specifications."

Response Response Status C
ACCEPT.

Cl FM SC FM P 11 L 20 # 156
Grow, Robert RMG Consulting

Comment Type E Comment Status A bucket
P802.3cx is no longer designated as Amendment 5.

SuggestedRemedy
Renumber and move to Amendment 6. P802.3de/D3.1 has been submitted to Revcom as Amendment 5. Reorder and number IEEE Std 802.3de-202x (or 2022 if approved).

Response Response Status C
ACCEPT IN PRINCIPLE.

See response to comment #21.

Comment Type E Comment Status D
802.3dd has been approved

SuggestedRemedy
Change: IEEE Std 802.3dd(TM)-202x
To: IEEE Std 802.3dd(TM)-2022

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

See response to comment #21.

Cl FM SC FM P 10 L 44 # 373
Wienckowski, Natalie General Motors

Comment Type E Comment Status A bucket
The expansion for PMA is physical medium attachment per 802.3-2022 1.5.

SuggestedRemedy
Change: Physical Media Attachment (PMA)
To: Physical Medium Attachment (PMA)

Response Response Status C
ACCEPT.

Cl FM SC FM P 11 L 3 # 368
Wienckowski, Natalie General Motors

Comment Type E Comment Status A bucket
The P802.3cw ballot group is now in use, and can be inserted so participants can review their names for proper presentation.

SuggestedRemedy
Populate list with the P802.3cw ballot group (removing the officer names already listed in lines 5 through 16.

Response Response Status C
ACCEPT.

Cl FM SC FM P 11 L 20 # 156
Grow, Robert RMG Consulting

Response Response Status C
ACCEPT IN PRINCIPLE.

See response to comment #21.
<table>
<thead>
<tr>
<th>Cl</th>
<th>FM</th>
<th>SC FM</th>
<th>P</th>
<th>11</th>
<th>L 32</th>
<th>#</th>
<th>CI</th>
<th>FM</th>
<th>SC FM</th>
<th>P</th>
<th>11</th>
<th>L 32</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>23</td>
<td>23</td>
<td></td>
<td></td>
<td>Marris, Arthur  Cadence Design Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>23</td>
<td>23</td>
<td></td>
<td></td>
<td><strong>Comment Type</strong> E <strong>Comment Status</strong> D</td>
<td>Swap cx and de and add cz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|     |      |       | 23 | 23  |      |    | **Suggested Remedy** | Make 802.3de amendment 5 and 802.3cx amendment 6. Add amendment 7 for "IEEE Std 802.3 -202x Amendment 7 - This amendment to IEEE Std 802.3-2022 adds physical layer specifications and management parameters for 2.5 Gb/s, 5 Gb/s, 10 Gb/s, 25 Gb/s and 50 Gb/s operation on optical fiber for use in automotive applications."

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

See response to comment 21

|     |      |       | 369| 369 |      |    | Wienckowski, Natalie  General Motors |
|     |      |       | 369| 369 |      |    | **Comment Type** E **Comment Status** A | bucket |
|     |      |       | 369| 369 |      |    | **Suggested Remedy** | The description of cx doesn't match D3.0 of P802.3cx.

**Response** **Response Status** C **ACCEPT.**

|     |      |       | 157| 157 |      |    | Grow, Robert  RMG Consulting |
|     |      |       | 157| 157 |      |    | **Comment Type** E **Comment Status** A | bucket |
|     |      |       | 157| 157 |      |    | **Suggested Remedy** | I believe P802.3cw has been designated Amendment 8.

**Response** **Response Status** C **ACCEPT IN PRINCIPLE.**

See response to comment 21

|     |      |       | 371| 371 |      |    | Wienckowski, Natalie  General Motors |
|     |      |       | 371| 371 |      |    | **Comment Type** E **Comment Status** A | bucket |
|     |      |       | 371| 371 |      |    | **Suggested Remedy** | cw is amendment 8

**Response** **Response Status** C **ACCEPT IN PRINCIPLE.**

See response to comment 21
### IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

<table>
<thead>
<tr>
<th>Cl</th>
<th>FM</th>
<th>SC</th>
<th>FM</th>
<th>P</th>
<th>I</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>411</td>
<td></td>
<td></td>
<td></td>
<td>11</td>
<td></td>
<td>37</td>
<td></td>
</tr>
</tbody>
</table>

**Dawe, Piers Nvidia**

**Comment Type**: E, **Comment Status**: R

- for operation over DWDM systems - not. Figure 156-1 has it right: "PMD FOR DWDM CHANNEL OVER A DWDM BLACK LINK"

**Suggested Remedy**

- Change "for operation over DWDM systems" to "for DWDM operation".
- This should match the abstract on page 2.

**Response**: REJECT.

- See response to comment 410

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>582</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

**Ran, Adee Cisco**

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

- Change "IEEE Std 802.3™-202x" to "IEEE Std 802.3™-2022" in the page header.
- Change "IEEE Std 802.3dd-202x" to "IEEE Std 802.3dd-2022" on line 25.
- Apply in other places across the document as appropriate, with editorial license.

**Response**: ACCEPT IN PRINCIPLE.

- See responses to comments 1 and 21

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>412</td>
<td>144b</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

**Wienckowski, Natalie General Motors**

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

- 8 could be p = 4, 8, or 16 as in Figure 120A-8. Or just 4

**Suggested Remedy**

- Change to:
  
  1.4.144b 400GBASE-Z: IEEE 802.3 family of Physical Layer devices with reach up to at least 80 km on single-mode optical fiber. (See IEEE Std 802.3, Clause 156.)

**Response**: ACCEPT IN PRINCIPLE.

- See response to comment 170

---

**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, U/unsatisfied, Z/withdrawn

**SORT ORDER**: Clause, Subclause, page, line

**Page 4 of 128** 10/18/2022 12:41:14 P
**Comment Type:** E
**Comment Status:** A

"family of Physical Layer devices" is misleading, as there would be only one member, based on this draft. Also it's unnecessary: any future 400GBASE-Z project could add the word at the time when the facts change.

**Suggested Remedy:**
Delete "family of"

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

ACCEPT IN PRINCIPLE.

See response to comment 170

---

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

The term 400GBASE-Z seems to only once in the specification, and there is no description of the "family" described in this definition. Further, based on where it is used appears to be in error. I only find it in connection with Figure 155-2 (page 35) in the sentence "A functional block diagram of the 400GBASE-Z PCS sublayer is shown in Figure 155-2". The figure itself calls this the 400GBASE-ZR PCS, and 400GBASE-ZR is used everywhere else. Suggest this definition may be left over from some earlier thought...

**Suggested Remedy:**
Delete 1.4.144b definition. Alternatively, add text to the draft (likely 155) explaining the general family and its members...

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

ACCEPT IN PRINCIPLE.

See response to comment 170

---

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

As the 400GBASE-ZR PHY uses the 400GBASE-ZR PCS, and is the only device that uses it - there is no family. Furthermore, while it leverages the 400GBASE-R PCS, it is not really 400GBASE-R encoded.

**Suggested Remedy:**
Delete 1.4.144b

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

ACCEPT IN PRINCIPLE.

Delete 1.4.144b. Replace 400BASE-Z with 400BASE-ZR throughout draft.

---

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

The 400GBASE-ZR PHY is not encoded with the 400GBASE-R PCS.

**Suggested Remedy:**
Modify definition to IEEE 802.3 Physical Layer specification for 400 Gb/s dense wavelength division multiplexing (DWDM) PHY using 400GBASE-ZR encoding, dual polarization 16-state quadrature amplitude modulation (DP-16QAM) modulation, and coherent detection with reach up to at least 80 km. (See IEEE Std 802.3, Clause 155 and Clause 156.)

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

ACCEPT IN PRINCIPLE.

Change 1.4.144c to

"400GBASE-ZR: IEEE 802.3 Physical Layer specification for 400 Gb/s dense wavelength division multiplexing (DWDM) PHY using 400GBASE-ZR PCS and PMA encoding, dual polarization 16-state quadrature amplitude modulation (DP-16QAM) modulation, and coherent detection with reach up to at least 80 km. (See IEEE Std 802.3, Clause 155 and Clause 156.)"
Defining this PHY as "using 400GBASE-R encoding ... DP-16QAM, and coherent detection" is highly misleading. The BASE-R encoded signal is transported, but what is actually used is GMP, SC-FEC, SD-FEC DP-16QAM and coherent transmission and detection. Although it is debatable whether GMP is useful, or just included because it's there. In a short definition we need to say something about the GMP and FEC because neither are BASE-R, but we don't need the detail.

Suggested Remedy
Change "using 400GBASE-R encoding, dual polarization 16-state quadrature amplitude modulation (DP-16QAM) modulation, and coherent detection" to "using 400GBASE-R encoding, GMP, strong FEC, dual polarization 16-state quadrature amplitude modulation (DP-16QAM) modulation, and coherent optical signalling".

ACEPT IN PRINCIPLE.

See response to comment 171.

The term "ADC" is already used in IEEE Std 802.3 and is a well understood term. See later comments about use in this draft as well...

Suggested Remedy
delete inserted abbreviation

REJECT.

The term "DAC" is already used in IEEE Std 802.3 and is a well understood term. This is only used in a figure, and without expansion in the draft.

Suggested Remedy
delete inserted abbreviation

REJECT.

The term "GMP" is used 42 times in the draft and is not listed in the abbreviation table.

GMP is described in 155.2.4.3 (p38, line 8) but not formally defined

Suggested Remedy
Add "GMP: generic mapping procedure" to the entries.

REJECT.

The term "ADC" is used in the base standard as well as this document but is not in the base standard abbreviation list so consensus of the CRG was it should be added.

The term "DAC" is used in the base standard as well as this document but is not in the base standard abbreviation list so consensus of the CRG was it should be added.

The term "GMP" is included in 1.5 of IEEE Std 802.3-2022
The term "SC-FEC" is used 59 times in the draft and is not listed in the abbreviation table. CI 155.1.2 defines SC-FEC to mean "staircase forward error correction".

**Suggested Remedy**
Add "SC-FEC: staircase forward error correction" to the entries.

**Response**  
REJECT.

"SC-FEC" is included in 1.5 of IEEE Std 802.3-2022

CI 30  SC 30.5.1.1.2  P 19  L 12  # 196
Huber, Thomas Nokia

**Comment Type**  E  **Comment Status**  A  
The values of aMAUType are alphabetized by rate in 802.3-2022. 400GBASE-ZR should be inserted after 400GBASE-VR4 that 802.3db added.

**Suggested Remedy**
Change SR16 to VR4 in the editing instruction

**Response**  
ACCEPT IN PRINCIPLE.

Change editing instruction to "Insert 400GBASE-ZR PHY type into the "APPROPRIATE SYNTAX" section of 30.5.1.1.2 after 400GBASE-VR4 (as inserted by IEEE Std 802.3db-202x) as follows"
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 45 SC 45.2.1.22.13 P 22 L 1 # 160
Grow, Robert RMG Consulting

Comment Type E Comment Status A bucket
Incorrect insert point, subclauses are in decreasing register bit number order.

SuggestedRemedy
Insert new subclause 45.2.1.22.1c after 45.2.1.22.1b (as inserted by IEEE Std 802.3db-202x) as follows:
Renumber subclause as 45.2.1.22.1.c.

Response Response Status C
ACCEPT IN PRINCIPLE.
See response to comment 25

Cl 45 SC 45.2.1.22.13 P 22 L 1 # 25
Marris, Arthur Cadence Design Systems

Comment Type ER Comment Status A bucket
Needs to reference modification made by 802.3db and change paragraph number to 45.2.1.22.1aa

SuggestedRemedy
Change editig instruction to: "Insert new subclause 45.2.1.22.1aa after 45.2.1.22.1 and before 45.2.1.22.1a (as inserted by IEEE Std 802.3db-2022) as follows:"

Response Response Status W
ACCEPT IN PRINCIPLE.
Change editing instruction to "Insert new subclause 45.2.1.22.1c after 45.2.1.22.1b (as inserted by IEEE Std 802.3db-2022) as follows:"

Cl 45 SC 45.2.1.1150 P 22 L 15 # 375
Wienckowski, Natalie General Motors

Comment Type E Comment Status A bucket
typo 154.6 is not a proper Table number.

SuggestedRemedy
Change: 154.6
To: 154-5

Response Response Status C
ACCEPT.

Cl 45 SC 45.2.1.150.1 P 22 L 11 # 161
Grow, Robert RMG Consulting

Comment Type E Comment Status A bucket
The subclause title for this subclause number and the following text is: Tx optical channel index (1.800.5:0)

SuggestedRemedy
Correct title as in 802.3-2022.

Response Response Status C
ACCEPT IN PRINCIPLE.
Change subclause title to "Tx optical channel index (1.800.5:0)"

Cl 45 SC 45.2.1.150.1 P 22 L 17 # 416
Dawe, Piers Nvidia

Comment Type E Comment Status R bucket
It would help to point out that these the channel plans differ in more ways than that one has more channels than the other.

SuggestedRemedy
Maybe NOTE--These two tables are significantly different?

Response Response Status C
REJECT.
The referenced tables provide the information necessary to understand how they are different.

Cl 45 SC 45.2.1.153.1a P 23 L 4 # 221
Law, David Hewlett Packard Enterprise

Comment Type E Comment Status A
Subclause 45.2.1.153.1a 'Tx index ability 48 through 63 (1.804.0 through 1.804.15)' says that ‘Bits 1.804.1 through 1.804.15 indicate the equivalent for index values 48 through 63, respectively.’ Bit 1.804.1 is Tx index ability 49, not Tx index ability 48 (see page 23, line 23).

SuggestedRemedy
Suggest that the text ‘... for index values 48 through 63 ...’ should read ‘... for index values 49 through 63 ...’.

Response Response Status C
ACCEPT IN PRINCIPLE.
See response to comment 198
Cl 45 SC 45.2.1.153.1a P 23 L 31 # 376
Wienckowski, Natalie General Motors

Comment Type E Comment Status A bucket
Comment 45.2.1.153.1a is not being placed under 45.2.1.153.1 in the base spec, it should be under 45.2.1.153a in this spec.

SuggestedRemedy
Change: 45.2.1.153.1a
To: 45.2.153a.1
Also in the instructions on P22L19.

Accept

Response Response Status C
See response to comment 162

Cl 45 SC 45.2.1.153.1a P 23 L 35 # 198
Huber, Thomas Nokia

Comment Type ER Comment Status A
The index value associated with bit 1.804.1 should be 49 rather than 48

SuggestedRemedy
Change
"Bits 1.804.1 through 1.804.15 indicate the equivalent for for index values 48 through 63, respectively."
to
"Bits 1.804.1 through 1.804.15 indicate the equivalent for for index values 49 through 63, respectively."

Accept

Cl 45 SC 45.2.1.153a P 22 L 19 # 197
Huber, Thomas Nokia

Comment Type E Comment Status A bucket
The numbering of the subclauses in the editing instruction is not consistent with the style guide. The subclause underneath new subclause 45.2.1.153a should be numbered as 1a rather than 1.

SuggestedRemedy
Change 45.2.1.153.1a to 45.2.1.153a.1

Accept

See response to comment 162
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Response</th>
<th>Response Status</th>
<th>Suggested Remedy</th>
<th>Comment Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>45.2.1.153a</td>
<td>22</td>
<td>19</td>
<td>162</td>
<td>E</td>
<td>A</td>
<td></td>
<td></td>
<td>Insert point is after the subclauses of 45.2.1.153.</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Insert 45.2.1.153a and 45.2.1.153.1a after 45.2.1.153.1 as follows:</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Accept In Principle.</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Change editing instruction to &quot;Insert 45.2.1.153a after 45.2.1.153.1 as follows&quot; and add new editing instruction to &quot;Insert 45.2.1.153a.1 after 45.2.1.153a as follows&quot;</td>
<td>美股</td>
</tr>
<tr>
<td>45</td>
<td>45.2.1.157a</td>
<td>24</td>
<td>1</td>
<td>377</td>
<td>E</td>
<td>A</td>
<td></td>
<td></td>
<td>45.2.1.157.1a is not being placed under 45.2.1.157.1 in the base spec, it should be under 45.2.1.157a in this spec.</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Change: 45.2.1.157.1a to 45.2.1.157a.1</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Also in the instructions on P24L3.</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Accept In Principle.</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>See response to comment 163</td>
<td>美股</td>
</tr>
<tr>
<td>45</td>
<td>45.2.1.157a.1</td>
<td>22</td>
<td>19</td>
<td>163</td>
<td>E</td>
<td>A</td>
<td></td>
<td></td>
<td>The numbering of the subclauses in the editing instruction is not consistent with the style guide. The subclause underneath new subclause 45.2.1.157a should be numbered as .1 rather than 1a.</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Change 45.2.1.157.1a to 45.2.1.157a.1</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Accept In Principle.</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>See response to comment 163</td>
<td>美股</td>
</tr>
<tr>
<td>78</td>
<td>78</td>
<td>26</td>
<td>1</td>
<td>35</td>
<td>T</td>
<td>D</td>
<td></td>
<td></td>
<td>802.3cw does not have an objective to support EEE.</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The usage of EEE in current high-speed Ethernet applications is practically non-existent. Therefore there is no need to list new PHYs as supporting EEE, nor to add LPI specific features to new PCSs that are added for these PHYs. Having optional features that are never used is a burden for readers and implementers.</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Remove clause 78 from this amendment.</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Remove the &quot;O&quot; in the 400GBASE-ZR row for EEE in Table 116-5.</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Delete all registers and functions related to EEE or LPI from the PCS specifications in clause 155.</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Implement additional changes as necessary with editorial license.</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Proposed Accept In Principle.</td>
<td>美股</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Review supporting presentation, for comment resolution group (CRG) consideration.</td>
<td>美股</td>
</tr>
</tbody>
</table>

**Additional Information:**

- **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 U/unsatisfied Z/withdrawn
- **SORT ORDER:** Clause, Subclause, page, line

**Page:** 10 of 128

**Date:** 10/18/2022 12:41:14 PM
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Proposed Response</th>
<th>Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>78</td>
<td>78.1.4</td>
<td>TR</td>
<td>D</td>
<td>EEE Clauses point to the respective PCS, PMA, and PMD sublayers of the PHY. Clause 118 is an extender sublayer but the DTE/PHY XS sublayers, which are essentially PCS functions. So it may be ok to leave - but this has never been done before. Clause 120 is not part of the 400GBASE-ZR stack.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>116.1.3</td>
<td>TR</td>
<td>A</td>
<td>As in an earlier comment; just saying &quot;using 400GBASE-R encoding&quot; is highly misleading. This PHY and its coding is very different to normal BASE-R.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>116.1.3</td>
<td>TR</td>
<td>A</td>
<td>The 400GBASE-ZR PHY leverages the 400GBASE-R PCS, but is not really 400GBASE-R encoded.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>116.1.3</td>
<td>TR</td>
<td>A</td>
<td>All normal BASE-R PHYs use the same Clause 120 PMA, so it has not been mentioned in this table up to now. This one is different.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Suggested Remedy

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

EEE Clauses point to the respective PCS, PMA, and PMD sublayers of the PHY. Clause 118 is an extender sublayer but the DTE/PHY XS sublayers, which are essentially PCS functions. So it may be ok to leave - but this has never been done before. Clause 120 is not part of the 400GBASE-ZR stack.

- **Proposed Response**: Change entry in Clause field to: 155, 156
- **Response Status**: W

**PROPOSED ACCEPT IN PRINCIPLE.**

**Review supporting presentation, for comment resolution group (CRG) consideration.**

Suggested Remedy

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

As in an earlier comment; just saying "using 400GBASE-R encoding" is highly misleading. This PHY and its coding is very different to normal BASE-R.

- **Suggested Remedy**: Either, change "using 400GBASE-R encoding" to "using 400GBASE-R encoding, GMP, strong FEC, dual polarization DP-16QAM, and coherent optical signalling", or delete "using 400GBASE-R encoding". People can follow the link to Clause 156 to find out more.
- **Response Status**: W

**ACCEPT IN PRINCIPLE.**

**See response to comment 173**
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 116 SC 116.1.3 P 27 L 22 # 419
Dawe, Piers Nvidia

Comment Type TR Comment Status R

The manipulations described in this draft don't describe a BASE-R "native Ethernet"; rather, they are like 10GBASE-W. An Ethernet signal is packed into a telecoms wrapper (then, based on SONET, here, based on OTN). The combination is clumsy and messy. Starting from Ethernet building blocks, one would not engineer it like this. I understand that the rationale is because those designs were already there, and the cost of a clean design was thought to outweigh the inefficiencies of this scheme. But that calls "broad market potential" into question. 800G coherent will affect the market for this.

SuggestedRemedy
I can think of three options:

Redo Clause 155, leaving out GMP and FAW and simplifying the training sequence and pilot sequence to make an Ethernet PHY;

Cancel this project, and encourage those interested to feed their learnings into OIF's "400ZR" maintenance;

Rename this PHY to 400GBASE-ZW, which is more honest and leaves the "400GBASE-ZR" name available to any future native Ethernet PHY, should the broad market potential be found.

Response Response Status U
REJECT.

No consensus within the CRG to change the name of the 400GBASE-ZR PHY.

Cl 116 SC 116.1.4 P 28 L 8 # 4
Brown, Matt Huawei

Comment Type ER Comment Status A

This table is wider than the defined margins. It would be better to create a new table for 400GBASE-Z optical PHYs. Note that 400GBASE-ZR is part of the family of physical layer devices called 400GBASE-Z as defined in 1.4.144b.

SuggestedRemedy

Change title of Table 116-5 to "PHY type and clause correlation (400GBASE-R optical)" with appropriate editorial instruction and change formatting. Insert new Table 116-x "PHY type and clause correlation (400GBASE-Z optical)" and include the row for 400GBASE-ZR as provided in Table 116-5 in D2.0 with only the necessary columns.

Response Response Status C
ACCEPT IN PRINCIPLE.

Change title of Table 116-5 to "PHY type and clause correlation (400GBASE-R optical)" and remove the table from the draft. With editorial license.

Insert new Table 116-x "PHY type and clause correlation (400GBASE-Z optical)" and include the row for 400GBASE-ZR as provided in Table 116-5 in D2.0 with only the necessary columns. See response to comment 174.

Cl 116 SC 116.1.4 P 28 L 10 # 164
Grow, Robert RMG Consulting

Comment Type TR Comment Status A

Base text is not correct. P802.3db/D3.2 inserted two columns under clause 167 (400GBASE-SR4 PMD is missing). The column is also missing from P802.3ck/D3.3

SuggestedRemedy

Add column for 400GBASE-SR4 PMD under Clause 157 as found in the latest version of P802.3db (or if approved or published IEEE Std 802.3db).

Response Response Status W
ACCEPT IN PRINCIPLE.

See response to comment 4.
Comment Type E Comment Status A

Table 116-5 has been changed in 802.3db to have one column group for clause 167 (with its two PHYs).

Also, the table ruling should be cleaned up.

Suggested Remedy

Align the columns with 802.3db D3.2 and apply formatting as required to match the original table structure.

Response Response Status C

ACCEPT IN PRINCIPLE.

See response to comment 4

Comment Type TR Comment Status A

The table notes the following clauses as optional - 119, 120, 120B, 120C, 120D, 120E, 120F, and 120G. These layers are not directly used as part of the 400GBASE-ZR PHY, but are inferred through the use of the 400GMII Extender.

Suggested Remedy

Make entries for the following clauses blank: 119, 120, 120B, 120C, 120D, 120E, 120F, and 120G.

Response Response Status C

ACCEPT IN PRINCIPLE.

For the 400GBASE-ZR row in Table 116-5 delete "o" (optional) in following clauses (119, 120, 120B – 120G)
Subclause 155.2.4.11 ‘Hamming SD-FEC encoder’ says that ‘The 128-bit code words are sent as 8-bit symbols to the 400GBASE-ZR PMA sublayer on the PMA:IS_UNITDATA_0.request to PMA:IS_UNITDATA_7.request inter-sublayer signals.’ Further, subclause 155.2.5.1 ‘Hamming SD-FEC decoder’ says ‘The incoming DP-16QAM symbols are digitized to an m-bit resolution by the PMA sublayer receive direction (see 155.3.3.5) and provided to the PCS receive direction by PMA:IS_UNITDATA_0.indication to PMA:IS_UNITDATA_m–1.indication inter-sublayer signals.’ and that ‘The Hamming SD-FEC decoder is a soft decision decoder and so requires a higher resolution than 2 bits / 4 levels for each of the signals XI, XQ, YI, and YQ.’. Finally, Figure 155-10 ‘400GBASE-ZR PMA functional block diagram’ says ‘m is implementation dependent and is the number of bits of resolution of the DP-16QAM symbols.’

Rather than operating as n parallel asynchronous PCS lanes that carry alignment markers and lane numbers that enable the original data to be restored or n lanes to be multiplex into m lanes, it appears the 400GBASE-ZR PMA service interface between the PCS and the PMA operates as an n-bit synchronous data path, transferring a single DP-16QAM symbol during each operation. This seems to be confirmed by subclause 155.2.5.1 ‘GMP mapper’ that says ‘... 400GBASE-ZR frames are not mapped to 16 PCS lanes ...’. In the case of the receive path, the DP-16QAM symbols are encoded as p bits representing q levels, where p and q are implementation dependant. This all seems to preclude the physical instantiation of the 400GBASE-ZR PMA service interface between the PCS and the PMA as a physical instantiation of the 400GAUI. This is because [1] the PMA service interface doesn't support alignment markers and lane numbers allowing multiplexing and de-multiplexing to different widths; [2] the PMA service interface width on the receive path is n bits representing the 4 levels for each of the in-phase and quadrature components of the X and Y polarizations. In the case of the receive path, the DP-16QAM symbols are encoded as p bits representing q levels, where p and q are implementation dependant.

This all seems to preclude the physical instantiation of the 400GBASE-ZR PMA service interface between the PCS and the PMA as a 400GAUI. This is because [1] the PMA service interface doesn't support alignment markers and lane numbers allowing multiplexing and de-multiplexing to different widths; [2] the PMA service interface width on the receive path is implementation dependant; and [3] the PMA service interface operates as a synchronous data path, transferring a single DP-16QAM symbol during each operation, requiring a skew between the bits of less than one 400GBASE-ZR frame DP-16QAM symbol time (~17.3 ps) which I don't believe a 400GAUI would meet. This seems to be confirmed by the one example given in annex 120A.6 ‘Partitioning example supporting 400GBASE-ZR’ which only shows a 400GAUI ‘above’ the 400GBASE-ZR PCS, and not ‘below’.

Based on the above, add footnotes to the 'O's in the 400GAUI columns of the 400GBASE-ZR row in Table 116–5 to note the 400GAUI is only supported 'above' the 400GBASE-ZR PCS.

Suggested Remedy

Add a footnote to the 'O's in the 400GAUI columns of the 400GBASE-ZR row in Table 116–5 that reads '400GAUI only supported as a physical instantiation of the 400GMII Extender (see 118.1.3).'.

Response

ACCEPT IN PRINCIPLE.

See response to comment 5
This says "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 Clause 155 and the PMA specifications defined in Clause 120 or Clause 155." But these are two distinctly different "families".

Suggested Remedy
Revert this text and add a separate paragraph introducing 400GBASE-W

ACCEPT IN PRINCIPLE.

See response to comment 5

This paragraph summarizing the PCS needs a new sentence specifically for the Clause 155 PCS, which does clock domain translation and uses a concatenated FEC scheme, neither part of which is a BASE-R FEC

Suggested Remedy
Add new sentence.

ACCEPT IN PRINCIPLE.

See response to comment 5

The changes to the base text are incorrect as 400GBASE-ZR is not a member of 400GBASE-R family.

Suggested Remedy
Delete noted text in 802.3cw D2.0 116.2.4 recommended text will be provided in a follow-up presentation.

ACCEPT IN PRINCIPLE.

See response to comment 6
### IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
<th>Response</th>
<th>Comment Status</th>
<th>Response Status</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>116</td>
<td>116.2.4</td>
<td>29</td>
<td>12</td>
<td>422</td>
<td>TR</td>
<td>A</td>
<td>&quot;all 400GBASE-R PMAs other than 400GBASE-ZR&quot; is making my point that this is not a type R PMA.</td>
<td>Add a new sentence to the first paragraph explaining what the Clause 155 PMA does - it's different (including, no loopback).</td>
<td>ACCEPT IN PRINCIPLE. See response to comment 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>116.2.4</td>
<td>29</td>
<td>12</td>
<td>200</td>
<td>E</td>
<td>A</td>
<td>P802.3cw is introducing a second PMA for 400GBASE-R. While the text &quot;all 400GBASE-R PMAs other than 400GBASE-ZR are specifed in clause 120&quot; is correct, it also implies that there are many 400GBASE-R PMAs besides the one in clause 155, which is not the case.</td>
<td>Change the first sentence to read &quot;The 200GBASE-R PMA and 400GBASE-R PMA for PHYs other than 400GBASE-ZR are specified in Clause 120.&quot;</td>
<td>ACCEPT IN PRINCIPLE. See response to comment 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>116.2.5</td>
<td>29</td>
<td>18</td>
<td>178</td>
<td>TR</td>
<td>A</td>
<td>The 400GBASE-ZR is not a member of 400GBASE-R family.</td>
<td>The changes to the base text are incorrect as 400GBASE-ZR is not a member of 400GBASE-R family.</td>
<td>ACCEPT IN PRINCIPLE. See response to comment 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>116.4</td>
<td>29</td>
<td>27</td>
<td>8</td>
<td>E</td>
<td>A</td>
<td>The 400GBASE-ZR is not a member of 400GBASE-R. It is also noted that per 1.4.215, the bit time is the reciprocal of the bit rate.</td>
<td>As noted, 400GBASE-ZR is not a member of 400GBASE-R. It is also noted that the bit time is the reciprocal of the bit rate.</td>
<td>ACCEPT.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>116.4</td>
<td>29</td>
<td>30</td>
<td>179</td>
<td>TR</td>
<td>D</td>
<td>For 400GBASE-R and 400GBASE-ZR</td>
<td>Modify beginning of notes a and b to</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. Review supporting presentation, for comment resolution group (CRG) consideration.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

---

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

4688 pause_quanta equals 2400256 bit times, not 2400000, and 6000.64 ns, not 6000. So either BT and ns column or pause_quanta column should be changed.

**Suggested Remedy**

Change maximum in BT from 2400000 to 2400256 and maximum in ns from 6000 to 6000.64.

Also change in 155.6.

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

PROPOSED ACCEPT IN PRINCIPLE.

Review supporting presentation, for comment resolution group (CRG) consideration.

---

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

Note a and b for Table 116-7 only provide respective definitions for 400GBASE-R.

**Suggested Remedy**

Modify notes to provide definitions for 400GBASE-ZR.

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

PROPOSED ACCEPT IN PRINCIPLE.

Review supporting presentation, for comment resolution group (CRG) consideration.

---

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

400GBASE-ZR has no PCS lanes -

**Suggested Remedy**

all of these notes need to remove any references to clause 156

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

PROPOSED ACCEPT IN PRINCIPLE.

Review supporting presentation, for comment resolution group (CRG) consideration.

---

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

The change indicated to be made to the NOTE in 119.2.5.7 has already been made in 802.3-2022

**Proposed Response**  **Response Status:** C

ACCEPT IN PRINCIPLE.

See response to comment 165

---

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

The strikethrough text does not appear in the published IEEE Std 802.3-2022 standard.

**Proposed Remedy**

Delete Clause 119 from the draft.

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

ACCEPT.

---

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

Upon further review it is not clear how Table 116-8 actually ties into 400GBASE-ZR:

The skew variation is tied to 400GBASE-R - 3RD column

- Unclear that there are PCS lanes in 400GBASE-ZR

- Both Fig 1164 and 116-5 are relevant to 400GBASE-ZR and these are not the same service interfaces that are defined for 400GBASE-ZR

**Suggested Remedy**

Presentation to be provided to address topic.

Proposed remedy at this time -

1. Delete Table 116-8 in P802.3cw - not relevant to 400GBASE-ZR

2. Create new skew constraint table

3. A skew points diagram for 400GBASE-ZR is needed.

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

PROPOSED ACCEPT IN PRINCIPLE.

Review supporting presentation, for comment resolution group (CRG) consideration.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Type</th>
<th>Status</th>
<th>Reason</th>
<th>Suggested Remedy</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI 120A SC 120A.6 P 103 L 8</td>
<td>E</td>
<td>A</td>
<td>Text of the editorial instruction should be bolded and italics</td>
<td>Per comment</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>CI 120A SC 120A.6 P 103 L 30</td>
<td>E</td>
<td>A</td>
<td>Missing space between &quot;400GXS&quot; and &quot;=&quot;</td>
<td>Per comment</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>CI 120A SC 120A.6 P 103 L 43</td>
<td>E</td>
<td>A</td>
<td>two 400GMII and 400GAUI-8 interfaces</td>
<td>Only one 400GAUI-8 interface</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. Review supporting presentation, for comment resolution group (CRG) consideration.</td>
</tr>
<tr>
<td>CI 155 SC 155.1.1 P 32 L 3</td>
<td>TR</td>
<td>D</td>
<td>This is a single clause that covers both the PCS and PMA sublayers. Section 155.1 includes a summary of the PCS functions (in section 155.1.3). For consistency with previous standards I think this section should also include a summary of the PMA functions.</td>
<td>Add a new sub-section after 155.1.3 and before 155.1.4, to include a summary of the PMA functions.</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. Review supporting presentation. For comment resolution group (CRG) consideration.</td>
</tr>
<tr>
<td>CI 155 SC 155.1.1 P 32 L 10</td>
<td>E</td>
<td>A</td>
<td>PHY name breaks across two rows.</td>
<td>Use non-breaking hyphen for &quot;400BASE-ZR&quot; throughout document.</td>
<td>ACCEPT.</td>
</tr>
</tbody>
</table>

**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  U/unsatisfied  Z/withdrawn  
**Sort Order:** Clause, Subclause, page, line
<table>
<thead>
<tr>
<th>Cl</th>
<th>155</th>
<th>SC 155.1.1</th>
<th>P 32</th>
<th>L 14</th>
<th># 26</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>A</td>
<td>bucket</td>
<td></td>
</tr>
<tr>
<td>Marris, Arthur</td>
<td>Cadence Design Systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment</strong></td>
<td><strong>Type</strong></td>
<td><strong>Response Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing space</td>
<td><strong>E</strong></td>
<td><strong>ACCEPT.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td>Change &quot;characters. The&quot; to &quot;characters. The&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td><strong>ACCEPT.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl</th>
<th>155</th>
<th>SC 155.1.1</th>
<th>P 32</th>
<th>L 14</th>
<th># 423</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comment Type</td>
<td>TR</td>
<td>Comment Status</td>
<td>A</td>
<td>PCS description</td>
<td></td>
</tr>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;The 64B/66B code is transcoded to 256B/257B encoding to reduce the overhead before the addition of forward error correction (FEC); that's what true 400GBASE-R does. This is different.&quot;</td>
<td><strong>TR</strong></td>
<td><strong>ACCEPT IN PRINCIPLE.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td>before clock domain translation, addition of a CRC, the addition of forward error correction (FEC) and SC-FEC, scrambling, interleaving and a second FEC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td><strong>W</strong></td>
<td><strong>ACCEPT.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replace 155.1.1 with &quot;This clause specifies the physical coding sublayer (PCS) and physical medium attachment (PMA) sublayer for the physical layer implementation known as 400GBASE-ZR. The 400GBASE-ZR PCS and 400GBASE-ZR PMA are sublayers of the 400GBASE-ZR PHY listed in Table 116–2. The term 400GBASE-ZR is used when referring to the 400GBASE-ZR PHY, which uses the PCS and PMA defined in this clause.&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl</th>
<th>155</th>
<th>SC 155.1.1</th>
<th>P 32</th>
<th>L 17</th>
<th># 169</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comment Type</td>
<td>T</td>
<td>Comment Status</td>
<td>R</td>
<td>PCS description</td>
<td></td>
</tr>
<tr>
<td>Maguire, Valerie</td>
<td>Copperopolis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The QAM naming convention in the 802.3-2022 document employs a hyphen between the number of states and QAM (e.g., 16-QAM). See 45.2.1.208.3 for an example reference.</td>
<td><strong>T</strong></td>
<td><strong>REJECT.</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td>Globally replace &quot;16QAM&quot; with &quot;16-QAM&quot; and &quot;DP-16QAM&quot; with &quot;DP-16-QAM&quot;.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td><strong>C</strong></td>
<td><strong>See reponse to comment 415</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CI</td>
<td>SC</td>
<td>Comment Type</td>
<td>Comment Status</td>
<td>Proposed Response</td>
<td></td>
</tr>
<tr>
<td>----</td>
<td>----</td>
<td>--------------</td>
<td>---------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.1.2</td>
<td>E</td>
<td>D</td>
<td>REJECT.</td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.1.3</td>
<td>ER</td>
<td>D</td>
<td>PROPOSED ACCEPT.</td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.1.3</td>
<td>E</td>
<td>A</td>
<td>ACCEPT.</td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.1.4</td>
<td>ER</td>
<td>D</td>
<td>PROPOSED ACCEPT IN PRINCIPLE</td>
<td></td>
</tr>
</tbody>
</table>

---

**Comment:** SC-FEC is used throughout the draft, but is not detailed in 1.5

**Suggested Remedy:**
- add abbreviation SD-FEC - staircase forward error correction

**Proposed Response (Z):**
- PROPOSED ACCEPT.

This comment was WITHDRAWN by the commenter.

---

**Comment:** See Figure 155-1. The bottom of the stack should include a label that is the PMD. Reference Figure 124-1 for a similar diagram.

**Suggested Remedy:**
- Add 400GBASE-ZR under the box labeled "MEDIUM". Reference Figure 124-1 for a similar diagram.

**Proposed Response (W):**
- PROPOSED ACCEPT.

---

**Comment:** Change: Transcoding from 66-bit blocks to (from) 257-bit blocks.

**Proposed Response (C):**
- ACCEPT.

---

**Comment:** This is just a question for clarification.

**Suggested Remedy:**
- Add a definition for "SC-FEC" into section 1.4 (unless it was added by a previous project).

**Proposed Response (W):**
- PROPOSED ACCEPT IN PRINCIPLE.

---

**Comment:** This section is under "overview" and is titled "Inter-sublayer interfaces". However it only mentions the inter-sublayer interfaces above and below the PCS. Shouldn't this section also cover the PMA inter-sublayer interfaces?

**Suggested Remedy:**
- Add a description of the PMA inter-sublayer interfaces to this section.

**Proposed Response (W):**
- PROPOSED ACCEPT IN PRINCIPLE.

---

**Comment:** Item e) and f) mention SC-FEC, but there is no definition of "SC-FEC" in the definitions section (1.4).

**Suggested Remedy:**
- Add a definition at 1.4:
  "SC-FEC: Forward error correction using 512 x 510 staircase codes as defined in ITU-T G.709.2 Annex A."

---

**Comment:** Item d on the list references to "ITU-T G.709 Annex D". Is this a publically available document?

**Suggested Remedy:**
- This is just a question for clarification.

**Proposed Response (Z):**
- PROPOSED ACCEPT.

This comment was WITHDRAWN by the commenter.

---

**Comment:** Item 1.4.xxx SC-FEC: Forward error correction using 512 x 510 staircase codes as defined in ITU-T G.709.2 Annex A.

**Proposed Response (W):**
- REVIEW SUPPORTING PRESENTATION. For comment resolution group (CRG) consideration.

---

**Comment:** Transcoding of 66-bit blocks to (from) 257-bit blocks.

**Proposed Response (C):**
- ACCEPT.

---

**Comment:** This is a question for clarification.

**Suggested Remedy:**
- Add a description of the PMA inter-sublayer interfaces to this section.

**Proposed Response (W):**
- PROPOSED ACCEPT IN PRINCIPLE.

---

**Comment:** This section is under "overview" and is titled "Inter-sublayer interfaces". However it only mentions the inter-sublayer interfaces above and below the PCS. Shouldn't this section also cover the PMA inter-sublayer interfaces?

**Suggested Remedy:**
- Add a description of the PMA inter-sublayer interfaces to this section.

**Proposed Response (W):**
- PROPOSED ACCEPT IN PRINCIPLE.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

<table>
<thead>
<tr>
<th>Cl.</th>
<th>SC.</th>
<th>Comment Type</th>
<th>P</th>
<th>L</th>
<th>Comment Status</th>
<th>Proposed Response</th>
<th>Response Status</th>
<th>Proposed Response</th>
<th>Response Status</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.1.4</td>
<td>E</td>
<td>33</td>
<td>52</td>
<td>D</td>
<td>When using an Extender, the PCS is connecting to the 400GMII in theory. This sentence does not express this. Optionally the upper interface may connect to a 400GMII Extender, defined in Clause 118, which then connects to the Reconciliation Sublayer.</td>
<td>Suggested Remedy</td>
<td>D</td>
<td>Review supporting presentation. For comment resolution group (CRG) consideration.</td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
<td>W</td>
</tr>
</tbody>
</table>
| 155 | 155.1.4 | E | 34 | 2 | D | The letter x should be replaced by the multiplication sign ? (twice) | Suggested Remedy | D | The "rate" of the PCS output has been defined as per-lane transfer rate in previous PCS clauses, not as the aggregate bit rate as defined here. Consistency is preferable. | PROPOSED ACCEPT IN PRINCIPLE. | W | Change: "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)" to "The 400GBASE-ZR PCS has a nominal rate per lane at the PMA service interface of 59.84375 x (28/29) Gb/s (~57.780172 Gb/s)"

---

D'Ambrosia, John
Futurewei, US Subsidiary of Huawei

Ran, Adee
Cisco

Dawe, Piers
Nvidia

---

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 U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Page 21 of 128
10/18/2022 12:41:15 PM
<table>
<thead>
<tr>
<th>Cl 155</th>
<th>SC 155.1.4.2</th>
<th>P 32</th>
<th>L 15</th>
<th># 27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morris, Arthur</td>
<td>Cadence Design Systems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td>Missing word &quot;The&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td>Accept</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl 155</th>
<th>SC 155.1.4.2</th>
<th>P 34</th>
<th>L 15</th>
<th># 380</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wienckowski, Natalie</td>
<td>General Motors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td>Change: &quot;PMA service interface&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td>Accept</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl 155</th>
<th>SC 155.1.4.2</th>
<th>P 34</th>
<th>L 15</th>
<th># 184</th>
</tr>
</thead>
<tbody>
<tr>
<td>D'Ambrosia, John</td>
<td>Futurewei, US Subsidiary of Huawei</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td>Add &quot;The&quot; at the beginning of the sentence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td>Accept</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl 155</th>
<th>SC 155.1.4.2</th>
<th>P 34</th>
<th>L 17</th>
<th># 185</th>
</tr>
</thead>
<tbody>
<tr>
<td>D'Ambrosia, John</td>
<td>Futurewei, US Subsidiary of Huawei</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>ER</td>
<td>Comment Status</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td>The inclusion of the word FEC in this sentence implies that the only encoding is FEC - The PMA Service Interface supports the exchange of FEC encoded data between the PCS and PMA sublayer. There is also the 64B/66B encoding.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td>Accept</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl 155</th>
<th>SC 155.1.4.2</th>
<th>P 34</th>
<th>L 17</th>
<th># 381</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wienckowski, Natalie</td>
<td>General Motors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td>Change: between the PCS and PMA sublayer. To: between the PCS and PMA sublayers.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td>Accept</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl 155</th>
<th>SC 155.1.4.2</th>
<th>P 34</th>
<th>L 17</th>
<th># 187</th>
</tr>
</thead>
<tbody>
<tr>
<td>D'Ambrosia, John</td>
<td>Futurewei, US Subsidiary of Huawei</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>TR</td>
<td>Comment Status</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td>Stated sentence - The PMA service interface is defined in 155.3 The link for 155.3 does not go to a PMA service interface sub clause.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td>Accept</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Update cross reference as required with editorial license

**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  U/unsatisfied  Z/withdrawn

**SORT ORDER:** Clause, Subclause, page, line

---

IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.1.5</td>
<td>35</td>
<td>1</td>
<td>427</td>
</tr>
</tbody>
</table>

**Comment Type:** TR  
**Comment Status:** D  
**PCS description:**  
This PCS is too complicated for just a "directive" specification. We need examples.  

**Suggested Remedy:**  
Create examples of e.g. FEC and other blocks before and after coding. Smallish ones can go in the document, all can be uploaded to the directory that IEEE provides for these things. They might need to cover some of the PMA.

**Proposed Response:**  
PROPOSED REJECT.  
The suggested remedy does not propose specific changes to the draft.

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.1.5</td>
<td>35</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

**Comment Type:** E  
**Comment Status:** A  
"400GBASE-Z" should be "400GBASE-ZR".  

**Suggested Remedy:**  
Change "400GBASE-Z" to "400GBASE-ZR".

**Response:**  
ACCEPT IN PRINCIPLE.  
See response to 170

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.1.5</td>
<td>35</td>
<td>25</td>
<td>428</td>
</tr>
</tbody>
</table>

**Comment Type:** E  
**Comment Status:** D  
"SC-FEC adapt & encoding", "SC-FEC decoding & adapt" - it would help to know that there is interleaving here as well as below.

**Suggested Remedy:**  
"SC-FEC adapt, encoding and interleaving", "SC-FEC de-interleaving, decoding & adapt"?

**Proposed Response:**  
PROPOSED ACCEPT IN PRINCIPLE.  
Change text in transmit direction from:  
"SC-FEC adapt & encoding" to  
"SC-FEC adapt, encoding & interleaving"  
Change text in receive direction from:  
"SC-FEC decoding & adapt" to  
"SC-FEC de-interleaving, decoding & adapt"

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.1.5</td>
<td>35</td>
<td>13</td>
<td>130</td>
</tr>
</tbody>
</table>

**Comment Type:** TR  
**Comment Status:** D  
**Block diagrams**  
Figure 155-2 is only a functional block diagram of the PCS. However section 155.1 is an overview for both the PCS and PMA sub-layers, so I think the functional block diagram should include both layers.

**Suggested Remedy:**  
Either update Figure 155-2 to include the PMA functions, or add a separate functional block diagram of the 400BASE-ZR PMA.

**Proposed Response:**  
PROPOSED ACCEPT IN PRINCIPLE.  
Review supporting presentation. For comment resolution group (CRG) consideration.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 155 SC 155.1.5 P 35 L 43 # 429
Dawe, Piers Nvidia
Comment Type E Comment Status D rewrite bucket
"PMA:IS_UNITDATA_m-1.indication": the "m" in one direction only is not usual (so it looks like a leftover from Clause 119 where two widths are possible, but for a known and different reason), and not explained until much later in the document
SuggestedRemedy
Add an informative NOTE saying why it's m-1 not 7, and referring to the appropriate subclause.
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Add a note to Figure 155-2:
"The PMA service interface in the receive direction has a variable width of "m" where m > 8, and is implementation dependent. This is because the Hamming decoder is a soft-decision decoder and needs higher precision than the 8 bits in the transmit direction. See 155.3.3.8."

Cl 155 SC 155.1.5 P 55 L 3 # 338
Zimmerman, George CME Consulting/APL Group, Cisco, CommScope, Ma
Comment Type E Comment Status A
The sentence says 400GBASE-Z PCS sublayer, but the figure is labeled and used as the 400GBASE-ZR PCS sublayer (also the "R" generally is used to refer to the BASE-R encoding used here.)
SuggestedRemedy
change 155.1.5, page 34 line 3, to "400GBASE-ZR PCS sublayer" to agree with the figure
Response Response Status C
ACCEPT IN PRINCIPLE.
See response to 170

Cl 155 SC 155.2.1 P 36 L 6 # 43
Ran, Adee Cisco
Comment Type E Comment Status D
The sentence "The PCS can operate in normal mode or in test-pattern mode" is out of place in the first paragraph. These modes are only discussed in the third paragraph.
SuggestedRemedy
Move the last sentence of the first paragraph to a separate paragraph before the current third paragraph.
Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 155 SC 155.2.1 P 36 L 7 # 44
Ran, Adee Cisco
Comment Type E Comment Status D
Line 5 says "PCS Transmit and PCS Receive processes", but then in lines 7, 17, and 27 it is "transmit channel", and line 35 "receive channel". "channel" is an overloaded term, it is not defined in this clause and its other meanings are quite different.
SuggestedRemedy
Change "transmit channel" to "Transmit process", 3 times. Change "receive channel" to "Receive function".
Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 155 SC 155.2.1 P 36 L 12 # 188
D'Ambrosia, John Futurewei, US Subsidiary of Huawei
Comment Type ER Comment Status D
The following is stated -
When communicating with the PMA in the transmit direction, the 400GBASE-ZR PCS provides eight digital lanes, which the PMA encodes into two streams of 16QAM symbols.
What are eight digital lanes? Isn't this just the PMA Service Interface
SuggestedRemedy
Reword
Transmit data-units are sent to the PMA service interfacee via the PMA:IS_UNITDATA_i.request primitive. The PMA then encodes the data into two streams of 16QAM symbols.
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Review supporting presentation. For comment resolution group (CRG) consideration.

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 U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line
There is inconsistency wording between Figure 155-2 (which shows m lanes in the receive direction between the PMA and PCS), the text in 155.2.1 (which indicates two streams of m-bit symbols), and text in 155.2.5.1 and in 155.3.2 (both of which reference DP-16QAM symbols digitized to m-bit resolution).

**SuggestedRemedy**

Change:

- "When communicating with the PMA in the receive direction, the 400GBASE-ZR PCS receives two streams of digitally encoded m-bit 16QAM symbols." to
- "When communicating with the PMA in the receive direction, the 400GBASE-ZR PCS receives digitally encoded m-bit DP-16QAM symbols."

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

Review supporting presentation. For comment resolution group (CRG) consideration.

---

"receives two streams of digitally encoded m-bit 16QAM symbols" we need an explanation of why "m-bit".

**SuggestedRemedy**

Add sentence explaining that m is an implementation choice, for SD-FEC.

**Proposed Response**

PROPOSED REJECT.

The proposed response to comment 429 adds a note to Figure 155-2 explaining why the PMA service interface is m lanes wide in the receive direction, and pointing to 155.3.3.8. It seems unnecessary to add an explanatory sentence everywhere that m-bits is used in the document.

**SuggestedRemedy**

In this paragraph and any other occurrences, references to the frequency or frequency offset of "blocks" should be changed to "block stream."

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

Change:

- "The transcoded blocks are then mapped into a 400GBASE-ZR frame using GMP, with the +/-100ppm 257-bit blocks being mapped into a +/-20ppm timing domain."
- "The transcoded blocks have a frequency tolerance of +/- 100 ppm and are mapped into a 400GBASE-ZR frame with a frequency tolerance of +/- 20 ppm, using GMP."

---

"missing space between "20" and the unit "ppm"."

**SuggestedRemedy**

Insert a space.

**Response**

ACCEPT.
### IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

<table>
<thead>
<tr>
<th>CI</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.2.1</td>
<td>36</td>
<td>21</td>
<td>432</td>
<td>E</td>
<td></td>
<td>Markers</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>190</td>
<td>155.2.1</td>
<td>36</td>
<td>22</td>
<td>190</td>
<td>TR</td>
<td></td>
<td></td>
<td>PROPOSED ACCEPT IN PRINCIPLE. See the response to comment 20.</td>
</tr>
<tr>
<td>20</td>
<td>155.2.1</td>
<td>36</td>
<td>22</td>
<td>20</td>
<td>TR</td>
<td></td>
<td></td>
<td>PROPOSED ACCEPT IN PRINCIPLE. See the response to comment 20.</td>
</tr>
</tbody>
</table>

**Comment: The use of inner and outer FEC codes seems to be backwards when compared to industry standards. Two industry books on FEC are: Error control coding (Shu Lin/Daniel Costello) and Error Control Coding (Peter Sweeney), both refer to the first code in a concatenation as the outer, and the 2nd code in a concatenation as the inner. This makes sense when you look at a diagram of the FEC codes, though it does not make sense when looking at the location of the codes in the concatenation.**

**Suggested Remedy:** Reverse the usage to: "an outer SC-FEC code" and "an inner Hamming code SD-FEC."**

**Proposed Response:** PROPOSED ACCEPT IN PRINCIPLE. Change: 
"...consisting of an inner SC-FEC code and an outer Hamming code SD-FEC." to 
"...consisting of an outer SC-FEC code and an inner Hamming code SD-FEC."
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Line</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
<th>Proposed Response</th>
<th>Response Status</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.2.1</td>
<td>36</td>
<td>25</td>
<td># 131</td>
<td>ER</td>
<td>D</td>
<td>&quot;Transmit data-units are sent to the service interface via the PMA:IS_UNITDATA_i.request primitive.&quot; I presume when we say &quot;service interface here&quot; we are referring to the PMA service interface and not the PCS service interface?</td>
<td>Change From: &quot;Transmit data-units are sent to the service interface via the PMA:IS_UNITDATA_i.request primitive.&quot; To: &quot;Transmit data-units are sent to the PMA service interface via the PMA:IS_UNITDATA_i.request primitive.&quot;</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. Review supporting presentation. For comment resolution group (CRG) consideration.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.2.1</td>
<td>36</td>
<td>29</td>
<td># 46</td>
<td>T</td>
<td>D</td>
<td>The scrambled idle pattern defined in 119.2.4.9 cannot be used here as is, because the PCS processes are different.</td>
<td>Add a new subclause based on 119.2.4.9 but specific to this clause, and refer to it instead.</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. A contribution with the proposed test pattern is needed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.2.1</td>
<td>36</td>
<td>32</td>
<td># 436</td>
<td>E</td>
<td>D</td>
<td>PCS Synchronization process</td>
<td>PCS Receive process or PCS receive process</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. Change: &quot;...decodes a stream of 128-symbol codewords.&quot; to &quot;...decodes a stream of 128-bit codewords.&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.2.1</td>
<td>36</td>
<td>35</td>
<td># 28</td>
<td>T</td>
<td>D</td>
<td>PCS Receive process</td>
<td>PCS Receive function or PCS receive process</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. Change &quot;Receive process&quot; to &quot;receive process&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 155 SC 155.2.1 P 36 L 38 # 47

Ran, Adee  Cisco

Comment Type E  Comment Status A

SC-FEC blocks of 510 ? 512
I assume is it the number of bits (otherwise, what is it?)

SuggestedRemedy
Add "bits" after "510 ? 512".

Response Response Status C

ACCEPT.

Cl 155 SC 155.2.1 P 36 L 38 # 439

Dawe, Piers  Nvidia

Comment Type E  Comment Status D

SC-FEC blocks

SuggestedRemedy
SC-FEC codewords (as on line 39)

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 155 SC 155.2.1 P 36 L 38 # 438

Dawe, Piers  Nvidia

Comment Type T  Comment Status D

SC-FEC blocks of 510 x 512

SuggestedRemedy
whats? bits? bytes?

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change: "...blocks of 510 ? 512 are."
to "...blocks of 510 ? 512 bits are."

Cl 155 SC 155.2.1 P 36 L 40 # 224

Law, David  Hewlett Packard Enterprise

Comment Type E  Comment Status D

The terms 'overhead fields' (page 36, line 40) and 'OH fields' (page 38, line 46), 'OH bytes' (page 38, line 2) then 'OH blocks' on the next line, and 'GMP overhead' (page 38, line 12), seem to be used interchangeable.

SuggestedRemedy
Please use a consistent term, 'overhead field' seems to be the most common.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

At item 3 of the list in 155.2.4.3, change: "carry OH bytes" to "carries the overhead field"

At the last sentence of the 3rd paragraph of 155.2.4.3, change:
"details of the encoding of the GMP overhead"
to
"details of the encoding of the GMP justification control bytes that are carried in the 400GBASE-ZR frame’s overhead field"

At 155.2.4.4, change:
"The AM, pad and OH fields are"
to
"The AM, pad and overhead fields are"

Cl 155 SC 155.2.1 P 36 L 41 # 29

Marris, Arthur  Cadence Design Systems

Comment Type T  Comment Status D

Is "frame" the correct word to use here?

SuggestedRemedy
Consider changing "each 400GBASE-ZR frame" to "each 400GBASE-ZR PCS lane" or define what "frame" means in this context. Perhaps add a link to Figure 155-3.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change:
"The PCS then removes the alignment markers and overhead fields from each 400GBASE-ZR frame and passes the data to the GMP de-mapper."
to
"The PCS then removes the alignment marker, pad and overhead fields from the received data and passes the remaining payload bits, shown in Figure 155-3, to the GMP de-mapper."
### Comment from Ran, Adee, Cisco

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

"257B blocks" is inconsistent with "257-bit blocks" used earlier. "B" is not used to denote bits elsewhere (except as abbreviations in coding scheme names).

**Suggested Remedy:**
Change "257B" to "257-bit" across the draft except where it is part of "256B/257B".

Similarly, change "66b" to "66-bit" in 155.2.2, "120b" to "120-bit" in 155.2.4.3, and similar instances as necessary.

**Proposed Response:** PROPOSED ACCEPT.

### Comment from PCS description

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

It is not clear to me from reading the descriptions as to how the 400GBASE-ZR base frame (Figure 155-3), 400GBASE-ZR OH frame (Figure 155-4) and the SC-FEC frame (Figure 155-5) are related and aligned?

**Suggested Remedy:**
Add a description or diagram to indicate how the various frame structures described in the comment are related and aligned (if indeed they are aligned).

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

A contribution with the suggested diagram and description is needed.
Cl 155  SC 155.2.4.3  P 37  L 29  # 226
Law, David  Hewlett Packard Enterprise

Comment Type  TR  Comment Status  D
GMP mapper

Subclause 155.2.4.3 'GMP mapper' says that 'The GMP mapper inserts the serialized stream of 257B blocks into the payload area of a 400GBASE-ZR frame.' and that '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 seems to imply that the stream of 257B blocks is inserted into one 400GBASE-ZR frame at a time.

Subclause 155.2.4.3 however then says that 'The Payload area of a four-frame multi-frame is divided into 10 220 GMP words ... encoded stream produced according to 155.2.4.2) ...'. This seems to imply that the 257B blocks are inserted into four 400GBASE-ZR frames, that form a single multi-frame, at a time.

Subclause '155.2.4.6 CRC32 and multi-block alignment signal (MBAS) insertion' then says 'The stream of 400GBASE-ZR frames, illustrated in Figure 155-3, provide the input ...' seems to imply 400GBASE-ZR frames are formed one at a time, and does not reference multi-frames.

Suggested Remedy
Clarify the definition of a multi-frame, potentially through a figure, how 257B blocks are mapped to it, and how it is mapped to the SC-FEC message.

Proposed Response  Response Status  W
PROPOSED ACCEPT IN PRINCIPLE.
A contribution with proposed figure is needed.

257-bit blocks from the transcoder are grouped into 4x257=1028-bit GMP words. Because of the rate difference, between 10,214 and 10,218 plus between 6 and 2 stuffing words, for a total of 10,220 words are mapped into four 400GBASE-ZR frames along with the AM, pad and OH fields.

Cl 155  SC 155.2.4.3  P 37  L 30  # 40
Ran, Adee  Cisco

Comment Type  E  Comment Status  D

This frame is a structure that contains 5140 bits of overhead followed by 10 220 257-bit blocks of payload. This frame is illustrated in Figure 155-3, with transmission order from top row to bottom row and from left to right within each row).

Proposed Response  Response Status  W
PROPOSED ACCEPT.

Cl 155  SC 155.2.4.3  P 37  L 31  # 592
Slavick, Jeff  Broadcom

Comment Type  TR  Comment Status  D

257b blocks

We traditionally refer to the 257b blocks as 257-bit blocks not 257B blocks (which could be inferred as 257 Byte)

Suggested Remedy
Change the seven instances of 257B block to 257-bit block

Proposed Response  Response Status  W
PROPOSED ACCEPT.

Cl 155  SC 155.2.4.3  P 37  L 44  # 441
Dawe, Piers  Nvidia

Comment Type  E  Comment Status  A

"Base Frame": undefined term not used elsewhere, rogue capitals

Suggested Remedy
Change to "frame"

Response  Response Status  C
ACCEPT.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

**Comment:**

400 Gb/s over DWDM systems

**Comment Type:**

E - technical requirement

**Comment Status:**

A - accepted

**Suggested Remedy:**

16 x 120b markers

120-bit

**Response:**

ACCEPT.

---

**Comment:**

The description of the 20-bit pad says it is inserted after the OH blocks, but the OH is a 1280 bit field (which is later described as four chunks of 320 bits that are interleaved).

Since much of the text talks about 66b blocks or 257 blocks, it is probably better to refer to the OH bits rather than blocks.

**Suggested Remedy:**

Change "A 20 bit pad of all zeros is added after the OH blocks" to "A 20 bit pad of all zeros is added after the 1280 OH bits."

**Proposed Response:**

PROPOSED ACCEPT.

---

**Comment:**

"column" has not been mentioned in preceding text. I assume a column is a bit, so there's no no need to use another term (and possibly create confusion, since in the related Clause 155 the columns denote octets).

The payload area ends simply at the end of the frame, so rows are not necessary either.

**Suggested Remedy:**

Change the quoted text to "from bit 5141 to the end of the frame, using GMP" across this description.

**Proposed Response:**

PROPOSED ACCEPT.

---

**Comment:**

Subclause 155.2.4.3 says 'The 400GBASE-ZR PCS payload is mapped …' however this is the only use of the term '400GBASE-ZR PCS payload' in the draft.

**Suggested Remedy:**

Suggest that the text 'The 400GBASE-ZR PCS payload is mapped …' is changed to read 'The 400GBASE-ZR PCS payload of the serialized stream of 257B blocks is mapped …'.

**Proposed Response:**

PROPOSED ACCEPT.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Slavick, Jeff  
Broadcom  
Comment Type TR  
Comment Status D  
row and column numbering  
in item 5 it refers to the PCS payload beginning at column 5141 which would be true for a  
indexing that begins at 1, but Table 155-1 appears to use column indexing that begins with 0  

SuggestedRemedy  
Change "column 5141 or row 0 and ending at column 10 280 of row 255" to "column 5140  
of row 0 and ending at column 10 279 of row 255".  

Proposed Response  
Response Status W  
PROPOSED ACCEPT.  

Law, David  
Hewlett Packard Enterprise  
Comment Type E  
Comment Status D  
The antepenultimate paragraph of subclause 155.2.4.3 'GMP mapper' seems to be an  
introduction to the GMP and would be better placed as the first paragraph.  

SuggestedRemedy  
Suggest that the antepenultimate paragraph of subclause 155.2.4.3 'GMP mapper' should  
be moved to be the first paragraph of subclause 155.2.4.3.  

Proposed Response  
Response Status W  
PROPOSED ACCEPT.  

Slavick, Jeff  
Broadcom  
Comment Type TR  
Comment Status D  
rewrite bucket  
I could not find a Clause 9.4.3.2 in ITU-T G.709 but I did find a 19.4.3.2 that talks about  
GMP  

SuggestedRemedy  
Change 9.4.3.2 to 19.4.3.2  

Proposed Response  
Response Status W  
PROPOSED ACCEPT IN PRINCIPLE.  
See response to comment 205  

Huber, Thomas  
Nokia  
Comment Type TR  
Comment Status D  
rewrite bucket  
Clause 9.4.3.2 of ITU-T G.709 does not discuss GMP. Since the GMP OH being used  
aligns with 400ZR, maybe it is better to point to 155.2.4.5.3 (which then points to the OIF  
400ZR IA). ITU-T G.709 and G.709.x don't specifically discuss the GMP encoding that is  
used in 400ZR and 400GBASE-ZR  

SuggestedRemedy  
Change  
The principles of the GMP mapper are described in ITU-T G.709 (06/2020) Annex D, with  
details of the encoding of the GMP overhead in ITU-T G.709 Clause 9.4.3.2.  
to:  
The principles of the GMP mapper are described in ITU-T G.709 (06/2020) Annex D.  
Details of the overhead encoding for 400GBASE-ZR are in 155.2.4.5.3.  

Proposed Response  
Response Status W  
PROPOSED ACCEPT.  

Dawe, Piers  
Nvidia  
Comment Type E  
Comment Status D  
ITU-T G.709 Clause 9.4.3.2  

SuggestedRemedy  
ITU-T G.709 Clause 19.4.3.2 ?  

Proposed Response  
Response Status W  
PROPOSED ACCEPT IN PRINCIPLE.  
See response to comment 205
Subclause 155.2.4.3 'GMP mapper' says 'The principles of the GMP mapper ... with details of the encoding of the GMP overhead in ITU-T G.709 Clause 9.4.3.2.' On review of ITU-T G.709/Y.1331 (06/2020) <https://www.itu.int/rec/recommendation.asp?lang=en&parent=T-REC-G.709-202006-I>, there doesn't seem to be a subclause 9.4.3.2. Perhaps the reference should have been to subclause 19.4.3.2 'Generic mapping procedure (GMP)' in ITU-T G.709, although that only seems to address the justification overhead bytes.

Suggested Remedy
Correct the reference to the GMP overhead in ITU-T G.709.

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.

See response to comment 205

Payload should not be capitalized.

Suggested Remedy
Change: The Payload area
To: The payload area

Accept.

As a first time reader of this section, the term "stuff" and its use in this sub-clause is difficult to follow. It took me a while to understand what "stuff" was. In this case, I interpret "stuff" to mean non-data blocks or stuffing blocks. The last two paragraphs of the sub-clause could use wording improvements to make it clearer to the reader.

Suggested Remedy
In the second to last paragraph, change:
"Each 1028-bit GMP word is either filled with data (the logically serialized 257B encoded stream produced according to 155.2.4.2) or stuff, which is transmitted as zero and ignored on receipt." to
"Each 1028-bit GMP word is either filled with data bits (the logically serialized 257B encoded stream produced accounting to 155.2.4.2) or stuffing blocks, which is transmitted as zero and ignored on receipt."

In the last paragraph, change:
"While the GMP mechanism is generic, the particular clock rates and tolerances for this application result in only five cases, allowing the positions of data blocks and stuffing blocks to be pre-computed." to
"While the GMP mechanism is generic, the particular clock rates and tolerances for this application result in only five cases, allowing the positions of data blocks and stuffing blocks to be pre-computed."

Update title of Table 155-1 to:
"GMP stuffing block locations in 400GBASE-ZR frame"

In Table 155-1, change column header from:
"GMP word numbers of stuff locations" to
"GMP word numbers of stuffing block locations"

In Table 155-1, change column header from:
"(row, column) of stuff location starting bits" to
"(row, column) of stuffing block starting location"

Proposed Response
PROPOSED ACCEPT.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Dawe, Piers Nvidia

Comment Type T  Comment Status D  rewrite bucket

155.2.4.1 says "The rate matching described in 119.2.4.1 is not required", so the 257B encoded data can have a rate of 401.5625 Gb/s +/- 100 ppm, not 401.542892 Gb/s +/- 100 ppm

Suggested Remedy
Change 401.5625 to 401.542892 mention both

Proposed Response  Response Status W

PROPOSED REJECT.

The suggested remedy is not clear.

The rate of 401.542892 is before insertion of the alignment marker block. Referring to Figure 119-8, the rate before AM insertion is: (163,832 / 163,840) x 401.5625 = 401.542892

Dawe, Piers Nvidia

Comment Type T  Comment Status D  GMP mapper

The clock rate of the 400GBASE-ZR frame (GMP clock domain) is not given, although 155.1.4 gives the PMA service interface rate

Suggested Remedy
Define the GMP rate in the PCS section

Proposed Response  Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

The GMP rate is a multiple of the line rate of 59.84375 GBd from Table 156-6. The presentation of the GMP rate requires a table showing the rate expansion between the GMP clock and the line clock.

Dawe, Piers Nvidia

Comment Type E  Comment Status D

~10 214.684 -eh?

Suggested Remedy
Wow, this is hard to read! Spaces inside indivisible things such as numbers or variable names are bad!

Proposed Response  Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change "between ~10 214.684 and ~10 217.136" to "between 10 214 and 10 218".

Ran, Adee Cisco

Comment Type E  Comment Status D

The space as thousands separator in numbers with fractional digits is unusual and confusing.Alsol the tilde prefix with numbers with three fractional digits seems unnecessary, especially since these numbers are then bounded by integer values.

Suggested Remedy
Change "between ~10 214.684 and ~10 217.136" to "between 10 214 and 10 218".

Proposed Response  Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change "between ~10 214.684 and ~10 217.136" to "between 10 214 and 10 218"
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 155 SC 155.2.4.3 P 38 L 30 # 53
Ran, Adee Cisco
Comment Type E Comment Status D
The "(row, column)" column seems redundant with the GMP word numbers. Also, "rows" is only used for illustration and "column" is not defined.
SuggestedRemedy
Consider deleting the third column. Otherwise, change "column" to "bit #".
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Delete the 3rd column from Table 155-1.

Cl 155 SC 155.2.4.3 P 38 L 30 # 52
Ran, Adee Cisco
Comment Type T Comment Status D
GMP mapper
It seems that the GMP word numbers start from 1 while the bits and rows start from 0. If the starting index is inconsistent, it should at least be explicit.
SuggestedRemedy
Add "(starting from 1)" after "GMP word numbers".
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Change the heading of the 2nd column of Table 155-1 from "GMP word numbers of stuff locations" to "GMP word numbers (starting from 1) of stuffing block locations"

See the response to comment 150.

Cl 155 SC 155.2.4.3 P 38 L 42 # 447
Dawe, Piers Nvidia
Comment Type E Comment Status A
Blank line
SuggestedRemedy
Remove
Response Response Status C
ACCEPT.

Cl 155 SC 155.2.4.3 P 39 L 6 # 54
Ran, Adee Cisco
Comment Type E Comment Status A
"10 970 bit row aligned" - the number is part of a compound noun so a hyphen should be used. The separator is not helpful in this case.
SuggestedRemedy
Change to "10970-bit row aligned".
Response Response Status C
ACCEPT.

Cl 155 SC 155.2.4.3 P 39 L 7 # 55
Ran, Adee Cisco
Comment Type E Comment Status A
"The AM field, containing am_mapped<1919:0> is transmitted LSB first, i.e. am_mapped<0> first, and am_mapped<1919> last"
This phrasing is awkward (am_mapped has already been defined in the first paragraph) and redundant.
SuggestedRemedy
Change to "The transmission order of am_mapped is from am_mapped<0> to am_mapped<1919>".
Response Response Status C
ACCEPT.

Cl 155 SC 155.2.4.4 P 38 L 46 # 206
Huber, Thomas Nokia
Comment Type T Comment Status D
PCS description
This text could be clarified. GMP is converting from the clock domain of the payload (stream of 257b blocks) to the clock domain of the 400GBASE-ZR frame. Presumably the payload blocks are already aligned to the payload clock.
SuggestedRemedy
Rewrite as follows: The AM, pad, and OH fields are populated after the GMP mapping process has rate-matched the 257B block stream to the payload area of the 400GBASE-ZR frame.
Proposed Response Response Status W
PROPOSED ACCEPT.
Slavick, Jeff  
Broadcom

**Comment Type** E  **Comment Status** D  
The name of the section include 400GBASE-ZR, why?  
Cl119 uses "for 200GBASE-R" and "for 400GBASE-R" since it has two different methods done for the different rates.  
But this is only 1 rate clause and Clause 91 and 135 don't attach the rate to it's section heading

**Suggested Remedy**  
Remove "400GBASE-ZR" from the section title of 155.2.4.4.1 and 155.2.4.4.2

**Proposed Response**  **Response Status** W
PROPOSED ACCEPT IN PRINCIPLE.
Review supporting presentation.  
For comment resolution group (CRG) consideration.

---

Ran, Adee  
Cisco

**Comment Type** E  **Comment Status** D
"The 400GBASE-ZR overhead is a 40-byte frame structure that uses a four-frame multi-frame, as shown in Figure 155-4."

There are 3 occurrences of "frame" in this sentence, it's unclear what they mean (especially with "400GBASE-ZR frame" also being defined; "frame" is an overly overloaded term).

Also, "byte" is not strictly defined in 802.3 and we typically use the more specific "octet" instead.

**Suggested Remedy**
Change to "The 400GBASE-ZR overhead is a 1280-bit structure that is divided into four 320-bit structures, as shown in Figure 155-4."

**Proposed Response**  **Response Status** W
PROPOSED ACCEPT IN PRINCIPLE.
In 155.2.4.5.1, change "a 256-frame multi-frame sequence" to "a 256-frame sequence."

In 155.2.4.5.3 change "four-frame multi-frame" to "OH."

Change elsewhere as appropriate.
Implement with editorial license.

---

D'Ambrosia, John  
Futurewei, US Subsidiary of Huawei

**Comment Type** E  **Comment Status** D
MFAS is not listed in abbreviations

**Suggested Remedy**
Add to 1.5

**Proposed Response**  **Response Status** W
PROPOSED ACCEPT.
I assume the MFAS is an 8-bit counter, but figure 155-4 shows only 2 bits. This can confuse readers.

**Suggested Remedy**

Change "It is a wrapping counter that is incremented each frame" to "It is an auto-wrapping 8-bit counter that is incremented on each 40-octet frame within the OH block".

**Proposed Response**

PROPOSED REJECT. This needs more work to explain correctly.

The first 40 octets (320 bits) of Figure 155-4 are inserted into the OH field of a first 400GBASE-ZR frame. The second 40 octets are inserted into the next 400GBASE-ZR frame, and so on.

The suggested remedy sounds as though the four rows are going into the same OH field of a single 400GBASE-ZR frame.

---

ITU-T G.709.1 seems to be a normative reference. It does not appear in the list in 1.3 (the ones that appear are G.709 and G.709.2; these are separate documents).

**Suggested Remedy**

Add a reference in 1.3.

**Proposed Response**

ACCEPT.

The first 40 octets (320 bits) of Figure 155-4 are inserted into the OH field of a first 400GBASE-ZR frame. The second 40 octets are inserted into the next 400GBASE-ZR frame, and so on.

The suggested remedy sounds as though the four rows are going into the same OH field of a single 400GBASE-ZR frame.

---

ITU-T Recommendation G.709.1 - Flexible OTN short-reach interfaces
Comment Type: T  Comment Status: D  Link status monitoring

Subclause 155.2.4.5.2 says 'The RPF bit indicates signal fail status was detected by the remote 400GBASE-ZR receive function ...' which seems to imply that the RPF bit is mapped from the SIGNAL_OK parameter of the PMA:IS_SIGNAL.indication primitive.

Suggested Remedy
If the RPF bit is mapped from the PMA:IS_SIGNAL.indication primitive, replace the second sentence of the second paragraph of subclause 155.2.4.5.2 with 'The bit is set based on the most recently received SIGNAL_OK parameter of the PMA:IS_SIGNAL.indication primitive. It is "0" if the value was OK and "1" if the value was FAIL.'

If the RPF bit is not mapped from the PMA:IS_SIGNAL.indication primitive, please define where it is mapped from, or the conditions for when it is set and cleared.

Proposed Response  Response Status: W
PROPOSED ACCEPT IN PRINCIPLE.

Add a sentence after the 1st sentence, 2nd paragraph of 155.2.4.5.2:
"The bit is set based on the most recently received SIGNAL_OK parameter of the PMA:IS_SIGNAL.indication primitive. It is "0" if the value was OK and "1" if the value was FAIL."

Comment Type: TR  Comment Status: D  Link status monitoring

"signal fail status was detected by the remote 400GBASE-ZR receive function in the upstream direction". But see 1.4.586 upstream: In an access network, transmission away from the subscriber end of the link. Applicable to networks where there is a clear indication in each deployment as to which end of a link is closer to a subscriber. A status is generated, maybe based on detecting something.

Suggested Remedy
Something like:
The RPF bit is used by a 400GBASE-ZR PHY to indicate to its link partner the signal fail status at its receive function

Proposed Response  Response Status: W
PROPOSED ACCEPT IN PRINCIPLE.
Change:
"The RPF bit indicates signal fail status was detected by the remote 400GBASE-ZR receive function in the upstream direction..." to:
"The RPF bit is used by a 400GBASE-ZR PHY to indicate to its link partner the signal fail status at its receive function..."

Comment Type: E  Comment Status: D  Link status monitoring

Isn't "... 400GBASE-ZR receive function in the upstream direction ..." duplicative as the 'upstream direction' is the receive path. And since there is only one 400GBASE-ZR receive function, it doesn't need to be qualified by 'in the upstream direction'.

Suggested Remedy
Suggest that "... 400GBASE-ZR receive function in the upstream direction and ...' should read '... 400GBASE-ZR receive function and ...".

Proposed Response  Response Status: W
PROPOSED ACCEPT IN PRINCIPLE.
See response to comment 449.

This bit appears to be carried over from OIF 400ZR, which referenced it from FlexO (G.709.1). The task force can decide if it's needed for Ethernet and if not, we can make it a reserved bit.
**IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments**

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Page</th>
<th>Line</th>
<th>#</th>
<th>Type</th>
<th>Status</th>
<th>Comment</th>
<th>Response Status</th>
<th>Proposed Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.2.4.5.2</td>
<td>39</td>
<td>50</td>
<td></td>
<td>232</td>
<td></td>
<td>T</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Law, David</td>
<td>Hewlett Packard Enterprise</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td><strong>Link status monitoring</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subclause 155.2.4.5.2 'Link status monitoring and signaling' says 'RPF is set to &quot;1&quot; to indicate a remote 400GBASE-ZR PHY defect indication' however there appears to be no definition of a 400GBASE-ZR PHY defect in the draft.</td>
<td>Please provide a definition of the conditions considered a 400GBASE-ZR PHY defect.</td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
<td>See response to comment 230.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cl</td>
<td>155</td>
<td>155.2.4.5.2</td>
<td>39</td>
<td>51</td>
<td>389</td>
<td></td>
<td>TR</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slavick, Jeff</td>
<td>Broadcom</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td><strong>RPF field location</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per Figure 155-4 the RPF field is in bit location 0 of the Status Octect. But the Text states it's bit location 1.</td>
<td>Change &quot;in bit 1&quot; to &quot;the first bit&quot;</td>
<td>PROPOSED ACCEPT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cl</td>
<td>155</td>
<td>155.2.4.5.2</td>
<td>40</td>
<td>1</td>
<td>50</td>
<td></td>
<td>E</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ran, Adee</td>
<td>Cisco</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td><strong>What do &quot;downstream&quot;, &quot;host interface signal&quot; and &quot;MDI&quot; signal mean?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perhaps &quot;downstream&quot; should be &quot;link partner&quot;? For signals, are there any signals received by the 400GAUI C2M (which is optional) and the MDI?</td>
<td>Please rephrase to clarify.</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. Review supporting presentation. For comment resolution group (CRG) consideration.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cl</td>
<td>155</td>
<td>155.2.4.5.2</td>
<td>40</td>
<td>9</td>
<td>60</td>
<td></td>
<td>E</td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CI</td>
<td>SC</td>
<td>Comment Type</td>
<td>Comment Status</td>
<td>SuggestedRemedy</td>
<td>Proposed Response</td>
<td>Comment</td>
<td>SuggestedRemedy</td>
<td>Proposed Response</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-----</td>
<td>--------------</td>
<td>----------------</td>
<td>-----------------</td>
<td>-------------------</td>
<td>---------</td>
<td>-----------------</td>
<td>-------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.2.4.5.2</td>
<td>T</td>
<td>D</td>
<td>&quot;the received status byte in the receive direction&quot;: eh?</td>
<td></td>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td>Change &quot;then the value of LD in transmitted STAT&lt;6&gt; is set to the value of LD in the received STAT&lt;6&gt;&quot;?</td>
<td>PROPOSED ACCEPT.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.2.4.5.3</td>
<td>T</td>
<td>D</td>
<td>References to OIF-400ZR-01.0, March 10, 2020, subclause 8.9. Note that this document is subject to active maintenance</td>
<td></td>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td>If feasible, write the specification here. If not, check that the reference is complete, correct and detailed enough, add a normative reference. Refer to a later OIF-400ZR if appropriate.</td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.2.4.5.3</td>
<td>ER</td>
<td>A</td>
<td>Everywhere else uses the word four not the number</td>
<td></td>
<td>Slavick, Jeff</td>
<td>Broadcom</td>
<td>Change &quot;4-frame multi-frame&quot; to &quot;four-frame multi-frame&quot;</td>
<td>ACCEPT.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.2.4.5.3</td>
<td>E</td>
<td>D</td>
<td>It seems worthwhile to provide some basic context regarding the meaning of Cm(t) and SCn(t). Although G.709 provides the details, it may be worthwhile expanding this statement somewhat.</td>
<td></td>
<td>Gorshe, Steve</td>
<td>Microchip Technology</td>
<td>I suggest adding the following sentences to the end of this paragraph: &quot;Note that Cm(t) indicates the number of 1028-bit GMP data words that will be transmitted during the next multi-frame, with SCnD(t) nominally indicating the running remainder. Averaging the Cm(t) plus SCnD(t) values across multiple multi-frames, the average represents the incoming serial stream rate as the number of information bytes arriving at the GMP encoder per multi-frame.&quot;</td>
<td>PROPOSED ACCEPT.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 155 SC 155.2.4.5.3 P 40 L 24 # 57
Ran, Adee Cisco
Comment Type T Comment Status D GMP description
C_m(t) and CnD(t) are used but not defined.
I assume they are defined in an external reference, but it is unclear. If all control bytes are
defined externally then there is no need for this text.
SuggestedRemedy
Preferably add the detailed definitions from the referenced document.
Otherwise, delete the entire last paragraph.
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
See response to comment 17.

Cl 155 SC 155.2.4.5.3 P 40 L 25 # 207
Huber, Thomas Nokia
Comment Type E Comment Status D
The "nD" in CnD(t) should be subscripted
SuggestedRemedy
Change the nD to subscript.
Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 155 SC 155.2.4.5.4 P 40 L 30 # 348
Maniloff, Eric Ciena
Comment Type E Comment Status D
A figure showing the interleaving of the 4 OH instances would help clarify the OH structure.
SuggestedRemedy
Add a figure showing the interleave of the OH mapping
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Add a figure based on Figure 14 of the 400ZR IA.

Cl 155 SC 155.2.4.5.4 P 40 L 32 # 247
Law, David Hewlett Packard Enterprise
Comment Type T Comment Status D
OH mapping
It appears that the 10-bit interleaver isn't specified.
SuggestedRemedy
Specify the 10-bit interleaver.
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
See response to comment 348

Cl 155 SC 155.2.4.6 P 40 L 37 # 248
Law, David Hewlett Packard Enterprise
Comment Type T Comment Status D
SC-FEC blocks
Subclause 155.2.4.6 'CRC32 and multi-block alignment signal (MBAS) insertion' says that
"each SC-FEC block has 119 x 10 280 / 5 bits = 244 664 bits," but isn't an input SC-FEC
block 244 736 bits, formed of 244 664 information bits, 32 CRC bits, 6 MBAS bits, and 34
bits of padding (see figure 155-5). In addition, based on figure 155-5 and subclause
155.2.4.7, subclause 155.2.4.6 describes the input SC-FEC block.
SuggestedRemedy
Suggest that:
[1] The first paragraph of subclause 155.2.4.6 should be changed to read 'The stream of
400GBASE-ZR frames, illustrated in Figure 155-3, provide the information bits for
the calculation of SC-FEC input blocks. To conform with the format of the input SC-FEC
block, 119 rows from the stream of 400GBASE-ZR frames are mapped to the information bits in 5
successive SC-FEC input blocks. Each SC-FEC input block has 119 x 10 280 / 5 bits =
244 664 information bits.'.
[2] The text '... cyclic redundancy code is calculated over the 244 664 information bits as ...
and in the
second paragraph of subclause 155.2.4.6 should be changed to read '... cyclic redundancy
code is calculated over the 244 664 information bits as ...'.
[3] The term 'SC-FEC block' be changed to read 'SC-FEC input block' in subclause
155.2.4.6.
Proposed Response Response Status W
PROPOSED ACCEPT.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

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

"mapped to 5 successive SC-FEC blocks"

isolated numbers less than 10 in general text should be spelled out.

**SuggestedRemedy**

Change "5" to "five".

Implement similar changes, and write numbers greater than 9 in digits, across the document as necessary.

**Proposed Response**

**Response Status: W**

PROPOSED ACCEPT.

---

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

Subclause 155.2.4.6 'CRC32 and multi-block alignment signal (MBAS) insertion' says 'The 32 bits of the CRC value are placed with the x31 term as the left-most bit of the CRC32 field and the x0 term as the right-most bit of the CRC32 field'

There is no illustration of the CRC32 block, so "right" and "left" are not really meaningful; The subsequent sentence defines the transmission order, so this sentence seems redundant.

**SuggestedRemedy**

Delete the quoted sentence.

**Proposed Response**

**Response Status: W**

PROPOSED ACCEPT.

---

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

"The 32 bits of the CRC value are placed with the x31 term as the left-most bit of the CRC32 field and the x0 term as the right-most bit of the CRC32 field"

There is no illustration of the CRC32 block, so "right" and "left" are not really meaningful; The subsequent sentence defines the transmission order, so this sentence seems redundant.

**SuggestedRemedy**

Delete the quoted sentence.

**Proposed Response**

**Response Status: W**

PROPOSED ACCEPT.

---

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

Subclause 155.2.4.6 'CRC32 and multi-block alignment signal (MBAS) insertion' says 'The 32 bits of the CRC value are placed with the x31 term as the left-most bit of the CRC32 field and the x0 term as the right-most bit of the CRC32 field'

There is no illustration of the CRC32 block, so "right" and "left" are not really meaningful; The subsequent sentence defines the transmission order, so this sentence seems redundant.

**SuggestedRemedy**

Delete the quoted sentence.

**Proposed Response**

**Response Status: W**

PROPOSED ACCEPT.

---

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

"The 32 bits of the CRC value are placed with the x31 term as the left-most bit of the CRC32 field and the x0 term as the right-most bit of the CRC32 field"

There is no illustration of the CRC32 block, so "right" and "left" are not really meaningful; The subsequent sentence defines the transmission order, so this sentence seems redundant.

**SuggestedRemedy**

Delete the quoted sentence.

**Proposed Response**

**Response Status: W**

PROPOSED ACCEPT.

---

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

Subclause 155.2.4.6 'CRC32 and multi-block alignment signal (MBAS) insertion' says 'The 32 bits of the CRC value are placed with the x31 term as the left-most bit of the CRC32 field and the x0 term as the right-most bit of the CRC32 field'

There is no illustration of the CRC32 block, so "right" and "left" are not really meaningful; The subsequent sentence defines the transmission order, so this sentence seems redundant.

**SuggestedRemedy**

Delete the quoted sentence.

**Proposed Response**

**Response Status: W**

PROPOSED ACCEPT.

---

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

"The 32 bits of the CRC value are placed with the x31 term as the left-most bit of the CRC32 field and the x0 term as the right-most bit of the CRC32 field"

There is no illustration of the CRC32 block, so "right" and "left" are not really meaningful; The subsequent sentence defines the transmission order, so this sentence seems redundant.

**SuggestedRemedy**

Delete the quoted sentence.

**Proposed Response**

**Response Status: W**

PROPOSED ACCEPT.

---

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

Subclause 155.2.4.6 'CRC32 and multi-block alignment signal (MBAS) insertion' says 'The 32 bits of the CRC value are placed with the x31 term as the left-most bit of the CRC32 field and the x0 term as the right-most bit of the CRC32 field'

There is no illustration of the CRC32 block, so "right" and "left" are not really meaningful; The subsequent sentence defines the transmission order, so this sentence seems redundant.

**SuggestedRemedy**

Delete the quoted sentence.

**Proposed Response**

**Response Status: W**

PROPOSED ACCEPT.

---

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

"The 32 bits of the CRC value are placed with the x31 term as the left-most bit of the CRC32 field and the x0 term as the right-most bit of the CRC32 field"

There is no illustration of the CRC32 block, so "right" and "left" are not really meaningful; The subsequent sentence defines the transmission order, so this sentence seems redundant.

**SuggestedRemedy**

Delete the quoted sentence.

**Proposed Response**

**Response Status: W**

PROPOSED ACCEPT.

---

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

Subclause 155.2.4.6 'CRC32 and multi-block alignment signal (MBAS) insertion' says 'The 32 bits of the CRC value are placed with the x31 term as the left-most bit of the CRC32 field and the x0 term as the right-most bit of the CRC32 field'

There is no illustration of the CRC32 block, so "right" and "left" are not really meaningful; The subsequent sentence defines the transmission order, so this sentence seems redundant.

**SuggestedRemedy**

Delete the quoted sentence.

**Proposed Response**

**Response Status: W**

PROPOSED ACCEPT.

---

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

"The 32 bits of the CRC value are placed with the x31 term as the left-most bit of the CRC32 field and the x0 term as the right-most bit of the CRC32 field"

There is no illustration of the CRC32 block, so "right" and "left" are not really meaningful; The subsequent sentence defines the transmission order, so this sentence seems redundant.

**SuggestedRemedy**

Delete the quoted sentence.

**Proposed Response**

**Response Status: W**

PROPOSED ACCEPT.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 155  SC 155.2.4.6  P 40  L 50  # 455
Dawe, Piers  Nvidia

Comment Type  T  Comment Status  D  CRC32 and MBAS
between source and sink

Suggested Remedy
eh? Change to the usual terminology

Proposed Response  Response Status  W
PROPOSED ACCEPT IN PRINCIPLE.
Delete the words "between source and sink"

Cl 155  SC 155.2.4.7  P 41  L 1  # 251
Law, David  Hewlett Packard Enterprise

Comment Type  T  Comment Status  D  SC-FEC blocks
Suggest that subclause 155.2.4.7 be retitled ‘SC-FEC adapt and encoding’ to match the equivalent block in Figure 155-2.

Suggested Remedy
See comment.

Proposed Response  Response Status  W
PROPOSED ACCEPT.

Cl 155  SC 155.2.4.7  P 41  L 11  # 252
Law, David  Hewlett Packard Enterprise

Comment Type  E  Comment Status  D
Subclause 155.2.4.7 ‘400GBASE-ZR frame to SC-FEC adaptation’ says ‘... which are added to the 400GBASE-ZR SC-FEC frame as ...’. This seems to be the only time the term ‘400GBASE-ZR SC-FEC encoded frames’ is used and the title of the referenced figure 155-6 is ‘400GBASE-ZR SC-FEC encoded frames’.

Suggested Remedy
Subclause 155.2.4.7 ‘400GBASE-ZR frame to SC-FEC adaptation’ says ‘... which are added to the 400GBASE-ZR SC-FEC frame as ...’. This seems to be the only time the term ‘400GBASE-ZR SC-FEC encoded frames’ is used and the title of the referenced figure 155-6 is ‘400GBASE-ZR SC-FEC encoded frames’.

Proposed Response  Response Status  W
PROPOSED ACCEPT IN PRINCIPLE.

Change “400GBASE-ZR SC-FEC encoded frames” to “SC-FEC encoder input blocks” in 155.2.4.7. Change the title of Figure 155-6 to “SC-FEC encoder output block transmission format.”
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Proposed Response</th>
<th>Response Status</th>
<th>SuggestedRemedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.2.4.7</td>
<td>E</td>
<td>D</td>
<td>The &quot;dark&quot; line appears to be on the wrong side of the CRC+MBAS grey box. Should be on the right edge of all boxes but that's not true for 3 of them. And the last one isn't part of it's Bj+3 box.</td>
<td>Thicken the right edge of the grey boxes that represent the CRC+MBAS.</td>
<td>W</td>
<td>PROPOSED ACCEPT.</td>
</tr>
<tr>
<td>155</td>
<td>155.2.4.7</td>
<td>TR</td>
<td>D</td>
<td>Figure 155-6 does not show the 6x119b pad</td>
<td>Add box at the end of the i+119 row to the right of the CRC+MBAS labeled 6x119b PAD</td>
<td>W</td>
<td>PROPOSED ACCEPT.</td>
</tr>
<tr>
<td>155</td>
<td>155.2.4.8</td>
<td>TR</td>
<td>D</td>
<td>What is the contents of the PAD?</td>
<td>Change &quot;pad bits added&quot; to &quot;pad bits of all zeroes added&quot;</td>
<td>W</td>
<td>PROPOSED ACCEPT.</td>
</tr>
</tbody>
</table>

**Comment Status:** D/dispatched  A/accepted  R/rejected  
**Response Status:** O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Clause</th>
<th>Subclause</th>
<th>Page</th>
<th>Line</th>
<th>Type</th>
<th>Status</th>
<th>Suggested Remedy</th>
<th>Proposed Response</th>
<th>Response Status</th>
<th>Comment Type</th>
<th>Suggested Remedy</th>
<th>Proposed Response</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cl 155 SC 155.2.4.9 P 43 L 12</td>
<td>Comment Type T</td>
<td>Comment Status D</td>
<td>scrambler</td>
<td>is row 1 the first or second row?</td>
<td>PROPOSED REJECT.</td>
<td>No suggested remedy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cl 155 SC 155.2.4.9 P 43 L 12</td>
<td>Comment Type E</td>
<td>Comment Status A</td>
<td>bucket</td>
<td>Extra &quot;.&quot;</td>
<td>Remove the . After the 1 in the equation</td>
<td>ACCEPT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cl 155 SC 155.2.4.9 P 43 L 12</td>
<td>Comment Type T</td>
<td>Comment Status D</td>
<td>scrambler</td>
<td>which end goes first?</td>
<td>PROPOSED REJECT.</td>
<td>No suggested remedy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cl 155 SC 155.2.4.9 P 43 L 12</td>
<td>Comment Type E</td>
<td>Comment Status A</td>
<td>The equation should be numbered.</td>
<td>Add Equation number to the scrambler equation, e.g. (155-1).</td>
<td>ACCEPT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Comment Type: T  Comment Status: D  scrambler
Is resetting the scrambler a functional requirement?

Suggested Remedy
Consider changing "resets" to "shall be reset"

Proposed Response: Response Status: W  PROPOSED ACCEPT.

Comment Type: T  Comment Status: D  scrambler
The definition of the scrambler is ambiguous; The choice of coefficient order, shift direction, and the point from which the output is taken can create different results.

Suggested Remedy
Add a diagram (similar to e.g. Figure 49-8) and some portion of the sequence following the initial 16 bits (0xFFFF).

Proposed Response: Response Status: W  PROPOSED ACCEPT IN PRINCIPLE.
See response to comment 65.

Comment Type: TR  Comment Status: D  scrambler
The scrambler stops advancing during the PAD bits? So the 714b of PAD will be either all 0's or all 1's?

Suggested Remedy
Define the pad to be a random pattern or change "the scrambling state advances during each bit of the five SC-FEC blocks" to "the scrambling state advances for each transmitted bit"

Proposed Response: Response Status: W  PROPOSED ACCEPT IN PRINCIPLE.
See response to comment 65.

Comment Type: E  Comment Status: A  bucket
Suggest that "... SC-encoder ..." should read "... SC-FEC encoder ...".

Suggested Remedy
See comment.

Response: Response Status: C  ACCEPT.

Comment Type: T  Comment Status: D  references
ITU-T G.709.3 seems to be a normative reference.

Suggested Remedy
Add a reference in 1.3.

Proposed Response: Response Status: W  PROPOSED ACCEPT IN PRINCIPLE.
See response to comment 67.

Comment Type: TR  Comment Status: D  references
G.709.3 is not a normative reference

Suggested Remedy
Add the content locally or add the reference and any information that is needed to make the definition accessible, complete and unambiguous

Proposed Response: Response Status: W  PROPOSED ACCEPT IN PRINCIPLE.
See response to comment 67.

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  U/unsatisfied  Z/withdrawn
SORT ORDER: Clause, Subclause, page, line
Comment Type | Cl | SC | 155.2.4.10 | P | 44 | L | 30 | # | 208
---|---|---|---|---|---|---|---|---|---
Comment | TR | Comment Status | D | convolutional interleaver
The convolutional interleaver and Hamming encoder are working with 10976 rows, but figure 155-7 indicates 10970 rows
SuggestedRemedy
Change 10970 to 10976 in Figure 155-7.
Proposed Response | Response Status | W | PROPOSED ACCEPT.

Comment Type | Cl | SC | 155.2.4.11 | P | 44 | L | 36 | # | 32
---|---|---|---|---|---|---|---|---|---
Comment | E | Comment Status | A | bucket
119b
SuggestedRemedy
Change "119b" to "119-bit"
Response | Response Status | C | ACCEPT.

Comment Type | Cl | SC | 155.2.4.11 | P | 44 | L | 36 | # | 257
---|---|---|---|---|---|---|---|---|---
Comment | T | Comment Status | D | SD-FEC encoder
Subclause seems to use the terms ’119b’, ’119-bit block’ and ’119-bit message’ interchangeably. Suggest that ’119-bit message’ is used to match subclause 155.2.5.1.
SuggestedRemedy
Suggest:
[1] The text ‘The 119b outputs of the convolutional interleaver are encoded …’ is changed to read ‘The 119-bit messages output by the convolutional interleaver are encoded …’

[2] The text ‘... to each of the 10 976 119-bit blocks as output ...’ is changed to read ‘... to each of the 10 976 119-bit messages as output ...’.

Proposed Response | Response Status | W | PROPOSED ACCEPT.
The generic operation of the Hamming SD-FEC scheme is specified in ITU-T G.709.3 Annex D but that contains undefined symbols and terms.

**Suggested Remedy**
As it seems it is not very long, write it out cleanly here

**Proposed Response**
PROPOSED ACCEPT.

---

The 128-bit code word referenced in subclause 155.2.4.11 ‘Hamming SD-FEC encoder’ is called the ‘SD-FEC codeword’ in Figure 155-8, subclause 155.2.5.1 (page 46, line 5) and subclause 155.3.3.2 (page 53, line 36). Suggest the same terminology should be used in subclause 155.2.4.11 ‘Hamming SD-FEC encoder’.

**Suggested Remedy**
Suggest that:

1. The text ‘... results in 10 796 128-bit blocks.’ be changed to read ‘... results in 10 796 128-bit SD-FEC codewords.’
2. The text ‘... is encoded to the 128-bit code word ...’ be changed to read ‘... is encoded to the 128-bit SD-FEC codeword ...’
3. The text ‘The 128-bit code words are ...’ should be changed to read ‘The 128-bit SD-FEC codewords are ...’.

**Proposed Response**
PROPOSED ACCEPT IN PRINCIPLE. See reponse to comment 463

---

This says 8-bit symbols, 155.2.1 says two streams of 4-bit data.
PMA:IS_UNITDATA_i.request is 7 wide.

**Suggested Remedy**
The difference may matter when we are discussing Skew limits

**Proposed Response**
PROPOSED ACCEPT IN PRINCIPLE.
Change:
"The 128-bit code words are sent as 8-bit symbols.."
to:
The 128-bit code words are sent as two streams of 4-bit data.."
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

### Comment 155

**Cl 155 SC 155.2.4.12 P 45 L 33 # 465**

**Dawe, Piers**

**Nvidia**

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

Hamming

**SuggestedRemedy**

Hamming

**Response**

**Response Status** C

**ACCEPT.**

---

**Comment 155**

**Cl 155 SC 155.2.4.12 P 45 L 50 # 259**

**Law, David**

Hewlett Packard Enterprise

**Comment Type** T  **Comment Status** D  **Transmit bit ordering**

Suggest that Figure 155-8 and the last paragraph of subclause 155.2.4.11 be updated to describe how the 128-bit code word from the SD-FEC encoder is passed across the PMA service interface. In addition, the fourth paragraph of subclause 155.3.3.1 should be updated to note that the 128-bit code word is passed across the PMA service interface to the PMA where the Gray mapping and polarization distribution described occurs.

**SuggestedRemedy**

[1] Suggest that the PMA service interface be added to Figure 155-8. To do this suggest that the label 'PMA:IS_UNITDATA_0.request' be added to the leftmost arrow at the bottom of the figure, with the label 'PMA:IS_UNITDATA_1.request' and 'PMA:IS_UNITDATA_2.request' staggered above on the next two arrows to the right. The label 'PMA:IS_UNITDATA_7.request' should be added to the rightmost arrow. As an existing example, see Figure 119-10 '200GBASE-R Transmit bit ordering and distribution'.

[2] Suggest that the last paragraph of subclause 155.2.4.11 be changed to read 'The 128-bit code word is then passed across the 8 lane PMA service interface to the PMA sublayer as 16 groups of 8 bits, each representing a DP-16GAM symbol. The first group of 8 bits are c0 through c7, the last group of 8 bits are c120 through c127, with the LSB through the MSB or each group of 8 bits mapped in order to the tx symbol parameter of the PMA:IS_UNITDATA_0.request through the PMA:IS_UNITDATA_7.request primitive respectively (see Figure 155-8)'.

[3] Suggest that the text 'Each 128-bit code word from the SD-FEC encoder c = [c0, c1, ...,c127], is mapped ...' in the fourth paragraph of subclause 155.3.3.1 should be changed to read 'Each 128-bit code word from the SD-FEC encoder is passed across the PMA service interface as described in 155.2.4.11. Each 128-bit code word c = [c0, c1, ...,c127], is mapped ...'.

**Proposed Response**

**Response Status** W

PROPOSED ACCEPT IN PRINCIPLE.

Review supporting presentation.  For comment resolution group (CRG) consideration.

---

**Comment 155**

**Cl 155 SC 155.2.5.1 P 46 L 11 # 467**

**Dawe, Piers**

Nvidia

**Comment Type** TR  **Comment Status** D  **SD-FEC decoder**

"Logic described generically in ITU-T G.709.3 Annex D": generically - vague, and Annex D does not address FEC decoding at all, only check-block generation.

**SuggestedRemedy**

Write out what you need to say, here

**Proposed Response**

**Response Status** W

PROPOSED REJECT.

There is no suggested remedy.  I need text to put in the document.

---

**Comment 155**

**Cl 155 SC 155.2.5.1 P 46 L 11 # 466**

**Dawe, Piers**

Nvidia

**Comment Type** T  **Comment Status** D  **rewrite bucket**

"The Hamming SD-FEC decoder is a soft decision decoder"

**SuggestedRemedy**

What requires this? a sensitivity / OSNR tolerance spec? Please refer to wherever the reason is given.

**Proposed Response**

**Response Status** W

PROPOSED REJECT.

This is part of the baseline architecture adopted by the task force

---

**Comment 155**

**Cl 155 SC 155.2.5.1 P 46 L 11 # 467**

**Nicholl, Gary**

Cisco Systems

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

The format of the text in Figure 155-8 is all over the place. I know in 802.3df we are using a constant font for all text in figures.

**SuggestedRemedy**

Update Figure 155-8 to use a constant font for all text.

**Proposed Response**

**Response Status** W

PROPOSED ACCEPT.
The vast majority of references to the in-phase and quadrature-phase X and Y polarization use the symbols I\(\text{X}\), Q\(\text{X}\), I\(\text{Y}\), and Q\(\text{Y}\) (e.g., Figure 155-10 on page 51, line 28 and subclause 155.3.3, page 52, line 9). There, however, seem to be a few instances where the X and Y are not in subscript, or the phase and polarization symbols are reversed.

**SuggestedRemedy**

On the assumption that they are referencing the same signals, please use I\(\text{X}\), Q\(\text{X}\), I\(\text{Y}\), and Q\(\text{Y}\) in the following locations:

- Subclause 155.2.5.1, page 46, line 12
- Table 155-3, page 55, line 38
- Table 155-4, page 56, line 35
- Table 155-7, page 59, line 5 through 16

**Proposed Response**

**Response Status** W

PROPOSED ACCEPT.

---

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

**Comment**

Law, David  Hewlett Packard Enterprise

***Comment***

The vast majority of references to the in-phase and quadrature-phase X and Y polarization use the symbols I\(\text{X}\), Q\(\text{X}\), I\(\text{Y}\), and Q\(\text{Y}\) (e.g., Figure 155-10 on page 51, line 28 and subclause 155.3.3, page 52, line 9). There, however, seem to be a few instances where the X and Y are not in subscript, or the phase and polarization symbols are reversed.

**SuggestedRemedy**

On the assumption that they are referencing the same signals, please use I\(\text{X}\), Q\(\text{X}\), I\(\text{Y}\), and Q\(\text{Y}\) in the following locations:

- Subclause 155.2.5.1, page 46, line 12
- Table 155-3, page 55, line 38
- Table 155-4, page 56, line 35
- Table 155-7, page 59, line 5 through 16

**Proposed Response**

**Response Status** W

PROPOSED ACCEPT.

---

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

**Comment**

Law, David  Hewlett Packard Enterprise

***Comment***

The vast majority of references to the in-phase and quadrature-phase X and Y polarization use the symbols I\(\text{X}\), Q\(\text{X}\), I\(\text{Y}\), and Q\(\text{Y}\) (e.g., Figure 155-10 on page 51, line 28 and subclause 155.3.3, page 52, line 9). There, however, seem to be a few instances where the X and Y are not in subscript, or the phase and polarization symbols are reversed.

**SuggestedRemedy**

On the assumption that they are referencing the same signals, please use I\(\text{X}\), Q\(\text{X}\), I\(\text{Y}\), and Q\(\text{Y}\) in the following locations:

- Subclause 155.2.5.1, page 46, line 12
- Table 155-3, page 55, line 38
- Table 155-4, page 56, line 35
- Table 155-7, page 59, line 5 through 16

**Proposed Response**

**Response Status** W

PROPOSED ACCEPT.

---

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

**Comment**

Law, David  Hewlett Packard Enterprise

***Comment***

The vast majority of references to the in-phase and quadrature-phase X and Y polarization use the symbols I\(\text{X}\), Q\(\text{X}\), I\(\text{Y}\), and Q\(\text{Y}\) (e.g., Figure 155-10 on page 51, line 28 and subclause 155.3.3, page 52, line 9). There, however, seem to be a few instances where the X and Y are not in subscript, or the phase and polarization symbols are reversed.

**SuggestedRemedy**

On the assumption that they are referencing the same signals, please use I\(\text{X}\), Q\(\text{X}\), I\(\text{Y}\), and Q\(\text{Y}\) in the following locations:

- Subclause 155.2.5.1, page 46, line 12
- Table 155-3, page 55, line 38
- Table 155-4, page 56, line 35
- Table 155-7, page 59, line 5 through 16

**Proposed Response**

**Response Status** W

PROPOSED ACCEPT.

---

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

**Comment**

Law, David  Hewlett Packard Enterprise

***Comment***

The vast majority of references to the in-phase and quadrature-phase X and Y polarization use the symbols I\(\text{X}\), Q\(\text{X}\), I\(\text{Y}\), and Q\(\text{Y}\) (e.g., Figure 155-10 on page 51, line 28 and subclause 155.3.3, page 52, line 9). There, however, seem to be a few instances where the X and Y are not in subscript, or the phase and polarization symbols are reversed.

**SuggestedRemedy**

On the assumption that they are referencing the same signals, please use I\(\text{X}\), Q\(\text{X}\), I\(\text{Y}\), and Q\(\text{Y}\) in the following locations:

- Subclause 155.2.5.1, page 46, line 12
- Table 155-3, page 55, line 38
- Table 155-4, page 56, line 35
- Table 155-7, page 59, line 5 through 16

**Proposed Response**

**Response Status** W

PROPOSED ACCEPT.

---

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

**Comment**

Law, David  Hewlett Packard Enterprise

***Comment***

The vast majority of references to the in-phase and quadrature-phase X and Y polarization use the symbols I\(\text{X}\), Q\(\text{X}\), I\(\text{Y}\), and Q\(\text{Y}\) (e.g., Figure 155-10 on page 51, line 28 and subclause 155.3.3, page 52, line 9). There, however, seem to be a few instances where the X and Y are not in subscript, or the phase and polarization symbols are reversed.

**SuggestedRemedy**

On the assumption that they are referencing the same signals, please use I\(\text{X}\), Q\(\text{X}\), I\(\text{Y}\), and Q\(\text{Y}\) in the following locations:

- Subclause 155.2.5.1, page 46, line 12
- Table 155-3, page 55, line 38
- Table 155-4, page 56, line 35
- Table 155-7, page 59, line 5 through 16

**Proposed Response**

**Response Status** W

PROPOSED ACCEPT.

---

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

**Comment**

Law, David  Hewlett Packard Enterprise

***Comment***

The vast majority of references to the in-phase and quadrature-phase X and Y polarization use the symbols I\(\text{X}\), Q\(\text{X}\), I\(\text{Y}\), and Q\(\text{Y}\) (e.g., Figure 155-10 on page 51, line 28 and subclause 155.3.3, page 52, line 9). There, however, seem to be a few instances where the X and Y are not in subscript, or the phase and polarization symbols are reversed.

**SuggestedRemedy**

On the assumption that they are referencing the same signals, please use I\(\text{X}\), Q\(\text{X}\), I\(\text{Y}\), and Q\(\text{Y}\) in the following locations:

- Subclause 155.2.5.1, page 46, line 12
- Table 155-3, page 55, line 38
- Table 155-4, page 56, line 35
- Table 155-7, page 59, line 5 through 16

**Proposed Response**

**Response Status** W

PROPOSED ACCEPT.
<table>
<thead>
<tr>
<th>Cl 155</th>
<th>SC 155.2.5.5</th>
<th>P 46</th>
<th>L 36</th>
<th># 209</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huber, Thomas</td>
<td>Nokia</td>
<td><strong>Comment Type</strong></td>
<td>E</td>
<td><strong>Comment Status</strong></td>
</tr>
<tr>
<td>Missing an &quot;of&quot; in the second sentence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change &quot;Each incoming block 10976 x 119 bits.&quot; to &quot;Each incoming block of 10976 x 119 bits.&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response Status</strong></td>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCEPT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl 155</th>
<th>SC 155.2.5.5</th>
<th>P 46</th>
<th>L 43</th>
<th># 210</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huber, Thomas</td>
<td>Nokia</td>
<td><strong>Comment Type</strong></td>
<td>E</td>
<td><strong>Comment Status</strong></td>
</tr>
<tr>
<td>Missing a subscript in Bi_corrected.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make the i in Bi subscripted.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response Status</strong></td>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCEPT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl 155</th>
<th>SC 155.2.5.5</th>
<th>P 46</th>
<th>L 46</th>
<th># 401</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slavick, Jeff</td>
<td>Broadcom</td>
<td><strong>Comment Type</strong></td>
<td>TR</td>
<td><strong>Comment Status</strong></td>
</tr>
<tr>
<td>Last paragraph of this section states that link degrade status is provided,, but there's no MDIO mapping provided in the text to indicate its status bits or control of thresholds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Add references to the MDIO registers to control and observe link degrade</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Proposed Response</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response Status</strong></td>
<td>W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>See response to comment 408</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl 155</th>
<th>SC 155.2.5.5</th>
<th>P 46</th>
<th>L 46</th>
<th># 71</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ran, Adee</td>
<td>Cisco</td>
<td><strong>Comment Type</strong></td>
<td>E</td>
<td><strong>Comment Status</strong></td>
</tr>
<tr>
<td>The third paragraph &quot;The 400GBASE-ZR PCS provides detection and signaling of link degrade for use by network equipment...&quot; is repeated verbatim in 155.2.5.7.2. No need to write it twice.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delete the third paragraph.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Proposed Response</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response Status</strong></td>
<td>W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROPOSED ACCEPT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The last paragraph states that the link degrade function is provided and that the bit error ratio is used to indicate this. But in the MDIO mapping (Table 155-8) points to fields that exist but reference 119.2.5.3 which specifies the thresholds in terms of rs-symbol error rates and FEC codewords.

**SuggestedRemedy**

Replace the last paragraph of 155.2.5.5 with the following:

The 4000GBASE-ZR PCS may optionally provide the ability to signal degradation of the received signal. The presence of this option is indicated by the assertion of the **FEC degraded SER ability variable** (see 155.4.2.1). When the option is provided it is enabled by the assertion of the **FEC degraded SER enable variable** (see 155.4.2.1).

When **FEC degraded SER enable** is asserted, additional error monitoring is performed by the PCS. The PCS counts the number of bits corrected by the SC-FEC decoder in consecutive nonoverlapping SC-FEC frames of **FEC degraded SER interval** (see 155.4.2.1). If the SC-FEC decoder determines that a codeword is uncorrectable or errors are detected by the CRC32 check (see 155.2.5.6), the number of symbol errors detected is increased by 957 x 257. When the number of bit errors exceeds the threshold set in **FEC degraded SER activate threshold** (see 155.5.1), the **FEC degraded SER bit** is set. At the end of each interval, if the number of symbol errors is less than **FEC degraded SER deactivate threshold**, the **FEC degraded SER bit** is cleared. If either **FEC degraded SER ability** or **FEC degraded SER enable** is de-asserted then the **FEC degraded SER bit** is cleared.

Bring in 45.2.3.60.1 and add "155.2.5.5" to the see list
Bring in 45.2.3.61.1 and add "155.4.2.1" to the see list
Bring in 45.2.3.61.3 and add "155.2.5.5" to the see list
Bring in 45.2.3.61.4 and add "155.4.2.1" to the see list

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

**SuggestedRemedy**

I think this means the "B" blocks of 155.2.5.5. Are they "SC-FEC codewords", and are they named?

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

Change "the entire base block of 30 592 x 8 bits.." to "the entire block of information bits from the SC-FEC decoder (30 592 x 8 bits)."

**SuggestedRemedy**

Add references to the MDIO register for counting corrected and uncorrected FEC CW and bits

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

Need a contribution.

**SuggestedRemedy**

in "952 x 257B" does the "B" stand for bits ? If so I am not sure this follows the 802.3 style manual ?

**Proposed Response**  **Response Status** W  PROPOSED ACCEPT.
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>Page</th>
<th>Line</th>
<th>Type</th>
<th>Comment</th>
<th>Status</th>
<th>Remedy</th>
<th>Response</th>
<th>Status</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.2.5.7</td>
<td>47</td>
<td>9</td>
<td>E</td>
<td>will have</td>
<td>D</td>
<td>rewrite bucket</td>
<td></td>
<td></td>
<td>PROPOSED ACCEPT.</td>
</tr>
<tr>
<td>155</td>
<td>155.2.5.7</td>
<td>47</td>
<td>9</td>
<td>E</td>
<td>&quot;will&quot; is deprecated.</td>
<td>D</td>
<td>rewrite bucket</td>
<td></td>
<td></td>
<td>PROPOSED ACCEPT.</td>
</tr>
<tr>
<td>155</td>
<td>155.2.5.7</td>
<td>47</td>
<td>14</td>
<td>E</td>
<td>There are multiple state machines (diagrams) in 155.4.</td>
<td>D</td>
<td></td>
<td></td>
<td>PROPOSED ACCEPT.</td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.2.5.7</td>
<td>47</td>
<td>14</td>
<td>E</td>
<td>&quot;follows the state machine in 155.4&quot; to &quot;is depicted by the state diagram in Figure 155-16&quot;.</td>
<td>D</td>
<td></td>
<td></td>
<td>PROPOSED ACCEPT.</td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.2.5.7</td>
<td>47</td>
<td>19</td>
<td>T</td>
<td>Figure 155-9 is identical to Figure 155-4. It is also not referenced in the text at all, though it is obvious how it relates to the text. To avoid potential divergence of the figures, it would be better to refer to the earlier figure rather than replicate it.</td>
<td>D</td>
<td></td>
<td></td>
<td>PROPOSED ACCEPT.</td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.2.5.7</td>
<td>47</td>
<td>19</td>
<td>T</td>
<td>Reference is to 155.4 which is all the FSM blocks, call out the specific AM lock one.</td>
<td>D</td>
<td></td>
<td></td>
<td>PROPOSED ACCEPT.</td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.2.5.7</td>
<td>47</td>
<td>19</td>
<td>E</td>
<td>Suggest a direct reference to the Alignment marker lock state diagram is provided in subclause 155.2.5.7.</td>
<td>D</td>
<td></td>
<td></td>
<td>PROPOSED ACCEPT.</td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.2.5.7</td>
<td>47</td>
<td>19</td>
<td>E</td>
<td>The process of locking to the AM field is described in the Alignment marker lock state diagram in Figure 155-16.</td>
<td>D</td>
<td></td>
<td></td>
<td>PROPOSED ACCEPT.</td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.2.5.7</td>
<td>47</td>
<td>19</td>
<td>E</td>
<td>Remove figure 155-9. Add a sentence to the end of clause 155.2.5.7 indicating that the overhead bytes over the four-frame multiframe are shown in Figure 155-4.</td>
<td>D</td>
<td></td>
<td></td>
<td>PROPOSED ACCEPT.</td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>Comment Status</td>
<td>Suggested Remedy</td>
<td>Proposed Response</td>
<td>Response Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>----------------</td>
<td>------------------</td>
<td>-------------------</td>
<td>----------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>D</td>
<td>Figure 155-9 seems to be identical to Figure 155-4</td>
<td>Remove it, refer to 155-4 instead</td>
<td>PROPOSED ACCEPT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>D</td>
<td>Figure 155-9 is identical to 155-4 and is not referenced</td>
<td>Reference it or remove it. See another comment.</td>
<td>PROPOSED ACCEPT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>D</td>
<td>It looks like there is an 'of' that should be 'or' - I think the intent is that if the receiver can't frame to the DSP frame, or the 400ZR frame or multi-frame, it inserts LF</td>
<td></td>
<td>PROPOSED ACCEPT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

<table>
<thead>
<tr>
<th>Ci 155 SC 155.2.5.7.1</th>
<th>P 47 L 33 # 473</th>
<th>Ci 155 SC 155.2.5.7.2</th>
<th>P 48 L 5 # 474</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td>Dawe, Piers</td>
<td>Nvidia</td>
</tr>
<tr>
<td>Comment Type E</td>
<td>Comment Status D</td>
<td>Comment Type T</td>
<td>Comment Status D</td>
</tr>
<tr>
<td>Figure 155-9 is identical to 155-4</td>
<td>Figure 155-9 is an orphan</td>
<td>upstream, downstream rewrite bucket</td>
<td></td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td></td>
<td>Suggested Remedy</td>
<td></td>
</tr>
<tr>
<td>Remove it, refer to 155-4 instead</td>
<td>Reference it or remove it. See another comment.</td>
<td>Change: &quot;The RPF bit indicates, in the upstream direction, that...&quot;, to &quot;The RPF bit indicates to its link partner, that...&quot;</td>
<td></td>
</tr>
<tr>
<td>Proposed Response</td>
<td>Response Status W</td>
<td>Proposed Response</td>
<td>Response Status W</td>
</tr>
<tr>
<td>PROPOSED ACCEPT.</td>
<td></td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Change: &quot;...are defined to indicate to the downstream 400GBASE-ZR PHY the quality...&quot;, to &quot;...are defined to indicate to the link partner the quality...&quot;</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ci 155 SC 155.2.5.7.1</td>
<td>P 47 L 33 # 472</td>
<td>Ci 155 SC 155.2.5.7.2</td>
<td>P 48 L 9 # 475</td>
</tr>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td>Dawe, Piers</td>
<td>Nvidia</td>
</tr>
<tr>
<td>Comment Type E</td>
<td>Comment Status D</td>
<td>Comment Type E</td>
<td>Comment Status D</td>
</tr>
<tr>
<td>Figure 155-9 is identical to 155-4</td>
<td>Figure 155-9 is an orphan</td>
<td>detailed in 155.2.5.7.2 - but this is 155.2.5.7.2</td>
<td></td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td></td>
<td>Suggested Remedy</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replace 155.2.5.7.2 with 155.2.4.5.2.</td>
<td></td>
</tr>
<tr>
<td>Proposed Response</td>
<td>Response Status W</td>
<td>Proposed Response</td>
<td>Response Status W</td>
</tr>
<tr>
<td>PROPOSED ACCEPT.</td>
<td></td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ci 155 SC 155.2.5.7.2</td>
<td>P 48 L 21 # 212</td>
<td>Huber, Thomas</td>
<td>Nokia</td>
</tr>
<tr>
<td>Comment Type E</td>
<td>Comment Status D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>It looks like there is an 'of' that should be 'or' - I think the intent is that if the receiver can't frame to the DSP frame, or the 400ZR frame or multi-frame, it inserts LF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td></td>
<td>Change: &quot;In the case of a DSP framing of 400GBASE-ZR frame or multi-frame loss,&quot; to &quot;In the case of a DSP framing loss or 400GBASE-ZR frame or multi-frame loss.&quot;</td>
<td></td>
</tr>
<tr>
<td>Proposed Response</td>
<td>Response Status W</td>
<td>Proposed Response</td>
<td>Response Status W</td>
</tr>
<tr>
<td>PROPOSED ACCEPT.</td>
<td></td>
<td>PROPOSED ACCEPT.</td>
<td></td>
</tr>
<tr>
<td>Cl 155</td>
<td>SC 155.2.5.7.2</td>
<td>P 48</td>
<td>L 22</td>
</tr>
<tr>
<td>---------</td>
<td>----------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td><strong>Comment Type:</strong> T</td>
<td><strong>Comment Status:</strong> D</td>
</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td></td>
<td>framing of frame or multi-frame loss - eh?</td>
<td></td>
</tr>
<tr>
<td><strong>Proposed Response</strong></td>
<td><strong>Response Status:</strong> W</td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
<td></td>
</tr>
<tr>
<td>See response to comment 212</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl 155</th>
<th>SC 155.2.5.7.2</th>
<th>P 48</th>
<th>L 23</th>
<th># 74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ran, Adee</td>
<td>Cisco</td>
<td><strong>Comment Type:</strong> T</td>
<td><strong>Comment Status:</strong> D</td>
<td><strong>Link status monitoring</strong></td>
</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td></td>
<td>&quot;LF ordered sets&quot; are not defined in this draft.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I assume it is the &quot;Local Fault&quot; RS ordered set.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Proposed Response</strong></td>
<td><strong>Response Status:</strong> W</td>
<td>PROPOSED ACCEPT.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl 155</th>
<th>SC 155.2.5.8</th>
<th>P 48</th>
<th>L 36</th>
<th># 19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gorshe, Steve</td>
<td>Microchip Technology</td>
<td><strong>Comment Type:</strong> E</td>
<td><strong>Comment Status:</strong> D</td>
<td><strong>Link status monitoring</strong></td>
</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td></td>
<td>This sentence appears to incorrectly imply that the CRC8 is the sole protection against errors in JC1-3. Although G.709 provides the details, it may be worthwhile expanding this statement somewhat.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Proposed Response</strong></td>
<td><strong>Response Status:</strong> W</td>
<td>PROPOSED ACCEPT.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 155 SC 155.3.1 P 49 L 3 # 135
Nicholl, Gary Cisco Systems

Comment Type ER  Comment Status D
The first several sub-sections of 155.3.1 appear to repeat the same format as section 155.1. It appears that this overview information for the PCS sublayer is in 155.1 and the same overview information for the PMA sublayer is in 155.3.

Suggested Remedy
I would propose to delete section 155.1., and put all of the corresponding overview information into either the PCS section (155.2) or the PMA section (155.3) respectively.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Make 155.1 an Overview of PCS and PMA.
Move scope of PMA from 155.3.1.1 to end of 155.1.1, as modified by other comments.
Move position of PMA in the 400GBASE-ZR sublayers from 155.3.1.2 to end of 155.1.2.
Move summary of functions from 155.3.1.3 to the end of 155.1.3 - continue list after "h)".
Change title of 155.1.3 from "Physical Coding Sublayer (PCS)" to "Physical Coding Sublayer (PCS) and Physical Medium Attach Sublayer (PMA)".

Cl 155 SC 155.3.1.1 P 49 L 9 # 262
Law, David Hewlett Packard Enterprise

Comment Type E  Comment Status X
Since [1] the subclause of 156.5 'PMD functional specifications' lists more than just a transmit and receive function, and [2] to parallel the text 'The PMA allows the 400GBASE-ZR PCS (specified in 155.2)...', suggest that '... media-independent way to a coherent transmitter and receiver specified in Clause 156.' should be changed to read '... media-independent way to the 400GBASE-ZR PMD (specified in 156).'.

Suggested Remedy
See comment.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
See response to 135. This text will move.
Change '... media-independent way to a coherent transmitter and receiver specified in Clause 156.' to '... media-independent way to the 400GBASE-ZR PMD (specified in 156).'

Cl 155 SC 155.3.1.2 P 49 L 16 # 481
Dawe, Piers Nvidia

Comment Type T  Comment Status D
PMA description
The interfaces for the inputs of

Suggested Remedy
The interfaces of ?

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
See proposed response to comment 135.

Cl 155 SC 155.3.1.2 P 49 L 11 # 478
Dawe, Piers Nvidia

Comment Type E  Comment Status D
rewrite bucket relationship with

Suggested Remedy
relationship to  Also 156.1

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Change at page 49 line 16 and also at page 73 line 46:
"with other" to "to other"

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  U/unsatisfied  Z/withdrawn
SORT ORDER: Clause, Subclause, page, line
The term "symbol" seems to be overloaded in the PMA subclause, sometimes meaning bit, other times an element of the set \{-3, -1, +1, +3\}, and other times a pair of such elements (DP-16QAM symbol).

This is confusing.

Suggested Remedy
Define a clear terminology (e.g. bits, quaternary symbols, DP-16QAM symbols) and apply it across 155.3.

PROPOSED ACCEPT IN PRINCIPLE.
Add a new paragraph at the start of 155.3.1:

"In the transmit direction the PMA generates the analog signals used by the PMD sublayer, defined in 156, to create pairs of 16QAM symbols for transmission on two polarizations. In the receive direction the PMA converts analog signals from the PMD sublayer into digital representations of pairs of 16QAM symbols. Each 16QAM symbol is coded as a four-level signal in phase, Ix or Iy, and a four-level signal with quadrature phase, Qx or Qy. The four-level signals are represented by values from the set \{-3, -1, +1, +3\}, and are represented digitally as two or more bits with Gray coding."

Figure 155-10 is separated from the text which describes it, by the intervening description of the service interface.

Suggested Remedy
Beat on frame, and move the figure 155-10 be after 155.3.1.3 and before 155.3.2 (one way to do this may be forcing a page break before 155.3.2)

Agree on the need to keep the figure before 155.3.2 PMA service interface.

This figure is supposed to be a functional block diagram, not an implementation diagram. There are no characteristics for the DAC blocks defined in the specification. The closest thing to the text is 155.3.3.4 which are called the 16QAM encode and signal drivers. However, most other 802.3 PHY clauses leave out signal drivers, DACs and the like, and there are no specific requirements in 155.3.3.4, so deleting the blocks seems the right approach to making a functional block diagram.

Suggested Remedy
Preferably, delete the "DAC" blocks from Figure 155-10 (going straight to the output is fine) Alternatively, Relabel "16QAM Encoder and Signal Driver" (probably drawing as 2 blocks since you show I&Q paths)

Agree on the need to keep the figure before 155.3.2 PMA service interface.

In the transmit direction the PMA generates the analog signals used by the PMD sublayer, defined in 156, to create pairs of 16QAM symbols for transmission on two polarizations. In the receive direction the PMA converts analog signals from the PMD sublayer into digital representations of pairs of 16QAM symbols. Each 16QAM symbol is coded as a four-level signal in phase, Ix or Iy, and a four-level signal with quadrature phase, Qx or Qy. The four-level signals are represented by values from the set \{-3, -1, +1, +3\}, and are represented digitally as two or more bits with Gray coding."
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

The 400GBASE-ZR PMA service interface is defined in 155.3.2.

- Change the last paragraph of subclause 155.2.4.11 'Hamming SD-FEC encoder' to read:

The 128-bit code words are sent as 8-bit encoded DP-16QAM symbols to the 400GBASE-ZR PMA sublayer using sixteen PMA_UNITDATA.request messages.

- Change the text ‘... by PMA:IS_UNITDATA_i.indication to PMA:IS_UNITDATA_m-1.indication inter-sublayer signals.’ to read ‘... by the PMA_UNITDATA.indication primitive.’ in subclause 155.2.5.1 ‘Hamming SD-FEC decoder’.

- Change subclause 155.3.2 ‘400GBASE-ZR PMA service interface’, adding new subclauses 155.3.2.1 through 155.3.2.2.3, to read:

155.3.2 400GBASE-ZR PMA service interface

The 400GBASE-ZR PMA Service Interface supports the exchange of encoded DP-16QAM symbols between the PCS and PMA sublayer. The 400GBASE-ZR PMA service interface is described in an abstract manner and does not imply any particular implementation. The 400GBASE-ZR PMA Service Interface supports the exchange of encoded DP-16QAM symbols between the PCS and PMA sublayer. The 400GBASE-ZR PMA service interface is defined in 155.3.2.

The 400GBASE-ZR PMA service interface provided by the 400GBASE-ZR PMA for the 400GBASE-ZR PCS is described in an abstract manner and does not imply any particular implementation. The 400GBASE-ZR PMA Service Interface supports the exchange of encoded DP-16QAM symbols between the PCS and PMA sublayer. The 400GBASE-ZR PMA service interface is defined in 155.3.2.

Rather than operating as n parallel asynchronous PCS lanes that carry alignment markers and lane numbers that enable the original data to be restored or n lanes to be multiplexed into m lanes, it appears the 400GBASE-ZR PMA service interface between the PCS and the PMA operates as an n-bit synchronous data path, transferring a single DP-16QAM symbol during each operation. This seems to be confirmed by subclause 155.2.4.3 ‘GMP mapper’ that says ‘... to and from the PMA and PCS, incorporating the alignment and lane numbers that enable the original data to be restored or n lanes to be multiplexed into m lanes. In the case of the transmit path, the DP-16QAM symbols are encoded as 8-bit words, 2 bits representing the 4 levels for each of the in-phase and quadrature-phase components of the X and Y polarizations. In the case of the receive path, the DP-16QAM symbols are encoded as p bits representing q levels, where p and q are implementation dependant.

It, therefore, doesn’t seem correct to define the 400GBASE-ZR PMA service interface through reference to the lane-based PMA service interface definition in 116.3 when it doesn’t support the features of a lane-based service interface. Based on this, suggest that the 400GBASE-ZR PMA service interface be defined using a single .request and .indicate primitive, with a tx_symbol and rx_symbol parameter respectively, to reflect the synchronous data path nature of the interface.

Suggested Remedy

Specify the 400GBASE-ZR PMA as a single .request and .indicate primitive, with a tx_symbol and rx_symbol parameter respectively as follows:

- Change the three instances of ‘PMA:IS_UNITDATA_i.request’ to read ‘PMA_UNITDATA.request’ in subclause 155.2.1 ‘Functions within the PCS’.

- Change subclause 155.1.4.2 ‘Physical Medium Attachment (PMA) service interface’ to read as follows:

The 400GBASE-ZR PMA service interface provided by the 400GBASE-ZR PMA for the 400GBASE-ZR PCS is described in an abstract manner and does not imply any particular implementation. The 400GBASE-ZR PMA Service Interface supports the exchange of encoded DP-16QAM symbols between the PCS and PMA sublayer. The 400GBASE-ZR PMA service interface is defined in 155.3.2.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

155.3.2.1.2 When generated

The PCS generates sixteen PMA_UNITDATA.request messages for each 128-bit code word from the PCS SD-FEC encoder. The messages convey the least significant octet C<7:0> first, most significant octet C<127:120> last, with code word bits C<n+7:n> mapped to tx_symbol<7:0>. The nominal rate of PMA_UNITDATA.indication messages is 57.78 Gbd.

155.3.2.1.3 Effect of receipt

The PMA continuously forms the tx_symbol parameters received in sixteen consecutive PMA_UNITDATA.indication messages into 128-bit code words that are passed to the PMA Gray mapping and polarization distribution function (see 155.3.3.1).

155.3.2.2 PMA_UNITDATA.indication

This primitive defines the transfer of encoded DP-16QAM symbols in the rx_symbol parameter from the 400GBASE-ZR PMA to the 400GBASE-ZR PCS.

155.3.2.2.1 Semantics of the primitive

PMA_UNITDATA.indication (rx_symbol)

During reception, the PMA_UNITDATA.indication simultaneously conveys m bits of an n-bit code word generated by the symbol de-interleaving function (see 155.3.3.8) representing an encoded DP-16QAM symbol to the 400GBASE-ZR PCS where m is implementation dependent, representing the number of bits of the encoded DP-16QAM symbol, and n = 16 x m.

155.3.2.2.2 When generated

The PMA generates sixteen PMA_UNITDATA.indication messages for each n-bit code word generated by the PMA symbol de-interleaving function. The messages convey the least significant m bits of the n-bit code word first. The nominal rate of PMA_UNITDATA.indication messages is 57.78 Gbd.

155.3.2.2.3 Effect of receipt

The PCS continuously forms the rx_symbol parameters received in sixteen consecutive PMA_UNITDATA.indication messages into n-bit code words that are passed to the PCS Hamming SD-FEC decoder function (see 155.2.5.1).

155.3.2.3 PMA_SIGNAL.indication

This primitive defines the transfer of the status of the PMA receive process in the SIGNAL_OK parameter from 400GBASE-ZR PMA to the 400GBASE-ZR PCS.

155.3.2.3.2 When generated

The PMA generates a PMA_SIGNAL.indication message whenever there is change in the value of the SIGNAL_OK parameter (see 155.3.3.9).

155.3.2.3.3 Effect of receipt

The PCS Synchronization process monitors the PMA_SIGNAL.indication primitive for a change in the SIGNAL_OK parameter (see 155.2.1).

- Move the last paragraph of the current subclause to a new subclause 155.3.3.9 titled 'Signal Indication Logic (SIL).

- Change the last paragraph of subclause 155.3.3.8 'Polarization combining and symbol de-interleaving' to read:

The sixteen encoded DP-16QAM symbols are transferred to the 400GBASE-ZR PCS sublayer as m-bit DP-16QAM symbols using sixteen PMA_UNITDATA.indication messages.

- Change 'PMA:IS_UNITDATA_0.request to PMA:IS_UNITDATA_7.request' to read 'PMA_UNITDATA.request' and 'PMA:IS_UNITDATA_0.indication to PMA:IS_UNITDATA_m-1.indication' to read 'PMA_UNITDATA.indication' in Figure 155-2 'Functional block diagram'.

- Change 'PMA:IS_UNITDATA_0.request to PMA:IS_UNITDATA_7.request' to read 'PMA_UNITDATA.request and PMA:IS_UNITDATA_0.indication to PMA:IS_UNITDATA_m-1.indication' to read 'PMA_UNITDATA.indication' in Figure 155-10 '400GBASE-ZR PMA functional block diagram'.

Proposed Response

PROPOSED ACCEPT IN PRINCIPLE.

Review supporting presentation. For comment resolution group (CRG) consideration.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

264
Law, David
Hewlett Packard Enterprise
Comment Type E Comment Status D
Since subclause 155.3.2 only summarizes the primitives, a cross reference to where they are defined should be added.

SuggestedRemedy
Suggest that ‘The 400GBASE-ZR PMA service interface is provided ...’ should be changed to read ‘The 400GBASE-ZR PMA service interface (see 155.1.4.2) is provided ...’.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
‘The 400GBASE-ZR PMA service interface (see 155.1.4.2) is provided ...’

76
Law, David
Hewlett Packard Enterprise
Comment Type E Comment Status D
Since subclause 155.3.2 only summarizes the primitives, a cross reference to where they are defined should be added.

SuggestedRemedy
Suggest that ‘The 400GBASE-ZR PMA service interface is provided ...’ should be changed to read ‘The 400GBASE-ZR PMA service interface (see 155.1.4.2) is provided ...’.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
‘The 400GBASE-ZR PMA service interface (see 155.1.4.2) is provided ...’

76
Law, David
Hewlett Packard Enterprise
Comment Type E Comment Status D
Since subclause 155.3.2 only summarizes the primitives, a cross reference to where they are defined should be added.

SuggestedRemedy
Suggest that ‘The 400GBASE-ZR PMA service interface is provided ...’ should be changed to read ‘The 400GBASE-ZR PMA service interface (see 155.1.4.2) is provided ...’.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
‘The 400GBASE-ZR PMA service interface (see 155.1.4.2) is provided ...’

136
Nicholl, Gary
Cisco Systems
Comment Type T Comment Status D
Why is the approximate sign used in the term * (512/511) x (5485/5140) x (5488/5485) x (128/119) x ~50.212875 Gb/s ?20 ppm* . Isn't the nominal signalling rate known exactly ? I don't remember seeing the "approximate" sign used in other IEEE standards when referring to the nominal signalling rate?

SuggestedRemedy
This is more of a question of clarification ?

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Remove the +/- 20 ppm in two places.

Since we have an accurate optical line rate of 59.84375 GbD, we can express the PMA service interface rates as (28/29) x 59.84375 GbD = 57.780 172 413 793 1 GbD. After that it's all zeroes.

265
Law, David
Hewlett Packard Enterprise
Comment Type T Comment Status D
PMA service interface
Subclause 155.3.2 says ‘... sends eight parallel bit streams to the PMA, each at a nominal signaling rate of ...’. Since this is a signalling rate, the unit of measurement should be in Bd rather than Hz (see the following paragraph).

SuggestedRemedy
Suggest that ‘... ~50.212875 Gb/s +/-20 ppm (~57.78 Gb/s).’ should read ‘... ~50.212875 GbD +/-20 ppm (~57.78 GbD).’ (where +/- is a plus-minus symbol).

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Review supporting presentation. For comment resolution group (CRG) consideration.
<table>
<thead>
<tr>
<th>CI</th>
<th>SC</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.3.2</td>
<td>E</td>
<td>D</td>
<td>There is a rectangle to the right of the 'Carrier phase recovery', 'PMD equalizer' and 'chromatic dispersion equalizer' within the 400GBASE-ZR PMA sublayer box in Figure 155-10 '400GBASE-ZR PMA functional block diagram' that is unlabelled.</td>
<td>Either label the rectangle or delete it.</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. See response to comment 15.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CI</th>
<th>SC</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.3.2</td>
<td>E</td>
<td>D</td>
<td>Empty box without any function</td>
<td>Remove empty fbox from figure 155-10</td>
<td>PROPOSED ACCEPT.</td>
</tr>
</tbody>
</table>
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 155 SC 155.3.2 P 51 L 31 # 12

Lewis, Jon Dell Technologies

Comment Type E Comment Status D

Text and arrow intersect.

SuggestedRemedy
Remove intersection of text and arrow to make the figure more legible.

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 155 SC 155.3.2 P 51 L 31 # 385

Wienckowski, Natalie General Motors

Comment Type E Comment Status D

It's hard to see the text with the line through it.

SuggestedRemedy
Add a box around "400GBASE-ZR PMA sublayer" so the line is "behind" it.

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 155 SC 155.3.2 P 51 L 48 # 265

Law, David Hewlett Packard Enterprise

Comment Type E Comment Status D

Suggest that "... through a signal indication logic (SIL) that reports ..." should read "... through a signal indication logic (SIL) function that reports ...".

SuggestedRemedy
See comment.

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 155 SC 155.3.2 P 51 L 49 # 77

Ran, Adee Cisco

Comment Type T Comment Status D PMD:IS_SIGNAL

Signal health should not be "based on receipt of the PMD:IS_SIGNAL.indication from the 400GBASE-ZR PMD sublayer" because this indication is always OK.

SuggestedRemedy
Delete "receipt of the PMD:IS_SIGNAL.indication from the 400GBASE-ZR PMD sublayer,"
and the comma after "functions".

In Figure 155-10 delete PMD:IS_SIGNAL.indication as input to the SIL.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Delete "receipt of the PMD:IS_SIGNAL.indication from the 400GBASE-ZR PMD sublayer,"
and the comma after "functions".

In Figure 155-10 delete PMD:IS_SIGNAL.indication completely.

Cl 155 SC 155.3.2 P 51 L 49 # 77

Ran, Adee Cisco

Comment Type T Comment Status D PMD:IS_SIGNAL

Signal health should not be "based on receipt of the PMD:IS_SIGNAL.indication from the 400GBASE-ZR PMD sublayer" because this indication is always OK.

SuggestedRemedy
Delete "receipt of the PMD:IS_SIGNAL.indication from the 400GBASE-ZR PMD sublayer,"
and the comma after "functions".

In Figure 155-10 delete PMD:IS_SIGNAL.indication as input to the SIL.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Delete "receipt of the PMD:IS_SIGNAL.indication from the 400GBASE-ZR PMD sublayer,"
and the comma after "functions".

In Figure 155-10 delete PMD:IS_SIGNAL.indication completely.
Subclause 155.3.2 '400GBASE-ZR PMA service interface' says that 'The PMA:IS_SIGNAL.indication primitive is generated through a signal indication logic (SIL) that reports signal health based on receipt of the PMD:IS_SIGNAL.indication from the 400GBASE-ZR PMD sublayer, data being processed successfully by the signal processing functions, and symbols being sent to the PCS on all of the output lanes.' however subclause 156.5.4 'PMD global signal detect function' says that 'The PMD global signal detect function shall set the state of the SIGNAL_DETECT parameter to a fixed OK value.' and that 'The presence of a valid signal is determined only by the 400GBASE-ZR PCS (see 155.2.1.). In addition, subclause 155.2.1 says 'The PCS Synchronization process continually monitors PMA:IS_SIGNAL.indication[SIGNAL_OK]. When SIGNAL_OK indicates OK, then the PCS synchronization process accepts the streams of symbols via the PMA:IS_UNIDATA_i.indication primitive.'.

Based on the signal indication logic (SIL) contained in the PMA sublayer described in subclause 155.3.2, and subclause 155.2.1 describing only the use of the SIGNAL_DETECT parameter in the PCS sublayer, it doesn't seem correct to say in subclause 156.5.4 that a valid signal is determined only by the PCS sublayer. And based on subclause 156.5.4 setting the SIGNAL_DETECT parameter of the PMD:IS_SIGNAL.indication to a fixed 'OK' value, it doesn't seem correct to say that the SIL will report signal health based on the PMD:IS_SIGNAL.indication primitive since it is fixed.

**SuggestedRemedy**

Suggest that:

1. The PMD:IS_SIGNAL.indication primitive is disconnected from the SIL box in figure 155-10 and is shown as not used by the PMA sublayer.

2. In subclause 155.3.2 the text '.. reports signal health based on receipt of the PMD:IS_SIGNAL.indication from the 400GBASE-ZR PMD sublayer, data being processed successfully by the signal ..' be changed to read '.. reports signal health based on data being processed successfully by the signal ..'.

3. In subclause 155.5.4 the text 'The presence of a valid signal is determined only by the 400GBASE-ZR PCS (see 155.2.1.)' should be changed to read 'The presence of a valid signal is determined only by the SIL function in the PMA (see 155.3.2.)'.

**Proposed Response**

Proposed ACCEPT IN PRINCIPLE.

Review supporting presentation. For comment resolution group (CRG) consideration.

---

Law, David
Hewlett Packard Enterprise

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

**Proposed Response**: Review supporting presentation. For comment resolution group (CRG) consideration.

---

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

Huber, Thomas
Nokia

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

Dawe, Piers
Nvidia

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

I don't see any loopback here. The only test signal comes from the PCS.

**SuggestedRemedy**

Delete "and optionally to provide test signals and loop-back"

**Proposed Response**: PROPOSED ACCEPT.
Subclause 155.3.3 'Functions within the PMA' says 'The purpose of the PMA is to ... and optionally to provide test signals and loop-back.'.

There, however, doesn't appear to be any subclauses under subclause 155.3 'Physical Medium Attachment (PMA) sublayer, type 400GBASE-ZR' that define test signals or loop-back.

SuggestedRemedy

Either add definitions defining test signals and loop back within the PMA or remove this text from subclause 155.3.3.

PROPOSED ACCEPT IN PRINCIPLE.
Review supporting presentation. For comment resolution group (CRG) consideration.

In the rest of 802.3, loopback is not hyphenated

SuggestedRemedy

Change loop-back to loopback

ACCEPT.

It is not clear how the "Gray-coded symbol" defined here is used in the remainder of the process - the subsequent DP-16QAM mapping is defined in terms of bits, not symbols.

SuggestedRemedy

Consider defining the Gray code mapping as a function from bit-pairs to bit-pairs, instead of the set {-3, -1, +1, +3}, or removing it completely since it is embedded in the mapping defined in Table 155-2.

PROPOSED ACCEPT IN PRINCIPLE.
Move the last sentence of 155.3.3.1 to the beginning, and remove the next two paragraphs.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 155 SC 155.3.3.1 P 52 L 20 # 79
Ran, Adee Cisco
Comment Type E Comment Status A bucket
"Gray-coded signals" should be "Gray-coded symbols".
SuggestedRemedy
Per comment
Response Response Status C ACCEPT.

Cl 155 SC 155.3.3.1 P 52 L 27 # 80
Dawe, Piers Nvidia
Comment Type TR Comment Status D PMA description
This says the PMA does Gray de-mapping then it says it doesn't the PCS does it.
SuggestedRemedy
Remove lines 20-25, add apprpriate material to PCS section.
Proposed Response Response Status W PROPOSED ACCEPT IN PRINCIPLE.
See response to comment 80.

Cl 155 SC 155.3.3.1 P 52 L 20 # 79
Ran, Adee Cisco
Comment Type T Comment Status D Gray mapping
"Note that the receive process mapping of Gray-coded signals is applicable only after the SD-FEC decoder process in the 400GBASE-ZR PCS"
This means that the Gray de-mapping function is not part of the PMA but part of the PCS; indeed, the service interface of the PMA is based on ADC samples, not bits, and the Gray de-mapping does not appear in Figure 155-10, because it cannot be performed until SD-FEC decoding (in the PCS) is completed.
Similarly, the Gray mapping in the Tx direction logically belongs in the PCS, because its output is Gray-coded symbols.
SuggestedRemedy
Possibly, move the content of the Gray mapping function to the PCS (retaining the polarization distribution in the PMA).
Or find another way to cleanly separate these functions.
Proposed Response Response Status W PROPOSED ACCEPT IN PRINCIPLE.
Remove "gray mapping" from Figure 155-10.
Change the title of 155.3.1 to Polarization distribution.
Move the gray mapping description in the first 3 paragraphs of 155.3.3.1 to new subclauses in 155.2.4 (transmit) and 155.2.5 (receive).
"The received symbol signals are digitized into more than 4 discrete levels by the analog to
digital converters (ADC) in the PMA sublayer and the number of bits for each signal is m/4
bits." This is a description of an implementation and is inappropriate for an interoperability
standard. If some description is needed, one could rewrite this more generally, as is
suggested in the remedy. Further, it appears that the "m/4 bits" is a detail that is unused in
the draft (I searched). If it is used somewhere, please provide a pointer to where it is
relevant. Otherwise delete the unnecessary detail which looks like a specification but isn't.

SuggestedRemedy
Preferably - delete the indicated sentence.
Alternatively, change the indicated sentence to read "The received symbol signals are
sampled and quantized in the PMA sublayer." If the m/4 bits is used somewhere, provide a reference.

Proposed Response
PROPOSED ACCEPT IN PRINCIPLES
Delete the sentence starting "The received symbol signals are..

Comment Type: TR  Comment Status: D  rewrite bucket

The terms 'DP-16QAM symbol' (e.g., page 52, line 32 and line 48), 'Gray-coded signals'
(e.g., page 52, line 44) and 'Gray mapped' symbols (e.g., page 54, line 29) seem to be
used interchangeably in the subclauses of 155.3.3 'Functions within the PMA'. For example, subclause 155.3.3.2 Symbol interleaving' says 'The DP-16QAM symbols are time
interleaved ...' yet the following subclause 155.3.3.3 'Insert FAW, TS and PS symbols'
says '...the stream of Gray mapped, interleaved symbols are ...': It, however, appears the
'symbols' in both cases are the same.

SuggestedRemedy
Suggest that a consistent terminology should be used for DP-16QAM symbols.

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.
Need a contribution with proposed terminology.

Comment Type: ER  Comment Status: D  Symbol distribution

"Each 128-bit code word from the SD-FEC encoder c = [c0, c1,...c127], is mapped to
sixteen DP-16QAM symbols (S)"

Does the PMA have to be aligned with the SD-FEC encoder codewords?
If so, the alignment function is not defined; it may be more appropriate to define the service
interface in the Tx direction in terms of 128-bit codewords instead of bits on 8 lanes, such
that the alignment is inherent.
If not, please clarify that the 128-bit blocks start point within the SD-FEC codeword is
arbitrary.
A similar question holds for the Rx direction (based on the text in 155.3.3.8) - is the
alignment of SD-FEC defined as a PMA function or a PCS function?

SuggestedRemedy
From 155.3.3.2 it seems that alignment is necessary, so the service interface should be
defined with 128-element vectors (instead of lanes), and perhaps use tx_word instead of
br_symbol and rx_word instead of rx_symbol.

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.
Good idea - but this would require a contribution to work out the details of what to change
in the draft.

Comment Type: ER  Comment Status: D
The terms '128-bit code word' (e.g., page 52, line 32), 'FEC codeword' (e.g., page 52, line
44), SD-FEC codewords (e.g., page 53, line 36), 'Hamming code words' (e.g., page 52, line
53), and just 'code word' (page 53, line 32) seem to be used interchangeably to describe
the 128-bit code word that is passed across the 8 lane PMA service interface to the PMA
sublayer as 16 groups of 8

SuggestedRemedy
Suggest that the term 'SD-FEC codeword' be used consistently in subclause 155.3.3 to
describe the 128-bit code word that is passed across the 8 lane PMA service interface.

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.
Review supporting presentation. For comment resolution group (CRG) consideration.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>PMA description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>D</td>
<td>Doesn't the symbol interleaving operate on groups of sixteen DP-16QAM symbols, mapped from the 128-bit SD-FEC codewords passed across the PMA service interface, as described in subclause 155.3.3.1.</td>
</tr>
</tbody>
</table>

**SuggestedRemedy**
Suggest that the text 'The symbol interleaver performs an 8-way interleaving of symbols from Hamming code words ...' be changed to read 'The symbol interleaver performs an 8-way interleaving of groups of sixteen symbols mapped from SD-FEC codewords ...'.

**Proposed Response**
PROPOSED ACCEPT IN PRINCIPLE.

Review supporting presentation. For comment resolution group (CRG) consideration.

<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>PMA description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>D</td>
<td>On page 52, line 54, the symbol number is in normal font whereas it is in subscript font in the remainder of subclause 155.3.3.2.</td>
</tr>
</tbody>
</table>

**SuggestedRemedy**
Suggest that, based on page 52, line 54, the symbol number should be in normal rather than subscript font in the rest of the subclause to make it clear the two numbers following 'S' separated by a comma are the code word number followed by the symbol number in the code word. Alternatively, perhaps it should be stated that two numbers following 'S' separated by a comma are the code word number followed by the symbol number in the code word.

**Proposed Response**
PROPOSED ACCEPT.

<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>PMA description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR</td>
<td>D</td>
<td>The intended interleaving is that first symbol of each of 16 codewords is transmitted, then the second symbol, etc. The example is not consistent with that - S(1,1) should follow S(0,1) rather than S(0,2) as seen in figure 155-11.</td>
</tr>
</tbody>
</table>

**SuggestedRemedy**
Change S0,2 to S1,1

**Proposed Response**
PROPOSED ACCEPT.

<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>PMA description</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>D</td>
<td>There is a horizontal line missing between the second and third sets of symbols in Figure 155-11</td>
</tr>
</tbody>
</table>

**SuggestedRemedy**
Add the missing line

**Proposed Response**
PROPOSED ACCEPT IN PRINCIPLE.

The gap is intentional because there are only 5 of 8 sets of symbols shown in the Figure.

Add a dashed line to join the left-hand output of S6,0 to the right-hand input of S2,15.
There is no specification of how the output from PAM symbol interleaving function is mapped into the payload fields of the sub-frame of a super-frame.  

SuggestedRemedy
Add a subclause to describe how the output of the PAM symbol interleaving function is mapped into the payload fields of the sub-frame of a super-frame.

Proposed Response  
PROPOSED ACCEPT IN PRINCIPLE.

Figure 155-12 shows the positions of the 175,616 payload symbols m<0:175,615> in the transmission sub-frames. However, as the comment says, there is no information on mapping between the interleaver and the payload symbols.

Add a description saying that the first 128 symbols from the interleaver are mapped directly to the first 128 positions of the payload symbols:

interleaver output is S0,0 S1,0 .. S6,15 S7,15  
maps to: m<0:127>.

The next 128 interleaver output symbols map to m<128:255>, etc.

With editorial license.

The second paragraph of subclause 155.3.3.3 'Insert FAW, TS and PS symbols' however says 'the first sub-frame of a super-frame includes ... 76 reserved symbols (rsvd<0:75>) ...'. However, there is no specification of what 16QAM symbol should be transmitted for these reserved symbols.

SuggestedRemedy
Define the 16QAM symbol to be transmitted for these 76 reserved symbols.

Proposed Response  
PROPOSED ACCEPT IN PRINCIPLE.

The sentence states "Each super-frame is made up of 49 sub-frames. .*. This is unusual terminology as a super-frame (or multi-frame) is usually made of n frames (and not -sub-frames). This also begs the question as to why "super-frame" is used instead of the more usual "multi-frame"

SuggestedRemedy
Propose changing "super-frame" to "multi-frame" and "sub-frame" to "frame" throughout this section. An alternative would be to use "frame" and "sub-frame".

Proposed Response  
PROPOSED ACCEPT IN PRINCIPLE.

Change: "super-frame" to "multi-frame" and "sub-frame" to "frame" throughout 155.3.3.3

Define the 16QAM symbol to be transmitted for these 76 reserved symbols.

Proposed Response  
PROPOSED ACCEPT IN PRINCIPLE.

The OIF 400ZR IA says "These symbols should be randomized to avoid strong tones. These symbols should be selected from 16QAM modulation." 

For Ethernet we need to define what the sequence shall be for these 76 reserved symbols. A contribution is needed.
The contents of the sub-frame 0 between P4 and P115, and sub-frame 1 and 48 between P2 and P115, are not defined in Figure 155-12.

For sub-frame 0, the number of symbols shown in Figure 155-12 after P0, P1, P2, P3 and P115 is 31. A sub-frame is 3712 symbols long, and there are 116 PS symbols, and since 3712/32 = 116 it seems reasonable to assume that there are 31 symbols after every PS symbol for sub-frame 0, but this needs to be specified.

For sub-frame 1, the number of symbols shown in Figure 155-12 after P0 is 31, after P1 it is 32. Similarly, for sub-frame 48, the number of symbols shown in Figure 155-12 after P0 is 42, after P1 is 31, and after P115 it is 32. It is therefore difficult to make an assumption about the number of symbols after each PS between P2 and P115, so this needs to be specified.

Suggested Remedy
Specify the contents of the sub-frame 0 between P4 and P115, and sub-frame 1 and 48 between P2 and P115.

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.

Add a caption between P4 and P115 of sub-frame 0: "repeating sequence of 31 payload symbols from the set m<16:3456> and 1 pilot symbol from the set P5 to P114".

Add a caption between P2 and P115 of sub-frame 1: "repeating sequence of 31 payload symbols from the set m<3540:7042> and 1 pilot symbol from the set P3 to P114".

Correct the payload after P115 of sub-frame 1 from "m<7042:7073>" to "m<7043:7073>".

Correct the payload before P1 of sub-frame 48 from "m<172 030:172 061>" to "m<172 030:172 050>".

Correct the payload between P1 and P2 of sub-frame 48 from "m<172 062:172 093>" to "m<172 051:172 081>".

Correct the payload after P115 of sub-frame 48 from "m<175 584:175 615>" to "m<175 585:175 615>".

Add a caption between P2 and P115 of sub-frame 48: "repeating sequence of 31 payload symbols from the set m<172 082:175 583> and 1 pilot symbol from the set P3 to P114".

The third paragraph of subclause 155.3.3.3 'Insert FAW, TS and PS symbols' says that 'The next 48 sub-frames of the super-frame have an 11-symbol TS (ts<0:10>), 116 PS symbols [P0,...,P115], and 3586 payload symbols.' which seems to imply that sub-frames 1 through 48 are all the same formats. Figure 155-12, however, shows 31 symbols after P0 for sub-frame 1, yet 42 symbols after P0 for sub-frame 48. Similarly, Figure 155-12 shows 31 symbols after P1 for sub-frame 1, yet 32 symbols after P1 for sub-frame 48. And if sub-frame 1 and sub-frame 48 are different formats, what are the formats for sub-frames 2 through 47.

The 31 symbols after P0 shown for sub-frame 1 in Figure 155-12 are ts<0:10>, but P0 overlaps ts<0>, so this is 10 bits, followed by m<3488:3508> which is 21 bits resulting in a total of 31 bits. The 42 symbols after P0 shown for sub-frame 48 in Figure 155-12 are ts<0:10>, but P0 overlaps ts<0>, so this is 10 bits, followed by m<172 030:172 061> which is 32 bits, resulting in a total of 42 bits. The 31 symbols after P1 shown for sub-frame 1 in Figure 155-12 are m<3509:3539>, the 32 symbols after P1 shown for sub-frame 48 in Figure 155-12 are m<172 062:172 093>.

Suggested Remedy
If sub-frames 1 through 48 are not the same format, specify which sub-frames are in what format. If they are in the same format, correct the figure to show the correct number of bits.

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.

Sub-frames 1 through 48 are the same format. See the response to comment 244, which corrects the length of the payload before P1 in sub-frame 48 of Figure 115-12.

The fourth paragraph of 155.3.3.3 mentions that the first symbol of TS, i.e., ts<0> has the same value as the corresponding PS symbol, i.e., P0, for each polarization and is counted as a pilot symbol.

In order to emphasize this fact, move the 4th paragraph to after the first paragraph.

After the paragraph that starts "The first sub-frame.", add a new sentence: "Note that ts<0> and P0 are a single symbol, resulting in a count of 3712 symbols for the first sub-frame."

After the paragraph that starts "The next 48 sub-frames.", add a new sentence: "Note that ts<0> and P0 are a single symbol, resulting in a count of 3712 symbols for each of the next 48 sub-frames."
While sub-frames 1 and 48 are annotated with 3 and 0 in P0, sub-frames 0 doesn't have this annotation. In addition, it isn't clear what the 3 to 0 signifies, perhaps that each DP-16QAM symbol has four components, but subclause 155.3.3.3 (page 54, line 29) says 'For each polarization, the stream of Gray mapped, interleaved symbols are assembled into a frame format suitable for transmission over ...' which seems to imply a separate frame for each polarization.

**Suggested Remedy**

Either remove the 3 to 0 annotation for sub-frames 1 and 48 or add to sub-frames 0 and define the meaning.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

Remove the 3 to 0 annotation.

Change the Figure title to:

"Per polarization transmission frame and sub-frame..."

---

**Comment Type:** T  **Comment Status:** D  **DSP frame**

Subclause 155.3.3.3 'Insert FAW, TS and PS symbols' says 'The super-frame and sub-frame formats are shown in Figure 155-12,' however the title of Figure 155-12 'Transmission frame and sub-frame organization and bit ordering' and there doesn't seem to be any illustration of a super-frame.

**Suggested Remedy**

[1] Suggest the title of Figure 155-12 be changed to read 'Super-frame and sub-frame organization and bit ordering'.

[2] Suggest that the transmission order of the sub-frame and sub-frames to from a super-frame be added to the figure.

**Proposed Response**

PROPOSED ACCEPT.

---

**Comment Type:** T  **Comment Status:** D  **Table 155-6-PS split table (not properly indicated). Also Table 155-6-PS**

The PS is a fixed PRBS10 sequence mapped to 16QAM symbols with different seed values for X and Y polarizations. The generator for the pilot sequence is shown in Figure 155-13.

Is it two separate PRBS sequences with different seeds?

Also it is unclear how bits are mapped to the I and Q values in Table 155-6.

**Suggested Remedy**

Rewrite to clarify.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

Split Table 155-6 into two tables, one for the X polarization PS, and one for the Y polarization PS. Include the values for li and qi in the X polarization table. Include the values for ly and qy in the Y polarization table.
Comment Type T Comment Status D PS generator
Subclause 155.3.3.3 'Pilot sequence (PS)' says that 'The seed is reset at the start of every sub-frame ...'. Isn't it the generator that is reset at the start of every sub-frame using the seed value?

Suggested Remedy
Suggest that the text 'The seed is reset at the start of every sub-frame, so that the same ...' be changed to read 'The generator is initialized using the seed at the start of every sub-frame, so that the same ...'.

Proposed Response PROPOSED ACCEPT.

Comment Type TR Comment Status D PS generator
There is no specification of how the PRBS10 sequence is mapped to 16QAM symbols. From review of Table 155-6 it appears that the generator in Figure 155-13 is used to produce 232 bits. The even bits are mapped to the in-phase component of the 16QAM symbol, odd bits mapped to the quadrature-phase component of the 16QAM symbol, with a 0 mapped to a '-3' and a 1 mapped to a '+3'.

Suggested Remedy
Suggest that the second paragraph of subclause 155.3.3.3.3 be changed to read:

The seed is reset at the start of every sub-frame, so that the same 116 symbols, \([P_0, \ldots, P_{115}]\) are inserted into every sub-frame of the same polarization. For each polarization \(X\) and \(Y\), the generator produces 232 bits \(\text{PRBS}[231:0]\) that are mapped to 116 16QAM symbols, \([P_0, \ldots, P_{115}]\) where for \(i = 0\) to \(115\),

- \(\text{PSBR}[2i]\) maps to the in-phase (I) component of the 16QAM symbol \([P_i]\) for the respective polarization
- \(\text{PSBR}[2i+1]\) maps to the quadrature-phase (Q) component of the 16QAM symbol \([P_i]\) for the respective polarization

and where,

- 0 maps to -3 for the respective 16QAM symbol component
- 1 maps to +3 for the respective 16QAM symbol component

The generator polynomial and seed values are listed in Table 155-6 and the complete PS sequence is shown in Table 155-6.

Proposed Response PROPOSED ACCEPT IN PRINCIPLE.

The description of the mapping is correct. Implement the suggested remedy but also see the response to comment 82.
Comment Type E  Comment Status A
Since the abbreviation 'PS' is 'pilot sequence' the text '... PS sequence ...' expands to '... pilot sequence sequence ...'.

SuggestedRemedy
Suggest the text '... the complete PS sequence is ...' be changed to read '... the complete PS is ...'.

Response Response Status C
ACCEPT.

Comment Type E  Comment Status D
Add an arrow head to the line from P8, P4 and P3 where they connect to the XOR logic operator symbol.

SuggestedRemedy
See comment.

Proposed Response Response Status W
PROPOSED ACCEPT.

Comment Type E  Comment Status D
Missing arrowheads on 3 vertical paths

SuggestedRemedy
Add them

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
See response to comment 275.

Comment Type E  Comment Status D
There appear to be two separate tables number 155-6, the first labelled 'Table 155-5-PS generator polynomial and seed values', the second labelled 'Table 155-6-PS'.

SuggestedRemedy
[1] Suggest that the second Table 155-6 'PS' be renumbered to be 155-7, with subsequent tables renumbered, and its title should be
[2] Suggest that the title of the second Table 155-6 should be changed from 'PS' to read 'Pilot sequence'.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
See response to comment 82.

Change title of both PS tables to spell out "pilot sequence".

Comment Type T  Comment Status D  PMA description
The title of subclause 155.3.3.4 is '16QAM encode and signal drivers' however I don't think IEEE P802.3cw specifies a physical instantiation of the PMD service interface, and I don't see any text related to signal drivers in subclause 155.3.3.4. Perhaps it would be better to reference the DAC (see Figure 155-10) to parallel the title of subclause 155.3.3.5 below.

SuggestedRemedy
Suggest that the title of subclause 155.3.3.4 is changed to read '16QAM encode and DAC'.

Proposed Response Response Status W
PROPOSED ACCEPT.
The first sentence states "On each polarization, the stream of symbols is converted to four analog signals per symbol: IX, QX, IY, and QY,...". This makes it sound like that they are four analog signals per symbol per polarization (making 8 in total).

I thought IX and QX formed one 16QAM symbol on one polarization (the X polarization) and IY and QY formed one 16QAM symbol for the other polarization (the Y polarization).

Suggested Remedy
Rewrite the text to make it clear that there are not four analog signals (IX, QX, IY, QY) for each polarization (which would mean 8 analog signals in total), but instead there are two analog signals (IX, QX) per symbol for the X polarization and two analog signals (IY, QY) per symbol for the Y polarization.

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.

Change:
"On each polarization, the stream of symbols is converted to two analog signals per symbol: IX and QX for the X polarization, and IY and QY for the Y polarization. Mapping of binary values to the analog signals is according to the mapping in Table 155-2."

D'Ambrosia, John
Fuaturewei, US Subsidiary of Huawei

The title says "Symbol mapping to physical lanes", but in the text it is "coherent signal to physical lane mappings".

The conversion of symbols to signals is done in the PMD.

Suggested Remedy
Change "All of the coherent signal to physical lane mappings" to "All options for symbol mapping to physical lanes". Change Table 155-7 title accordingly.

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.

Review supporting presentation. For comment resolution group (CRG) consideration.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

CI 155 SC 155.3.3.5 P 58 L 45 # 341
Zimmerman, George CME Consulting/APL Group, Cisco, Commscope, Ma

Comment Type TR Comment Status D PMA description
"The signals are sampled by an ADC on each lane at a sampling rate." "The details of the ADC are implementation specific." This is a description of an implementation, not appropriate for an interoperability specification. If someone could do the signal processing optically, analog, or by magic, it would still comply with the standard. The fact that an ADC is used, isn't a part of the interoperability standard, or even any of the characteristics of the ADC. Hence the mention is inappropriate and should be deleted. The sentence works just fine anyways and describes the processing without the "by an ADC".

SuggestedRemedy
Change header of 155.3.5 to Receive signal sampling. On line 50, Delete "by an ADC" Change line 54 to "The details of the sampling, including any quantization and the chosen sampling rate are implementation specific." Replace "ADC" with "Sampler" in figure 155-10.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

For CRG discussion.

CI 155 SC 155.3.3.5 P 58 L 47 # 84
Zimmerman, George CME Consulting/APL Group, Cisco, Commscope, Ma

Comment Type TR Comment Status D Received signals
"The encoding of 16QAM symbols is based on Table 155-2" This table does not define any encoding of input symbols - it defines mapping of bits tuples to output symbols.

but with a higher resolution than 4 bits

Resolution is for the digital representation of each analog value. The resolution here should be more than two bits (per dimension). The resolution seems to be left open to implementation.

This should be written more clearly. The suggested remedy is my attempt, but other text may be used.

SuggestedRemedy
Change from "The encoding of 16QAM symbols is based on Table 155-2 but with a higher resolution than 4 bits to enable the SD-FEC decoder to detect and correct symbol errors" to "The 16QAM symbols should be sampled with more than two bits per dimension, to enable the SD-FEC decoder to correct errors and recover the bits from the symbols based on the mapping in Table 155-2".

Proposed Response Response Status W
PROPOSED ACCEPT.
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Response Status</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.3.3.6</td>
<td>E</td>
<td>A</td>
<td>The hyphen in &quot;-12&quot; should be an en-dash (or minus sign).</td>
<td>bucket</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>155</td>
<td>155.3.3.7</td>
<td>E</td>
<td>A</td>
<td>Suggest that ‘... frames with minimum interpacket ...’ should read ‘... frames with a minimum interpacket ...’.</td>
<td>bucket</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>155</td>
<td>155.3.3.7</td>
<td>E</td>
<td>A</td>
<td>Subclause 155.3.3.6 ‘Receive signal processing’ says ‘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 additionally processed according to this clause.’. It’s not clear what the additionally processed is in reference to as there is no other processing referenced.</td>
<td>bucket</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>155</td>
<td>155.4.2</td>
<td>E</td>
<td>A</td>
<td>The subclause hierarchy below &quot;State variables&quot; is unnecessary, and includes subclauses that are not about state variables (155.4.2.2 through 155.4.2.4)</td>
<td>bucket</td>
<td>ACCEPT.</td>
</tr>
</tbody>
</table>

---

Comment: *comprising sixteen symbols encoded as shown in Table 155-2 but at a higher resolution than 8 bits*

SD-FEC codewords are by definition 128 bits; and table 155-2 shows mapping of bit tuples into output symbols.

Also, according to the next paragraph, the output of the process is a single stream of samples, not codewords.

This text seems to specify that the input to the decoder should be four streams of samples (combinations of X/Y and I/Q) with more than two bits per sample.

**Suggested Remedy**

Rewrite to clarify.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

**Change:**

"The message symbols from the X and Y polarization streams are combined to form SD-FEC codewords comprising sixteen symbols encoded as shown in Table 155-2 but at a higher resolution than 8 bits in order to aid the SD-FEC error detection and correction process."

...to:

"The digitized signals from the X and Y polarization streams are combined to form an input codeword for the SD-FEC decoder. The codeword is extracted from sixteen consecutive DP-16QAM symbols encoded at a higher resolution than as shown in Table 155-2 in order to aid the SD-FEC error detection and correction process."

---

**Proposed Response**

PROPOSED ACCEPT.
**IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments**

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>Page</th>
<th>Line</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Proposed Response</th>
<th>Response Status</th>
<th>Suggested Remedy</th>
<th>Comment Status</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.4.2.1</td>
<td>60</td>
<td>26</td>
<td>T</td>
<td>D</td>
<td>pma_align_status</td>
<td>Assuming this is a boolean variable, suggest this should be noted in the variable description, as with other boolean variables.</td>
<td>PROPOSED ACCEPT.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.4.2.1</td>
<td>60</td>
<td>29</td>
<td>T</td>
<td>D</td>
<td>pma_enable_deskew</td>
<td>The description of the 'pma_enable_deskew' variable says 'A boolean variable that enables and disables the PMA deskew process.' Is this correct as 'pma_enable_deskew' is an output of the Figure 155 'PMA deskew state diagram' that doesn't appear to be used anywhere else.</td>
<td>PROPOSED ACCEPT.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>155.4.2.1</td>
<td>60</td>
<td>30</td>
<td>E</td>
<td>A</td>
<td>bucket</td>
<td>Since Boolean is named after George Boole, I believe that it should always be Boolean (and not boolean).</td>
<td>ACCEPT.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comment Type**
- **T**: Trivial
- **E**: Editorial
- **D**: Design

**SORT ORDER**: Clause, Subclause, page, line

**COMMENT STATUS**: D/dispatched A/accepted R/rejected

**RESPONSE STATUS**: O/open W/written C/closed U/unsatisfied Z/withdrawn

**Page 76 of 128**

**10/18/2022 12:41:16 P**
The description of the 'reset' variable says that it is 'A boolean variable that controls the resetting of the PCS and PMA sublayers' and that 'It is true whenever a reset is necessary including when reset is initiated from the MDIO ... and when the MDIO has put the PCS and PMA sublayers into low-power mode.'.

The PMA and PCS are separate MMDs (see Table 45-1). The PMA/PMD reset bit is 1.0.15 and the low power bit is 1.0.11, both found in PMA/PMD control 1 register. The PCS reset bit is 3.0.15 and the low power bit is 3.0.11, both found in the PCS control 1 register. Since these registers are in separate MMDs, and since their state is not communicate across the PMA service interface, the PMA and PCS resets can operate independently.

SuggestedRemedy

1. Rename the 'reset' variable used in Figure 155-14 'Frame alignment word (FAW) lock state diagram' to be 'pma_reset'.

2. Rename the 'reset' variable used in Figure 155-15 'PMA deskew state diagram' to be 'pma_reset'.

3. Rename the 'reset' variable used in Figure 155-16 'Alignment marker lock state diagram' to be 'pcs_reset'.

4. Rename the 'reset' variable defined in subclause 155.4.2.1 'Variables' to be 'pma_reset' and change the description to read 'A Boolean variable that controls the resetting of the PMA sublayer. It is true whenever a reset is necessary including when reset is initiated from the MDIO, during power on, and when the MDIO has put the PMA sublayer into low-power mode.

5. Add a definition of the 'pcs_reset' variable to subclause 155.4.2.1 'Variables' with the description 'A Boolean variable that controls the resetting of the PCS sublayer. It is true whenever a reset is necessary including when reset is initiated from the MDIO, during power on, and when the MDIO has put the PCS sublayer into low-power mode.

Proposed Response

PROPOSED ACCEPT IN PRINCIPLE.

Review supporting presentation. For comment resolution group (CGR) consideration.

Subclause 155.4.2.1 'Variables' says 'The PMA:IS_SIGNAL.indication primitive is generated through a signal indication logic (SIL) that reports signal health based on ... symbols being sent to the PCS on all of the output lanes.' The SIGNAL_OK parameter of the PMA:IS_SIGNAL.indication primitive is, however, used to derive the signal_ok variable (page 60, line 45) which is used as an 'open arrow' entry condition to the 'LOCK_INIT' state of the Figure 155-14 Frame alignment word (FAW) lock state diagram.

As a result, it appears that if the SIGNAL_OK parameter is ever set to FAIL, setting 'signal_ok' to FALSE, the figure 155-14 Frame alignment word (FAW) lock state diagram will enter the 'LOCK_INIT' state. I assume this will mean that symbols will not be sent to the PCS since the PMA will not have FAW alignment. This in turn will mean the condition 'symbols being sent to the PCS' for the SIL to set the SIGNAL_OK parameter to OK will not be met.

The PMA will then be locked in this condition permanently. The SIL cannot set the SIGNAL_OK parameter to OK until symbols are sent to the PCS. Yet symbols won't be sent to the PCS until the SIGNAL_OK parameter is set to OK.

SuggestedRemedy

Please clarify the operation of the signal indication logic. Suggest, based on Figure 155-10, and the dotted line from the 'Carrier phase recovery block to the SIL, that the 'signal_ok' variable used by the Frame alignment word (FAW) lock state diagram should be based on the status of the blocks below the 'Pilot removal' blocks while the SIGNAL_OK parameter sent to the PCS should also use the FAW alignment status.

See also my other comment suggest separate 'pma_signal_ok' and 'pcs_signal_ok' variables.

Proposed Response

PROPOSED ACCEPT IN PRINCIPLE.

At 155.3.2, change the 5th paragraph from:

"The PMA:IS_SIGNAL.indication primitive is generated through a signal indication logic (SIL) that reports signal health based on receipt of the PMD:IS_SIGNAL.indication from the 400GBASE-ZR PMD sublayer, data being processed successfully by the signal processing functions, and symbols being sent to the PCS on all of the output lanes. When these conditions are met, the SIGNAL_OK parameter sent to the PCS via the PMA:IS_SIGNAL.indication primitive has the value OK. Otherwise, the SIGNAL_OK primitive has the value FAIL."

to:

"The PMA:IS_SIGNAL.indication primitive is generated by all of the signal processing below the pilot removal blocks in Figure 155-10 through a signal indication logic (SIL)."
Signal health is based on data being processed successfully by the signal processing functions. When these conditions are met, the SIGNAL_OK parameter sent to the PCS via the PMA:IS_SIGNAL.indication primitive has the value OK. Otherwise, the SIGNAL_OK primitive has the value FAIL.

The description of the 'signal.ok' variable says 'A boolean variable that is set based on the most recently received value of PMA:IS_SIGNAL.indication(SIGNAL_OK).’ however that is generated by the PMA, see last paragraph of subclause 155.3.2 400GBASE-ZR ‘PMA service interface’.

[SuggestedRemedy]

1. Rename the 'signal.ok' variable used in Figure 155-14 'Frame alignment word (FAW) lock state diagram' to be 'pma_signal_ok'.

2. Rename the 'signal.ok' variable used in Figure 155-16 'Alignment marker lock state diagram' to be 'pcs_signal_ok'.

3. Rename the 'signal.ok' variable defined in subclause 155.4.2.1 'Variables' to be 'pcs_signal_ok' and change the description to read 'A Boolean variable that is set based on the most recently received SIGNAL_OK parameter of the PMA:IS_SIGNAL.indication primitive. It is true if the value was OK and false if the value was FAIL'.

4. Add a new variable 'pma_signal_ok' with the description 'A Boolean variable that is set by the signal indication logic (see 155.3.2.). It is true when symbols received from the PMD are being processed successfully by the signal processing, false otherwise.

Proposed Response: PROPOSED ACCEPT.

-----

Definition of variable "faws_lock<x>". A number of issues here. Firstly the text states that "...receiver has detected the location of the FAW for a given lane on the PMA service interface.". There is no "FAW" on the "PMA service interface" (i.e. the interface above the PMA sublayer) as the FAW is inserted/removed by the PMA sublayer itself. I think what is meant here is the "PMD service interface" and not the "PMA service interface"? Secondly the description states "...where x=0:3". This suggests that there are four separate FAWs being locked to, whereas according to section 155.3.3.3 and Figure 155-10 there is only a single FAWs inserted per polarization, so one FAW for X polarization and one FAW for Y polarization.

[SuggestedRemedy]

Correct the reference to the PMD service interface (if the assumption in the comment is correct) and explain why there are 4 "faws_lock<x>" boolean variables when according to section 155.3.3.3 there are only two FAWs (one for X polarization and one for Y polarization)

Proposed Response: PROPOSED ACCEPT IN PRINCIPLE.

Change:
"A boolean variable that is set to true when the receiver has detected the location of the FAW for a given lane on the PMA service interface, where x = 0:3."

if:
"A Boolean variable that is set to true when the receiver has detected the location of the FAW for a given lane on the PMD service interface, where x = 0:1. There are two FAWs, one for the X and one for the Y polarization, as listed in Table 155-3."

-----

Definition of "faw_valid". The references to "Table 153-3" and section "155.3.3.3.1" are not active cross-references.

[SuggestedRemedy]

Correct cross-references.

Proposed Response: PROPOSED ACCEPT.
The description of the 'faw_valid' variable says 'The FAW consists of one of the sequences listed in Table 155-3.' but then 'The sequence is considered to be valid if at least 36 bits match the 44 known bits of the FAW pattern described in 155.3.3.3.1.' The sequence listed in Table 155-3, and the candidate sequences received over the PMD service interface, are both 22 DP-16QAM symbols, not 44 bits. Based on slide 4 of the contribution 'faw_valid analysis' from Mike Sluyski (https://www.ieee802.org/3/cw/public/22_0523/sluyski_3cw_01a_220523.pdf#page=4) referencing a QPSK FAW value of 44 in the spreadsheet, I assume the reference to 36 bits matching the 44 known bits should be to 36 16QAM symbols matching the 44 16QAM symbols (which form the 22 DP-16QAM symbol FAW sequence), defined in Table 155-3.

Additionally, isn’t it the case that the four components of the DP-16QAM symbols of the candidate 22 symbol block received over the four-lane PMD service interface can be mapped to the four lanes in any of eight ways defined in Table 155-7? If that is the case, suggest that this is also addressed in the description of the 'faw_valid' variable.

**Suggested Remedy**

Suggest that the 'faw_valid' variable description should be changed to read:

A Boolean variable that is set to true if the candidate 22 DP-16QAM symbol block received over the four-lane PMD service interface is a valid FAW sequence. The candidate 22 DP-16QAM symbol block is compared to the FAW sequence defined in Table 155-3, considering all permitted PMD service interface lanes mappings defined in Table 155-7. The candidate 22 DP-16QAM symbol block is considered to be a valid FAW sequence if at least 36 of its component 16QAM symbols match, in value, sequence position, and the 44 known 16QAM symbols of the FAW sequence defined in Table 155-3.

**Proposed Response**

PROPOSED ACCEPT.

The definition of the 'faw_valid' variable says '... set to true if the received 22-symbol block is a valid FAW.' According to the super-frame format defined in subclause 155.3.3.3 the 22 FAW symbols are transmitted over a total of 23 symbols, as Pilot Sequence index P1 is inserted between the symbols faw<20> and faw<21> (see figure 155-12). As a result, a valid FAW will never be found in a received 22-symbol block, only in a received 23-symbol block after the 22nd symbol is deleted.

**Suggested Remedy**

If needed, clarify the definition of the 'faw_valid' variable to account for the P1 symbol inserted between the faw<20> and faw<21> symbols.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE

See response to comment 287. Add a new sentence after the first sentence of the proposed resolution from comment 287.

"The candidate 22 DP-16QAM symbol block is extracted from a sequence of 23 symbols, noting that there is a pilot symbol, P1, between the 21st and 22nd symbol of the FAW sequence as shown in Figure 155-12."

**Suggested Remedy**

make it a link

**Response**

ACCEPT.

The reference to 155.3.3.3.1 is not hyperlinked in faw_valid

**Proposed Response**

make it a link

**Response**

ACCEPT.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Bruckman, Leon
Huawei

Comment Type T  Comment Status D  faw_valid

Clause 155.3.3.3.1 defines FAW as a 22 symbols sequence, "bits" are not mentioned there

SuggestedRemedy
For consistency replace: "The sequence is considered to be valid if at least 36 bits match the 44 known bits of the FAW pattern described in 155.3.3.3.1.", with: "The sequence is considered to be valid if at least 18 symbols match the 22 known symbols of the FAW pattern described in 155.3.3.3.1."

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
See the response to comment 287.

Law, David
Hewlett Packard Enterprise

Comment Type T  Comment Status D  current_pmal

Subclause 155.3.3.3 'Insert FAW, TS and PS symbols' says that 'A super-frame is defined as ... including 175 616 payload symbols and 6272 additional symbols.' and that 'The first sub-frame of a super-frame includes ... a 22-symbol FAW (faw<0:21>) ... and 3488 payload symbols (m<0:3487>).'. Based on this it seems that the FAW is not considered part of the payload.

SuggestedRemedy
Since the title of subclause 155.3.3.3.1 'Frame alignment word (FAW) sequence', suggest that the four instances of '+... FAW payload ...' (page 61, lines 16, 18, 20 and 23) be changed to read '+... FAW sequence ...'.

Proposed Response Response Status W
PROPOSED ACCEPT.

Law, David
Hewlett Packard Enterprise

Comment Type TR  Comment Status D  current_pmal

The description of the variable 'current_pmal' says 'The PMA lane number is determined by the FAW payloads based on the mapping defined in 155.3.3.3.1.' and the description of the variable 'pma_lane' says 'The PMA lane number is determined by matching the received 22-symbol sequence to the values in one of the columns of Table 155-3 ...'. Subclause 155.3.3.3.1 and/or Table 155-3, suggest references to 'PMA lane numbers' be changed to 'PMA lane identifiers' with the values 'Ix', 'Qx', 'Iy' and 'Qy'. The state diagram can compare PMA lane identifiers to see if they match and can test for a unique PMA lane identifier for each PMA lane as easily as it can for PMA lane numbers.

In addition, the description of the 'faw_valid' variable says 'The sequence is considered to be valid if at least 36 bits match the 44 known bits of the FAW pattern described in 155.3.3.3.1.' The description of the variable 'current_pmal' however says 'The PMA lane number is determined by the FAW payloads based on the mapping defined in 155.3.3.3.1.' Similarly, the description of the variable 'pma_lane' says 'The PMA lane number is determined by matching the received 22-symbol sequence to the values in one of the columns of Table 155-3 ...'. Neither mention the '36 out 44' approach used for the 'faw_valid' variable.

The 'current_pmal' description could imply a requirement for a full match to a column of Table 155-3, and the 'pma_lane' description requires a full match to a column of Table 155-3. Since the entry into states where 'current_pmal' is used is based on faw_valid = TRUE, doesn't this mean that the use of the '36 out 44' approach, which permits 8 16QAM symbols to not match, needs to be considered when determining 'current_pmal' and 'pma_lane'. As a worst-case example, couldn't a faw_valid = TRUE result from eight 16QAM symbols not matching due to errors on just one phase of just one polarization. This would seem to imply that the compare for the values received on a lane with the columns of Table 155-3 also needs to permit eight values not matching.

In the case of 'current_pmal' and 'pma_lane', as there are only 22 values in a column of Table 155-3, it would seem a match would have to be valid if at least 14 values received on the lane match the 22 known values defined in a column to address the worst-case of all eight errors on one phase of one polarization. It seems there may, however, be another approach to determine 'current_pmal' and 'pma_lane'. Doesn't the PMD lane mapping row selected from Table 155-7 to achieve faw_valid = TRUE inherently provide the 'current_pmal' and 'pma_lane' values (see my comment on faw_valid)?

Finally, as this variable is used by a state diagram within the PMA, which sits above the PMD, the text '.. is recognized on a given lane of the PMA service interface.' should read '.. is recognized on a given lane of the PMD service interface.'
Suggested Remedy

[1] Change the description of the first_pmal variable to read as follows (note my other comment to change the coherent signal labels in Table 155-7 would impact this item if accepted):

A variable that holds the PMA lane identifier corresponding to the first FAW sequence that is recognized on a given lane of the PMD service interface. It is compared to the PMA lane identifier corresponding to the next FAW payload that is tested. The PMA lane identifier is the value for the given lane in the row of Table 155-7 that defines the PMD service interface lane mapping used to find the match for the current FAW sequence as described in the faw_valid variable.

Values:
- Ix: Value for given lane from mapping used in Table 155-7 to find the current FAW sequence is XI.
- Qx: Value for given lane from mapping used in Table 155-7 to find the current FAW sequence is XQ.
- Iy: Value for given lane from mapping used in Table 155-7 to find the current FAW sequence is YI.
- Qy: Value for given lane from mapping used in Table 155-7 to find the current FAW sequence is YQ.

[2] Change the description of the current_pmal variable to read as follows:

A variable that holds the PMA lane identifier corresponding to the current FAW sequence that is recognized on a given lane of the PMD service interface. It is compared to the variable first_pmal to confirm that the location of the FAW sequence has been detected. The PMA lane identifier is the value for the given lane in the row of Table 155-7 that defines the PMD service interface lane mapping used to find the match for the current FAW sequence as described in the faw_valid variable.

Values:
- See first_pmal.

[3] Change the description of the pma_lane variable to read as follows:

A variable that holds the PMA lane identifier received on lane x of the PMD service interface when faws_lock<x> = TRUE. The PMA lane identifier is determined by matching the received 22-symbol FAW sequence to the values in one of the columns of Table 155-7. The PMA lane identifier is the value for the given lane in the row of Table 155-7 that defines the PMD service interface lane mapping used to find the match for the current FAW sequence as described in the faw_valid variable.

Values:
- See first_pmal.

[4] Change all instances of ‘... PMA lane number ...’ to ‘... PMA lane identifier ...’.

Proposed Response: 

PROPOSED ACCEPT.

Response Status: W

Nicholl, Gary Cisco Systems

Comment Type: TR

Comment Status: D

PMA lanes

Definition of variable “pma_lane”. The definition states that there can be 4 PMA lane numbers on the PMA service interface. But if I look at Figure 155-10 there are 8 lanes on the PMD service interface. There are however 4 lanes on the PMD service interface. I suspect the editor meant "PMD service interface (i.e. the interface below the PMA sublayer) and not the PMA service interface (the interface above the PMA sublayer).

Also the reference to Table 155-3 is not an active cross reference.

Suggested Remedy

Change “PMA service interface” to ”PMD service interface”.

Fix the cross-reference to Table 155-3.

Proposed Response: 

PROPOSED ACCEPT IN PRINCIPLE.

Response Status: W

Law, David Hewlett Packard Enterprise

Comment Type: E

Comment Status: D

There are nine instances of 'super-frame' and two instances of 'DSP super-frame'. Suggest that one term is used consistently.

Suggested Remedy

Suggest that the two instances of ‘... DSP super-frame ...’ (page 61, line 33 and page 63 and line 4) be changed to read ‘... super-frame ...’.

Proposed Response: 

PROPOSED ACCEPT IN PRINCIPLE.

Response Status: W

See response to comment 271
A bad CW can be detected either by detecting errors after FEC decoding or by CRC errors. This should be clarified in the counter definition.

Proposed Response
PROPOSED ACCEPT.

FEC high SER is not a feature of 400GBASE-ZR

Proposed Response
PROPOSED ACCEPT.
The description of the 'restart_lock' variable says 'A boolean variable that is set by the frame alignment word (FAW) lock process to reset the synchronization process on all PMA lanes. It is set to TRUE when 15 FAWs in a row fail to match (15_BAD state)'. While the restart_lock variable is used in the frame alignment word (FAW) lock process described in Figure 155-14, it is also used in the Alignment marker lock process described in Figure 155-16.

**Suggested Remedy**

1. Rename all instances of the 'restart_lock' variable used in Figure 155-14 'Frame alignment word (FAW) lock state diagram' to be 'pma_restart_lock'.

2. Rename all instances of the 'restart_lock' variable used in Figure 155-16 'Alignment marker lock state diagram' to be 'pcs_restart_lock'.

3. Rename 'restart_lock' variable in subclause 155.4.2.1 'Variables' to be 'pma_restart_lock'.

4. Add a definition of the 'pcs_restart_lock' variable to subclause 155.4.2.1 'Variables'.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

---

**Comment Type** T  **Comment Status** D  **Rewrite Bucket**

Text on FAW synchronization seems to imply that there is a FAW synchronization process for each lane, for a total of 4 independent FAW synchronization processes. Actually there are 2 FAW synchronization processes, one per polarization (see figure 115.10 and clause 155.3.3.7)

**Suggested Remedy**

Replace: "The synchronization process operates independently on each lane" with: "The synchronization process operates independently on each polarization"

**Proposed Response**

PROPOSED ACCEPT.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

The state diagram has several blocks in which text of assignment statements wraps to the next line. There is enough room to prevent that.

SuggestedRemedy
Resize blocks (changing layout if required) to prevent wrapping lines.

Proposed Response Response Status W
PROPOSED ACCEPT.

Law, David Hewlett Packard Enterprise

Comment Type TR FAW lock state diagram
Comment Status D

Based on the description of the 'faw_valid' variable, and slide 4 of the contribution 'faw_valid analysis' from Mike Sluyski <https://www.ieee802.org/3/cw/public/22_0523/sluiski_3cw_01a_220523.pdf#page=4> referencing a 'QPSK FAW' value of 44, it seems a valid FAW sequence can only be detected across all four lanes. As a result, it will only be possible to achieve FAW lock on all lanes, or no lanes. There is no case where some lanes can be FAW locked, and others are not. Therefore, it seems no need to have four instances of the Frame alignment word lock state diagram (page 63, line 3). If there were, they wouldn't operate independently on each lane (page 63, line 5), and instead would operate in lock step.

It therefore seems that the four Frame alignment word lock state diagram can be collapsed into one if the first_pmal and current_pmal variables hold the mapping number found in table 155-7 to achieve faw_valid rather than the lane number. The PMA deskel state diagram can then be removed.

SuggestedRemedy

[1] Delete the variables 'pma_alignment_valid', 'all_locked', and PMA_lane_mapping from subclause 155.4.2.1 'Variables' and Figure 155-14.

[2] Change the description of the 'faws_lock' variable (page 61, line 1) to read:

faws_lock
A Boolean variable that is set to true when the receiver has detected the location of the FAW.

[3] Change the description of the faw_valid as suggested in my comment about faw_valid.

[4] Change the description of the first_pmal to read (this overrides my other comment about first_pmal):

A variable that holds the PMA lane mapping number found in the first column of Table 155-7 corresponding to the PMD service interface lane mapping used to find the match for the first FAW sequence. It is compared to the PMA lane mapping number corresponding to the next FAW payload that is found.

[5] Change the description of the current_pmal to read (this overrides my other comment about current_pmal):

A variable that holds the PMA lane mapping number found in the first column of Table 155-7 corresponding to the PMD service interface lane mapping used to find the match for the current FAW sequence. It is compared to the variable first_pmal to confirm that the location of the FAW sequence has been detected.

[6] Change all instances of '
... PMA lane number ...
' to '
... PMA lane mapping number ...
'.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

[7] Change the text ‘... of the next FAW on a PMA lane.’ to read ‘... of the next FAW.’ in the 'faw_counter' description.

[8] Change the first paragraph of subclause 155.4.2.4 'State diagrams' to read 'The PMA shall also implement the deskew process as shown in Figure 155-14.'

[9] Delete the second paragraph of subclause 155.4.2.4.

[10] Add the assignment 'pma_align_status <= FALSE' to the 'LOCK_INIT' state of Figure 155-14.

[14] Add the assignment 'pma_align_status <= TRUE' to the '2_GOOD' state of Figure 155-14.

[15] Delete Figure 155-15.

[16] Change the 'Value/Comment' field of PICS item SM1 in subclause 155.7.4.4 'State diagrams' to read 'Meets the requirements of Figure 155-14'.

[17] Delete the SM2 row from subclause 155.7.4.4 and renumber following items.

Proposed Response  
Response Status  W
PROPOSED ACCEPT IN PRINCIPLE.

[1] Delete the variables 'pma_alignment_valid', 'all_locked', and PMA_lane_mapping<x> from subclause 155.4.2.1 'Variables' and Figure 155-14.

[2] Change the description of the 'faws_lock<x>' variable (page 61, line 1) to read:

faws_lock
A Boolean variable that is set to true when the receiver has detected the location of the FAW.

[3] Change the description of the faw_valid as per the proposed resolution of comment 287.

[4] Change the description of the first_pmal to read (this overrides my other comment about first_pmal):

A variable that holds the PMA lane mapping number found in the first column of Table 155-7 corresponding to the PMD service interface lane mapping used to find the match for the first FAW sequence. It is compared to the PMA lane mapping number corresponding to the next FAW payload that is found.

[5] Change the description of the current_pmal to read (this overrides my other comment about current_pmal):

A variable that holds the PMA lane mapping number found in the first column of Table 155-7 corresponding to the PMD service interface lane mapping used to find the match for the current FAW sequence. It is compared to the variable first_pmal to confirm that the location of the FAW sequence has been detected.

Comment Type  TR  Comment Status  D  Comment: FAW lock state diagram
In the GET_BLOCK state, the variable slip_done should be faw_slip_done

Suggested Remedy
Change slip_done to faw_slip_done

Proposed Response  W  PROPOSED ACCEPT.
The 'slip_done' variable assigned to FALSE in the GET_BLOCK state of the Frame alignment word (FAW) lock state diagram is not defined. Suspect it should read 'faw_slip_done' so that it is set to FALSE before the FAW_SLIP function, which sets it TRUE, is called in the FAW_SLIP state.

SuggestedRemedy
Change the text 'slip_done <= FALSE' in the GET_BLOCK state in Figure 155-14 to read 'faw_slip_done <= FALSE'.

Proposed Response Response Status W
PROPOSED ACCEPT.

The description of the 'first_pmal' variable says it '... the PMA lane number that corresponds to the first FAW payload ...' however, it is updated by the assignment 'first_pmal <= current_pmal' every cycle through the '2_GOOD' and 'GOOD_FAW' states. With that said, the assignment 'first_pmal <= current_pmal' in the '2_GOOD' and 'GOOD_FAW' states appear to be redundant since the only way to enter these states is if 'faw_match' is TRUE and for 'faw_match' to be TRUE the first_pmal and current_pmal variables have to be equal (see FAWCOMPARE function, page 62, line 28).

SuggestedRemedy
Consider removing the assignment 'first_pmal <= current_pmal' from the '2_GOOD' and 'GOOD_FAW' states.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

There is no definition of the 'prev_pmal' variable used in the 'INVALID_FAW' state of figure 155-14 'Frame alignment word (FAW) lock state diagram', and there is no use or reference to the 'prev_pmal' variable elsewhere in the IEEE P802.3cw draft.

SuggestedRemedy
Delete the assignment ' prev_pmal <= prev_pmal + 4) mod 252' from the 'INVALID_FAW' state.

Proposed Response Response Status W
PROPOSED ACCEPT.

The 'faws_bad_count' whereas the Figure 155-14 'Frame alignment word (FAW) lock state diagram' uses 'faw_bad_count' ('faw' vs 'faws').

SuggestedRemedy
Suggest that:
[1] The transition from the 'INVALID_FAW' state to the '15_BAD' state be changed to read 'faws_bad_count = 15'.
[2] The transition from the 'INVALID_FAW' state to the 'COUNT_2' state be changed to read 'faws_bad_count < 15'.

Proposed Response Response Status W
PROPOSED ACCEPT.
The 'restart_lock' variable is set to TRUE on entry to the '15_BAD' state. This will cause the state diagram to transition to the 'LOCK_INIT' state because 'restart_lock' is one of the OR conditions in the 'open arrow' entry to that state. The actions in the 'LOCK_INIT' state will be executed, but since 'restart_lock' remains set to TRUE, and 'open arrow' transitions are evaluated continuously whenever any state is evaluating its exit conditions (see 21.5.3), on exit the state diagram will loop back to the 'LOCK_INIT' state. The state diagram will then be locked in this loop permanently.

**Suggested Remedy**

Suggest that either the action 'restart_lock <= FALSE' be added to the 'LOCK_INIT' state or the 'restart_lock' be deleted and a 'UCT' be added from the '15_BAD' state to the 'LOCK_INIT' state.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE. Add the action 'restart_lock <= FALSE' to the 'LOCK_INIT' state.

---

The variable 'PMA_lane_mapping' in the 2_GOOD state of the Frame alignment word (FAW) lock state diagram should read 'pma_lane_mapping' based on the definition in subclause 155.4.2.1 (page 61, line 34).

**Suggested Remedy**

Change the text 'PMA_lane_mapping<x> <= current_pmal' in the 2_GOOD state in Figure 155-14 to read 'pma_lane_mapping<x> <= current_pmal'.

**Proposed Response**

PROPOSED ACCEPT.
The figure 155-16 PCS alignment marker lock state diagram uses the variable 'pma_align_status', however that variable is generated by the figure 155-14 PMA frame alignment word (FAW) lock state diagram, and it is not passed across the PMA service interface from the PMA to the PCS. As a result, it is not available to be used in the figure 155-16 PCS alignment marker lock state diagram.

Suggest that 'pma_align_status' being 'TRUE' be used as a condition to set the SIGNAL_OK parameter of the PMA:IS_SIGNAL.indication primitive to OK and therefore communicate it across the PMA service interface. Since 'signal_ok,' derived from the SIGNAL_OK parameter, is already used as an 'open arrow' entry to the 'LOCK_INIT' state of the figure 155-16 PCS alignment marker lock state diagram, 'pma_align_status' can be deleted as an exit condition from that state.

SuggestedRemedy

[1] Add 'pma_align_status' being 'TRUE' as a condition to set the SIGNAL_OK parameter of the PMA:IS_SIGNAL.indication primitive to OK in clause 155.3.2 400GBASE-ZR PMA service interface

[2] Delete that exit condition 'pma_align_status' from the LOCK_INIT state in figure 155-16.

Proposed Response

PROPOSED ACCEPT.

Comment Type: T  Comment Status: D  state diagrams

Typo, amps_... should be amp_... based on counter definition, see page 62, line 37.

SuggestedRemedy

Change the action 'amps_bad_count <= 0' to read 'amp_bad_count <= 0' in the 'GOOD_AM' state of the Figure 155-16 'Alignment marker lock state diagram'.

Proposed Response

PROPOSED ACCEPT.

Comment Type: E  Comment Status: D  bucket

The following objects apply to: objects?

SuggestedRemedy

Reword

Proposed Response

PROPOSED ACCEPT IN PRINCIPLE.

See response to comment 310.
Strictly speaking, protocol agnostic management 'objects' are defined in Clause 30, with protocol specific 'objects' defined in IEEE Std 802.3.1 and IEEE Std 802.3.2.

Suggested Remedy
Since the title of subclause 45.2 in IEEE Std 802.3-2022 is 'MDIO Interface registers', suggest that the text 'The following objects apply ...' in subclause 155.5 be changed to read 'The following registers apply ...'.

PROPOSED ACCEPT.

Subclause 155.5 '400GBASE-ZR PCS and PMA management' uses the term 'provided' yet the following subclause 155.5.1 'PCS and PMA MDIO function mapping' uses 'implemented' about the MDIO interface.

Suggested Remedy
Suggest that in subclause 155.5 '400GBASE-ZR PCS and PMA management' the text 'If an MDIO interface is provided ...' is changed to read 'If an MDIO interface is implemented ...

PROPOSED ACCEPT.

In Table 155-8 there are several MDIO control variables associated with "FEC degraded SER" processing, but I can find no description of FEC degraded SER processing in the draft? For 400GBASE-R the FEC degrade SER processing is associated with the RS544 FEC and based on monitoring for RS symbol errors within a given time interval (as described in section 119.2.5.3).

If we want to do something similar for 400GBASE-ZR then the "FEC degrade" monitoring should be based on monitoring a combination of the SD-FEC and SC-FEC.

This appears to be completely missing from the current draft.

Suggested Remedy
Define a FEC degrade monitoring scheme for 400GBASE-ZR (similar to what was done in section 119.2.5.3 for 400GBASE-R).

PROPOSED ACCEPT IN PRINCIPLE.

A contribution is needed.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 155 SC 155.5.1 P 67 L 28 # 490

Dawe, Piers Nvidia

Comment Type TR Comment Status D MDIO mapping
FEC degraded SER activate threshold register should be PCS FEC degraded SER activate
threshold register, but it’s for Clause 119 PCS RS(544,514) FEC and there is no FEC
degraded SER feature in this draft.

Suggested Remedy
Delete the four FEC degraded SER rows

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 155 SC 155.5.1 P 67 L 37 # 145

Nicholl, Gary Cisco Systems

Comment Type TR Comment Status D MDIO mapping
Table 155-9 provides FEC corrected and uncorrected codeword counts for the SC-FEC?
Should there be similar monitoring for the SD-FEC? This is missing in the current draft?

Suggested Remedy
Define FEC monitoring for the SD-FEC.

Proposed Response Response Status W
PROPOSED REJECT.

My understanding is that the SD-FEC is not able to count errors but instead outputs the
most likely match to one of it's allowed 119-bit codewords. That data is then subject to
further error detection and correction by the SC-FEC decoder, which is able to keep a
count of corrected and uncorrected errors.
The MDIO references for corrected and uncorrected codeword counters only point to the Clause 45 register, which then points you back to Clause 153 for the definition of the counter. In Clause 153 it refers to “fec_align_status” which does not exist in Clause 155.

**Suggested Remedy**

Add sub-clauses for corrected and uncorrected codeword counters:

155.5.1.x FEC_corrected_cw_counter

A corrected FEC codeword is a codeword that contained errors and was corrected.

The FEC_corrected_cw_counter is a 32-bit counter that counts once for each corrected FEC codeword processed when pma_alignment_valid is TRUE. This variable is mapped to the registers defined in 45.2.1.227 (1.2276, 1.2277).

153.5.1.y FEC_uncorrected_cw_counter

An uncorrected FEC codeword is a codeword that contains errors that were not corrected, including FEC codewords that may have been mis-corrected or not completely corrected.

The FEC_uncorrected_cw_counter is a 32-bit counter that counts once for each uncorrected FEC codeword processed when pma_alignment_valid is TRUE. This variable is mapped to the registers defined in 45.2.1.228 (1.2278, 1.2279).

Bring in 45.2.1.227 and 45.2.1.228 and references to the newly added sub-clauses in Clause 155.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

We should make clear that these are SC-FEC codewords.

Add sub-clauses for corrected and uncorrected codeword counters:

155.5.1.x SC-FEC_corrected_cw_counter

A corrected SC-FEC codeword is a codeword that contained errors and was corrected.

The SC-FEC_corrected_cw_counter is a 32-bit counter that counts once for each corrected SC-FEC codeword processed when pma_alignment_valid is TRUE. This variable is mapped to the registers defined in 45.2.1.227 (1.2276, 1.2277).

153.5.1.y SC-FEC_uncorrected_cw_counter

An uncorrected SC-FEC codeword is a codeword that contains errors that were not corrected, including SC-FEC codewords that may have been mis-corrected or not completely corrected.

The SC-FEC_uncorrected_cw_counter is a 32-bit counter that counts once for each uncorrected SC-FEC codeword processed when pma_alignment_valid is TRUE. This variable is mapped to the registers defined in 45.2.1.228 (1.2278, 1.2279).

Bring in 45.2.1.227 and 45.2.1.228 and references to the newly added sub-clauses in Clause 155.

**Suggested Remedy**

Add the following sub-clauses:

155.5.1.x FEC_total_bits_counter

See 153.2.5.3 for the definition of this counter.

155.5.1.y FEC_corrected_bits_counter

See 153.2.5.4 for the definition of this counter.

Bring in 45.2.1.229 and 45.2.1.230 and add appropriate references to these new sub-clauses.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

Add the following sub-clauses:

155.5.1.x FEC_total_bits_counter

Reference 153.2.5.3 for the definition of this counter.

155.5.1.y FEC_corrected_bits_counter

Reference 153.2.5.4 for the definition of this counter.

Bring in 45.2.1.229 and 45.2.1.230 and add appropriate references to these new sub-clauses, with editorial license.
### IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.5.1</td>
<td>67</td>
<td>47</td>
<td>491</td>
</tr>
<tr>
<td>Law, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>broken variable names</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widen the right column width until they fit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accept</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.5.1</td>
<td>68</td>
<td>1</td>
<td>147</td>
</tr>
<tr>
<td>Nicholl, Gary</td>
<td>Cisco Systems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>T</td>
<td>Comment Status</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>Table 155-9 mentions the MDIO status variable &quot;FEC degraded SER&quot;, but as pointed out in an earlier comment the draft provides no description as to how the &quot;FEC degraded SER&quot; status variable is set.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The description for &quot;FEC degraded SER&quot; is missing from the draft.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Define a FEC degrade monitoring scheme for 400GBASE-ZR (similar to what was done in section 119.2.5.3 for 400GBASE-R).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proposed Response</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Comment: MDIO mapping

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>155</td>
<td>155.5.1</td>
<td>68</td>
<td>27</td>
<td>312</td>
</tr>
<tr>
<td>Law, David</td>
<td>Hewlett Packard Enterprise</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>TR</td>
<td>Comment Status</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>Register bits 3.52.3:0 (IEEE Std 802.3-2022 subclause 45.2.3.25) are PCS lane alignment lock status registers, yet they are mapped to PMA lane alignment lock variables (faw_lock&lt;3:0&gt;). Similarly, register bit 3.50.12 is the PCS alignment status, yet it is mapped to the PMA alignment status variable (pma_align_status).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If there was a 400GBASE-ZR framing issue on a link where the PMA framing was operating correctly, the faws_lock&lt;3:0&gt; bits and the pma_align_status would all be true based on the respective frame alignment word (FAW) lock state diagrams, while the PCS would not be aligned based on the alignment marker lock state diagram. In that case, the current register mapping would indicate that all the PCS lanes were aligned, and the overall PCS was aligned, even though this is not the case. This would seem to be misleading information to provide in the management registers in such a case.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Further, register 3.400 (IEEE Std 802.3-2022 subclause 45.2.3.49) through 3.419 are the PCS lane mapping registers, lanes 0 through 19 and these registers report the PCS lane number provide by the alignment marker for the respective PMA service interface lane. Table 155-9, however, maps these PCS lane mapping registers to the PAM lane mapping variable 'pma_lane_mapping&lt;xx&gt;' output by Figure 155-15, the 'Frame alignment word (FAW) lock state diagram'.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subclause 155.2.4.3 'GMP mapper' says 'The first 1920 bits of the frame contain alignment markers (AM)' and that 'These are identical to the 16 x 120b markers defined for 400GBASE-R in 119.2.4.4.2.' Since the 16 different 400GBASE-R PCS lane alignment markers are all placed in a single 400GBASE-ZR alignment marker (see 155.2.4.4.1) it seems that 400GBASE-ZR frames are not mapped to 16 PCS lanes. This seems to be confirmed in subclause 155.2.4.3 'GMP mapper' which says '...400GBASE-ZR frames are not mapped to 16 PCS lanes...'. As a result, there are no PCS lanes across the PMA service interface, therefore there is no PCS lane alignment lock status nor PCS Lane mapping.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finally, register bits 3.52.3:0, 3.50.12, and 3.400 through 3.403, which are all PCS register bits defined for MMD 3 (see IEEE Std 802.3-2022 Table 45-1), are mapped to variables found in the PMA. As illustrated in Figure 120A-9 (page 103), MMD 3 does not have access to the PMA (or PMD) as they are in MMD 1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based on the above, suggest that two new subclauses are added to say that registers 3.52, 3.53 and 3.400 through 3.403 are not used by the 400GBASE-ZR PCS because the 400GBASE-ZR PCS does not use PCS lanes across the PMA service interface. Require all PCS lane alignment bits to be set to zero. The content of the PCS lane mapping registers does not need to be defined because their content is only valid when the respective PCS lane alignment bit is set to one. In addition, suggest that thePCS lane alignment status bit be mapped from the 'amps_lock' variable generated by the Figure 155-16, the PCS alignment marker lock state diagram.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Suggested Remedy
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Suggested changes:

[1] Delete the antepenultimate row of Table 155-9.

[2] Add a new subclause 155.5.1 as follows:

155.5.1 PCS lane alignment registers

The PCS lane alignment registers (registers 3.52 and 3.53) are not used as the 400GBASE-ZR PCS does not use PCS lanes across the PMA service interface (see 155.2.4.3). A 400GBASE-ZR PCS shall return a zero for all bits in these registers.

[3] Change the variable 'pma_align_status' in the 'ZR-PCS/PMA variable' column of the penultimate row of Table 155-9 to 'amps_lock'.


[5] Add a new subclause 155.5.2 as follows:

155.5.2 PCS lane mapping registers

The PCS lane mapping registers (registers 3.400 through 3.419) are not used as the 400GBASE-ZR PCS does not use PCS lanes across the PMA service interface.

Proposed Response  Response Status  W

PROPOSED ACCEPT IN PRINCIPLE.

[1] Delete the antepenultimate row of Table 155-9.

[2] Add a new subclause 155.5.1 as follows:

155.5.1 PCS lane alignment registers

The PCS lane alignment registers (registers 3.52 and 3.53) are not used as the 400GBASE-ZR PCS does not use PCS lanes across the PMA service interface (see 155.2.4.3). A 400GBASE-ZR PCS shall return a zero for all bits in these registers.

[3] Change the variable 'pma_align_status' in the 'ZR-PCS/PMA variable' column of the penultimate row of Table 155-9 to 'amps_lock'.


[5] Add a new subclause 155.5.2 as follows:

155.5.2 PCS lane mapping registers

The PCS lane mapping registers (registers 3.400 through 3.419) are not used as the 400GBASE-ZR PCS does not use PCS lanes across the PMA service interface.

Proposed Response  Response Status  W

PROPOSED ACCEPT IN PRINCIPLE.

This is a general comment on the requirements. I am attaching it to these PICS because this is where it became apparent. The style of IEEE SA standards (and IEEE Std 802.3) is that requirements use the term "shall". Each PICS item should have an associated "shall" and each "shall" should have a PICS. However, 155.7.4.1 is a list of the subclauses for the most part. Further, looking at the subclauses, they are largely without "shall"s. Most of the items in clause 155 are descriptive of an implementation, and do not use the term shall. They use "is" or other descriptive language. The PICS are a list of the functional blocks described, but most of those functional blocks are lacking actual requirements. Instead they often describe an implementation or, worse yet, sometimes try to require a particular implementation ("an implementation shall"). What needs to happen is that the clause needs to be rewritten carefully considering what requirements are needed for interoperability, and deleting the unnecessary implementation description. This is a big job, and, in my opinion, means the draft is not technically complete, and should not have begun initial working group ballot. I truly regret having to make a comment like this, but I believe this is a great example of why we have working group ballots in 802.

SuggestedRemedy

Unfortunately, the draft is so far from complete that I cannot propose a specific remedy for the systematic problem. I can suggest that the TF look at each subblock, determine what the observed behavior is, determine which parts matter to interoperability, and write "shall" statements in the subclauses. Then those shall statements can be made as PICS. Additionally, this will highlight where there is implementation description that can be deleted. When this is done, restart working group ballot.

Proposed Response  Response Status  W

PROPOSED ACCEPT IN PRINCIPLE.

With editorial license, restructure and clarify Clause 155 and 156 as appropriate:

To identify interoperability requirements using "SHALL" statements, as needed.

To address issues noted in https://www.ieee802.org/3/cw/public/22_10/dambrosia_3cw_01b_221018.pdf
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>156</td>
<td>156.1</td>
<td>73</td>
<td>20</td>
<td>192</td>
</tr>
<tr>
<td>D'Ambrosia, John Fuutrewei, US Subsidiary of Huawei</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

- Associated clauses include the 400GBASE-R PCS, 400GBASE-4 PMA, and all AUI's. These clauses are referenced via the extender sublayer, so they should not be noted here.

**Suggested Remedy:**
Delete table entries Clause 119, 120, and all AUI related clauses.

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

- ACCEPT IN PRINCIPLE.

With editorial license

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>156</td>
<td>156.1</td>
<td>73</td>
<td>33</td>
<td>90</td>
</tr>
<tr>
<td>Ran, Adee Cisco</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

- Font size mismatch in "120C"

**Suggested Remedy:**
Reduce size to match surrounding text, here and elsewhere if necessary

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

- ACCEPT IN PRINCIPLE.
- Correct the font as required with editorial license

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>156</td>
<td>156.1</td>
<td>73</td>
<td>48</td>
<td>492</td>
</tr>
<tr>
<td>Dawe, Piers Nvidia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

- Clause 116 and the purpose

**Suggested Remedy:**
comma

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

- ACCEPT IN PRINCIPLE.
- Change "Clause 116 and the purpose" to "Clause 116, and the purpose"
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Comment Type: T  Comment Status: A
The bit error ratio (BER) when processed by the 400GBASE-ZR PMA (Clause 155) shall be less than $1.25 \times 10^{-2}$...

The output of the PMA is not bits but samples that are fed into the SD-FEC in the PCS. A BER cannot be defined at this interface before SD-FEC decoding, so this normative requirement is meaningless.

Maybe the intent was after the SD-FEC decoder (which is in the PCS)?

Perhaps the PMD/PMA BER should not be specified for this PHY.

SuggestedRemedy
Consider removing this requirement and defining only the PCS output frame loss ratio.
Otherwise, rewrite to create a well-defined requirement.

Response: Response Status: C
ACCEPT IN PRINCIPLE.

Change the title of 156.1.1 to "Frame loss ratio"

Change the 1st paragraph of 156.1.1 to:

"The frame loss ratio (FLR), (see 1.4.275) after processing by the PMA and PCS shall be less than $1.7 \times 10^{-12}$ for 64-octet frames with a minimum interpacket gap."

Delete the 2nd paragraph.

In clause 155 add additional language to clarify the degrade function and SER target.

With editorial license.

Comment Status: A

Law, David  Hewlett Packard Enterprise
Comment Type: T  Comment Status: A
Subclause '156.1.1 Bit error ratio' says '... for 64-octet frames with minimum interpacket gap when additionally processed by the CFEC (Clause 155).'. The text '... the CFEC (Clause 155) seems to imply a function but isn't CFEC '... a concatenated forward error correction (CFEC) code consisting of an inner SC-FEC code and an outer Hamming code SD-FEC' to quote subclause 155.2.1.

SuggestedRemedy
Suggest that the text '... for 64-octet frames with minimum interpacket gap when additionally processed by the CFEC (Clause 155).' should be changed to read '... for 64-octet frames with a minimum interpacket gap after CFEC error correction (see 155.2.1).'.

Response: Response Status: C
ACCEPT IN PRINCIPLE.

See response to comment 91.

Comment Status: A

Law, David  Hewlett Packard Enterprise
Comment Type: E  Comment Status: A
Suggest that '...frames with minimum interpacket ...' should read '... frames with a minimum interpacket ...'.

SuggestedRemedy
See comment.

Response: Response Status: C
ACCEPT IN PRINCIPLE.

See response to comment 91.

Comment Status: D

Law, David  Hewlett Packard Enterprise
Comment Type: E  Comment Status: D
Suggest that '... PMA entity that resides just above the PMD, and the PMD entity.' should read '... PMA sublayer that resides just above the PMD, and the PMD sublayer.'.

SuggestedRemedy
See comment.

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

Review supporting presentation, for comment resolution group (CRG) consideration.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 156 SC 156.2 P 75 L 3 # 92
Ran, Adee Cisco
Comment Type T Comment Status D
The service interface of this PMD is not consistent with 116.3 because as it's written, the inputs and outputs are analog signals, not streams of discrete symbols.

SuggestedRemedy
Rewrite the text without referring to 116.3 (or make it "similar to 116.3 but...")

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Review supporting presentation, for comment resolution group (CRG) consideration.

Cl 156 SC 156.2 P 75 L 11 # 93
Ran, Adee Cisco
Comment Type E Comment Status D
“The 400GBASE-ZR PMD has four analog streams, in which case i = 0 to 3.”

why "in which case"?

SuggestedRemedy
change "in which case" to "hence".

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Review supporting presentation, for comment resolution group (CRG) consideration.

Cl 156 SC 156.2 P 75 L 13 # 94
Ran, Adee Cisco
Comment Type T Comment Status D
As described here the PMA sends digital symbols (discrete and sampled) from a set of 4 levels), not "analog streams" (which is an undefined term).

Also applies to 156.5.2 which contains very similar text.

SuggestedRemedy
Change "In the transmit direction, the PMA continuously sends four analog streams to the PMD" to
"In the transmit direction, the PMA continuously sends four streams of quaternary symbols to the PMD".

Change "The PMD then converts these four analog streams" to
"The PMD then converts these streams of symbols".

Apply in 156.5.2, if it is retained.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Review supporting presentation, for comment resolution group (CRG) consideration.
Subclause '155.3.3 Functions within the PMA' says that 'The purpose of the PMA is to adapt between the PCS layer digital symbols to and from the four analog signals ...' and subclause 155.3.3.4 '16QAM encode and signal drivers' says that '... stream of symbols is converted to four analog signals ...' and that 'The analog signals are sent to the 400GBASE-ZR PMD sublayer over the PMD:IS_UNITDATA_0.request to PMD:IS_UNITDATA_3.request sublayer signals.' It, therefore, appears that the PMD service interface is a set of analogue signals. Finally, Figure 155-10 shows a DEC block above the PMD service interface.

Subclause 156.2 'Physical Medium Dependent (PMD) service interface', however, says 'In the transmit direction, the PMA continuously sends four analog streams to the PMD ... with binary values of 3, 1, -1, and -3 using the PMD:IS_UNITDATA_i.request primitive.' Is it correct to say ‘... with binary values ...’?

SuggestedRemedy
[1] Suggest that in subclause 156.2 (page 75, line 14) the text ‘... X and Y polarizations with binary values of 3, 1, -1, and -3 using the ...’ should be changed to read ‘... X and Y polarizations with the values of 3, 1, -1, and -3 using the ...’.

[2] Suggest that in subclause 156.5.2 (page 77, line 39) the text ‘... X and Y polarizations with binary values of 3, 1, -1, and -3.’ should be changed to read ‘... X and Y polarizations with the values of 3, 1, -1, and -3.’.

Proposed Response Response Status W
Proposed ACCEPT IN PRINCIPLE.

Review supporting presentation, for comment resolution group (CRG) consideration.
<table>
<thead>
<tr>
<th>Cl.</th>
<th>SC</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>156</td>
<td>156.2</td>
<td>E</td>
<td>D</td>
<td>&quot;the variable SIGNAL_DETECT parameter&quot;: 156.5.4 says it’s a parameter, this and that say not variable</td>
<td>Delete variable</td>
</tr>
<tr>
<td>156</td>
<td>156.2</td>
<td>T</td>
<td>D</td>
<td>The NOTE about signal detect is out of place since the value is always OK. &quot;sufficient light&quot; and &quot;meeting the BER&quot; are irrelevant for this PMD, since signal detect is not a function of light intensity and the PMD does not detect bits.</td>
<td>Delete the NOTE.</td>
</tr>
<tr>
<td>156</td>
<td>156.2</td>
<td>T</td>
<td>D</td>
<td>&quot;poor quality link to provide sufficient light for a SIGNAL_DETECT = OK&quot;: this note isn’t relevant if the parameter is fixed</td>
<td>Change the note to explain the situation</td>
</tr>
<tr>
<td>156</td>
<td>156.3.1</td>
<td>T</td>
<td>D</td>
<td>I suspect that skew variation cannot exist at SP2 (PMD service interface), because the PCS and PMA are defined as operating in one clock domain, not as multiple lanes with separate logic. This may be worth mentioning (as done in other cases where skew variation can’t exist, e.g. 140.3.2).</td>
<td>Add a statement that that there is no skew variation at TP2.</td>
</tr>
<tr>
<td>156</td>
<td>156.3.2</td>
<td>T</td>
<td>D</td>
<td>If skew variation between the PMDs isn’t relevant, change also the text about skew variation at SP3 and SP4, as in 140.3.2.</td>
<td>Review supporting presentation, for comment resolution group (CRG) consideration.</td>
</tr>
</tbody>
</table>
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

D'Ambrosia, John  
Futurewei, US Subsidiary of Huawei

Comment Type  TR  Comment Status  D

It is unclear if the skew constraints need to be revisited in light that the part is not part of 400GBASE-R family, but current pointer is to 80-8, which is for 100G

SuggestedRemedy

Revisit skew constraints as needed.
The diagram reference should be 116-4.

Proposed Response  Response Status  W
PROPOSED ACCEPT IN PRINCIPLE.

Review supporting presentation, for comment resolution group (CRG) consideration.

Dawe, Piers  
Nvidia

Comment Type  TR  Comment Status  D

Are these Skew and SV limits plausible? What does the PMA need? This is a hybrid of "parallel" and "serial", needs new numbers.

SuggestedRemedy

Revise to limits that are appropriate to DP-16PAM technology and the channel.

Proposed Response  Response Status  W
PROPOSED ACCEPT IN PRINCIPLE.

Review supporting presentation, for comment resolution group (CRG) consideration.
 Comment Type: T  Comment Status: D

There is no description of how the PMD_global_signal_detect variable, defined in subclause 156.4, should be driven. Subclause 156.5.4 'PMD global signal detect function' says that SIGNAL_DETECT is set to a fixed OK value, hence there is in effect no signal detect to report in the PMD.

Suggested Remedy

Suggest that:

[1] The PMD_global_signal_detect row in Table 156-3 (page 76, line 38) should be deleted.
[2] A change to subclause 45.2.1.9.7 'Global PMD receive signal detect (1.10.0)' be added to the draft that adds 'This bit is not supported by the 400GBASE-ZR PMDs.' to subclause 45.2.1.9.7.

Proposed Response  Response Status: W

PROPOSED ACCEPT IN PRINCIPLE.

Current wording aligns with IEEE Std 802.3-2022 subclause 154.4 and 802.3db D3.2 subclause 167.4, for comment resolution group (CRG) consideration.

Comment Type: T  Comment Status: A

There are no references to describe the use of the variables Tx_index_ability_0 to Tx_index_ability_63 and Rx_index_ability_0 to Rx_index_ability_63 defined in Table 156–3 in the draft. What happens if a value is selected in Tx optical channel index or Rx optical channel index register (page 76, line 25) corresponding to an index value in the Tx index ability 0 to Tx index ability 63 or Rx index ability 0 to Rx index ability 63 registers, respectively, that is false. Is the write to the Tx optical channel index or Rx optical channel index register ignored and operation continues on the existing value? Or is the value accepted, but then transmission of reception ceases, as the index value is not supported?

Suggested Remedy

Suggest that the last paragraph of 164.5, that already discusses Tx_optical_channel_index and the Rx_optical_channel_index be update the describe how Tx_optical_channel_index and the Rx_optical_channel_index interacts with the Tx_index_ability_0 to Tx_index_ability_63 and Rx_index_ability_0 to Rx_index_ability_63 variables.

Response  Response Status: C

ACCEPT IN PRINCIPLE.

At new sentence at the end of 45.2.1.150.1 and 45.2.1.154.2

"The supported channel indices of the PMA/PMD are advertised in the PMA/PMD index ability registers. A PMA/PMD may ignore writes to the PMA/PMD channel Index bits that select a channel it has not advertised in the PMA/PMD channel ability registers."

With editorial license.

Comment Type: T  Comment Status: A

The two references to the variable 'Tx_optical_frequency_index' in this subclause should be to 'Tx_optical_channel_index', see page 76, line 22.

Suggested Remedy

See comment.

Response  Response Status: C

ACCEPT IN PRINCIPLE.

Implement suggested remedies with editorial license.
The reference to the variable 'Rx_optical_frequency_index' here and on page 81 line 44 should be to 'Rx_optical_channel_index', see page 76, line 25.

**Suggested Remedy**
See comment.

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

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

Review supporting presentation, for comment resolution group (CRG) consideration.

---

The reference to the variable 'Tx_Rx_diff_opt_freq_ability' should be to 'Tx_Rx_diff_opt_chan_ability', see page 76, line 44.

**Suggested Remedy**
See comment.

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

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

Review supporting presentation, for comment resolution group (CRG) consideration.

---

Since subclause 156.5.4 'PMD global signal detect function' says that 'The PMD global signal detect function shall set the state of the SIGNAL_DETECT parameter to a fixed OK value.' it doesn't seem correct to show the SIGNAL_DETECT emanating from the 'Optical receiver' block in Figure 156-2 'Block diagram for 400GBASE-ZR transmit/receive paths'.

**Suggested Remedy**
Suggest that SIGNAL_DETECT be removed from Figure 156-2.

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

Review supporting presentation, for comment resolution group (CRG) consideration.
Rather than being requested by the PMD service interface messages, messages are passed across the PMD service interface, either from the PMA to the PMD or from the PMD to the PMA. In addition, abstract service interfaces pass data in the parameters of primitives. In the case of the inter-sublayer service interface primitives defined in subclause 116.3 referenced by IEEE P802.3cw, these parameters are tx_symbol (see 116.3.3.1.1) and rx_symbol (see 116.3.3.2.1).

**Suggested Remedy**

Suggest:

1. The text "The PMD Transmit function shall convert the four analog streams requested by the PMD service interface messages PMD:IS_UNITDATA_0.request to PMD:IS_UNITDATA_3.request into ..." (page 77, line 35) should be changed to read "The PMD Transmit function shall convert the four analog streams from the PMA passed across the PMD service interface in the tx_symbol parameters of the PMD:IS_UNITDATA_0.request to PMD:IS_UNITDATA_3.request primitives into ...".

2. The text "The PMD Receive function shall convert the composite optical signal received from the MDI into four analog streams for delivery to the PMD service interface using the messages PMD:IS_UNITDATA_0.indication to PMD:IS_UNITDATA_3.indication, all according ..." (page 77, line 45) should be changed to read "The PMD Receive function shall convert the composite optical signal received from the MDI into four analog streams passed across the PMD service interface to the PMA in the rx_symbol parameters of the PMD:IS_UNITDATA_0.indication to PMD:IS_UNITDATA_3.indication primitives, all according ...".

3. The text "The analog signals are sent to the 400GBASE-ZR PMD sublayer over the PMD:IS_UNITDATA_0.request to PMD:IS_UNITDATA_3.request sublayer signals." in subclause 155.3.4 (page 58, line 33) is changed to read "The four analog signals are passed across the PMD service interface to the PMD in the tx_symbol parameters of the PMD:IS_UNITDATA_0.request to PMD:IS_UNITDATA_3.request primitives.".

4. The text "Four coherent signals IX, QX, IY, and QY are supplied by the receive function of the 400GBASE-ZR PMD and input to the 400GBASE-ZR PMA over the PMD:IS_UNITDATA_0.indication to PMD:IS_UNITDATA_3.indication." in subclause 155.3.5 (page 58, line 47) is changed to read "Four coherent signals IX, QX, IY, and QY received by the PMD are passed across the PMD service interface to the PMA in the rx_symbol parameters of the PMD:IS_UNITDATA_0.indication to PMD:IS_UNITDATA_3.indication primitives.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

Review supporting presentation, for comment resolution group (CRG) consideration.
**IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments**

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.5.2</th>
<th>P 77</th>
<th>L 41</th>
<th># 322</th>
</tr>
</thead>
<tbody>
<tr>
<td>Law, David</td>
<td>Hewlett Packard Enterprise</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td><strong>T</strong></td>
<td><strong>Comment Status</strong></td>
<td><strong>A</strong></td>
<td>bucket</td>
</tr>
<tr>
<td>Subclause 156.5.2 'PMD transmit function' says 'The mapping of the analog values to the symbol amplitudes is listed in Table 155–2.' Is this correct, Table 155–2 seems to provide the mapping between the 128-bit digital code word from the SD-FEC encoder to the in-phase (I) and quadrature-phase (Q) components of the 16QAM symbols.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td>Change reference if required.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td><strong>Response Status</strong></td>
<td><strong>C</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>See response to comment 219</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.6</th>
<th>P 78</th>
<th>L 49</th>
<th># 323</th>
</tr>
</thead>
<tbody>
<tr>
<td>Law, David</td>
<td>Hewlett Packard Enterprise</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td><strong>T</strong></td>
<td><strong>Comment Status</strong></td>
<td><strong>A</strong></td>
<td></td>
</tr>
<tr>
<td>Subclause 156.6 'The DWDM channel over a DWDM black link' says '... the medium associated with the 400GBASE-ZR PMD, over which the PHY operates at a single optical frequency ...' Doesn't the PHY to operate over two different optical frequencies when the Tx Rx different optical channel ability is true?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td>Suggest that the text '... over which the PHY operates at a single optical frequency ...' in subclause 156.6 be changed to read '... over which the PHY transmits at a single optical frequency ...'.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td><strong>Response Status</strong></td>
<td><strong>C</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comment Status**

- **D**/dispatched
- **A**/accepted
- **R**/rejected

**Response Status**

- **O**/open
- **W**/written
- **C**/closed
- **U**/unsatisfied
- **Z**/withdrawn

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.6</th>
<th>P 78</th>
<th>L 3</th>
<th># 501</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td><strong>E</strong></td>
<td><strong>Comment Status</strong></td>
<td><strong>D</strong></td>
<td></td>
</tr>
<tr>
<td>No SD!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Proposed Response</strong></td>
<td><strong>Response Status</strong></td>
<td><strong>W</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROPOSED REJECT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comment unclear and no suggested remedy provided**

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.6</th>
<th>P 79</th>
<th>L 10</th>
<th># 328</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ghiasi, Ali</td>
<td>Quantum/Marvell</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td><strong>ER</strong></td>
<td><strong>Comment Status</strong></td>
<td><strong>R</strong></td>
<td></td>
</tr>
<tr>
<td>It would be helpful on figure 156-3 to also add TP2_0, TP2_n, TP3_0, and TP3_n</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td>add TP2_0, TP2_n, TP3_0, and TP3_n</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td><strong>Response Status</strong></td>
<td><strong>U</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REJECT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comment unclear and no suggested remedy provided**

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.6</th>
<th>P 79</th>
<th>L 18</th>
<th># 502</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td><strong>E</strong></td>
<td><strong>Comment Status</strong></td>
<td><strong>R</strong></td>
<td></td>
</tr>
<tr>
<td>misuse of TP2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td><strong>Response Status</strong></td>
<td><strong>C</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REJECT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comment unclear and no suggested remedy provided**
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.6</th>
<th>P 79</th>
<th>L 38</th>
<th># 503</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>A</td>
<td>bucket</td>
</tr>
<tr>
<td>blank line</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Response | Response Status | C |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remove any blank lines with editorial license

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.6</th>
<th>P 79</th>
<th>L 48</th>
<th># 101</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ran, Adee</td>
<td>Cisco</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>A</td>
<td>bucket</td>
</tr>
<tr>
<td>“Tx” and “Rx” should not be used as abbreviations of the terms “transmitter” and “receiver” (except in variable and register names, in diagram labels, or as qualifiers).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change to “transmitter” and “receiver” here and in other places as appropriate.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Response | Response Status | C |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Change “Tx” to “transmitter” and change “Rx” to “receiver” through the document. With editorial license.

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.6</th>
<th>P 79</th>
<th>L 52</th>
<th># 504</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>A</td>
<td>bucket</td>
</tr>
<tr>
<td>Rx_optical_frequency_index</td>
<td>Tx_optical_frequency_index</td>
<td>Tx_Rx_diff_opt_freq_ability</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SuggestedRemedy

Tables 156-2, 3 and a later sentence have Rx_optical_channel_index
Rx_optical_channel_index.Tx_Rx_diff_opt_chan_ability

Response | Response Status | C |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

See responses to comments 324, 325 and 326

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.6</th>
<th>P 80</th>
<th>L 1</th>
<th># 505</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>A</td>
<td>bucket</td>
</tr>
<tr>
<td>blank lines 1 to 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Response | Response Status | C |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remove any blank lines with editorial license

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.6</th>
<th>P 80</th>
<th>L 7</th>
<th># 506</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>f not defined</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Response | Response Status | C |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>REJECT.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

fi is defined on page 79, line 31 as “all channel frequencies fi.” and is consistent with figure 154-3 in IEEE Std 802.3-2022

A straw poll was taken:

I support rejection of comment #506 as proposed

Yes: 16
No: 2

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.6</th>
<th>P 80</th>
<th>L 28</th>
<th># 507</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>square or round brackets</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Response | Response Status | C |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>REJECT.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use of [ ] brackets consistent with Table 154-5 in IEEE Std 802.3-2022
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 156 SC 156.7 P 84 L 22 # 334
Ghiasi, Ali Ghiasi Quantum/Marvell
Comment Type TR Comment Status R
The receiver must tolerate 26 dB OSNR and meet the required error rate, it is not clear what receive OSNR (min) of 29 dB provides
SuggestedRemedy
Need discussions on the intent
Response Response Status W
REJECT.
Receiver OSNR tolerance is measured without line impairments, see 156.9.24, which is different than Receiver OSNR which includes line impairments, see 156.9.23

Cl 156 SC 156.7 P 84 L 24 # 333
Ghiasi, Ali Ghiasi Quantum/Marvell
Comment Type TR Comment Status R
Receive OSNR tolerance is not defined at point till one reads section 156.9.24
SuggestedRemedy
Please add reference to 156.9.24
Response Response Status C
REJECT.
All specifications in Tables 156-7, -8 and -9 including Receive OSNR tolerance are defined in 156.9 which is after the tables but consistent with multiple clauses in IEEE Std 802.3-2022.

Cl 156 SC 156.7.1 P 82 L 23 # 509
Dawe, Piers Nvidia
Comment Type E Comment Status R
Why +/− 20 ppm?
SuggestedRemedy
Response Response Status C
REJECT.
This is a value per adopted baseline from page 6 of https://www.ieee802.org/3/cn/public/19_01/lyubomirsky_3cn_01b_0119.pdf. There was no proposed remedy or justification for a change.

Cl 156 SC 156.7.1 P 82 L 23 # 508
Dawe, Piers Nvidia
Comment Type E Comment Status R
Why 59.84375?
SuggestedRemedy
59.84375
Response Response Status C
REJECT.
This is an exact value per adopted baseline from page 24 of https://www.ieee802.org/3/cn/public/19_01/lyubomirsky_3cn_01b_0119.pdf

Cl 156 SC 156.7.1 P 82 L 27 # 510
Dawe, Piers Nvidia
Comment Type E Comment Status R
Average channel output power
SuggestedRemedy
Average launch power as for single-wavelength duplex fibre PMDs such as 100GBASE-DR, 100GBASE-FR1, and 100GBASE-LR1
Response Response Status C
REJECT.
Use of "Average channel output power" consistent with Table 154-7 in IEEE Std 802.3-2022

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 U/unsatisfied Z/withdrawn
Sort Order: Clause, Subclause, page, line
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 156 SC 156.7.1 P 82 L 30 # 353
Maniloff, Eric Ciena

Comment Type  TR  Comment Status  D
Limiting Adjacent channel crosstalk penalty requires a reduction in the power deltas between channels. To ensure this, adjustable power must be specified.

SuggestedRemedy
Add an entry "Adjustable Range of Tx Output Power" with Min limited to -13 to -9 dBm

Proposed Response  Response Status  W
PROPOSED ACCEPT IN PRINCIPLE.
Review supporting presentation, for comment resolution group (CRG) consideration.

Cl 156 SC 156.7.1 P 82 L 30 # 354
Maniloff, Eric Ciena

Comment Type  TR  Comment Status  D
When adding the Tx output power tuning, its accuracy should be defined as well

SuggestedRemedy
Add an entry "Transmit output power control absolute accuracy" with Min = -1.0 dB and Max = 1.0 dB

Proposed Response  Response Status  W
PROPOSED ACCEPT IN PRINCIPLE.
Review supporting presentation, for comment resolution group (CRG) consideration.

Cl 156 SC 156.7.1 P 82 L 35 # 511
Dawe, Piers Nvidia

Comment Type  E  Comment Status  A
RRC Roll-Off

SuggestedRemedy
?

Response  Response Status  C
ACCEPT IN PRINCIPLE.
See response to comment 103

Cl 156 SC 156.7.1 P 82 L 35 # 329
Ghiasi, Ali Ghiasi Quantum/Marvell

Comment Type  TR  Comment Status  A
RRC is introduced for 1st time in table 156-6 with no reference

SuggestedRemedy
Add reference to 156.9.4

Response  Response Status  C
ACCEPT IN PRINCIPLE.
See response to comment 103

Cl 156 SC 156.7.1 P 82 L 35 # 103
Ran, Adee Cisco

Comment Type  T  Comment Status  A
"RRC Roll-Off" is not a unit. It is unclear what it means in this context.
Similarly for the (min) row.
The spectral mask is specified in 156.9.4 - reading this subclause it becomes clear that the "Value" in the table are the beta parameter values for the two masks.
Instead of listing numbers that are meaningless without reading the subclause text, simply point to the subclause.

SuggestedRemedy
Change "Value" to "See 156.9.4" and use em-dash for "Unit" in both rows.

Response  Response Status  C
ACCEPT.

Cl 156 SC 156.7.1 P 82 L 48 # 337
Ghiasi, Ali Ghiasi Quantum/Marvell

Comment Type  TR  Comment Status  R
For full interoperability using EVM may need additional constrains based on the data in rahn_3cw_01a_220223 and way_3cw_01a_220523

SuggestedRemedy
Need more data to prove that EVM will provide the IEEE level of interoperability

Response  Response Status  U
REJECT.
No suggested remedy provided
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.7.1</th>
<th>P 82</th>
<th>L 49</th>
<th># 512</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td>E</td>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>I-Q (max instantaneous), I-Q (mean)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Suggested Remedy**

?

**Response**

**Response Status**

ACCEPT IN PRINCIPLE.

See responses to comment 350 and 351

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.7.1</th>
<th>P 82</th>
<th>L 49</th>
<th># 350</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maniloff, Eric</td>
<td>Ciena</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td>T</td>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>I-Q is an insufficient name for this spec</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Suggested Remedy**

Change spec name to "I-Q Offset per Polarization (Max Instantaneous)"

**Response**

**Response Status**

ACCEPT IN PRINCIPLE.

In Tables 156-6 and Table 156-11 change "I-Q (max instantaneous)" to "Instantaneous I-Q offset per polarization (max)"

With editorial license

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.7.1</th>
<th>P 82</th>
<th>L 50</th>
<th># 351</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maniloff, Eric</td>
<td>Ciena</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td>T</td>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>I-Q is an insufficient name for this spec</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Suggested Remedy**

Change spec name to "I-Q Offset per Polarization (Mean)"

**Response**

**Response Status**

ACCEPT IN PRINCIPLE.

In Table 156-6 and Table 156-11 change "I-Q (mean)" to "Mean I-Q offset per polarization (max)"

With editorial license

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.7.1</th>
<th>P 82</th>
<th>L 53</th>
<th># 513</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td>E</td>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>Several things with max and min, others without. Definition of 156.9.14 in I-Q phase error doesn't define its sign</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Suggested Remedy**

**Response**

**Response Status**

ACCEPT IN PRINCIPLE.

In Table 156-6 delete "I-Q phase error (min)", change "I-Q phase error (max)" to "I-Q phase error magnitude (max)" with a value of 5.

With editorial license

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.7.1</th>
<th>P 82</th>
<th>L 54</th>
<th># 514</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td>E</td>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>dB(12.5 GHz) is not a unit. Also in Table 156-7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Suggested Remedy**

Change to dB and move the 12.5 GHz to the description or add a footnote to explain if necessary.

**Response**

**Response Status**

ACCEPT IN PRINCIPLE.

In Table 156-6 and Table 156-11 change "dB(12.5 GHz)" to "dB (12.5 GHz)"

With editorial license

<table>
<thead>
<tr>
<th>Cl 156</th>
<th>SC 156.7.1</th>
<th>P 83</th>
<th>L 8</th>
<th># 104</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ran, Adee</td>
<td>Cisco</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td>T</td>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>dB(12.5 GHz) is not a unit. Also in Table 156-7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Suggested Remedy**

Change to dB and move the 12.5 GHz to the description or add a footnote to explain if necessary.

**Response**

**Response Status**

ACCEPT IN PRINCIPLE.

Add a space between change "dB(12.5 GHz)" to "dB (12.5 GHz)"

Same unit in IEEE Std 802.3-2022 clause 154 table 154.7
Comment: In-band should not be capitalized
Suggested Remedy: change In to in
Response: ACCEPT.

Comment: Transmitter In-band OSNR
Suggested Remedy: Change In to in
Response: ACCEPT IN PRINCIPLE.
See response to comment 352

Comment: Transmitter output power stability can't be negative
Suggested Remedy: Remove the negative line
Proposed Response: PROPOSED ACCEPT IN PRINCIPLE.
See responses to comments 353 and 354
"Average receive power (max)" does not depend on the receiver, but on the channel output. So it can't be a receiver specification (as the text above the table states).

Maybe it should be "Average receive power tolerance (min)"?

Similarly for "Average receive power (min)" which may be a tolerance requirement.

Similarly for Receiver OSNR (also defined in Table 156-8 for the channel, with the same value).

Suggested Remedy

Change parameter names and/or add explanations in footnotes.

Consider moving parameters to the black link characteristics in Table 156-8 or deleting duplicates.

Comment Type: E  Comment Status: A

says that receiver OSNR tolerance "is informative and compliance is not required"

Suggested Remedy

Table needs a footnote. Example of current wording from 140: 
Receiver sensitivity (OMAouter) (max) for 100GBASE-DR is optional and is defined for a transmitter with a value of SECQ up to 3.4 dB. 140.7.12.1 Receiver sensitivity for 100GBASE-DR. The receiver sensitivity for 100GBASE-DR is optional and is defined for a transmitter with a value of SECQ up to 3.4 dB. Receiver sensitivity for 100GBASE-DR should meet Equation (140-1), which is illustrated in Figure 140-9. The normative requirement for the 100GBASE-DR receiver is stressed receiver sensitivity.

Response  Response Status: C

ACCEPT IN PRINCIPLE.

Add note in Table 156-7 for Receiver OSNR tolerance stating "OSNR tolerance is optional and compliance is not required."
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 156 SC 156.8 P 85 L 5
Dawe, Piers Nvidia
Comment Type E Comment Status D
Average output power at TP3
SuggestedRemedy
each / per channel?
Proposed Response Response Status Z
REJECT.

This comment was WITHDRAWN by the commenter.

Cl 156 SC 156.8 P 85 L 8
Maniloff, Eric Ciena
Comment Type E Comment Status A
Text for OSNR... should not be present
SuggestedRemedy
Delete text "for OSNR at TP3 (12.5 GHz)"
Response Response Status C
ACCEPT IN PRINCIPLE.

In Table 156-8 change "Average output power at TP3 (min): for OSNR at TP3 (12.5 GHz)" to "Average output power at TP3 (min)"

Cl 156 SC 156.8 P 85 L 13
Maniloff, Eric Ciena
Comment Type E Comment Status A
Text for OSNR... should not be present
SuggestedRemedy
Delete text "for OSNR at TP3 (12.5 GHz)"
Response Response Status C
ACCEPT IN PRINCIPLE.

In Table 156-8 change "Optical path OSNR penalty (max), for OSNR at TP3 (12.5 GHz)" to "Optical path OSNR penalty (max)"

Cl 156 SC 156.8 P 85 L 22
Dawe, Piers Nvidia
Comment Type E Comment Status D
DGD-max
SuggestedRemedy
Is there a spec to make the Rx tolerate it?
Proposed Response Response Status W
PROPOSED REJECT.

No consensus to make a change. This requirement in the specifications defined in 156.9.23.

Cl 156 SC 156.8 P 85 L 28
Dawe, Piers Nvidia
Comment Type E Comment Status A
Adjacent channel isolation
SuggestedRemedy
? see G.671
Response Response Status C
ACCEPT IN PRINCIPLE.

In 156.9.29 delete reference to ITU-T G671

Cl 156 SC 156.8 P 85 L 29
Dawe, Piers Nvidia
Comment Type E Comment Status D
Interferometric crosstalk at TP3
SuggestedRemedy
? 
Proposed Response Response Status Z
REJECT.

This comment was WITHDRAWN by the commenter.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 156 SC 156.8 P 85 L 35 # 523
Dawe, Piers Nvidia
Comment Type E Comment Status A
Only relevant
SuggestedRemedy

Response Response Status C
ACCEPT IN PRINCIPLE.

In footnote d change:
"Only relevant with implementations of a DWDM black link with one or more optical add-drop multiplexers present."

to
"Applicable to implementations of a DWDM black link with one or more optical add-drop multiplexers present."

Cl 156 SC 156.8 P 85 L 44 # 524
Dawe, Piers Nvidia
Comment Type E Comment Status D
why is the table like this, high? isolation at 0 and +/-75?
SuggestedRemedy

Proposed Response Response Status C
REJECT.
This comment was WITHDRAWN by the commenter.

Cl 156 SC 156.8 P 85 L 45 # 107
Ran, Adee Cisco
Comment Type E Comment Status A
"/+/-"
SuggestedRemedy
Change to "±" (symbol) across the table
Response Response Status C
ACCEPT IN PRINCIPLE.

Change symbol as suggested throughout the document. With editorial license

Cl 156 SC 156.9.1 P 86 L 35 # 525
Dawe, Piers Nvidia
Comment Type E Comment Status R
Scrambled idle encoded by CFEC and not SD-FEC?
SuggestedRemedy

Response Response Status C
REJECT.
Use of CFEC is correct as per 155.2.1 "The transmit data is encoded with a concatenated forward error correction (CFEC) code consisting of an inner SC-FEC code and an outer Hamming code SD-FEC"

Cl 156 SC 156.9.1 P 86 L 35 # 108
Ran, Adee Cisco
Comment Type T Comment Status D
82.2.11 defines a 100GBASE-R test pattern, which is irrelevant. The 400GBASE-ZR PCS has a test pattern mode specified in 155.2.1.
SuggestedRemedy
Change "82.2.11, Clause 155" to *155.2.1*.
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Review supporting presentation, for comment resolution group (CRG) consideration.
<table>
<thead>
<tr>
<th>Cl</th>
<th>156</th>
<th>SC 156.9.1</th>
<th>P 86</th>
<th>L 42</th>
<th># 526</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Valid 400GBASE-R</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td>400GBASE-ZW</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td><strong>Response Status</strong></td>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Table 156-11 change &quot;400GBASE-R&quot; to &quot;400GBASE-ZR&quot;. With editorial license.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl</th>
<th>156</th>
<th>SC 156.9.1</th>
<th>P 87</th>
<th>L 8</th>
<th># 357</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maniolf, Eric</td>
<td>Ciena</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;I-Q is an insufficient name for this spec&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td>Change spec name to &quot;I-Q Offset per Polarization (Max Instantaneous)&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td><strong>Response Status</strong></td>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>See response to comment 350</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl</th>
<th>156</th>
<th>SC 156.9.1</th>
<th>P 87</th>
<th>L 10</th>
<th># 358</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maniolf, Eric</td>
<td>Ciena</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;I-Q is an insufficient name for this spec&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td>Change spec name to &quot;I-Q Offset per Polarization (Mean)&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td><strong>Response Status</strong></td>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>See response to comment 351</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl</th>
<th>156</th>
<th>SC 156.9.1</th>
<th>P 87</th>
<th>L 13</th>
<th># 527</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Type</strong></td>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;I-Q phase error (max), I-Q phase error (min)&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td>Combine, as for Average receive power</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td><strong>Response Status</strong></td>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>See response to comment 513</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 156  SC 156.9.1  P 87  L 25  # 528
Dawe, Piers  Nvidia

Comment Type E  Comment Status D
Is Average receive power a kind of sensitivity/overload? If not, why not any 400GBASE-ZW signal? Same for Ripple? which is a channel (black link) property

SuggestedRemedy

Proposed Response  Response Status Z
REJECT.

This comment was WITHDRAWN by the commenter.

Cl 156  SC 156.9.4  P 87  L 52  # 529
Dawe, Piers  Nvidia

Comment Type E  Comment Status D
Compliant transmitters ... are required to ... by applying minimum and maximum masks to the spectrum acquired using an optical spectrum analyzer.

SuggestedRemedy

Proposed Response  Response Status W
PROPOSED REJECT.

No suggested remedy provided

Cl 156  SC 156.9.4  P 88  L 1  # 530
Dawe, Piers  Nvidia

Comment Type E  Comment Status A
As this mask is a normative spec

SuggestedRemedy

Write out the frequency-domain equations for a RRC response with a damping factor of 0.4

Response  Response Status C
ACCEPT IN PRINCIPLE.

See response to comment 359

Cl 156  SC 156.9.4  P 88  L 8  # 531
Dawe, Piers  Nvidia

Comment Type E  Comment Status A
set at -9 dB up to the -9 dB of an RRC

SuggestedRemedy

set at -9 dB up to 30.8 GHz offset for an RRC

Response  Response Status C
ACCEPT IN PRINCIPLE.

Change "set at -9 dB up to the -9 dB of an RRC with ß of 0.05." to "set at -9 dB up to 30.8 GHz offset and follows a RRC ß of 0.05 for higher frequencies."

Cl 156  SC 156.9.4  P 88  L 40  # 532
Dawe, Piers  Nvidia

Comment Type E  Comment Status A
Blank line

SuggestedRemedy

Remove

Response  Response Status C
ACCEPT IN PRINCIPLE.

Remove any blank lines with editorial license
This clause defines the transmit mask as following a RRC. The RRC definition should be included.

**Suggested Remedy**

Add an equation to 156.9.4 defining the RRC function and Beta used to define the mask, or a reference to a definition elsewhere in 802.3

**Response**

ACCEPT IN PRINCIPLE.

Add footnote for RRC Roll-Off "Root raised cosine (RRC) is the square root of the raised cosine which is calculated as" (see piecewise-defined function at https://en.wikipedia.org/wiki/raised-cosine_filter)

See 11.3.1.2.3 for possible RRC formula.

**Comment Status:** A

**Response Status:** C

**Dawe, Piers Nvidia**

**Response**

REJECT.

No suggested remedy provided

**Comment Status:** R

**Response Status:** C

**Ran, Adee Cisco**

**Comment Type:** T

**Comment Status:** A

*The laser frequency noise mask is the laser frequency noise measured at a resolution between 10^-1 and 10^-6 times the frequency of interest*

The mask is not the measured noise; it is the specified maximum.

The paragraph is not phrased in typical standard language and can be improved. The text in the suggested remedy may be used (or corrected if it contains any error).

**Suggested Remedy**

Change the first paragraph from *The laser frequency noise mask is the laser frequency noise measured at a resolution between 10^-1 and 10^-6 times the frequency of interest*. The frequency sweep relative to the laser center frequency shall be from less than 100 Hz to fbaud/2. With the exception of spurs, the measured frequency noise at any frequency shall be below the mask formed by interpolating between the points listed in Table 156–12 and illustrated in Figure 156–5 to *The laser frequency noise mask is the maximum allowed laser frequency noise and is formed by interpolating between the points listed in Table 156–12 and illustrated in Figure 156–5. The mask frequencies are relative to the laser center frequency from less than 100 Hz to fbaud/2. Measurement resolution should be between 10^-1 and 10^-6 times the frequency of interest. With the exception of spurs, the measured frequency noise at any frequency shall be below the mask*.  

**Response**

ACCEPT IN PRINCIPLE.

Change as suggested but in the second sentence change "than 100 Hz to fbaud/2" to "than 100 Hz to half the signaling rate". See response to comment 112

**Comment Status:** A

**Response Status:** C
<table>
<thead>
<tr>
<th>CI</th>
<th>156</th>
<th>SC</th>
<th>156.9.6</th>
<th>P</th>
<th>89</th>
<th>L</th>
<th>3</th>
<th># 537</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>R</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>the frequency of interest</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td>Response Status</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REJECT.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No suggested remedy provided.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CI</th>
<th>156</th>
<th>SC</th>
<th>156.9.6</th>
<th>P</th>
<th>88</th>
<th>L</th>
<th>52</th>
<th># 112</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ran, Adee</td>
<td>Cisco</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>T</td>
<td>Comment Status</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;fbaud&quot; is not defined in this clause.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Either define it (with a numerical value) or use the numerical value here.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td>Response Status</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change &quot;fbaud&quot; to &quot;signaling rate&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CI</th>
<th>156</th>
<th>SC</th>
<th>156.9.6</th>
<th>P</th>
<th>89</th>
<th>L</th>
<th>3</th>
<th># 536</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dawe, Piers</td>
<td>Nvidia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fbaud</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response</td>
<td>Response Status</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>See response to comment 112</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Comment Type:** TR/technical required
**Response Status:** C

---

**Comment Type:** ER/editorial required
**Response Status:** C

---

**Comment Type:** GR/general required
**Response Status:** C

---

**Comment Type:** T/technical
**Response Status:** C

---

**Comment Type:** E/editorial
**Response Status:** C

---

**Comment Type:** G/general
**Response Status:** C
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

---

Cl 156  SC 156.9.6  P 89  L 3  # 166
Abbott, John  Corning Incorporated

Comment Type  E  Comment Status  A  bucket
IN TABLE 156-12. Everywhere else in the 802.3 standard "1-sided" is spelled out as "one-sided". For example table 93.8, table 110-11, table 136-18, table 137-6, table 83D-6, table 93A-1, section 93A.1.6, table 120D-8.

Suggested Remedy
Spell out "1-sided" as "one-sided" IN TABLE 156-12

Response  Response Status  C  ACCEPT.

---

Cl 156  SC 156.9.6  P 89  L 20  # 113
Ran, Adee  Cisco

Comment Type  E  Comment Status  A
Figure 156-5 is cluttered.

This figure does not add any information beyond Table 156-12 (which is normative, whereas the figure is an illustration).

Suggested Remedy
Remove the marker labels (e.g. "X: 1 x 10^4, Y: 1 x 10^9") and change "Hz2" to "Hz^2" in the y axis label.

Alternatively, delete the figure.

Response  Response Status  C
ACCEPT IN PRINCIPLE.

Retain figure 156-5 and change "Hz2" to "Hz^2" in the y axis label.

---

Cl 156  SC 156.9.6  P 89  L 20  # 114
Abbott, John  Corning Incorporated

Comment Type  E  Comment Status  A  bucket
FIGURE 156-6. Everywhere else in the 802.3 standard "1-sided" is spelled out as "one-sided". For example table 93.8, table 110-11, table 136-18, table 137-6, table 83D-6, table 93A-1, section 93A.1.6, table 120D-8.

Suggested Remedy
Spell out "1-sided" as "one-sided" in FIGURE 156-6.

Response  Response Status  C
ACCEPT.

---

Cl 156  SC 156.9.10  P 90  L 13  # 114
Ran, Adee  Cisco

Comment Type  E  Comment Status  A
The abbreviation EVM should be introduced before it is used.

Suggested Remedy
Insert "(EVM)" after the first instance of "error vector magnitude" (which may be in a different paragraph, based on another comment).

Response  Response Status  C
ACCEPT IN PRINCIPLE.

Add "EVM: error vector magnitude" to 1.5. In all other usages in the document replace "error vector magnitude" with "EVM". With editorial license

---

Cl 156  SC 156.9.10  P 90  L 20  # 115
Ran, Adee  Cisco

Comment Type  T  Comment Status  D
The last paragraph defines EVMmax, but the specified value in Table 156-6 is for EVM (max). It does not seem to be the same thing.

Should the specification be for EVMmax (max)?

Suggested Remedy
Move the first paragraph (containing the "shall") after the last one (which defines EVMmax), and hinge the specifications to be EVMmax instead of EVM.

Proposed Response  Response Status  W
PROPOSED ACCEPT IN PRINCIPLE.

For comment resolution group (CRG) consideration.
Add a definition for I-Q Offset Measurement

SuggestedRemedy
Add the following Specification:

\[
I_Q_{\text{offset(Max)}} = 10\log_{10}\left(\frac{I_{\text{mean}}^2 + Q_{\text{mean}}^2}{P_{\text{signal}}}\right)
\]

with a measurement interval of 1 us

Response
ACCEPT IN PRINCIPLE.

Change 156.9.11 to "The instantaneous I-Q offset per polarization is calculated as \(I_Q_{\text{offset}} = 10\log_{10}\left(\frac{I_{\text{mean}}^2 + Q_{\text{mean}}^2}{P_{\text{signal}}}\right)\) with a measurement interval of 1 us. The instantaneous I-Q offset per polarization is the maximum value per polarization and shall be within the limits given in Table 156–6."

With editorial license

I-Q is an insufficient name for this spec

SuggestedRemedy
Change spec name to "I-Q Offset per Polarization (Max Instantaneous)"

Response
ACCEPT IN PRINCIPLE.

Change spec name to "Instantaneous I-Q offset per polarization"

Font size is inconsistent in the text, also in 156.9.12.

SuggestedRemedy
Make it consistent.

Response
ACCEPT IN PRINCIPLE.

Ensure consistent font in 156.9.11 and 156.9.12. With editorial license

The definition of I-Q (max instantaneous) is unclear. "peak value" of what per polarization? is it peak power?

Assuming it is not the difference between I and Q, the current name is confusing. Should it be "Max instantaneous power per polarization"?

Also, having the definition and the "shall" in the same sentence create poor language.

SuggestedRemedy
Consider renaming this parameter.
Rewrite the definition to make it clear, even if the name is not changed.
Make the "shall" statement separate from the definition.

Response
ACCEPT IN PRINCIPLE.

See response to comments 361

I-Q (max instantaneous)

SuggestedRemedy
?

Response
ACCEPT IN PRINCIPLE.

See response to comment 350
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Comment Type: E  Comment Status: A
I-Q is an insufficient name for this spec

Suggested Remedy
Change spec name to "I-Q Offset per Polarization (Mean)"

Response  Response Status: C
ACCEPT IN PRINCIPLE.

"Mean I-Q offset per polarization"

Comment Type: T  Comment Status: A
Add a definition for I-Q Offset Measurement

Suggested Remedy
Add the following Specification:

\[
IQoffset(Mean) = 10\log_{10}\left(\frac{I_{mean}^2 + Q_{mean}^2}{P_{signal}}\right)
\]

Response  Response Status: C
ACCEPT IN PRINCIPLE.

See response to comment #362. Change 156.9.12 to "The mean I-Q offset is calculated as \[IQoffset(\text{Mean}) = 10\log_{10}\left(\frac{I_{mean}^2 + Q_{mean}^2}{P_{signal}}\right)\]. The mean I-Q offset per polarization is the mean value per polarization and shall be within the limits given in Table 156-6."

With editorial license.

Comment Type: T  Comment Status: A
<= 1us measurement interval applies to Max, not mean

Suggested Remedy
Remove reference to <= 1 us from 156.9.12

Response  Response Status: C
ACCEPT IN PRINCIPLE.

See response to comment 363

Comment Type: T  Comment Status: A
The definition of I-Q (mean) is unclear. "mean value" of what per polarization? Is it mean power?

Response  Response Status: C
ACCEPT IN PRINCIPLE.

Assuming it is not the difference between I and Q, the current name is confusing. Should it be "mean power per polarization"?

What does "averaged over <=1 us" mean? Is averaging over only 1 ps acceptable? Should it perhaps be measured over at least 1 us?

In clause 154 there is a parameter with a different name, "I-Q offset (max)", and its definition refers to ITU-T G.698.2. This may create further confusion.

Also, having the definition and the "shall" in the same sentence create poor language.

Suggested Remedy
Consider renaming this parameter.
Rewrite the definition to make it clear, even if the name is not changed.
Make the "shall" statement separate from the definition.

Response  Response Status: C
ACCEPT IN PRINCIPLE.

See responses to comments 362 and 363

Comment Type: T  Comment Status: A
"<=" should be a symbol

Suggested Remedy
change to the <= symbol

Response  Response Status: C
ACCEPT.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

---

**Comment Type**

Comment Type  | E | I-Q (mean)
---|---|---

**Suggested Remedy**

ACCEPT IN PRINCIPLE.

See responses to comments 351 and 363

---

**Comment Type**

Comment Type  | E | I-Q amplitude imbalance (mean)
---|---|---

**Suggested Remedy**

proportional amplitude difference?

**Response**

Response Status  | C
---|---

ACCEPT IN PRINCIPLE.

Comment unclear and no suggested remedy provided

---

**Comment Type**

Comment Type  | E | "proportional" phase difference
---|---|---

**Suggested Remedy**

Response Status  | C
---|---

ACCEPT IN PRINCIPLE.

Delete "proportional".

---

**Comment Type**

Comment Type  | E | shall with no PICS
---|---|---

**Suggested Remedy**

Response Status  | C
---|---

ACCEPT IN PRINCIPLE.

Add "Optical signal-to-noise ratio (OSNR)" to 156.13.4.4. With editorial license
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 156 SC 156.9.17 P 91 L 3 # 544
Dawe, Piers Nvidia
Comment Type E Comment Status D
who is supposed to act on this "shall"? Black link, as it points to Table 156-8. 156.8 has the necessary "shall". Don't write in the passive voice.
SuggestedRemedy

Proposed Response Response Status Z
REJECT.
This comment was WITHDRAWN by the commenter.

Cl 156 SC 156.9.17 P 91 L 4 # 365
Maniloff, Eric Ciena
Comment Type E Comment Status A
Both in-band and out-of-band OSNR use the same definition for Signal Power. 156.9.17 refers to this as average signal power, 156.9.19 refers to this as the total signal power. These should be the same.
SuggestedRemedy
Change Average to Total on line 4
Response Response Status C
ACCEPT IN PRINCIPLE.
Change "ratio of the average signal power" to "ratio of the total signal power within the signal's ~20 dB spectral mask points".

Cl 156 SC 156.9.17 P 91 L 5 # 546
Dawe, Piers Nvidia
Comment Type E Comment Status A
maximum spectral excursion
SuggestedRemedy
unused / undefined
Response Response Status C
ACCEPT IN PRINCIPLE.
In 156.9.17 change the end of the second sentence from "plus and minus the maximum spectral excursion" to "plus and minus the maximum spectral excursion as defined in ITU-T G.698.2."
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

**Comment #552**

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

- **Dawe, Piers**  
  - **Nvidia**

**Comment**: pre-FEC BER level lower than the CFEC threshold

**Suggested Remedy**

- which is? and the SD-FEC?

**Response**  

- **Response Status**: C

- **ACCEPT IN PRINCIPLE.**

- Change "while maintaining a pre-FEC BER level lower than the CFEC threshold" to "while maintaining a frame loss ratio within the limit specified in 156.1.1"

- Only applies to CFEC, see response to comment #525. With editorial license.

**Comment Status**: A

**Response Status**: C

**Response**  

- **Dawe, Piers**  
  - **Nvidia**

**Comment**: has to be met with a worst-case compliant transmitter, but it does not have to be met

**Suggested Remedy**

**Proposed Response**  

- **Response Status**: Z

- **REJECT.**

- This comment was WITHDRAWN by the commenter.

**Comment #550**

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

- **Dawe, Piers**  
  - **Nvidia**

**Comment**: see earlier for table footnote and "optional"

**Suggested Remedy**

**Response**  

- **Response Status**: C

- **ACCEPT IN PRINCIPLE.**

- Change the last sentence in 156.9.24 to

- "OSNR tolerance is optional and compliance is not required. The normative receiver requirement is receiver OSNR, see 156.9.23."

**Comment #120**

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

- **Ran, Adee**  
  - **Cisco**

**Comment**: "OSNR tolerance is informative and compliance is not required."

- **Suggested Remedy**

- Informative text should not appear in normative clauses. 802.3dc did the work of removing "informative specifications" or turning them into recommendations.

- This parameter seems to be loosely defined and unmeasurable in a deployed system (pre-FEC BER counters and test patterns are not specified). So maybe it should not even be a recommendation.

- Also, the "Receiver OSNR" parameter have names that does not suggest their meaning. If this parameter is retained, the name should be changed, maybe to "Receiver OSNR tolerance without channel impairments"

**Suggested Remedy**

- Preferably delete this parameter (subclause text and table).

- Otherwise change the "informative" paragraph to make it a recommendation, and change the parameter name to be more meaningful.

**Proposed Response**  

- **Response Status**: W

- **PROPOSED ACCEPT IN PRINCIPLE.**

- For comment resolution group (CRG) consideration. Same informative or optional approach taken in IEEE Std 802.3-2022 154.9.16.
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 156 SC 156.9.25 P 92 L 13 # 553
Dawe, Piers Nvidia
Comment Type E Comment Status D
insertion loss
SuggestedRemedy
channel response?

Proposed Response Response Status W
PROPOSED REJECT.
Comment unclear and no suggested remedy provided

Cl 156 SC 156.9.26 P 92 L 18 # 554
Dawe, Piers Nvidia
Comment Type E Comment Status D
[Optical path OSNR penalty, defined in Recommendation ITU-T G.698.2, qv]
SuggestedRemedy
Proposed Response Response Status W
PROPOSED REJECT.
Comment unclear, no suggested remedy provided and reference to ITU-T is consistent with IEEE Std 802.3-2022.

Cl 156 SC 156.9.29 P 92 L 33 # 555
Dawe, Piers Nvidia
Comment Type E Comment Status D
[Adjacent channel isolation, defined in Recommendation ITU-T G.671, qv]
SuggestedRemedy
Proposed Response Response Status W
PROPOSED REJECT.
Comment unclear, no suggested remedy provided and reference to ITU-T is consistent with IEEE Std 802.3-2022.

Cl 156 SC 156.9.30 P 92 L 38 # 556
Dawe, Piers Nvidia
Comment Type E Comment Status D
[Interferometric crosstalk at TP3, defined in Recommendation ITU-T G.698.2, qv]
SuggestedRemedy
Proposed Response Response Status W
PROPOSED REJECT.
Comment unclear, no suggested remedy provided and reference to ITU-T is consistent with IEEE Std 802.3-2022.

Cl 156 SC 156.10.1 P 92 L 49 # 558
Dawe, Piers Nvidia
Comment Type E Comment Status D
Connect the 400 Gb/s DP-16QAM transmitter to
SuggestedRemedy
The 400GBASE-ZW transmitter is connected to
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Review supporting presentation, for comment resolution group (CRG) consideration.

Cl 156 SC 156.10.1 P 93 L 8 # 561
Dawe, Piers Nvidia
Comment Type E Comment Status A
Calibrated Coherent Receiver
SuggestedRemedy
Calibrated coherent receiver and so on, also in other figures
Response Response Status C
ACCEPT IN PRINCIPLE.
In 156.10 ensure correct capitalization with editorial license

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 U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line
<table>
<thead>
<tr>
<th>CI</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Proposed Response</th>
<th>SuggestedRemedy</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>156</td>
<td>156.10.1</td>
<td>93</td>
<td>8</td>
<td>562</td>
<td>E</td>
<td>D</td>
<td>Digital Signal Processing</td>
<td>A to D and analysis?  156.10.1.2 says it's Offline</td>
<td>PROPOSED REJECT.</td>
</tr>
<tr>
<td>156</td>
<td>156.10.1</td>
<td>93</td>
<td>9</td>
<td>560</td>
<td>E</td>
<td>A</td>
<td>TX</td>
<td>If there is interest I can bring a frequency dependent ENOB mask</td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
</tr>
<tr>
<td>156</td>
<td>156.10.1</td>
<td>93</td>
<td>9</td>
<td>559</td>
<td>E</td>
<td>D</td>
<td>It would be helpful to show the patch cord, between Tx and TP2</td>
<td>Add patch cord and MDI point to figure 156-6 similar to figure 156-2, with editorial license</td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
</tr>
<tr>
<td>156</td>
<td>156.10.1.2</td>
<td>94</td>
<td>44</td>
<td>536</td>
<td>TR</td>
<td>R</td>
<td>Assuming just 4 bits ENOB from 10 MHz to 29.9 MHz the reference receiver will have additional penalty than real receiver that has typically 6+ bits ENOB at low frequencies and about 4 bits at high frequency</td>
<td>No suggested remedy provided</td>
<td>PROPOSED REJECT.</td>
</tr>
<tr>
<td>156</td>
<td>156.10.1.2</td>
<td>94</td>
<td>3</td>
<td>563</td>
<td>TR</td>
<td>A</td>
<td>blank line</td>
<td>Remove any blank lines with editorial license</td>
<td>PROPOSED REJECT.</td>
</tr>
<tr>
<td>156</td>
<td>156.10.1.2.2</td>
<td>94</td>
<td>36</td>
<td>554</td>
<td>TR</td>
<td>D</td>
<td>Need a bigger block size for at least one of these, to go with the jitter corner frequency</td>
<td>No suggested remedy provided</td>
<td>PROPOSED REJECT.</td>
</tr>
</tbody>
</table>
"3rd-order super Gaussian filter with RRC = 0.2"

This is an uncommon way to specify a filter, and it is unclear.

RRC seems to stand for root raised cosine (0.2 may be the roll-off parameter beta), but this filter is not "super Gaussian" and it's unclear what "3rd-order" means for a raised cosine. Or is it a different filter?

Also, the cutoff frequency is not specified.

Suggested Remedy

Rewrite to clarify.

PROPOSED ACCEPT IN PRINCIPLE.

"3rd-order super Gaussian filter with RRC = 0.2" to "RRC filter with beta = 0.2"

PROPOSED ACCEPT IN PRINCIPLE.

See response to comment 121

3rd-order super Gaussian filter with RRC = 0.2

ACCEPT IN PRINCIPLE.

See response to comment 359

IQ offset (twice)

ACCEPT IN PRINCIPLE.

Change "IQ Offset" to "IQ offset" with editorial license
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Comment from Cl 156 SC 156.10.1.2.6 P 94 L 3 # 569
Dawe, Piers Nvidia

Comment Type: E  Comment Status: D
FIR filter with 15 real taps

Suggested Remedy:
Where is the cursor?

Proposed Response:  Response Status: W
PROPOSED REJECT.

No suggested remedy provided.

Comment from Cl 156 SC 156.10.1.2.6 P 94 L 4 # 570
Dawe, Piers Nvidia

Comment Type: E  Comment Status: D
using the signal with additive white Gaussian noise considering the Receiver OSNR(min)

Suggested Remedy:
do what?

Proposed Response:  Response Status: W
PROPOSED REJECT.

No suggested remedy provided.

Comment from Cl 156 SC 156.10.1.2.6 P 95 L 3 # 335
Ghiasi, Ali Ghiasi Quantum/Marvell

Comment Type: TR  Comment Status: D
Improve definition of the FIR

Suggested Remedy:
The signal is equalized using an FIR filter with 15 T spaced equalizer with real taps. The sum of all taps is equal to 1, and the main tap is allowed to vary from tap 1 to tap 8.

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

Change the first sentence of 156.10.1.2.6 to "The signal is equalized using an FIR filter with a 15 T spaced equalizer with real taps. The sum of all taps is equal to 1 and the main tap is allowed to vary from tap 1 to tap 8."

Comment from Cl 156 SC 156.10.1.2.6 P 95 L 9 # 122
Ran, Adee Cisco

Comment Type: E  Comment Status: A
I don't see any TBDs.

Suggested Remedy:
Delete the editor's note.

Response:  Response Status: C
ACCEPT.

Comment from Cl 156 SC 156.10.1.2.6 P 95 L 9 # 220
Huber, Thomas Nokia

Comment Type: E  Comment Status: A
The editor's note about TBDs is no longer relevant

Suggested Remedy:
Remove the editor's note.

Response:  Response Status: C
ACCEPT IN PRINCIPLE.

See response to comment 122

Comment from Cl 156 SC 156.10.1.2.6 P 95 L 9 # 306
Maniloff, Eric Ciena

Comment Type: E  Comment Status: A
Editor's Note should be removed

Suggested Remedy:
Remove Note

Response:  Response Status: C
ACCEPT IN PRINCIPLE.

See response to comment 122

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 U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line
### IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Response Status</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>156</td>
<td>156.10.1.2.7</td>
<td>P</td>
<td>95</td>
<td>17</td>
<td>E</td>
<td>A</td>
<td>The equation label format seems unusual (hyphen instead of en dash, spaces). Also, the equation labels are not on the same line as the equation. Use the standard equation style. ACCEPT IN PRINCIPLE. Update equation style to match style guide. With editorial license.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>156</td>
<td>156.10.1.2.7</td>
<td>P</td>
<td>95</td>
<td>20</td>
<td>E</td>
<td>D</td>
<td>It would be better to count from 1 to K in the usual way.</td>
<td>W</td>
<td>PROPOSED REJECT. No suggest remedy provided.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>156</td>
<td>156.10.1.2.7</td>
<td>P</td>
<td>95</td>
<td>31</td>
<td>E</td>
<td>D</td>
<td>Do what with alpha_peak? add equation.</td>
<td>W</td>
<td>PROPOSED REJECT. No suggest remedy provided.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>156</td>
<td>156.10.1.2.7</td>
<td>P</td>
<td>95</td>
<td>45</td>
<td>E</td>
<td>D</td>
<td>n and eta are the same thing? Why not k?</td>
<td>W</td>
<td>PROPOSED REJECT. No suggest remedy provided.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**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  U/unsatisfied  Z/withdrawn
IEEE P802.3cw D2.0 400 Gb/s over DWDM systems Initial Working Group ballot comments

Cl 156  SC 156.10.1.2.7  P 95  L 49  # 576
Dawe, Piers  Nvidia
Comment Type  E  Comment Status  D
starting at 0
SuggestedRemedy

Proposed Response  Response Status  W
PROPOSED REJECT.
No suggest remedy provided

Cl 156  SC 156.10.1.2.7  P 95  L 51  # 577
Dawe, Piers  Nvidia
Comment Type  E  Comment Status  D
N vs K vs 1000
SuggestedRemedy

Proposed Response  Response Status  W
PROPOSED REJECT.
No suggest remedy provided

Cl 156  SC 156.10.1.2.7  P 96  L 28  # 578
Dawe, Piers  Nvidia
Comment Type  E  Comment Status  A
blank line
SuggestedRemedy

Response  Response Status  C
ACCEPT IN PRINCIPLE.
Remove any blank lines with editorial license

Cl 156  SC 156.11.1  P 96  L 35  # 124
Ran, Adee  Cisco
Comment Type  E  Comment Status  A
bucket
The text here does not match the common text for the "General safety" subclauses across the 2022 revision.
SuggestedRemedy
Change the text in this subclause to "Equipment subject to this clause shall conform to the general safety requirements in J.2."
Response  Response Status  C
ACCEPT.

Cl 156  SC 156.12  P 97  L 41  # 579
Dawe, Piers  Nvidia
Comment Type  E  Comment Status  A
(compare 156A)
SuggestedRemedy
Make it clear that there is one fibre per direction at the MDI even if there is bidirectional fibre between mux/demuxes
Response  Response Status  C
ACCEPT IN PRINCIPLE.
Change "is coupled to the DWDM black link medium at the MDI" to "is coupled to the DWDM black link medium via one fiber per direction at the MDI"

Cl 156  SC 156.13.4.2  P 100  L 28  # 580
Dawe, Piers  Nvidia
Comment Type  E  Comment Status  A
bucket
PMD_global_transmit_disable  _variable
Tx_Rx_diff_opt_channel_ability  variable
SuggestedRemedy
rogue underscore, column widths
Response  Response Status  C
ACCEPT IN PRINCIPLE.
Correct underscore and column widths, with editorial license
Black Link examples should be expanded to include some specifications for Mux and Demux devices that would satisfy the black-link transfer function.

**Suggested Remedy**

Add a table to 156.A.1 including Mux and Demux example specifications. For example see https://www.ieee802.org/3/cw/public/22_0523/maniloff_3cw_01_220523.pdf#page=5

**Response**

**Response Status**: C

ACCEPT IN PRINCIPLE.


Adding clarifying language that the filter characteristics in this presentation were derived for the case where adjacent channels were propagating in the same direction in one fiber.

With editorial license.