Cl **FM** SC **FM** P **2** L **16** # 480
Remein, Duane Futurewei Technologie

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

This is the only case of Point to Multipoint in the draft.

SuggestedRemedy

Replace with Point-to-multipoint.

Proposed Response *Response Status* **O**

Cl **1** SC **1.4.245a** P **22** L **33** # 481
Remein, Duane Futurewei Technologie

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

Surely there are other "unit of measurement of volume of information"

SuggestedRemedy

Change:
"The unit of measurement of volume of information." to
"A unit of information volume."

Proposed Response *Response Status* **O**

Cl **45** SC **45.2.3** P **38** L **17** # 482
Remein, Duane Futurewei Technologie

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

The entry "45.2.1.45a" in Table 45-176 should be "45.2.3.45a" and a live link.

SuggestedRemedy

per comment

Proposed Response *Response Status* **O**

Cl **45** SC **45.2.3.8** P **40** L **4** # 483
Remein, Duane Futurewei Technologie

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

IEEE Std 802.3cb-2018 changed table 45-182 Bit(s) from 3.9.15:3 to 3.9.15:4. This should be reflected in our draft.

SuggestedRemedy

Change the crossed out 3 to a crossed out 4 in the first row of table 45-182

Proposed Response *Response Status* **O**

Cl **45** SC **45.2.3.45a.2** P **42** L **44** # 485
Remein, Duane Futurewei Technologie

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

"When bit this bit is set" is a bit overstated. Same error at pg 43 line 3 and 17.

SuggestedRemedy

Change to "When this bit is set"

Proposed Response *Response Status* **O**

Cl **45** SC **45.2.3.11ad** P **40** L **44** # 484
Remein, Duane Futurewei Technologie

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

Not quite able to achieve 125 Gb/s just yet.

SuggestedRemedy

Change:
"support the 125GBASE-PQ Tx only PCS" to:
"support the 25GBASE-PQ Tx only PCS"

Proposed Response *Response Status* **O**

Cl **56** *SC* **56.1.2** *P* **47** *L* **2** # 486
Remein, Duane Futurewei Technologie

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

This statement is confusing at best "Each PCS and PMA channel operates at a 25.78125 GBd line rate in the downstream direction and a 25.78125 GBd or a 10.3125 GBd in the upstream direction."

SuggestedRemedy

Change to:
"Each PCS and PMA channel in the downstream direction operates at a 25.78125 GBd line rate. A PCS and PMA channel in the upstream direction operates at either a 25.78125 GBd or a 10.3125 GBd line rate."

Proposed Response *Response Status* **O**

Cl **56** *SC* **56.1.3** *P* **49** *L* **25** # 487
Remein, Duane Futurewei Technologie

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

I believe Clause 141 defined more than one PMD.

SuggestedRemedy

Change
"All these systems employ the PMD defined in" to
"All these systems employ a PMD defined in"

Proposed Response *Response Status* **O**

Cl **56** *SC* **56.1.3** *P* **49** *L* **35** # 488
Remein, Duane Futurewei Technologie

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

There is a stray character (possibly an underlined space) at the end of this para.

SuggestedRemedy

Remove the stray character(s).

Proposed Response *Response Status* **O**

Cl **56** *SC* **56.1.3** *P* **53** *L* **1** # 489
Remein, Duane Futurewei Technologie

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

Table 56-4 is not clear with all the "XXXX" everywhere. Use the same insertion style that is used a clause 45 without the "XXXX"x. Note that this table is being inserted and therefore does not need any mark-up.

SuggestedRemedy

Remove all markup from table 56-4 (title and table proper).

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.1** *P* **119** *L* **10** # 478
Remein, Duane Futurewei Technologie

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

Don't need to callout the same figure 2x in one para

SuggestedRemedy

Strike "(see Figure 143–1)"

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.1.1** *P* **54** *L* **14** # 490
Remein, Duane Futurewei Technologie

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

141.1.1 Terminology and conventions
what of 142.1.1 Conventions, 143.3.3.1 Conventions, 143.3.4.1 Conventions and 144.1.6 Conventions?
Should we have a convention convention? OR perhaps a convention for Conventions?

SuggestedRemedy

Change 141.1.1 to just "Terminology"

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.2.7** *P* **58** *L* **29** # 491

Remein, Duane Futurewei Technologie

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

What does "PMDs in the function transmitter launch power" mean in the parenthetical "a power budget is a characteristic of a link and depends on PMDs in the function transmitter launch power and receiver sensitivity"?

SuggestedRemedy

Change the parenthetical to read: "a power budget is a characteristic of a link and depends on the paired PMDs transmitter launch power and receiver sensitivity"

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.2.7** *P* **58** *L* **32** # 492

Remein, Duane Futurewei Technologie

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

I do not see any "power budgets listed in Table 141–1 through Table 141–5."

SuggestedRemedy

change to read "power budgets listed in Table 141–8 through Table 141–9."

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.2.7.1** *P* **59** *L* **20** # 493

Remein, Duane Futurewei Technologie

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

I do not see any "medium power budgets as shown in Table 141–1 through Table 141–5"

SuggestedRemedy

Strike "as shown in Table 141–1 through Table 141–5"

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.2.7.2** *P* **60** *L* **20** # 494

Remein, Duane Futurewei Technologie

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

I do not see any high power budgets as shown in Table 141–1 through Table 141–5"

SuggestedRemedy

Strike "as shown in Table 141–1 through Table 141–5"

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.3.1.1** *P* **60** *L* **50** # 615

Remein, Duane Futurewei Technologie

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

AI #1 Delay (variation) Constraints

SuggestedRemedy

Replace the Editor's note with the following.
"Due to the nature of the Nx25G-EPON PMD delay variation within the PMD is expected to be very little (< ± 0.25 EQT)."

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.3.1.2** *P* **61** *L* **7** # 495

Remein, Duane Futurewei Technologie

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

This is excessively wordy just to say we have a signaling rate of 10 or 25G; it is also incorrect (assuming 25/10 & 5010 are included in Nx25G). "The PMA defined in 142.4 continuously sends the appropriate stream of bits to the PMD for transmission on the medium, at a nominal signaling speed of 25.78125 GBd in the case of Nx25G-EPON OLT and ONU PMDs. The PMA defined in 142.4 continuously sends the appropriate stream of bits to the PMD for transmission on the medium, at a nominal signaling speed of 10.3125 GBd in the case of 25/10G-EPON and 50/10G–EPON ONU PMDs."

SuggestedRemedy

Change to "The PMA defined in 142.4 continuously sends the appropriate stream of bits to the PMD for transmission on the medium. A nominal signaling speed of 25.78125 GBd or 10.3125 GBd depending on the rate class of the PMD."

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.3.1.3** *P* **61** *L* **20** # 496

Remein, Duane Futurewei Technologie

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

Also wordy and incorrect. "The PMD continuously sends a stream of bits to the PMA defined in 142.4 corresponding to the signals received from the MDI, at the nominal signaling speed of 25.78125 GBd in the case of Nx25G–EPON OLT and ONU PMDs or to the PMA defined in 142.4 at the nominal signaling speed of 10.3125 GBd in the case of 25/10G–EPON and 50/10G-EPON OLT PMDs."

SuggestedRemedy

Change to "The PMD continuously sends a stream of bits to the PMA defined in 142.4 corresponding to the signals received from the MDI, at the nominal signaling speed of 25.78125 GBd or 10.3125 GBd depending on the rate class of the PMD."

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.3.1.5** *P* **61** *L* **43** # 497

Remein, Duane Futurewei Technologie

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

signal names should not cross a line as in "PMD_global_signal_detect". Make the signal name non-breaking.

SuggestedRemedy

per comment

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.3.5.3** *P* **63** *L* **30** # 498

Remein, Duane Futurewei Technologie

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

We seem to have some duplicate redundancy "The value of the SIGNAL_DETECT parameter for Nx25G–EPON PMDs shall be generated according to the conditions defined in T able 141–10. The Signal Detect value definitions for Nx25G-EPON PMDs are shown in Table 141–10."

SuggestedRemedy

Strike "The Signal Detect value definitions for Nx25G-EPON PMDs are shown in Table 141–10."

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.5.2** *P* **36** *L* **36** # 433

Johnson, John Broadcom

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

Having an explicit TX spec for "Decision timing offset for transmitter and dispersion penalty" in Tables 141-13, 14, 17 and 18 is unnecessary. Clause 75 (10G-EPON) has this parameter in the TX tables, but more recent PMDs (100GBASE-LR4/ER4, 25GBASE-LR/ER) do not. They rely on the default value of +/- 0.05 UI that's included in the text of 52.9.10.4 which all of these clauses ultimately point to for TDP measurement. I don't think that the difference in between OLT TX (+/-0.05 UI) and ONU TX (+/-0.0625 UI) in 10G-EPON is significant enough to justify calling them out explicitly for Nx25G-EPON.

SuggestedRemedy

Delete the line for "Decision timing offset for transmitter and dispersion penalty" in Tables 141-13, 14, 17 and 18.

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.5.2** *P* **67** *L* **1** # 453

Harstead, Ed Nokia

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

In “Table 141–15—OLT Receive Characteristics, medium power class”, there are 4 PHYs grouped together, which cover 10G upstream PHYs:
•25/10GBASE-PQG-D2
•50/10GBASE-PQG-D2
•25/10GBASE-PQX-D2
•50/10GBASE-PQX-D2
These include “G” and “X”, but for “Channel wavelengths (range)” they all point to Table 75-6. Of course “Table 75–6—PR type OLT PMD receive characteristics” only specifies Wavelength (range) 1260 to 1280, the “G” variant.

Same observation for Table 141–16—OLT Receive Characteristics, high power class.

SuggestedRemedy

For 25G upstream PHYs, Table 141–15 indeed shows both “G” UW0 and “X” UW1 options. It appears to me that we need to explicitly specify in Table 141–15 an “X” UW1 wavelength for 10G.

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.5.2** *P* **67** *L* **1** # 627
Kramer, Glen Broadcom

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

Signal Detect Threshold is measured in dBm, not GHz

SuggestedRemedy

In Tables 141-15 and 141-16, replace GHz with dBm in Units column

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.5.2** *P* **67** *L* **24** # 434
Knittle, Curtis CableLabs

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

Missing parameter for Signal detect threshold, each channel (min), wrong unit

SuggestedRemedy

Replace TBD with -40, replace GHz with dBm

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.5.2** *P* **67** *L* **28** # 435
Knittle, Curtis CableLabs

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

Missing parameter for Receiver settling time (max)

SuggestedRemedy

Replace TBD with 800

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.5.2** *P* **67** *L* **34** # 436
Knittle, Curtis CableLabs

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

Missing parameter for Stressed eye J2 Jitter,e each channel

SuggestedRemedy

Replace TBD w/ 0.3

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.5.2** *P* **67** *L* **36** # 437
Knittle, Curtis CableLabs

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

Missing parameter for Stressed eye J9 Jitter,e each channel

SuggestedRemedy

Replace TBD w/ 0.47

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.5.2** *P* **68** *L* **26** # 438
Knittle, Curtis CableLabs

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

Missing parameter for Signal detect threshold, each channel (min), plus wrong unit

SuggestedRemedy

Replace TBD with -40, replace GHz with dBm

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.5.2** *P* **68** *L* **30** # 439
Knittle, Curtis CableLabs

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

Missing parameter for Receiver settling time (max)

SuggestedRemedy

Replace TBD with 800

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.5.2** *P* **68** *L* **35** # 440

Knittle, Curtis CableLabs

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

Missing parameter for Stressed eye J2 Jitter,e each channel

SuggestedRemedy

Replace each TBD w/ 0.3

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.5.2** *P* **68** *L* **36** # 441

Knittle, Curtis CableLabs

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

Missing parameter for Stressed eye J9 Jitter,e each channel

SuggestedRemedy

Replace each TBD w/ 0.47

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.6.1** *P* **69** *L* **15** # 499

Remein, Duane Futurewei Technologie

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

Tables 141-17 & 18 are not referenced, This section seems to be lacking some text.

SuggestedRemedy

Add: "A medium power class Nx25G-EPON ONU PMD transmitter shall comply with the parameters shown in Table 141–17. A high power class Nx25G-EPON ONU PMD transmitter shall comply with the parameters shown in Table 141–18."
Update PICS as needed.

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.6.2** *P* **72** *L* **29** # 442

Knittle, Curtis CableLabs

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

Missing parameter for Detect threshold, each channel (min)

SuggestedRemedy

Replace TBD w/ -40

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.6.2** *P* **72** *L* **35** # 443

Knittle, Curtis CableLabs

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

Missing parameter for Stressed eye J2 Jitter,e each channel

SuggestedRemedy

Replace TBD w/ 0.3

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.6.2** *P* **72** *L* **36** # 444

Knittle, Curtis CableLabs

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

Missing parameter for Stressed eye J9 Jitter,e each channel

SuggestedRemedy

Replace TBD w/ 0.47

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.6.2** *P* **73** *L* **23** # 445

Knittle, Curtis CableLabs

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

Missing parameter for Detect threshold, each channel (min)

SuggestedRemedy

Replace TBD w/ -40

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.6.2** *P* **73** *L* **30** # 446

Knittle, Curtis CableLabs

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

Missing parameter for Stressed eye J2 Jitter,e each channel

SuggestedRemedy

Replace TBD w/ 0.3

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.6.2** *P* **73** *L* **31** # 447

Knittle, Curtis CableLabs

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

Missing parameter for Stressed eye J9 Jitter,e each channel

SuggestedRemedy

Replace TBD w/ 0.47

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.7** *P* **74** *L* **4** # 431

Hajduczenia, Marek Charter Communicatio

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

A "should" statement that is not intended to be an optional requirement: " … alternative verification methods should ensure adequate correlation ..."

SuggestedRemedy

Change to read "alternative verification methods need to ensure adequate correlation"

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.7.2** *P* **74** *L* **16** # 500

Remein, Duane Futurewei Technologie

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

Referenced Table 88-11 lists "or valid 100GBASE-R signal" as an acceptable test pattern for use in several measurements. This is inappropriate for Nx25G-EPON.

SuggestedRemedy

Add to the end of the paragraph "A valid Nx25G-EPON signal may be used in any test where Table 88-11 indicates a valid 100GBASE-R signal may be used.

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.7.10** *P* *L* # 454

Umeda, Daisuke Sumitomo

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

Referred and modified 88.8.9 "Receiver sensitivity" on 100GBASE-LR4/ER4 and 114.7.9 "Receiver sensitivity" on 100GBASE-LR4/ER4. The modification is VECP = 0.5 dB for 25 Gb/s PHYs

SuggestedRemedy

Use the following definition.

141.7.10 Receiver sensitivity
Receiver sensitivity, which is defined for an ideal input signal for 10 Gb/s PHYs and an input signal with VECP = 0.5 dB for 25 Gb/s PHYs, is informative and compliance is not required. If measured, the test signal should have negligible impairments such as intersymbol interference (ISI), rise/fall times, jitter and RIN. Instead, the normative is stressed receiver sensitivity.

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.7.10** *P* **75** *L* **46** # 646

Powell, William Nokia

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

Receiver Sensitivity
Current Section 141.7.10 only contains "TBD"

SuggestedRemedy

(Ref. powell_3ca_1_0319)
Replace contents of 141.7.10 with:
"Receiver sensitivity is defined for test patterns in 75.7.3 (10G) and 141.7.2 (25G), and an ideal input signal quality with the specified extinction ratio. The measurement procedure is described in 52.9.8 for 10 Gb/s PHYs and 88.8.9 for 25 Gb/s PHYs. The sensitivity shall be met for the bit error ratio defined in Table 141-15, Table 141-16, Table 141-19, or 141-20 as appropriate."

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.7.11** *P* *L* # 455

Umeda, Daisuke Sumitomo

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

Referred and modified 88.8.10 "Stressed receiver sensitivity" on 100GBASE-LR4/ER4. The quality of reference transmitter is defined based on TDP in Figure 87-4. The recent standard of 25GBASE-LR/ER (114.7.10) uses the definition based on TDEC in Figure 95-4. But there's not enough correlation data between TDP and TDEC in the wide ER range, so I propose the reference transmitter based on TDP for 802.3ca.

SuggestedRemedy

Use the following definition.

141.7.11 Stressed receiver sensitivity
Stressed receiver sensitivity shall be within the limits given in Table 141–15, Table 141–16, Table 141–19 and Table 141–20 if measured using the method defined in 87.8.11 with the following exceptions:
a) Added sinusoidal jitter is as specified in Table 88–13 for 25 Gb/s PHYs.
b) The stressed eye J2 Jitter, stressed eye J9 Jitter, and vertical eye closure penalty are as given in Table 141–15, Table 141–16, Table 141–19 and Table 141–20.
c) The test pattern is as given in Table 88–11 for 25 Gb/s PHYs, with the exception of Pattern 5.
d) The reference receiver used to verify the conformance test signal is required to have the bandwidth given in 88.8.8 for 25 Gb/s PHYs.

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.7.11** *P* **75** *L* **50** # 647

Powell, William Nokia

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

Stressed RX conformance
The current 141.7.11 only contains "TBD"

SuggestedRemedy

(Ref. powell_3ca_1_0319)
Replace contents of 141.7.11 with:
"Compliance with stressed receiver sensitivity is mandatory for the following PMDs: 25GBASE-PQG-D2, 50/25GBASE-PQG-D2, 25GBASE-PQX-D2, 50/25GBASE-PQX-D2, 50/25GBASE-PQG-D2, 50GBASE-PQG-D2, 50/25GBASE-PQX-D2, 50GBASE-PQX-D2, 25/10GBASE-PQG-D2, 50/10GBASE-PQG-D2, 25/10GBASE-PQX-D2, 50/10GBASE-PQX-D2, 25GBASE-PQG-D3, 0/25GBASE-PQG-D3, 25GBASE-PQX-D3, 50/25GBASE-PQX-D3, 50/25GBASE-PQG-D3, 50GBASE-PQG-D3, 50/25GBASE-PQX-D3, 50GBASE-PQX-D3, 25/10GBASE-PQG-D3, 50/10GBASE-PQG-D3, 25/10GBASE-PQX-D3, and 50/10GBASE-PQX-D3. The stressed receiver conformance test is intended to screen against receivers with poor frequency response or timing characteristics that could cause errors when combined with a distorted but compliant signal. To be compliant with stressed receiver sensitivity, the receiver shall meet the specified bit error ratio at the power level and signal quality defined in Table 141-15, Table 141-16, Table 141-19, or 141-20 as appropriate, according to the measurement procedures of 52.9.9 for 10 Gb/s PHYs and 88.8.10 for 25 Gb/s PHYs."

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.7.13** *P* **76** *L* **13** # 648

Powell, William Nokia

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

Laser timing parameters
Current text reads:
- Ton is defined in 141.7.13.1 and has the value of less than or equal to 128 ns (defined in Table 141–17 and Table 141–18).
- A method for measuring Treceiver_settling is illustrated in 141.7.13.2 (informative) and has a value of less than {TBD} ns (defined in Table 141–15 and Table 141–16).
- TCDR is defined in {TBD, Clause 142} and has the value of less than {TBD} ns.
- Toff is defined in 141.7.13.1 and has the value of less than or equal to 128 ns (defined in Table 141–17 and Table 141–18).

SuggestedRemedy

(Ref. powell_3ca_1_0319)
Eliminate bullet points 2 & 3 that include the TBDs. These items will be covered in other subclauses and comments to this draft.

Thus, final text for 141.7.13 should read:
- Ton is defined in 141.7.13.1 and has the value of less than or equal to 128 ns (defined in Table 141–17 and Table 141–18).
- Toff is defined in 141.7.13.1 and has the value of less than or equal to 128 ns (defined in Table 141–17 and Table 141–18).

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.7.13.1** *P* **76** *L* **31** # 501

Remein, Duane Futurewei Technologie

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

Why is any valid 256B/257B symbol allow for Toff measurements when we have a defined EBD?

SuggestedRemedy

Change "The data transmitted may be any valid 256B/257B symbols." to "The data transmitted is the EBD257 as defined in 142.3.5.1."

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.7.13.1** *P* **77** *L* **1** # 623

Kramer, Glen Broadcom

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

Action item to update Figure 141-3 (remove Grant Length signal as it doesn't match the definition of grant in .3ca).

SuggestedRemedy

Update the figure and the text in 141.7.14.1 as shown in kramer_3ca_1_0319.pdf

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.7.14.1** *P* **77** *L* **39** # 649

Powell, William Nokia

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

RX settling time measurement
Current text reads:
"Treceiver_settling is denoted as the elapsed time beginning from the moment that the optical power in the receiver at TP7 reaches the conditions specified in 141.7.11 and ending at the moment that the electrical signal after the PMD at TP8[i] reaches within 15 % of its steady state average power, jitter (see {TBD}).
Treceiver_settling is presented in Figure <TBD>....."

SuggestedRemedy

(Ref. powell_3ca_1_0319)
Change the text at the end of the first sentence to read:
...the electrical signal after the PMD at TP8[i] reaches within 15 % of its "steady state average power and jitter (see Table 141-15 and Table 141-16)."

Change the second sentence to read:
Treceiver_settling is presented in Figure 141-3.
[the new Fig. 141-3 from Glen]

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.7.14.2** *P* **79** *L* **4** # 432

Hajduczenia, Marek Charter Communicatio

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

A "should" statement that is not intended to be an optional requirement: " … Conformance should be assured for an optical signal at TP7 ..."

SuggestedRemedy

Change to read "Conformance needs to be assured for an optical signal at TP7"

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.7.14.2** *P* **79** *L* **37** # 650

Powell, William Nokia

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

Currrent text in this line has a TBD.

SuggestedRemedy

Replace "TBD" with "Table 141-17 and Table 141-18."

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.9.1** *P* **81** *L* **2** # 502

Remein, Duane Futurewei Technologie

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

Should "IEC 61280–
4–2:2000" cross the line? Probably not.

SuggestedRemedy

Make the reference non-breaking.

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.9.3** *P* **81** *L* **34** # 503

Remein, Duane Futurewei Technologie

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

"channel insertion loss specified in T able 141–21" but Table 141-21 does not describe insertion loss.

SuggestedRemedy

Change ref to Table 141-1 through 141-5

Proposed Response *Response Status* **O**

Cl **141** *SC* **141.10** *P* **82** *L* **1** # 422

Hajduczenia, Marek Charter Communicatio

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

PICS needed and missing

SuggestedRemedy

Use hajduczenia_3ca_1_0319.pdf

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.1.1.3** *P* **86** *L* **1** # 504

Remein, Duane Futurewei Technologie

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

Figure 142–2— needs update

SuggestedRemedy

See file remein_3ca_3_0319.pdf (or remein_3ca_0319 PCS FBD.vcs). In draft globally replace "Parity staging buffer" (1x Fig 142-6) and "ParityStagingBuffer" (9x) with "TxParBuf" using proper formatting.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.1.1.4** *P* **86** *L* **42** # 628

Kramer, Glen Broadcom

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

Action item from Long Beach: "Subtraction for rollover (144.3.6.8, Page:172, Line: 52)"

I am not entirely convinced we need any explanation for subtraction. The subtraction operation is straighforward.

SuggestedRemedy

The explanation text is added to 142.1.1.4 (see kramer_3ca_6_0319.pdf). Discuss at the meeting if the standard needs to explain such fundamental concepts.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.1.1.4** *P* **87** *L* **39** # 505

Remein, Duane Futurewei Technologie

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

Stray period between parenthesis in Table 142-1 for "Indicates precedence or a set of function arguments"

SuggestedRemedy

Strike the stray period

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.1.1.4** *P* **87** *L* **43** # 506

Remein, Duane Futurewei Technologie

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

Symbol for "is a member of" and ""is not a member of"" are not included in Table 142–1 but is used in Figure 144-5

SuggestedRemedy

Add both to the bottom of the table.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.1.2** *P* **88** *L* **15** # 616

Remein, Duane Futurewei Technologie

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

AI #16 Delay Constraints

SuggestedRemedy

Replace the Editor's note with the following.
Due to the nature of the Nx25G-EPON PCS and PMA the combined delay variation within these sublayers is expected to be very little (< ± one EQT for 25 Gbps and < ± two EQT for 10 Gbps).

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.1.3** *P* **88** *L* **24** # 507

Remein, Duane Futurewei Technologie

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

Why is "(SP)" used to explain "FEC-unprotected area"? There is no lone "SP" in the figure.

SuggestedRemedy

Strike the wayward "(SP)"

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.1.3** *P* **88** *L* **27** # 508

Remein, Duane Futurewei Technologie

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

Are these zones or elements? "Each SP element … "

SuggestedRemedy

Change "Each SP element" to "Each zone"

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.1.3** *P* **88** *L* **34** # 509

Remein, Duane Futurewei Technologie

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

Remove the editor's note. Discovery operations are well addressed in the draft and no additional details are needed in this overview section.

SuggestedRemedy

per comment

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.1.3.1** *P* **89** *L* **35** # 510

Remein, Duane Futurewei Technologie

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

What is "Tsetting"? The figure uses "Tsettling" while in 141.7.14.1 we use "Treceiver_settling". We should be consistent.

SuggestedRemedy

Use Tsettling throughout the draft (subscripted).

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.1** *P* **90** *L* **48** # 511

Remein, Duane Futurewei Technologie

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

The following statement is redundant with the last ending sentence of the para preceding just before this one. "The PCS bit transmission order is illustrated in Figure 142–5."

SuggestedRemedy

Strike and remove the redundant statement.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.4** *P* **92** *L* **35** # 512

Remein, Duane Futurewei Technologie

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

We should enforce a constant delay in the FEC Encoder, regardless of the size of the encoded FEC CW (i.e., even when the CW is shortened).

SuggestedRemedy

Add the following: "The FEC encoder shall have a constant delay for each FEC codeword including shortened codewords."
Add requirement to PICS.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.4.2** *P* **95** *L* **25** # 641

Kramer, Glen Broadcom

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

QC-LDPC abbreviation is not defined

SuggestedRemedy

add to 1.5:
QC_LDPC quasi-cyclic low-density parity code

Throughout the draft, replace "LDPC" with "QC-LDPC"

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.4.2** *P* **95** *L* **53** # 513

Remein, Duane Futurewei Technologie

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

Is the one double quoted u" (and p" on pg 96) correct?

SuggestedRemedy

Change to double prime (pg/ln: 95/52, 96/34, 96/35, 95/36, 96/42 (x2))

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.4.2** *P* **96** *L* **1** # 514

Remein, Duane Futurewei Technologie

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

Figure 142–6—FEC encoder we should id what's in the FEC Encoder and what is in other SD's

SuggestedRemedy

Change figure to match remein_3ca_5_0319 (or remein_3ca_5_0319.Fig 142-6.vsd, red highlight can be omitted).
Make the same modifications to Figure 142A-1.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.5.1** *P* **101** *L* **38** # 640

Kramer, Glen Broadcom

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

There is nothing undefined in the definitions of FEC_PARITY_SIZE and FEC_PAYLOAD_SIZE

SuggestedRemedy

Replace "{10 TBD}" with "10"
Replace "{56 TBD}" with "56"
For both definitions, replace "Unit: 257 bits" with "Unit: 257-bit block"

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.5.1** *P* **101** *L* **41** # 515

Remein, Duane Futurewei Technologie

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

Value for FEC_PARITY_SIZE (10), and FEC_PAYLOAD_SIZE (56) need not be marked TBD

SuggestedRemedy

Strike offensive red TBD and curly braces in two places.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.5.1** *P* **101** *L* **42** # 637

Kramer, Glen Broadcom

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

TBDs in the definitions of FEC_PARITY_SIZE and FEC_PAYLOAD_SIZE constants.

SuggestedRemedy

The provided values are correct. Remove braces {} and TBDs.
Replace "Unit: 257 bits" with "Unit: 257-bit block"

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.5.1** *P* **101** *L* **51** # 639

Kramer, Glen Broadcom

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

Action item to update definition of IBI (missing value)

SuggestedRemedy

Use the following definition:

IBI258
Type: 258-bit block
Description: The IBI258 constant holds the value of the inter-burst idle pattern.
Value: 0x0-(0A)₃₂

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.5.1** *P* **102** *L* **2** # 456

Remein, Duane Futurewei Technologie

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

The description "The IBI constant holds the value of the inter burst idle pattern." is incorrect as the inter burst idle pattern is only 257 bits long. (Note all other instance put a dash between inter and burst).
Also IBI value: need not be TBD

SuggestedRemedy

Change
"Description: The IBI constant holds the value of the inter burst idle pattern." to read
"Description: The IBI constant holds the value of the inter-burst idle pattern with a prepended MSB indicating the lower 257 bits are not scrambled."
Change Value to "0x0-(0A)32" with 32 subscripted (binary 00 concatenated with 32 x 0x0a)

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.5.1** *P* **102** *L* **4** # 457

Remein, Duane Futurewei Technologie

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

In most of the constant/variable/… definitions where we have “See x.y.x” there is no ending period. Technically I would classify these statements as sentences and they therefore should have a period. I notice in the current standard both forms are supported.

SuggestedRemedy

Throughout the draft add the ending period in each case. If staff object change wording to "This variable is defined in x.y.x." where x.y.x is the reefed clause.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.5.2** *P* **102** *L* **33** # 635

Kramer, Glen Broadcom

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

ClkOut and ClkXfer are defined in terms of PMD output rate. This is not correct as the relationship should be the opposite: The PMD output rate is driven by the PMA clock.

Also, missing text on ONU loop-timing and the definitions of PMA transmit clock.

SuggestedRemedy

Modify definitions of ClkOut and ClkXfer in PCS and add missing text to the PMA subclause as shown in kramer_3ca_10_0319.pdf.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.5.2** *P* **102** *L* **34** # 458

Remein, Duane Futurewei Technologie

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

It would be good to ensure ClkOut for each channel is phase aligned.

SuggestedRemedy

Add to the description of ClkOut "in PHYs supporting multiple channels the ClkOut for each PCS instance is phase aligned.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.5.2** *P* **102** *L* **43** # 459

Remein, Duane Futurewei Technologie

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

"... the MCRS Input Process …" really? I think not. Same issue:
pg 103 line 43, and 47

SuggestedRemedy

Change MCRS to PCS

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.5.2** *P* **103** *L* **7** # 460

Remein, Duane Futurewei Technologie

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

The following variables should be italicized.
Pg 103 line 7 "TxFifo[]"
Pg 103 line 11 "ParityLeft"
Pg 103 line 16 "PayloadLeft"

SuggestedRemedy

per comment

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.5.2** *P* **103** *L* **34** # 430

Hajduczenia, Marek Charter Communicatio

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

A "should" statement that is not intended to be an optional requirement: " … from the array should be sent to the TxFifo"

SuggestedRemedy

Change to read "from the array is sent to the TxFifo"

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.5.3** *P* **104** *L* **36** # 461

Remein, Duane Futurewei Technologie

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

Missing articles.

SuggestedRemedy

Change
"data received from xMII" to
"data received from the xMII"

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.5.3** *P* **104** *L* **44** # 624

Kramer, Glen Broadcom

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

Scramble() and Descramble() functions are not defined symattrically. Descramble takes a single 66b block and descrambles it. Scramble() takes an array of 66b blocks and scrambles 4 blocks at once.

Showing both functions operating on 66b is clearer and also would make it consistent with how these functions are defined in C49.

SuggestedRemedy

1) In Figure 142-10, replace
xBuffer[3:0] <= Scramble(xBuffer[3:0])
with
xBuffer[0] <= Scramble(xBuffer[0])
xBuffer[1] <= Scramble(xBuffer[1])
xBuffer[2] <= Scramble(xBuffer[2])
xBuffer[3] <= Scramble(xBuffer[3])

2) Use the following definition of Scramble (symmetric to Descramble):
Scramble(blk)
Description: This function accepts one 66-bit block blk and performs the scrambling operation on the 64-bit payload of the block, as described in 49.2.6. The returned value is a scrambled 66-bit block.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.5.4.1** *P* **106** *L* **20** # 644

Kramer, Glen Broadcom

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

In state diagram 142-10, the following transition has ambiguous precedence or operations:

TxNext = RATE_ADJ_EQ OR
TxNext = IBI_EQ AND
xIndex = 0

SuggestedRemedy

Cnage the transition to the following:

TxNext = RATE_ADJ_EQ OR
(TxNext = IBI_EQ AND
xIndex = 0)

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.5.4.3** *P* **105** *L* **34** # 462

Remein, Duane Futurewei Technologie

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

True or true (we are again using both). 30 instances of true 6 of True. Same if true for false/False (but only one False).

SuggestedRemedy

Pick one and be consistent.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.2.5.4.3** *P* **105** *L* **36** # 463

Remein, Duane Futurewei Technologie

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

Grammar

SuggestedRemedy

Change:
"and data is being sent towards the PMA for transmission" to
"and the data is sent towards the PMA for transmission"

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.3** *P* **105** *L* **48** # 464

Remein, Duane Futurewei Technologie

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

Unclosed parenthetical

SuggestedRemedy

Change
"(25/25G-EPON, 50/25G-EPON, and 50/50G-EPON" to
"(25/25G-EPON, 50/25G-EPON, and 50/50G-EPON)"

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.3.1** *P* **106** *L* **53** # 465

Remein, Duane Futurewei Technologie

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

The FEC decoder should enforce a constant delay (i.e., same delay for shortened CWs ad for full length CWs)

SuggestedRemedy

Add the following: "The FEC decoder shall have a constant delay for each FEC codeword including shortened codewords."
Add requirement to PICS.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.3.3** *P* **108** *L* **45** # 466

Remein, Duane Futurewei Technologie

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

The Descrambler in Cl 49.2.10 is 58 bits long, IBI_EQ is 72 bits. I assume that the lower 58 bits of IBI_EQ are being used

SuggestedRemedy

Change:
“the descrambler is initialized with the unscrambled value of IBI_EQ” to
“the descrambler is initialized with the lower 58 bits of the unscrambled value of IBI_EQ”

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.3.4** *P* **109** *L* **40** # 467

Remein, Duane Futurewei Technologie

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

Need Figure 142-14 PCS receive bit ordering.

SuggestedRemedy

See remein_3ca_7_0319.pdf (also in .vsc format).

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.3.5.1** *P* **110** *L* **28** # 468

Remein, Duane Futurewei Technologie

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

SBD257 is defined as a constant yet some TF members indicate that it can change burst to burst and should therefore be a variable.

SuggestedRemedy

Move to 142.3.5.2. Globally change to Sbd257 (3x excluding SDs). Change the description from
“The SBD257 constant represents the start-of-burst delimiter, and its value is equal to either SP2 or SP3, depending on the most recently provisioned synchronization pattern (see 142.1.3.1). Once provisioned, this value does not change and is treated as constant by the state diagram.” to
“The Sbd257 variable represents the most recently provisioned start-of-burst delimiter. Its value is equal to either SP2 or SP3, depending on the most recently provisioned synchronization pattern (see 142.1.3.1).”

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.3.5.2** *P* **111** *L* **18** # 469

Remein, Duane Futurewei Technologie

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

This description of PayloadLeft is a bit misleading, it has nothing to do with the FEC CW _reaching_ it's max length.

SuggestedRemedy

Change:
"This variable holds the number of EQs remaining until the FEC codeword payload reaches the maximum allowed length." to
"This variable holds the number of EQs remaining until one maximum length FEC codeword payload has been sent to the xMII."

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.3.5.2** *P* **111** *L* **30** # 470

Remein, Duane Futurewei Technologie

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

This description of RateAdjLeft is a bit misleading, as the current FEC CW doe not fill any gaps left by the removal of FEC CW Parity.

SuggestedRemedy

Change:
"This variable holds the number of EQs remaining to be generated for the current FEC codeword to fill the gap left by the removal of FEC codeword parity data." to read
"This variable holds the number of EQs remaining to be generated in the PCS Output Process to fill the gap left by the removal of FEC codeword parity data from the current FEC codeword ."

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.3.5.2** *P* **111** *L* **36** # 471

Remein, Duane Futurewei Technologie

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

While this definition is accurate it does nothing to help the reader understand what is going on without sending him or her in circles for additional definitions.

SuggestedRemedy

Change:
"storing up to FEC_CW_BLK_SZ 257-bit blocks" to read
"storing one full FEC codeword in blocks of 257-bits."

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.3.5.3** *P* **112** *L* **40** # 472

Remein, Duane Futurewei Technologie

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

This function definition seems overly complex. It is only used in the Synchronizes SDs and always take the same argument for "buffer", which is not a FIFO.
Note this is also the only mention of PMA_UNITDATA.indication in the draft which should include a channel reference "[ch]"

SuggestedRemedy

Change name to "ShiftInput(n),
Change description to "This function inserts n new bits at the MSB of the RxInput buffer via the PMA_UNITDATA.indication[i]<256:0> primitive while removing the same number of bits at the LSB of the buffer. The ShiftInput() function is blocking and its execution takes exactly n bit times at the given receiving line rate.
Update Synchronization SDs.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.3.5.4** *P* **113** *L* **1** # 473

Remein, Duane Futurewei Technologie

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

How can a process implement itself?
YASIP (Yet Another Self Implementing Process).

SuggestedRemedy

Change:
"The OLT Synchronizer Process shall implement an instance of state diagram as depicted in Figure 142–15 for every enabled receive channel." to
“The OLT shall implement an instance of Synchronizer Process as depicted in Figure 142–15 for every enabled receive channel.”

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.3.5.5** *P* **113** *L* **1** # 474

Remein, Duane Futurewei Technologie

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

How can another process implement itself?
YASIP (Yet Another Self Implementing Process).

SuggestedRemedy

Change:
"The ONU Synchronizer Process shall implement an instance of state diagram as depicted in Figure 142–16 for every enabled receive channel." to
"The ONU shall implement an instance of Synchronizer Process as depicted in Figure 142–16 for every enabled receive channel."

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.3.5.6** *P* **113** *L* **49** # 645

Laubach, Mark Broadcom

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

PCS BER monitor Process text is currently TBD.

SuggestedRemedy

Insert new BER monitoring function variables, text, and SD as per laubach_3ca_1_0319.pdf. Update Clause 45 registers used for EPON BER monitoring function as per laubach_3ca_2_0139.pdf.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.3.5.7** *P* **114** *L* **32** # 475

Remein, Duane Futurewei Technologie

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

potential number confusion: "56 257-bit blocks" is this 56,257-bit blocks with a missing comma or 56 x 257-bit blocks? The reader is left to wonder.

SuggestedRemedy

Change to "fifty-six 257-bit blocks"

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.3.5.7** *P* **114** *L* **39** # 476

Remein, Duane Futurewei Technologie

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

How can any process implement itself?
YASIP (Yet Another Self Implementing Process).

SuggestedRemedy

Change:
"The PCS Output Process shall implement an instance of state diagram as depicted in Figure 142–17 for every enabled receive channel." to
"The PCS shall implement an instance of Output Process as depicted in Figure 142–17 for every enabled receive channel."

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.4.1** *P* **114** *L* **50** # 651

Powell, William Nokia

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

PMA control register for CL45

SuggestedRemedy

Proposal to be available before the meeting starts.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.4.1** *P* **115** *L* **34** # 477

Remein, Duane Futurewei Technologie

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

In Fig 142-18 & 142-19. The default state for Cl 45 registers to "do nothing" is typically "0" and not "1". The Diff encoder should follow that principle.

SuggestedRemedy

Change "Control: 1 = off 0 =on" to "Control: 1 = on 0 = off"
Ensure Cl 45 matches this convention

Update PICS as needed.

Proposed Response *Response Status* **O**

Cl **142** *SC* **142.5** *P* **117** *L* **1** # 423

Hajduczenia, Marek Charter Communicatio

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

PICS needed and missing

SuggestedRemedy

Use hajduczenia_3ca_2_0319.pdf

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.1** *P* **119** *L* **46** # 479

Remein, Duane Futurewei Technologie

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

We SHOULD have a convention for Conventions! They should all be in the Overview.

SuggestedRemedy

Move 143.3.3.1 Conventions, 143.3.4.1 Conventions to 143.1.1 Conventions.
We can leave 144.1.6 at it's low priority in Cl 144.1 Overview

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.2.3** *P* **120** *L* **45** # 540

Remein, Duane Futurewei Technologie

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

In Cl 143 we need to distinguish MPRS channel from PMD channel or some other type of channel
Note that several of the proposed changes in this comment affect variable definitions, hence the "must be satisfied" designation.

SuggestedRemedy

In the following instances change channel to MCRS channel
pg/Line Current text
120/45 "MCRS transmit channels"
121/25 "multiple channels, envelopes may overlap"
125/42 "the number of channels supported"
126/43 "on different channels"
126/48 "on different channels carried"
127/2 "the receive channel write pointer"
127/14 "skew of the received channels"
127/21 "over all channels the receiver"
131/14 "envelope on channel ch" {ch should be in italics here}
131/22 "envelope in a given channel"
135/24 "ch - channel index" (left Figure 143-11)
136/13 "number of channels supported"
137/8 "current envelope for channel c."
137/28 "or Output Process for channel c."
137/45 "TX_CLK signal for channel c"
137/49 "indicates that channel c"
138/33 "(i.e., all channels are idle)"
139/2 "fill the transmit channel when"
140/28 "for each channel implemented"
142/30 "current LLID for that receive channel."
146/23 "for each channel implemented."
146/30 "data from multiple channels is"
151/10 "Both the channel rate asymmetry"
151/29 "operation over a single channel"
152/3 "receive channels are active"
152/8 "associated with the receive channel"
152/34 "pointers for all channels increment"

Globally replace "channel bonding" with "MCRS channel bonding"

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.2.3** *P* **152** *L* **51** # 619

Remein, Duane Futurewei Technologie

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

AI #21 Delay variability

SuggestedRemedy

Change:
"The actual delay is implementation dependent but an implementation shall maintain a combined delay variation through MCRS of no more than {TBD} EQ (see TBD 144.x.x.x) so as not to interfere with the MPCP timing." to
"The actual delay is implementation dependent but an implementation is expected to maintain a delay variation through the MCRS of no more than ± two EQT when operating at 25 Gbps and ± three EQT when operating at 10 Gbps so as not to interfere with the MPCP timing."

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.2.5.3** *P* **125** *L* **44** # 541

Remein, Duane Futurewei Technologie

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

While this statement is true it provides no guidance on the upper limit for the mechanism (160 ns due to the structure of the header).
"If an application requires additional skew mitigation the number of buffer rows can be increased."

SuggestedRemedy

Change the sentence to read: "If an application requires additional skew mitigation, up to 180 ns of skew can be accommodated by increasing the number of buffer rows."

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.1.1.1** *P* **130** *L* **1** # 622

Kramer, Glen Broadcom

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

Tables 143-1 and 143-2 are never introduced or referenced in text.

SuggestedRemedy

Add the following sentence just before Table 143-1:
"Depending on the MAC operating speed, the PLS_DATA.request primitive maps to one or multiple xMII transmit interfaces (see Table 143-1)."

Add the following sentence just before Table 143-2:
"Depending on the MAC operating speed, the PLS_DATA.indication primitive maps to one or multiple xMII receive interfaces (see Table 143-2)."

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.1.3** *P* **131** *L* **36** # 542

Remein, Duane Futurewei Technologie

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

This statement is nonsequitur "For multi-channel MCRS systems the transmit XGMIIs are synchronous and only one TX_CLK is required." there is only one 10G channel ever (we don't support 20G).

SuggestedRemedy

Strike the sentence.

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.2** *P* **132** *L* **38** # 543

Remein, Duane Futurewei Technologie

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

The xRef to Table 143–
3 should not cross the line.

SuggestedRemedy

per comment

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.2.1** *P* **133** *L* **50** # 544
Remein, Duane Futurewei Technologie

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

Table 143–4 to 6, what is the meaning of the offensive highlighting?

SuggestedRemedy

Remove the offensive highlighting.

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.3.2** *P* **135** *L* **42** # 638
Kramer, Glen Broadcom

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

Editor's Note (to be removed prior to publication) in the future, references to other applications-specific parameters are to be added in this subclause.

SuggestedRemedy

Just remove this note. There are no draft changes needed at this time.

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.3.3** *P* **135** *L* **49** # 545
Remein, Duane Futurewei Technologie

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

Style, ADJ_BLOCK_SIZE s/b in italics in description.

SuggestedRemedy

per comment

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.3.3** *P* **135** *L* **51** # 546
Remein, Duane Futurewei Technologie

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

Is there some real good reason to send the reader in an reef wild goose chase?

SuggestedRemedy

Change "(see 143.3.3.2)" to "(For Nx25G-EPON see 143.4.1.3)".
Do the same at the following locations (Pg/Line): 136/14, 136/34.

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.3.3** *P* **136** *L* **7** # 547
Remein, Duane Futurewei Technologie

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

Apparently IEI_EQ mean Inter-Envelope Idle somewhere, but not here.

SuggestedRemedy

Change "Inter-Envelope Idle" to "IEI_EQ" (in italics of course)

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.3.3** *P* **136** *L* **32** # 548
Remein, Duane Futurewei Technologie

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

The effective MAC rate is also dependent on the number of channels being used and the rate of that channel. And what is the "nominal MAC rate" anyway? It is not defined.

SuggestedRemedy

Change:
"The effective MAC rate is equal to <nominal MAC rate>" to
"The instantaneous MAC rate within a single envelope is equal to <xMII rate>"

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.3.3** *P* **136** *L* **39** # 549

Remein, Duane Futurewei Technologie

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

We are very inconsistent with the use of "ch" and "c" and seem to use these two variables interchangeable and/or without definition (for "c" anyway). I would like to suggest we adopt one and us it consistently. However, this is probably better left until after getting into WG Ballot so I will withdraw this comment against D1.5 (assuming we intent to go to WG ballot with 1.6).
Note there are 16 instances of "[c]" and 27 of "[ch]" with possible a few other variants of each so I will probably suggest changing "c" to "ch".
We are also quite inconsistent with including the [x] (where x = ch, c or something else) in variable definitions.

SuggestedRemedy

If anyone has an objection to this please voice it now.

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.3.3** *P* **137** *L* **1** # 550

Remein, Duane Futurewei Technologie

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

Elsewhere we state that EnvRx or EnvTx have 32 rows (Fig 143-11/12) Here we state it is 64. We should be more precise

SuggestedRemedy

Change:
"The number of rows is 64, as determined by" to
"The number of rows can be up to 64, as determined by the expected skew remediation and"

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.3.3** *P* **137** *L* **30** # 551

Remein, Duane Futurewei Technologie

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

rCol and rRow are modified in 143.4.1.3.2 but this is not mentioned here.

SuggestedRemedy

Add a cross reference to each "Also see 143.4.1.3.2"

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.3.4** *P* **137** *L* **44** # 552

Remein, Duane Futurewei Technologie

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

The is no "TX_CLK signal for channel c" there is only one TX_CLK.

SuggestedRemedy

Strike "for channel c"

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.3.6.1** *P* **140** *L* **12** # 553

Remein, Duane Futurewei Technologie

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

YASIP (Yet Another Self Implementing Process).

SuggestedRemedy

Change:
"The MCRS Input Process shall implement the state diagram as depicted in Figure 143–12." to
"The MCRS shall implement the Input Process as depicted in Figure 143–12."

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.3.6.2** *P* **140** *L* **25** # 554

Remein, Duane Futurewei Technologie

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

YASIP (Yet Another Self Implementing Process).

SuggestedRemedy

Change:
"The MCRS Transmit Process shall implement the state diagram as depicted in Figure 143–13." to
"The MCRS shall implement the Transmit Process as depicted in Figure 143–13."

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.4.3** *P* **144** *L* **12** # 555
Remein, Duane Futurewei Technologie

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

The is no "application-specific EnvRx definition in 143.3.3.2" to see in 143.3.3.2. Change the ref to

SuggestedRemedy

Strike the parenthetical.

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.4.3** *P* **144** *L* **25** # 556
Remein, Duane Futurewei Technologie

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

If OutClk is set True on each positive edge of TX_CLK this cannot be true; "and runs at half the frequency of TX_CLK"

SuggestedRemedy

Strike the erroneous phrase

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.4.3** *P* **144** *L* **51** # 557
Remein, Duane Futurewei Technologie

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

"from a xMII"

SuggestedRemedy

change to "from an xMII"

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.4.4** *P* **145** *L* **28** # 558
Remein, Duane Futurewei Technologie

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

In IsHeader we note what "0xFB" is, here we do not.

SuggestedRemedy

Add comment to line so it reads:
"return (eq<7:0> == 0xF8 AND // Start Control Code /S/"

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.4.5.1** *P* **146** *L* **16** # 559
Remein, Duane Futurewei Technologie

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

YASIP (Yet Another Self Implementing Process).

SuggestedRemedy

Change:
"The MCRS Receive Process shall implement the state diagram as depicted in Figure 143–15." to
"The MCRS shall implement the Receive Process as depicted in Figure 143–15."

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.4.5.2** *P* **146** *L* **27** # 560
Remein, Duane Futurewei Technologie

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

YASIP (Yet Another Self Implementing Process).

SuggestedRemedy

Change:
"The MCRS Output Process shall implement the state diagram as depicted in Figure 143–16." to
"The shall implement the MCRS Output Process as depicted in Figure 143–16."

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.3.4.5.2** *P* **147** *L* **30** # 420

Hajduczenia, Marek Charter Communicatio

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

Figure 143–15 caption "MCRS Receive Function, Receive Process state diagram" seems wrong - it is in output section

SuggestedRemedy

Change Figure 143–15 caption to read "MCRS Receive Function, Output Process state diagram"

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.4.1** *P* **150** *L* **11** # 561

Remein, Duane Futurewei Technologie

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

What does item b) mean? "The data and delimiters are synchronous to clock reference." Which "clock reference", 25.7..G or 25G or something else.

SuggestedRemedy

Strike b)

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.4.1.1** *P* **150** *L* **26** # 621

Kramer, Glen Broadcom

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

New line character is missing before "The 50/50G-EPON architecture…" and before "When two channels…"

SuggestedRemedy

Add two new line characters. Also move the paragraph on lines 31-34 to be after the Table 143-7.

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.4.1.1** *P* **150** *L* **44** # 562

Remein, Duane Futurewei Technologie

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

We need not mention that UC0 can be used for ONU discovery (so can every other US channel)

SuggestedRemedy

Strike ", ONU discovery"

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.4.1.2** *P* **151** *L* **7** # 563

Remein, Duane Futurewei Technologie

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

Give the para is discussing 25/10 and 50/25 systems this statement is deceiving "In 50/25G-EPON systems, the asymmetric data rate is achieved via the MCRS channel number asymmetry, where two MCRS channels are active in the downstream direction (DC0 and DC1), but only a single MCRS channel UC0 is active in the upstream direction. Note that every upstream and downstream MCRS channels operate at the data line rate of 25 Gb/s."

SuggestedRemedy

Change to: "In 50/25G-EPON systems, the asymmetric data rate is achieved via the MCRS channel number asymmetry, where two MCRS channels are active in the downstream direction (DC0 and
DC1), but only a single MCRS channel UC0 is active in the upstream direction. In 50/25G-EPON systems, upstream and downstream MCRS channel operates at the data line rate of 25 Gb/s."

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.4.2** *P* **151** *L* **41** # 564

Remein, Duane Futurewei Technologie

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

What is so special about "Time" in "MCRS Time synchronization"?

SuggestedRemedy

use lower case

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.4.2** *P* **151** *L* **45** # 565
Remein, Duane Futurewei Technologie

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

Read and write pointers are not just set at ONU registration. "Such delay margin is established at the ONU registration time by proper setting of MCRS EnvRx read and write pointers at the OLT and the ONU."

SuggestedRemedy

Change to:
"Such delay margin is established at the ONU registration time and by proper setting of MCRS EnvRx read and write pointers at the OLT and the ONU at the start of a burst transmission."

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.4.2** *P* **151** *L* **51** # 617
Remein, Duane Futurewei Technologie

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

AI #20 MCRS Time Sync line 30 & 50. There is no real need to discuss FEC delay in Cl 143 (RS).

SuggestedRemedy

Strike the phrase ", which introduces a near-constant (± {TBD} EQT) delay" in 2 places.

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.4.2** *P* **151** *L* **52** # 566
Remein, Duane Futurewei Technologie

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

This sentence doesn't seem to flow with the para. "The following are the ONU rules for setting the EnvRx write and read pointers:"

SuggestedRemedy

Start it on a new para.

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.4.2** *P* **152** *L* **28** # 618
Remein, Duane Futurewei Technologie

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

AI #20 MCRS Time Sync line 10

SuggestedRemedy

Strike "see (TBD))"

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.4.2** *P* **152** *L* **37** # 643
Kramer, Glen Broadcom

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

The following sentence on lines 37-38 is duplication of the sentence on lines 8-9:
"In an unregistered ONU, upon every update of a write pointer associated with the receive channel with the lowest index, the read pointer is also updated according to the following equation:"

The second sentence was not present in the accepted contribution.

SuggestedRemedy

Delete the sentence on lines 37-38.

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.4.2** *P* **152** *L* **38** # 567
Remein, Duane Futurewei Technologie

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

Stray para "In an unregistered transmitting, upon every update of a write pointer associated with the receive channel with the lowest index, the read pointer is also updated according to the following equation:"

SuggestedRemedy

This is in the first 2) ReadPointer item above. Strike the statement.

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.4.2** *P* **152** *L* **40** # 568

Remein, Duane Futurewei Technologie

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

In the last para it is claimed that "The above set of rules ensures that a delay of 32 EQT is built into the ONU MCRS receive path and a similar delay of 32 EQT is built into the OLT MCRS receive path." which is hardly true as the number 32 is never mentioned in the "above rules", furthermore EPAM can clearly assume a value of 64 so if a device is designed with a larger EnvRx there will be more than 32 EQ delay.
Later in the para it is stated "built-in margin of 64 EQT" is also incorrect

SuggestedRemedy

Change to:
"The EnvRx buffer combined with the above rules ensure there is a constant delay (determined by the size of the EnvRx buffer, typically 32 EQ) built into the MCRS receive path."
and "built-in margin of up to 128 EQT (typically 64 EQT)"

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.4.2** *P* **152** *L* **44** # 569

Remein, Duane Futurewei Technologie

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

"the delay any EQ experience" should be "the delay any EQ experiences"
and
"that this EQ encountered" should be "that this EQ encounters"
and
"two delays remain constant" should be "two delays remains constant"

SuggestedRemedy

per comment

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.4.3** *P* **153** *L* **1** # 570

Remein, Duane Futurewei Technologie

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

Strike "Editor's Note (to be removed prior to publication): in the above paragraph derived from Cl 76.1.2, "1
TQ" was changed to "TBD EQ". In Cl 76.1.2 this applied to the combined MCRS, PCS, & PMA. A
revised value is needed." it has served it purpose.

SuggestedRemedy

per comment

Proposed Response *Response Status* **O**

Cl **143** *SC* **143.5** *P* **154** *L* **1** # 424

Hajduczenia, Marek Charter Communicatio

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

PICS needed and missing

SuggestedRemedy

Use hajduczenia_3ca_3_0319.pdf

Proposed Response *Response Status* **O**

Cl **144** *SC* **144** *P* **156** *L* **1** # 571

Remein, Duane Futurewei Technologie

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

If we insist on defining TLAs (or FLAs) then we should insist they be used.

SuggestedRemedy

In Cl 144 replace "Multipoint MAC Control" or "Multipoint MAC Control (MPMC)" with "MPMC" except in first use, figures and titles.
In titles use "Multipoint MAC Control (MPMC)" consistently.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.1** *P* **156** *L* **21** # 572
Remein, Duane Futurewei Technologie

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

If we insist on defining TLAs (or FLAs) then we should insist they be used.

SuggestedRemedy

In Cl 144 after pg 156 line 19 replace "Multipoint control protocol" or "Multipoint control protocol (MPCP)" with "MPCP" except in figures and subclause titles.
In titles use "Multipoint control protocol (MPCP)" consistently.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.1** *P* **156** *L* **23** # 573
Remein, Duane Futurewei Technologie

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

CCP in defined multiple time in different ways.

SuggestedRemedy

At this location change "Channel control protocol (CCP)" to "Channel Control Protocol (CCP)"
Everywhere else in Cl 144 replace any variant of channel control protocol with CCP except for the title of 144.4 which can remain as is.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.1** *P* **156** *L* **27** # 574
Remein, Duane Futurewei Technologie

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

Clause 141 does not define a PHY "Physical Layer devices defined in Clause 141"

SuggestedRemedy

Change to "Physical Layer devices defined in Clause 141 and Clause 142"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.1.1** *P* **156** *L* **30** # 516
Remein, Duane Futurewei Technologie

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

If we insist on defining TLAs (or FLAs) then we should insist they be used.

SuggestedRemedy

Move the acrimonious definition of "(P2MP)" to line 27. Thereafter In Cl 144 replace "Point-to multipoint", "point-to multipoint", "point-to-multipoint" (or any other stray variants) with "P2MP" except in figures and subclause titles and remove an parenthesis around "P2MP".
In figures and title use "Point-to multipoint" consistently.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.1.1.1** *P* **156** *L* **42** # 517
Remein, Duane Futurewei Technologie

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

This statement is not quite correct "To avoid upstream data collisions, only a single ONU is allowed to transmit at a time."

SuggestedRemedy

Change to "To avoid upstream data collisions, transmission windows (grants) for all ONUs are controlled such that only a single ONUs transmission reaches the OLT at a given instant."
Strike "(grant)" later in the para.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.1.1.2** *P* **157** *L* **26** # 518
Remein, Duane Futurewei Technologie

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

MCRS has not yet been defined in this clause

SuggestedRemedy

change "MCRS (below the MAC)" to "Multi-Channel Reconciliation Sublayer (MCRS, below the MAC)"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.1.1.3** *P* **157** *L* **49** # 631

Kramer, Glen Broadcom

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

Action item to provide "ONU Discovery and Regsitration" introduction text (144.1.1.3)

SuggestedRemedy

Use the text for subclause 144.1.1.3 as shown in kramer_3ca_2_0319.pdf. Notice subclause title capitalization.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.1.3** *P* **159** *L* **7** # 633

Kramer, Glen Broadcom

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

The MAC Control block diagram shows MPCP, but doesn't show CPP. This comment addresses two action items to show both MPCP and CPP on Figures 144-3 and 144-4.

SuggestedRemedy

The proposed solution is to present block diagrams in hierarchical manner. Figures 144-3 and 144-4 will show CCP and MPCP as just two boxes, without any internal details. A two new figures showing just the MPCP (OLT and ONU) block diagrams are to be added to the MPCP subclause. A two more new figures, showing just the CCP (OLT and ONU) block diagrams are to be added to the CCP subclause.

All the proposed changes and the new figures are shown in the kramer_3ca_8_0319.pdf. This contribution also provides solutions for action items 26 (missing text in "Principles on MPCP") and 27 (TBD in MAC delay variability).

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.1.4** *P* **159** *L* **50** # 519

Remein, Duane Futurewei Technologie

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

Is this statement correct? Per Fig 144-1 it is not. "The Multipoint MAC Control does not interface with any MAC Clients."

SuggestedRemedy

Strike the statement.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.1.4** *P* **159** *L* **52** # 520

Remein, Duane Futurewei Technologie

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

Change "using service" to "using the service"

SuggestedRemedy

per comment

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.1.4.1** *P* **160** *L* **38** # 521

Remein, Duane Futurewei Technologie

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

MAC Control Service (MCS) Interface or
MAC Control Service (MCS) interface

SuggestedRemedy

Pick one and be consistent.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.1.4.1** *P* **160** *L* **40** # 522

Remein, Duane Futurewei Technologie

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

Missing articles.

SuggestedRemedy

Change:
"MCS interface is an interface between MAC Control sublayer and MAC Control Client above it (see Figure 144–3 and Figure 144–4). The definition and behavior of MAC Control Client is outside the scope of this standard." to:
The MCS interface is an interface between the MAC Control sublayer and the MAC Control Client above it (see Figure 144–3 and Figure 144–4). The definition and behavior of the MAC Control Client is outside the scope of this standard.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.1.4.1** *P* **160** *L* **44** # 523

Remein, Duane Futurewei Technologie

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

In several places in Clause 144 the term "MAC Control Client" is used to refer to the OLT MPMC Client or ONU MPMC Client. It would be better is we used the full and proper name. MAC Control Client appears 32x in the Clause.

SuggestedRemedy

Use "OLT MPMC Client" and "ONU MPMC Client" as appropriate. Where OLT/ONU is clear based on context in the paragraph this _may_ be shortened to "MPMC Client".

There are several locations in the text where "MAC Control Client" is correct and should not be changed: (Pg/Ln) 159/3, 159/52, and 160/40-46.

Additional notes:
pg 198 line 18 change "local MAC Control Client" to "OLT MPMC Client"
pg 198 line 29 change "local MAC Control Client" to "its MPMC Client"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.1.4.1** *P* **160** *L* **49** # 524

Remein, Duane Futurewei Technologie

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

Neither MCS:MA_CONTROL.indication(opcode, indication_operand_list) nor MCS:MA_CONTROL.request(destination_address, opcode, request_operand_list)are defined anywhere in 31

SuggestedRemedy

Strike the "MCS:"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.1.4.2** *P* **161** *L* **10** # 525

Remein, Duane Futurewei Technologie

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

Neither MCI:MA_CONTROL.indication(opcode, indication_operand_list) nor MCI:MA_CONTROL.request(destination_address, opcode, request_operand_list) are defined anywhere in 31

SuggestedRemedy

Strike the "MCI:"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.1.4.3** *P* **161** *L* **23** # 526

Remein, Duane Futurewei Technologie

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

Neither MAC:MA_DATA.indication(destination_address, source_address, mac_service_data_unit, frame_check_sequence, reception_status) nor MAC:MA_DATA.request(destination_address, source_address, mac_service_data_unit, frame_check_sequence)) are defined anywhere in Cl 2.

SuggestedRemedy

Strike the "MAC:"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.2** *P* **162** *L* **1** # 527

Remein, Duane Futurewei Technologie

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

Assuming we consider received frames can also be forwarded it would be more precise to use transmitted here.

SuggestedRemedy

Change "source of the forwarded frames" to "source of the transmitted frames"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.2** *P* **162** *L* **2** # 528

Remein, Duane Futurewei Technologie

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

What exactly does this mean "This block is responsible for handling the MPCP in the context of the MAC."?

SuggestedRemedy

Change to "This block is responsible for bringing ONUs on-line.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.2.1** *P* **162** *L* **12** # 529

Remein, Duane Futurewei Technologie

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

Missing "the" or "The" in the following location s(pg/line/following text)
162/12 "Control Parser"
162/13 "Timestamp field"
162/17 "Control Multiplexor"
162.14 "timestamp drift"
166/13 "REGISTER_REQ MPCPDU"
166/13 "timestamp value"
166/14 "MCRS_CTRL.request primitive"
166/15 "Envelope Activation Process"
174/2 "REPORT MPCPDU transmission"
175/6 "LLID equal"
187/27 "maximum delay the ONU"
189/9 "DISC_PLID value."
191/37 "unicast PLID and BCAST_PLID values,"
193/29 "MsgEnvGroup is generated"
200/29Change this:
"MAC Control Client may monitor and react to the changes in the state of the downstream and/or upstream channels, allowing ONU notify the OLT of observed or expected channel state changes. For example, MAC Control Client may have ability to detect failure of one of channel receivers.
To notify MAC Control Client at the OLT about a local channel state change, the Channel Control Protocol performs the following sequence of steps:" to this:
"The MAC Control Client may monitor and react to the changes in the state of the downstream and/or upstream channels, allowing the ONU notify the OLT of observed or expected channel state changes. For example, the MAC Control Client may have ability to detect a failure of one of the channel receivers.
To notify the MAC Control Client at the OLT about a local channel state change, the Channel Control Protocol performs the following sequence of steps:"
200/37 "MAC Control Client at the ONU"
200/40 "MAC Control Client in the OLT"
200/42 "MAC Control Client in the OLT"

SuggestedRemedy

Add missing "the" or "The" as appropriate.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.2.1** *P* **162** *L* **20** # 636

Kramer, Glen Broadcom

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

Action item #24 to address TBD values for DRIFT_THOLD.
Further review of the given text revealed that there are also issues in the MPCP Control Multiplexor and Control Parser state diagrams.

Currently, these state diagrams are not showing that the MPCP interfaces with multiple MAC instances and they use RTT[PLID] without any indication of whether the PLID value came from.

Also, the timestamp processing is not quite right. While the text somewhere else says that a large timestamp jump is expected when we receive a new PLID MPCPDU, the state diagrams did not allow that.

SuggestedRemedy

I am proposing the make the maximum timestamp drift 2 EQT for 25G receive channels and 3 EQT for 10G receive channels. Normally, at 25G, we should expect zero drift and at 10G we can expect a drift of +- 1, since some upstream EQs (6.4 ns @ 10G) can land in the middle of an EQT (always 2.56 ns). A small safety margin is added, since a timestamp drift causes immediate ONU deregistration.

Use updated definitions of DRIFT_THOLD constant, ProcessTimestamp() function, and Control Multiplexor/Parser state diagrams as shown in kramer_3ca_9_0319.pdf.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.2.1.2** *P* **162** *L* **37** # 530
Remein, Duane Futurewei Technologie

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

An evil red highlighted statement says "{TBD reference to Clause 142 needed}."

SuggestedRemedy

Replace the evil red highlighted text with "142.4.3"

In Cl 142 add:
142.4.3 Loop-timing specifications for ONUs
ONUs shall operate at the same time basis as the OLT, i.e., the ONU transmit clock tracks the ONU receive clock. Jitter transfer masks are defined in 141.6.2.
For the ONUs supporting 10G transmission in the upstream direction, the PMA received clock is 25.78125 GHz, however, the PMA transmit clock is 10.3125 GHz. The loop timing is achieved by dividing the PMA received clock by 2.5.

Update PICS.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.2.1.3** *P* **162** *L* **43** # 531
Remein, Duane Futurewei Technologie

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

Per our agreed style this should be Msdu

SuggestedRemedy

Globally replace with proper style

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.2.1.3** *P* **162** *L* **46** # 532
Remein, Duane Futurewei Technologie

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

Per our agreed style this should be Opcode

SuggestedRemedy

Replace variable opcode with Opcode *i.e., with proper style) use care as there are lots of instances (46 or so) of the word opcode in the draft.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.2.1.3** *P* **163** *L* **7** # 533
Remein, Duane Futurewei Technologie

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

Unit: QEQT?

SuggestedRemedy

Change to Unit: EQT

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.2.1.3** *P* **163** *L* **46** # 535
Remein, Duane Futurewei Technologie

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

Per our agreed style this should be TimestampOpcode

SuggestedRemedy

Globally replace with proper style

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.2.1.3** *P* **163** *L* **46** # 534
Remein, Duane Futurewei Technologie

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

Per our agreed style this should be SupportedOpcode

SuggestedRemedy

Globally replace with proper style

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.2.1.3** *P* **163** *L* **46** # 536
Remein, Duane Futurewei Technologie

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

Per our agreed style this should be TimestampDrift

SuggestedRemedy

Globally replace with proper style

Proposed Response *Response Status* **O**

Cl **144** SC **144.3.1.1** P **165** L **36** # 537
Remein, Duane Futurewei Technologie

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

see 143.3.3.3 should be see 143.3.3.4 (2x in this para)

SuggestedRemedy

per comment

Proposed Response *Response Status* **O**

Cl **144** SC **144.3.1.1** P **165** L **41** # 538
Remein, Duane Futurewei Technologie

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

Won't this cause false timestamp drift errors? "The time reference point for the timestamp value is the transmission time of the Envelope Start Header (ESH) of the envelope that includes the MPCPDU (see 143.3.2). In situations where multiple MPCPDUs are transmitted within a single envelope, all these MPCPDUs shall have the same timestamp value, referencing the transmission time of ESH."
Each MPCPDU will be off by 8 EQTs from the previous MPCPDU when processed. assuming DRIFT_THOLD is reasonably small this will cause an error if to many (3?) PMCPDUs are included in the same burst. The error will be even more pronounced (2.5x) in 10G US links.

SuggestedRemedy

Reconsider this statements

Proposed Response *Response Status* **O**

Cl **144** SC **144.3.1.1** P **166** L **20** # 448
Knittle, Curtis CableLabs

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

"movement" should be "moment"

SuggestedRemedy

Replace "movement" with "moment"

Proposed Response *Response Status* **O**

Cl **144** SC **144.3.1.1** P **166** L **50** # 539
Remein, Duane Futurewei Technologie

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

This maybe true if physics is non-deterministic. "this delay may be different on different channels"

SuggestedRemedy

Use a more deterministic statement:
"this delay is different on different channels"

Proposed Response *Response Status* **O**

Cl **144** SC **144.3.1.1** P **167** L **20** # 575
Remein, Duane Futurewei Technologie

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

When did FTTH become a movement? "the movement when"

SuggestedRemedy

Change "movement to "moment"

Proposed Response *Response Status* **O**

Cl **144** SC **144.3.1.1** P **167** L **21** # 449
Knittle, Curtis CableLabs

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

"movement" should be "moment"

SuggestedRemedy

Replace "movement" with "moment"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.1.1** *P* **167** *L* **24** # 576

Remein, Duane Futurewei Technologie

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

Why is this para indented? Why are equations interspersed with text?
There appear to be dots after TUP and t1 on lines 30 & 32.

SuggestedRemedy

For lines 23 - 33 use unindented text (Style T,Text in FM) for all plain text and unnumbered equation (Style EU,EquationUnnumbered in FM) for each equation (anything with the form of x = …). All equations should be on a separate line. Try to remove the stray dots

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.1.1** *P* **167** *L* **34** # 577

Remein, Duane Futurewei Technologie

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

"GATE generation Process" should be "GATE Generation process" There is no "GATE Generation Process"

SuggestedRemedy

per comment

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.1.1** *P* **167** *L* **35** # 578

Remein, Duane Futurewei Technologie

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

"All MPCPDUs send by the
OLT on unicast PLID have the"

SuggestedRemedy

change to "All MPCPDUs sent by the
OLT on unicast PLIDs have the"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.1.1** *P* **167** *L* **35** # 450

Knittle, Curtis CableLabs

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

"send" should be "sent"

SuggestedRemedy

Replace "send" with "sent"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.1.1** *P* **168** *L* **38** # 579

Remein, Duane Futurewei Technologie

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

"This large difference detected" missing is

SuggestedRemedy

change to "This large is difference detected"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.1.2** *P* **168** *L* **45** # 620

Remein, Duane Futurewei Technologie

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

AI #27 Delay variability

SuggestedRemedy

Change:
"The actual delay is implementation dependent; however, a complying implementation shall maintain a delay variation of no more than <TBD EQs> through the MAC." to
"The actual delay is implementation dependent; however, a complying implementation is expected to maintain a delay variation of no more than ± two EQT when operating at 25 Gbps and ± three EQT when operating at 10 Gbps through the MAC.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.2** *P* **169** *L* **1** # 580

Remein, Duane Futurewei Technologie

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

This explanation of LLID type should come earlier in the clause, we've already mention PLID and MLID several time.
(I can bring this comment into WG ballot Draft 2.0 if desired).

SuggestedRemedy

Move sections 144.3.2.1 through 144.3.2.4 under 144.1.1.2 where we explain the entire concept of LLID (so they become 144.1.1.2.1 .. 144.1.1.2.4). Remove 144.3.2.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.2.3** *P* **169** *L* **19** # 581

Remein, Duane Futurewei Technologie

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

"an ONUs using" should be either "an ONU using" or "ONUs using"

SuggestedRemedy

change ONUs to ONU

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.2.3** *P* **169** *L* **20** # 451

Knittle, Curtis CableLabs

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

Extraneous 's' in "ONUs"

SuggestedRemedy

Remove the 's'

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.2.3** *P* **169** *L* **21** # 452

Knittle, Curtis CableLabs

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

"An" should be "A"

SuggestedRemedy

Replace "An ULID…" with "A ULID…"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.3** *P* **170** *L* **20** # 418

Hajduczenia, Marek Charter Communicatio

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

"All unregistered ONUs shall only accept envelopes with DISC_PLID values. Upon successful registration, an ONU shall no longer accept envelopes with DISC_PLID." - this text contains requirements repeated from the Table 144–1.

SuggestedRemedy

To avoid unnecessary repetition, rewrite the text into a statement and leave PICS in the table: "All unregistered ONUs only accept envelopes with DISC_PLID values. Upon successful registration, an ONU does no longer accept envelopes with DISC_PLID."

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.4** *P* **170** *L* **36** # 419

Hajduczenia, Marek Charter Communicatio

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

No shall for the generic MPCPDU structure and needed

SuggestedRemedy

Change "The MPCPDU structure is shown in Figure 144–9, and is further defined as follows:" to "The MPCPDU structure shall be as shown in Figure 144–9, and is further defined as follows:"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.4** *P* **170** *L* **38** # 582
Remein, Duane Futurewei Technologie

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

"Length/Type:" and "Opcode:" should be italicized as all other fields are.
Alternatively in all either field definitions we could use non-italics.

SuggestedRemedy

Use Italics style.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.4.1** *P* **171** *L* **39** # 583
Remein, Duane Futurewei Technologie

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

"envelope allocations with non-zero value of the LLID field"

SuggestedRemedy

change to "envelope allocations with a non-zero value for the LLID field"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.4.1** *P* **172** *L* **28** # 584
Remein, Duane Futurewei Technologie

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

We should be more specific that "for the Envelope Header"

SuggestedRemedy

Change to "for the ESH"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.4.1** *P* **172** *L* **34** # 585
Remein, Duane Futurewei Technologie

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

We can be more precise "this old fragment is transmitted first"

SuggestedRemedy

change to "some or all of this old fragment is transmitted first"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.4.3** *P* **175** *L* **10** # 586
Remein, Duane Futurewei Technologie

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

The following field name should be in italics (pg/line name)
175/10 "Opcode"
180/50 "LLID"

SuggestedRemedy

per comment

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.4.3** *P* **176** *L* **10** # 587
Remein, Duane Futurewei Technologie

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

Apparently LaserOffTime units are much more important than LaserOnTime units.

SuggestedRemedy

Under "LaserOnTime:" change
"The value of LaserOffTime is expressed in the units of EQT." to
"The value of LaserOnTime is expressed in the units of EQT."

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.4.6** *P* **179** *L* **48** # 630
Kramer, Glen Broadcom

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

DiscoveryInfo needs to have additional flags to control access based on G/X coexistence.
The DISCOVERY MPCPDU definition needs to explain the expected ONU behavior for different settings of DiscoveryInfo flags.

SuggestedRemedy

Update the DISCOVERY MPCPDU definition as shown in kramer_3ca_3_0319.pdf (changes are tracked)

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.4.7** *P* **182** *L* **3** # 588

Remein, Duane Futurewei Technologie

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

This statement implies there is only one value for Sync Pat, delivered before Discovery and it never changes. "Generally, the SYNC_PATTERN MPCPDUs are transmitted in envelopes with LLID equal to DISC_PLID (see 144.3.3)." Yet we have stated multiple times that the SP can be freely changed by the OLT. Note that registered ONUs are forbidden from receiving DISC_PLID envelopes.

SuggestedRemedy

Change as follows:
"The OLT announces the synchronization pattern to unregistered ONUs in envelopes with the LLID equal to DISC_PLID (see 144.3.3) before issuing a DISCOVERY message.
Italicize LLID in the above
Add to the end o the last sentence in this para "until changed by the OLT"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.5** *P* **183** *L* **34** # 589

Remein, Duane Futurewei Technologie

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

This is a poor cross reference "see 144.3.4.7" given the previous explanation of SP1/2/3 and FEC unprotected areas of US burst.

SuggestedRemedy

Change xRef to 143.1.3.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.5** *P* **183** *L* **38** # 590

Remein, Duane Futurewei Technologie

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

Does this apply to any SP MPCPDU or only those sent to DISC_PLID? "If a SYNC_PATTERN MPCPDU is received"
Given that a unregistered ONU doesn't listen to other PLIDS I would guess this only applied to DISC_PLID.

SuggestedRemedy

Change to "a SYNC_PATTERN MPCPDU sent to the DISC_PLID is received"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.5** *P* **185** *L* **1** # 642

Kramer, Glen Broadcom

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

In Figure 144-17, the use of the "+" sign is confusing, as it may imply addition of multiple fiueld values.

The footnote 1 is wrong. Discovery process uses DISC_PLID, not BCAST_PLID.

SuggestedRemedy

1) Change footnote 1 to "Messages sent on disocvery PLID (DISC_PLID)"
2) Use "|" (concatenation) instead of "+"
3) Show MPCPDU field names exactly as defined in 144.3.4
4) Also, the boxes representing the messages may easily be narrowed, so that arrows are more visible.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.5** *P* **185** *L* **15** # 421

Hajduczenia, Marek Charter Communicatio

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

Figure 144–17 indicates that DISCOVERY MPCPDU is transmitted on a broadcast PLID - looking at Table 144-1, we have BCAST_PLID and DISC_PLID. Based on description in Table 144-1, it seems that DISC_PLID would be more appropriate for DISCOVERY MPCPDU than BCAST_PLID.

SuggestedRemedy

In Figure 144-17, in box for DISCOVERY MPCPDU, change footnote 1 to 4. Add a new footnote 4 with the following text: "Messages send on a discovery PLID (DISC_PLID, see Table 144-1)"
Also, change "Messages sent on a broadcast PLID" to read "Messages sent on a broadcast PLID (BCAST_PLID, see Table 144-1)"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.5.1** *P* **186** *L* **11** # 429

Hajduczenia, Marek Charter Communicatio

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

A "should" statement that is not intended to be an optional requirement: " … extra margin that should be reserved at the end of a discovery …"

SuggestedRemedy

Change to read "extra margin reserved at the end of a discovery"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.5.3** *P* **187** *L* **17** # 591

Remein, Duane Futurewei Technologie

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

While this is true where there are FEC CWs GrantMargin has none. "per each FEC codeword"

SuggestedRemedy

Strike "per each FEC codeword"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.5.3** *P* **187** *L* **21** # 592

Remein, Duane Futurewei Technologie

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

Is this receipt of DISCOVERY or REGISTER message "Value: Determined at the time of ONU discovery"?

SuggestedRemedy

Change to "Value: Determined at the time of ONU receipt of REGISET message.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.5.3** *P* **187** *L* **23** # 593

Remein, Duane Futurewei Technologie

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

This note is some what confusing. What is meant by "Separate" grants? And Also "latter" grant?

SuggestedRemedy

Reword as follows: "If an ONU receives a grant whose start time is less than GrantMargin, that grant is discarded."
italicize GrantMargin

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.5.3** *P* **187** *L* **38** # 594

Remein, Duane Futurewei Technologie

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

Wording

SuggestedRemedy

Change:
"This variable indicates the local time at the ONU, at which it REGISTER_REQ MPCPDU is to be transmitted." to
"This variable indicates the local time at which the ONU should transmit the REGISTER_REQ MPCPDU."

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.5.5** *P* **188** *L* **24** # 595

Remein, Duane Futurewei Technologie

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

Italicize MsgBurstSync.Count

SuggestedRemedy

per comment

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.5.5** *P* **188** *L* **32** # 428

Hajduczenia, Marek Charter Communicatio

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

A "should" statement that is not intended to be an optional requirement: " … synchronization pattern should be balanced or not …"

SuggestedRemedy

Change to read "synchronization pattern is balanced or not"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.5.6** *P* **189** *L* **6** # 596

Remein, Duane Futurewei Technologie

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

YASIP (Yet Another Self Implementing Process).

SuggestedRemedy

Change:
"The Discovery Process in the OLT shall implement a single instance of the Discovery Initiation state diagram shown in Figure 144–18." to
"The OLT shall implement a single instance of the OLT Discovery Process shown in Figure 144–18."

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.5.7** *P* **189** *L* **47** # 597

Remein, Duane Futurewei Technologie

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

YASIP (Yet Another Self Implementing Process).

SuggestedRemedy

Change:
"The Discovery Process in the OLT shall implement multiple instances of the Registration Completion state diagram shown in Figure 144–19 where each instance is associated with a unicast PLID being registered." to
"The OLT shall implement multiple instances of the OLT Registration Completion state diagram shown in Figure 144–19 where each instance is associated with a unicast PLID being registered."

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.5.8** *P* **190** *L* **35** # 598

Remein, Duane Futurewei Technologie

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

YASIP (Yet Another Self Implementing Process).

SuggestedRemedy

Change:
"The Discovery Process in the ONU shall implement a single instance of the ONU Registration state diagram shown in F figure 144–20." to
"The ONU shall implement a single instance of the ONU Registration state diagram as shown in Figure 144–20."

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.5.8** *P* **191** *L* **1** # 626

Kramer, Glen Broadcom

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

ONU Registration state diagram needs to check whether the ONU is allowed to register in the given discovery window. This check should be based on granted upstream channels, Rssi limits, X/G coexistence options, and allowed line rates.

SuggestedRemedy

Modify the ONU Registration state diagram (Fig 144-20) and add the necessary variable definitions as shown in kramer_3ca_4_0319.pdf.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.6** *P* **191** *L* **41** # 599

Remein, Duane Futurewei Technologie

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

It must be later by now "<subclause introduction text to be supplied later>"

SuggestedRemedy

Replace the evil red highlighted text with the text from remein_3ca_2_0319.pdf

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.6.3** *P* **192** *L* **40** # 600

Remein, Duane Futurewei Technologie

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

Wording

SuggestedRemedy

Change
"LLID: LLID value of a an envelope descriptor
StartTime: Start time of given envelope. Within a single burst, all envelope descriptions have
the same EnvStartTime value. The StartTime is expressed in units of EQT.
Length: The length of the envelope, including the envelope header. The Length value is expressed in units of EQ." to
"LLID: The LLID value of the envelope.
StartTime: The Start time of the envelope. Within a single burst, all envelopes have the same EnvStartTime value. The StartTime is expressed in units of EQT.
Length: The length of the envelope, including the envelope header. The Length value is expressed in units of EQ."

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.6.3** *P* **192** *L* **51** # 601

Remein, Duane Futurewei Technologie

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

"EnvList[]" should be "EnvList[ch]" (as is used in Description.

SuggestedRemedy

per comment

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.6.5** *P* **193** *L* **20** # 602

Remein, Duane Futurewei Technologie

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

GATE messages are required for each ONU not just on an OLT basis.

SuggestedRemedy

Change:
"The OLT is required to generate GATE MPCPDUs with a periodicity of less than GATE_TIMEOUT." to
"The OLT is required to generate GATE MPCPDUs for each active ONU with a periodicity of less than GATE_TIMEOUT."

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.6.6** *P* **193** *L* **45** # 603

Remein, Duane Futurewei Technologie

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

xRef to an xRef to an … 144.3.6.6 points to 144.3.5.5 which points to 144.3.4.1.

SuggestedRemedy

Change xRef in 144.3.6.6 to 144.3.4.4

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.6.7** *P* **193** *L* **46** # 604

Remein, Duane Futurewei Technologie

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

In most all cases we refer to GATE not Gate

SuggestedRemedy

Scrub the draft and change the word "Gate" to "GATE" (or even worse gate to GATE) where it refers to a GATE message.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.6.8** *P* **194** *L* **39** # 605

Remein, Duane Futurewei Technologie

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

No such variable/field as MsgGate.ChMap.

SuggestedRemedy

Change to MsgGate.ChannelMap (3x)

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.3.7** *P* **197** *L* **37** # 426

Hajduczenia, Marek Charter Communicatio

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

Text on Discovery process in multi-rate systems is needed and missing

SuggestedRemedy

Use hajduczenia_3ca_5_0319.pdf + add new PICS to address the new "shall" and "should" requirements

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.4.1** *P* **198** *L* **6** # 632

Kramer, Glen Broadcom

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

Section 144.4.1 uses "unicast CC_REQUEST" 4 times and "unicast CC_RESPONSE" once. Emphasizing that these are unicast messages is confusing because no such emphasis is made for other messages. Is the intention here to require the CCPDUs to use unicast MAC address instead of a well-known MAC Control address? I don't think so. All these messages use the globally-assigned DA 01-80-C2-00-00-01.

SuggestedRemedy

Explain what is meant by "unicast" in CCPDU context (unicast MAC address or unicast logical link) or simply remove the word "unicast"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.4.1** *P* **198** *L* **7** # 606

Remein, Duane Futurewei Technologie

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

What is meant here by the term "channel lineup"? Channel capability (which I would define as synonymous with channel lineup) is known through the Discovery process.

SuggestedRemedy

in 7 places change:
"channel lineup" to
"channel status"
Locations (line): 7, 11, 14, 17, 20, 30, 33 (all pg 198)

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.4.1** *P* **198** *L* **8** # 607

Remein, Duane Futurewei Technologie

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

What is this "CCPDU"?

SuggestedRemedy

Defined this FLA before using it: "Channel Control PDU (CCPDU)"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.4.1.1** *P* **199** *L* **46** # 609

Remein, Duane Futurewei Technologie

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

This statement is almost implying the OLT shuts down a DS channel when there are no ONUs left on that channel. This would make it difficult to bring up a PON. "The OLT data path and transmitter for the given channel may remain active if there are other ONUs configured to receive the data transmitted on this downstream channel."

SuggestedRemedy

Change to:
"The OLT data path and transmitter for the given channel remains active based solely on OLT provisioning."

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.4.1.3** *P* **199** *L* **41** # 608

Remein, Duane Futurewei Technologie

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

This statement is almost implying the OLT shuts down an US channel when there are no ONUs left on that channel. This would make it difficult to bring up a PON. "The OLT data path and receiver for the given channel may remain active if there are other ONUs configured to transmit data on this upstream channel."

SuggestedRemedy

Change to:
"The OLT data path and receiver for the given channel remains active based solely on OLT provisioning."

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.4.1.3** *P* **199** *L* **48** # 610

Remein, Duane Futurewei Technologie

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

Why enable a channel to disable it??

SuggestedRemedy

Change: "enable" to "disable"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.4.1.3** *P* **199** *L* **52** # 611

Remein, Duane Futurewei Technologie

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

Steps 2 & 4 create a window of uncertainty where the ONU may have disabled an US channel but is still receiving grants for it.

SuggestedRemedy

Change 2) from:
"2) MAC Control Client in the OLT continues to grant the upstream channel UCn on the target ONU." to
"2) MAC Control Client in the OLT may continue to grant the upstream channel UCn on the target ONU."
Change the last sentence of 3) from
"ONU also purges any pending upstream transmission envelopes scheduled for the now disabled upstream channel." to
"The ONU also purges any pending upstream transmission envelopes scheduled for the now disabled upstream channel and ignore any subsequent grants received."
and change 4) from:
"4) MAC Control Client in the OLT stops granting the upstream channel UCn on the target ONU only when the given upstream channel is confirmed to have been disabled on the ONU." to
"4) MAC Control Client in the OLT shall stop granting the upstream channel UCn on the target ONU when the given upstream channel is confirmed to have been disabled on the ONU."

Update PICS and format variables in the above appropriately.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.4.1.5** *P* **200** *L* **30** # 612

Remein, Duane Futurewei Technologie

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

Wording

SuggestedRemedy

Change:
"allowing ONU notify the OLT" to
"allowing the ONU to notify the OLT"

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.4.2** *P* **200** *L* **45** # 629

Kramer, Glen Broadcom

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

Action item "to rewrite the definitions of CCPDUs using template from MPCPDUs (see 144.3.4)."

SuggestedRemedy

Replace subclause 144.4.2 with the text and drawings provided in kramer_3ca_7_0319.pdf.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.4.3.5** *P* **207** *L* **7** # 613

Remein, Duane Futurewei Technologie

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

MsgChRequest not defined in "CC_REQUEST CCPDU, as defined in 144.4.2.1" or anywhere else I could search for.
Same issue for MsgChResponse.

SuggestedRemedy

Add a suitable definitions

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.4.3.5** *P* **207** *L* **18** # 427

Hajduczenia, Marek Charter Communicatio

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

Text makes references to "CCPDU Processing State Diagram" in ONU and OLT, matching state diagrams. However, there are also references to "CCP Processing state diagram" in 144.4.3.6 - these terms should be aligned

SuggestedRemedy

Change all instances of "CCP Processing state diagram" to "CCPDU Processing state diagram" (2 in total, both in 144.4.3.6)

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.4.3.6** *P* **207** *L* **22** # 625

Kramer, Glen Broadcom

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

"The CCP Process in the OLT shall implement multiple instances of the CCP Processing state diagram shown in Figure 144–29 where each instance is associated with a MLID being registered."

MLID "being registered" does not mean that it was successfully registered. Alos, we may want to allow operators to switch channles in mutiple ONUs at once, using broadcast or multicals MLID.

SuggestedRemedy

1) Replace "with a MLID being registered." with "with each registered MLID."
2) Add the following text after the "with each registered MLID.":
"Implementations may also allow instances of CCP Processing state diagrams to be associated with broadcast or multicast MLIDs, if any are defined. In such instances, handling of ccp_timer expiration events is out-of-scope of this standard."
3) Make the following sentence ("The ONU shall...") a separate paragraph.

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.4.3.6** *P* **208** *L* **26** # 614

Remein, Duane Futurewei Technologie

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

No definition for ActionResponseCode (should this be ActionResultCode?)

SuggestedRemedy

Add a suitable definition

Proposed Response *Response Status* **O**

Cl **144** *SC* **144.5** *P* **209** *L* **1** # 425

Hajduczenia, Marek Charter Communicatio

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

PICS needed and missing

SuggestedRemedy

Use hajduczenia_3ca_4_0319.pdf

Proposed Response *Response Status* **O**

Cl **1454** *SC* **1454.2..3** *P* **163** *L* **8** # 634

Kramer, Glen Broadcom

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

Typo in the definition of RttCurrent

SuggestedRemedy

Replace "QEQT" with "EQT"

Proposed Response *Response Status* **O**