Cl **00** *SC* **45** *P* *L* # 305

Dawe, Piers Avago Technologies

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

No registers? No management? You have to choose between Clause 22 or 45 for the registers; I would guess 45.

SuggestedRemedy

Create placeholder clauses 45 and 30.

Proposed Response *Response Status* **O**

Cl **00** *SC* **56.1.2** *P* **2** *L* **35** # 299

Dawe, Piers Avago Technologies

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

As one would reasonably think of 10GEPON as Ethernet for subscriber access networks, like GEPON, some minor additions to Clause 56, Introduction to Ethernet for subscriber access networks, are needed.

SuggestedRemedy

Change to:
For P2MP optical fiber topologies, EFM supports a nominal bit rates of 1000 Mb/s and 10 Gb/s, shared amongst the population of Optical Network Units (ONUs) attached to the P2MP topology. The 1000 Mb/s P2MP PHYs use the 1000BASE-X Physical Coding Sublayer (PCS), the Physical Medium Attachment (PMA) sublayer defined in Clause 65, and an optional FEC function defined in Clause 65. The 1 Gb/s P2MP PHYs use the 10GBASE-R PCS and Physical Medium Attachment (PMA) sublayers and FEC function defined in Clause 92.
In 56.1.3, after 'as defined in Clause 60.', add 'Physical Layer signaling systems at 10 Gb/s and 1/10 Gb/s are defined in Clause 91 and Clause 92.'
Add rows to table 56-1 and 56-2 to refer to other tables for 10GEPON and 1/10GEPON (which may already exist in Clause 91). Update 56.1.5 to cover the new OLT and ONU types.

Proposed Response *Response Status* **O**

Cl **64** *SC* *P* *L* # 403

Mandin, Jeff PMC Sierra

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

The state diagrams in clause 64 become very complex when GEPON, 10GEPON, and coexistence cases are considered.

In addition to the examples discussed previously, the control multiplexers in figures 64-12 and 64-13 need to operate using different logic for 1G and 10G. In 1G the FEC_Overhead function is invoked to provide interframe delay, whereas in 10G the Carrier Sense signal is used.

Moreover, technical difficulties result from maintaining a unified OLT definition: The multipoint MAC control entity in figure 64-3 will not allow simultaneous transmissions on the 10G and 1G downstreams.

SuggestedRemedy

1. Create a new clause (based on current clause 64) to describe 10GEPON MAC Control.

- 10GEPON MAC control is a revision of Clause 64 which enables coexistence on the same PON with an OLT an ONUs that comply with the 1G definition.

- The 10G OLT and 1G OLT communicate at the level of the DBA and might happen to be implemented in the same physical device.

- Initially, the new clause should point back at clause 64 except for the sections that have already been modified. Next, the Registration and control multiplexer state diagrams would be updated for 10G.

2. Create an informational annex to describe coexistence of 1G and 10G on the same PON.

Proposed Response *Response Status* **O**

Cl **64** *SC* **1.2** *P* **244** *L* **51** # 77

Marek, Hajduczenia Nokia Siemens Networ

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

This clause uses the term "Gbit/s" which is discouraged by the IEEE guidelines.

SuggestedRemedy

Replace all the terms "Gbit/s" with the "Gb/s" as appropriate for the IEEE 802.3 standard prepared for balloting.

Proposed Response *Response Status* **O**

Cl **64** *SC* **1.2** *P* **245** *L* **2** # 78

Marek, Hajduczenia Nokia Siemens Networ

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

Terms "Single Copy Broadcast" and "Single-Copy Broadcast" are used interchangeably in the Clause. The term is defined more than once in the text.

SuggestedRemedy

Adop only one spelling of the full acronym - suggected to accept "Single Copy Broadcast (SBC). Remove multiple definitions in the text of Clause 64. Add definition of the term SCB to Clause 1.5.

Proposed Response *Response Status* **O**

Cl **64** *SC* **3.2.3** *P* **262** *L* **19** # 79

Marek, Hajduczenia Nokia Siemens Networ

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

"The SCB MAC instance associated with the LLID 7F-FF shall provide broadcast services for 1 Gbit/s compliant ONUs," ... what does it mean that the ONU is 1 Gb/s compliant? It is too generic in the case of asymmetric data rate ONUs. The same comment goes to the sentence "SCB MAC instance associated with the LLID 7F-FE – for 10 Gbit/s compliant ONUs."

SuggestedRemedy

Suggestion to change the first sentence to "The SCB MAC instance associated with the LLID 7F-FF shall provide broadcast services for 1 Gbit/s DS capable ONUs," and the second one to "SCB MAC instance associated with the LLID 7F-FE – for 10 Gbit/s DS capable ONUs."

Proposed Response *Response Status* **O**

Cl **64** *SC* **3.2.3** *P* **262** *L* **19** # 15

Ossman, Valentin PMC-Sierra

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

There are mixed speed ONUs, for example 10Gbit/s downstream and 1Gbit/s upstream. The turrent text only refers in general to 10 or 1 Gbit/s ONUs while the distinction should be made on downstream speed only.

SuggestedRemedy

Add "downstream" twice in the sentence on line 19 of clause 64.3.2.3 to read like this:

"The SCB MAC instance associated with the LLID 7F-FF shall provide broadcast services for 1 Gbit/s downstream compliant ONUs, while SCB MAC instance associated with the LLID 7F-FE – for 10 Gbit/s downstream compliant ONUs."

Proposed Response *Response Status* **O**

Cl **64** *SC* **3.3.6** *P* **272** *L* **45** # 87

Marek, Hajduczenia Nokia Siemens Networ

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

Error in the state machine for the Discovery Processing OLT Register State Diagram: "data_tx[88:96] < pending_grants" - it would suggest that pending_grants is 9 bits wide (88, 89, ... 96). It is defined as 8 bits wide.

SuggestedRemedy

Change to "data_tx[88:95] < pending_grants".

Proposed Response *Response Status* **O**

Cl **64** *SC* **3.6.3** *P* **292** *L* # 86

Marek, Hajduczenia Nokia Siemens Networ

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

This particular Clause as well as Clause 64.3.6.4 need to be updated to reflect baseline proposal 30 as defined at http://www.ieee802.org/3/av/public/baseline.html. Currently Clause 64 does not include the adjustable Laser on/off times.

SuggestedRemedy

Add 2 new points in Clause 64.3.6.3 before the existing point e) (tentative names e-1, e-2) with the following text: "Laser On Time. This field is 1 byte long and carries the Laser On Time characteristic for the given ONU transmitter. The value is expressed inthe units of TQ." and "Laser Off Time. This field is 1 byte long and carries the Laser Off Time characteristic for the given ONU transmitter. The value is expressed in the units of TQ."

Add 2 new points in Clause 64.3.6.4 before the existing point g) (tentative names g-1, g-2) with the following text: "Echoed Laser On Time. This field is 1 byte long and carries the Laser On Time characteristic for the given ONU transmitter. The value is expressed inthe units of TQ. The value is delivered to the ONU for confirmation purposes only and its utilization is not prescribed in this specification." and "Echoed Laser Off Time. This field is 1 byte long and carries the Laser Off Time characteristic for the given ONU transmitter. The value is expressed in the units of TQ. The value is delivered to the ONU for confirmation purposes only and its utilization is not prescribed in this specification."

Update Figure 64–34 and Figure 64–35 to include information on the Laser On Time / Laser Off Time and Echoed Laser On Time / Echoed Laser Off Time fields, respectively (each 1 byte long). Update the size of the Pad fields for both Figure 64–34 and Figure 64–35 to 36 / 35 and 32 respectively.

Update the Pad field description in Clause 64.3.6.3 to "Pad/Reserved. This is an empty field that is transmitted as zeros, and ignored on reception when constructing a complying MPCP protocol implementation. The size of the Pad/Reserved field depends on the presence of the Discovery Information flag field - it is equal to 36 when the said field is absent and 35 when present."

Update the state machines for Discovery Processing in the ONU on:

Figure 64–23:
Box: REGISTER_REQUEST:
data_tx[0:15] < REGISTER_REQ
data_tx[48:55] < status
data_tx[56:63] < pendingGrants
data_tx[64:71] < laserOnTime
data_tx[72:79] < laserOffTime

Figure 64–20
Box SIGNAL
flags < data_rx[48:55]
pending_grants < data_rx[56:63]
laserOnTime < data_tx[64:71]
laserOffTime < data_tx[72:79]
status < incoming

Figure 64–21
Box REGISTER
data_tx[48:63] < LLID
data_tx[64:71] < status
data_tx[72:87] < syncTime
data_tx[88:95] < pending_grants (corrected version is already included, see my common number 15)
data_tx[96:103] < laserOnTime
data_tx[104:111] < laserOffTime

Add definitions of the variables in the Clause 64.3.3.2:

laserOnTime, type 32 bit unsigned, This variable holds the time required to turn on the ONU PMD. It counts in time_quanta units the time period required for turning on the PMD, as specified in 60.7.13.1. VALUE: 00-00-00-20 (512 ns) - default

laserOffTime, type 32 bit unsigned, This variable holds the time required to turn off the ONU PMD. It counts in time_quanta units the time period required for turning on the PMD, as specified in 60.7.13.1. VALUE: 00-00-00-20 (512 ns) - default

remove entries for the constants laserOnTime and laserOffTime in Clause 64.3.5.1.

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.1.2** *P* **244** *L* **49** # 344

Lynskey, Eric Teknovus

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

Changes have been made to Clause 64 which are not reflected by change bars in the document that was reviewed. One example can be found in the last paragraph on page 244. References to the 10G broadcast MAC have been added but no change bars appear to let the reviewer know that this is new text. Another example is 64.3.2.3 on page 263. I have not done a thorough search of the Clause to see if this occurs in additional places. Draft 0.91 does show the change bars here, so something was lost in the conversion from 0.91 to 1.0.

SuggestedRemedy

When D1.1 is created, do a diff between D1.1 and the latest version of Clause 64.

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.1.2** *P* **244** *L* **51** # 354

Lynskey, Eric Teknovus

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

The text seems to say that all 1Gb/s and 10Gb/s ONUs can be communicated to at once. It is not clear that one of these additional MACs is only for 1Gb/s ONUs and the other is only for 10Gb/s ONUs.

SuggestedRemedy

Reword sentence as follows, "One additional MAC is instantiated to communicate to all 1Gb/s ONUs and one additional MAC is instantiated to communicate to all 10Gb/s ONUs."

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.1.2** *P* **244** *L* **51** # 345

Lynskey, Eric Teknovus

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

Method used to describe speed is inconsistent between clauses.

Clause 64 - 1 Gbit/s, 10 Gbit/s
Clause 91 and 92 - 1000 Mb/s, 10 Gb/s

SuggestedRemedy

In Clause 64, replace all occurrences of 1 Gbit/s with 1000 Mb/s. Replace all occurrences of 10 Gbit/s with 10 Gb/s.

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.1.2** *P* **244** *L* **51** # 394

Mandin, Jeff PMC Sierra

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

802.3 convention is to use 'Gb/s' rather than 'Gbit/s'

SuggestedRemedy

Change every instance of 'Gbit/s' to 'Gb/s'

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.1.2** *P* **245** *L* **2** # 346

Lynskey, Eric Teknovus

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

We should not be adding new text to Clause 64 unless it is necessary.

SuggestedRemedy

Remove the word "compliant" from the sentence.

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.2.2.1** *P* **252** *L* **30** # 388

Kuroda, Yasuyuki O F Networks Co., Ltd.

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

In 1Gb/s, "16 bit times" is 16ns that is equal to 1 time_quantum.
On the other hand, "16 bit times" in 10Gb/s is 1.6ns that is different from 1 time_quantum.
It includes discrepancy.
While a time_quantum for 10Gb/s signal should be defined,
we propose that it is the same as the one for 1Gb/s.
Since 1Gb/s signal co-exists with 10Gb/s signal in upstream,
a common Timestamp for both 1Gb/s and 10Gb/s is required in order to
avoid collision with each signal.

SuggestedRemedy

Delete "bit times".
The same correction should be done in the texts of guardThresholdONU (Cl. 64.2.2.1 Page:252 line:35)

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.2.2.1** *P* **252** *L* **50** # 387

Kuroda, Yasuyuki O F Networks Co., Ltd.

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

Since the EPD is a byte in 64B/66B coding, the size of "tailGuard" is 27 bytes.

SuggestedRemedy

"VLAUE" should be 27.

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.2.2.4** *P* **255** *L* **3** # 397

Mandin, Jeff PMC Sierra

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

ONU discovery logic requires that there be a 10G equivalent to the 1G FEC_Overhead() function.

Burst init overhead (ie. leading IDLEs) should be included, and the value should be rounded up to the size of a full FEC block.

SuggestedRemedy

Insert Function definition:

10G_PCS_Overhead(length)

This function calculates the size of additional overhead to be added by the PCS and FEC encoders while transmitting a frame of size length. Parameter length represents the size of an entire frame including preamble, SFD, DA, SA Length/Type, and FCS. If the frame does not occupy an entire FEC block, the function result rounds up to the size of a complete FEC block. As well, the burst preamble is included in the overhead.

As specified in 49.2.4, the 66bit encoder adds 2 control bits for every 8 octets of data. As specified in 92.2.3.2, the FEC encoder adds 264 bits of parity and related control for every 216 data octets. The function returns the value of FEC overhead in units of time quanta.

The following formula is used to calculate the overhead:

PCS_Overhead = Ceiling [[[[[Ceiling(length/216)] * 318] + preambleBits] / BitTimesPerTQ]]

where PreambleBits == 66 and BitTimesPerTQ == 165

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.3.2.4** *P* **262** *L* **38** # 389

Kuroda, Yasuyuki O F Networks Co., Ltd.

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

In 1Gb/s, "16 bit times" is 16ns that is equal to 1 time_quantum.
On the other hand, "16 bit times" in 10Gb/s is 1.6ns that is different from 1 time_quantum.
It includes discrepancy.
While a time_quantum for 10Gb/s signal should be defined,
we propose that it is the same as the one for 1Gb/s.
Since 1Gb/s signal co-exists with 10Gb/s signal in upstream,
a common Timestamp for both 1Gb/s and 10Gb/s is required in order to
avoid collision with each signal.

SuggestedRemedy

Replace "16 bit times" to "one time_quantum".
The same correction should be done in the following.
- Grant #n Length (Cl. 64.3.6.1 Page:288 line:12)
- Sync Time (Cl. 64.3.6.1 Page:288 line:26)
- Sync Time (Cl. 64.3.6.4 Page:294 line:12)

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.3.3** *P* **264** *L* **1** # 111

Remein, Duane Alcatel-Lucent

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

Figure 64-15 is marked as being changes but there is no obvious change.
Figure 64–32 and surrounding text (Pg 287 & 288) appears to have changed substantially but is not marked as changed.
Numerous other changes appear to be improperly marked.

SuggestedRemedy

Issue Draft 1.1 with all changes marked as compared to c64 from 2005 version of the standard.

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.3.6.1** *P* **288** *L* **19** # 402

Mandin, Jeff PMC Sierra

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

Labels in "Discovery Information Field" could be more informative

SuggestedRemedy

In bullet e) [line 19] and in Table 64-1

* Change each instance of "OLT is 10G/1G capable" to "OLT supports both 10G and 1G upstreams"

* Change each instance of "OLT is opening 1G discovery window" to "OLT can receive at 1 Gb/s in this window".

* Change each instance of "OLT is opening 10G discovery window" to "OLT can receive at 10 Gb/s in this window"

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.3.6.1** *P* **288** *L* **31** # 116

Remein, Duane Alcatel-Lucent

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

The word "optional" appears to be struck from the sentence "The size of this field depends on the used Grant #n Length/Start Time entry-pairs as well as the presence of the optional Discovery Information field."
The presents of the Discovery Information field is indeed optional as existing PMDs will not have this field explicitly defined (true default values align with proper definition of the field but that's just good engineering).

SuggestedRemedy

Include the word "optional" in the referenced sentence.

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.3.6.1** *P* **288** *L* **7** # 347

Lynskey, Eric Teknovus

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

Figure 64-33 should be changed so that only a single frame is shown with all fields. Similar to the Sync Time field, the Discovery Information field is only transmitted in Discovery GATE messages. There is no need to show a separate figure for this. Now, what may be of value is showing a complete 1 Gb/s GATE and a separate but complete 10 Gb/s GATE message.

SuggestedRemedy

Option 1: Remove Figure 64-33(b) and add Discovery Information to (a).
Option 2: Update Figure 64-33(b) so that it shows a generic Discovery GATE. This can be done by fixing the Grant Start time (4), Grant length (2), and Sync Time(2) to the correct values and by showing that the Discovery Information (0/1) field may or may not be present.
Option 3: Show complete and separate 1 Gb/s and 10 Gb/s GATE frames.

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.3.6.1** *P* **289** *L* # 348

Lynskey, Eric Teknovus

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

There is a duplication of text between the description and Table 64-2.

SuggestedRemedy

Replace bullet "e" with the following, "Discovery Information. This is an 8 bit flag register present in 10 Gb/s capable devices. Table 64-2 presents the internal structure of the Discovery Information flag field."

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.3.6.1** *P* **289** *L* **23** # 355

Lynskey, Eric Teknovus

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

Like the Sync Time field, the Discovery Information field is only present when the gate is a discovery gate.

SuggestedRemedy

Copy the last sentence of bullet "f" to the end of bullet "e". "This field is present only when the gate is a discovery gate, as signaled by the Discovery flag and is not present otherwise."

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.3.6.1** *P* **289** *L* **30** # 349

Lynskey, Eric Teknovus

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

The changes to bullet item "g" are not necessary and make the text more confusing. Stating the minimum and maximum values of Pad/Reserved for all possible types of GATE frames is sufficient. As written, this text is also inconsistent with Figure 64-33(b), which shows fields with variable lengths.

SuggestedRemedy

Remove changes to bullet "g".

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.3.6.1** *P* **290** *L* **10** # 356

Lynskey, Eric Teknovus

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

It is not clear what bit 0 is used for in Table 64-2. A 10G OLT can be capable of 1G upstream, 10G upstream, or both 1G and 10G upstream. These three modes of operation need two bits to be fully described.

SuggestedRemedy

Rename bit 0 to "OLT receiver is capable of 1Gb/s".
Insert new bit 1 to be "OLT receiver is capable of 10Gb/s".
Shift existing bits 1 and 2 to 2 and 3.

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.3.6.3** *P* **292** *L* **32** # 100

Remein, Duane Alcatel-Lucent

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

Discovery Information is optional (marked deleted) in sentence "The size of the Pad/Reserved field depends on the presence of the optional Discovery Information flag field - it is equal to 38 when the said field is absent and 37 when present."

SuggestedRemedy

Include the word "optional" in the referenced sentence.

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.3.6.3** *P* **293** *L* **41** # 357

Lynskey, Eric Teknovus

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

It is not clear what bit 0 is used for in Table 64-6. A 10G ONU can be capable of 1G upstream, 10G upstream, or both 1G and 10G upstream. These three modes of operation need two bits to be fully described.

SuggestedRemedy

Rename bit 0 to "ONU transmitter is capable of 1Gb/s".
Insert new bit 1 to be "ONU transmitter is capable of 10Gb/s".
Shift existing bits 1 and 2 to 2 and 3.

Proposed Response *Response Status* **O**

Cl **64** *SC* **64.3.6.3** *P* **294** *L* **5** # 337

Lynskey, Eric Teknovus

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

Spilt Figure 64-35 into a 1 Gb/s REGISTER_REQ and a 10 Gb/s REGISTER_REQ instead of a general one and one with Discovery Information field. This will also make things easier if other changes are needed.

SuggestedRemedy

Have separate 1Gb/s and 10 Gb/s figures.

Proposed Response *Response Status* **O**

Cl **64** *SC* **Table 64-5** *P* **292** *L* **37** # 91

Ryan, Hirth Teknovus

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

An ONU may be 10G only upstream capable, 1G only upstream capable, or 10G or 1G upstream capable. The Flag Field should include 2 bits to describe the upstream capablility: One for 10G upstream capable, and one for 1G upstream capable.

SuggestedRemedy

add bit "ONU is 10G upstream capable" and "ONU is 1G upstream capable". remove "ONU is 10G/1G upstream capable"

Proposed Response *Response Status* **O**

Cl **91** *SC* **1** *P* **121** *L* **38** # 73

Marek, Hajduczenia Nokia Siemens Networ

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

Based on the stipulations of the IEEE 206.1-2004 maintaned by SCC14, 10 Gbps should not be used in the IEEE standards ready for the sponsoer ballot stage. 10 Gb/s should be used instead

SuggestedRemedy

Replace all "10 Gbps" with "10 Gbit/s" in clauses 64, 91 and 92.

Proposed Response *Response Status* **O**

Cl **91** *SC* **1** *P* **123** *L* **14** # 66

Marek, Hajduczenia Nokia Siemens Networ

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

What does the "minimum range" mean? There is no clear definition of this term?

SuggestedRemedy

Define the term "minimum range" below Table 91-1 and Table 91-2.

Proposed Response *Response Status* **O**

Cl **91** *SC* **1** *P* **123** *L* **14** # 65

Marek, Hajduczenia Nokia Siemens Networ

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

10GBASE-PR-U3/D3 is stated as working with the minimum range of 0.5 m to at least 20 km. This was not voted on - the U3/D3 PMDs should operate with the 29 dB ChIL, whereas the nominal reach for this power class is not defined.
The same comment applies to line 37 on the same page.

SuggestedRemedy

Remove the reference to the minimum range for the PR30 PBC and state only the minimum range of 0.5 m. The same remedy is suggested for line 37.

Proposed Response *Response Status* **O**

Cl **91** *SC* **1** *P* **123** *L* **22** # 76

Marek, Hajduczenia Nokia Siemens Networ

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

"The quoted minimum range values already account for FEC gain. The upper bound on minimum range may be increased by application on extended FEC." - extended FEC is already used in the form of the RS(255,233,8). The statement is inconsistent with the baseline nr. 29 on http://www.ieee802.org/3/av/public/baseline.html.

SuggestedRemedy

Remove sentence number 2 i.e. "The upper bound on minimum range may be increased by application on extended FEC" leaving the whole block in the following form "The quoted minimum range values already account for FEC gain."

Proposed Response *Response Status* **O**

Cl **91** *SC* **1** *P* **123** *L* **5** # 84

Marek, Hajduczenia Nokia Siemens Networ

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

Table 91-1 includes 10GBASE-PR-U1 with the ChIl min = 5 and ChIL max = 20 while it is supposed to work with PR10 and PR20 budgets with ChIL min 5 and 10 and ChIL max 20 and 24 respectively. That is not currently reflected in the Table 91-1.

SuggestedRemedy

Copy the 10GBASE–PR–U1 column to the right of the 10GBASE–PR–D1 column and use the appropriate min and max ChIL values i.e. 24 and 10 dB.

Proposed Response *Response Status* **O**

Cl **91** *SC* **1.2** *P* **125** *L* # 72

Marek, Hajduczenia Nokia Siemens Networ

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

Figure 91-1 does not represent correctly the relationship of the Clause 91 PMD to the OSI reference model. In the case of symmetric data rate PMDs, there is only XGMII interface between the RS and the PMD, in the case of the asymmetric data rate PMDs, the clause 91 PMD is connected to Clause 92 RS via XGMII and GMII in the appropriate directions i.e. in the OLT, the Tx direction is serviced by the XGMII, the Rx direction is serviced by the GMII.

SuggestedRemedy

Suggest to redesign Figure 91-1 to represent the symmetric 10 Gbps EPONs, with the XGMII interface only between the clause 92 RS and the PMD. Suggest to copy Figure 91-1 creating Figure 91-2 and represent the asymmetric data rate EPON, where the OLT has the RS connected to the PMD via XGMII in the TX and GMII in the Rx direction, while in the ONU - the RS will be connected to the PMD via XGMII in the Rx direction and via GMII in the Tx direction. The coexisting situation will not be covered in the Clause 91.

Proposed Response *Response Status* **O**

Cl **91** *SC* **4** *P* **130** *L* **26** # 194

Effenberger, Frank Huawei Technologies,

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

RMS spectral width does not make much sense for single moded lasers. I appreciate that we will keep it for the 1G upstream link, but for 10G it makes no sense.
Found on p130, line 26 and on p134, line 14.
(Tables 91-6 through 91-9; 91-12; 91-14 and 91-15)

SuggestedRemedy

Propose that RMS spectral width is removed from tables 91-6 and 91-12.
Delete tables 91-7,8,9,14,15.
Add the following items to tables 91-6 and 91-12:

Side Mode Suppression Ratio (min) [Note} 30 dB (for all cases)

Add Note: Transmitter is a single logitudinal mode device. Chirp is allowed such that the total optical path penalty does not exceed that found in table 91-18.

Proposed Response *Response Status* **O**

Cl **91** *SC* **4.1** *P* **130** *L* **33** # 85

Marek, Hajduczenia Nokia Siemens Networ

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

The OMA mW values are not calculated correctly e.g. is: 2.91 dBm = 1.54 mW.
Applicable to all OMA mW values in:
Table 91–6, Table 91–12 i.e. Launch OMA (min),
Table 91–10, Table 91–17i.e. Stressed receive sensitivity OMA (max)

SuggestedRemedy

Convert the OMA dBm values into OMA mW values using the formula: 10^(dBm/10).
Multiply by 1000 if to be expressed in uW.

Proposed Response *Response Status* **O**

Cl **91** *SC* **4.1** *P* **134** *L* **3** # 382

Toshiaki, Mukojima Oki Electric Industry C

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

Change spelling of "10G/1GBASE-PRX-D4" to "10G/1GBASE-PRX-D3"

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **5.1** *P* **133** *L* **42** # 74

Marek, Hajduczenia Nokia Siemens Networ

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

Reference to the non-existing PMD i.e. 10GBASE-PR-U2 is made - see
http://www.ieee802.org/3/av/public/baseline.html and
http://www.ieee802.org/3/av/public/2007_11/3av_0711_effenberger_1.pdf.

SuggestedRemedy

Remove all the references to the 10GBASE-PR-U2 from the text.

Proposed Response *Response Status* **O**

Cl **91** *SC* **5.1** *P* **137** *L* **47** # 383

Toshiaki, Mukojima Oki Electric Industry C

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

Delete unmapped PR PMD class name "10GBASE-PR-U2"

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **5.2** *P* **136** *L* **36** # 75

Marek, Hajduczenia Nokia Siemens Networ

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

Table 91–17 contains reference to the 10GBASE–PR–U2 PMD, which does not exist since the PR10 and PR20 ONU PMDs are to identical.

SuggestedRemedy

Table 91-17 needs to be separated into the symmetric PMD and asymmetric PMD definitions i.e. Table 91-17 would contain the specifications for the 10GBASE–PR–U1 and 10GBASE–PR–U3, while the new Table 91-18 would contain the specifications for the 10/1GBASE–PRX–U1, 10/1GBASE–PRX–U2 and 10/1GBASE–PRX–U3. If in the course of the further development, 10/1GBASE–PRX–U1 and 10/1GBASE–PRX–U2 is foudn to share the same parameters, the Table 91-17 and Table 91-18 could be merked again.

Proposed Response *Response Status* **O**

Cl **91** *SC* **5.2** *P* **140** *L* **47** # 381

Toshiaki, Mukojima Oki Electric Industry C

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

Delete unmapped PR PMD class name "10GBASE-PR-U2"

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **6** *P* **138** *L* **36** # 67

Marek, Hajduczenia Nokia Siemens Networ

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

Table 91–19 indicates significant differences for Channel insertion loss (min) and Allocation for penalties for the DS and US channels. The 1 Gbps specs should be aligned with the new power budget specifications to remain comparable with the 10 Gbps channel specs.

SuggestedRemedy

Align the channel link model for 1 Gbps and 10 Gbps links by e.g. recalculating the 1 Gbps channel models in the new link model spreadsheet. Then use the penalty and channel insertion values which are required to make the system work.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91** *P* **121** *L* **11** # 270

Dawe, Piers Avago Technologies

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

Draft says 'All insertions to the original text of the clause are marked with change bars and presented in underlined blue colour.'

SuggestedRemedy

Insertions/deletions to previous draft of the clause should be presented in underlined blue or cross-through red. Insertions/deletions to base document, if not new for this draft, should be underlined or cross-through black.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91** *P* **121** *L* **2** # 267

Dawe, Piers Avago Technologies

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

802.3 uses b/s not bps

SuggestedRemedy

Global search for bps and replace with b/s

Proposed Response *Response Status* **O**

Cl **91** *SC* **91** *P* **121** *L* **6** # 268
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **X**
amendment/corrigendum

SuggestedRemedy
amendment

Proposed Response *Response Status* **O**

Cl **91** *SC* **91** *P* **121** *L* **7** # 269
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **X**
802.3–2005

SuggestedRemedy
802.3–200x (should become 2008 later). If 802.3ay has changed Clause 64, keep in step.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **121** *L* **34** # 121
Kramer, Glen Teknovus, Inc.

Comment Type **TR** *Comment Status* **X**
Introduction text introduces many concepts out of order, e.g.,
Asymmetric and symmetric PMD definitions are given after they are used.
Repeated definitions for U- and D- suffix.
Introductions of power budgets and PMDs are all mixed together.

SuggestedRemedy
Replace text in sections 91.1 and 91.3 with sections 91.1 and 91.2 in the attached document 3av_0801_kramer_1.pdf.

Relocate sections 91.1.4 and 91.1.5 in C91 D1.0 under the section 91.3 PMD Functional Specifications (see outline shown in 3av_0801_kramer_1.pdf).

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **121** *L* **34** # 117
Kramer, Glen Teknovus, Inc.

Comment Type **ER** *Comment Status* **X**
Do not use gratuitous acronyms

SuggestedRemedy
Throughout the clause relpace
PBC = power budget class
DS = downstream
US = upstream

Remove editorial note #1

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **121** *L* **35** # 266
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **X**
PBC names PR10, PR20 and PR30 / PRX10, PRX20 and PRX30 could be shorter. The power budget class can be the same whatever the signaling rate. See other comments.

SuggestedRemedy
P1, P2 and P3 ?

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **121** *L* **42** # 271
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **X**
New abbreviations (actually, DS has been used occasionally already)

SuggestedRemedy
Don't put them here, put them in your Clause 1 draft (there'll be more). Explain that US and DS mean directions of transmission, not positions. Do you want to add PBC?

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **121** *L* **44** # 273
Dawe, Piers Avago Technologies

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

Trying to introduce confusing terminology

SuggestedRemedy

In an Ethernet PON, a single downstream (D) or 'OLT' PMD broadcasts in the downstream direction (DS) to multiple upstream (U) or 'ONU' PMDs and, in the upstream direction (US), receives bursts from each 'U' PMD over a single branched topology, single–mode fiber network.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **121** *L* **46** # 272
Dawe, Piers Avago Technologies

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

New train of thought

SuggestedRemedy

Start a new paragraph with 'This clause specifies'

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **121** *L* **48** # 300
Dawe, Piers Avago Technologies

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

Using / in a name is probably a bad idea, unless you really do mean dual mode like 10/100 Ethernet for twisted pair - and this draft doesn't.

SuggestedRemedy

Could use underscore instead. (Could we be more creative to make the names shorter e.g. 11GBASE....?)

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **121** *L* **48** # 274
Dawe, Piers Avago Technologies

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

If these names are too long, the 'BASE' is not accurate anyway. It doesn't mean baseband (for an optical link), but does signify Ethernet.

SuggestedRemedy

Could replace 'BASE' by 'E'. E.g. 10GE–PR–U1

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **122** *L* **1** # 301
Dawe, Piers Avago Technologies

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

PBCs are not just mappings, they define the optical distribution network in three grades

SuggestedRemedy

This clause specifies the following PMDs:
...
(including MDI), and three PBCs of the single–mode fiber medium.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **122** *L* **1** # 304
Dawe, Piers Avago Technologies

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

10GBASE–PR–Ux: I think this is the only paragraph where this syntax is used. As we use X for something else, 10GBASE–PR–U would be better, more like what has been done in previous clauses.

SuggestedRemedy

Or can '10GBASE–PR–Ux PMD, 10GBASE–PR–Dx PMD, 10/1GBASE–PRX–Dx PMD or 10/1GBASE–PRX–Ux PMD' be condensed to '10GBASE–PR or 10/1GBASE–PRX PMD'?

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **122** *L* **1** # 164
Lin, Rujian Shanghai Luster Terab

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

A 10GBASE-PR-UxDx PMD, 10GBASE-PR-DxUx PMD.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **122** *L* **18** # 165
Lin, Rujian Shanghai Luster Terab

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

as a PMD transmitting and receiving at the same data rate

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **122** *L* **19** # 303
Dawe, Piers Avago Technologies

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

Not data rate

SuggestedRemedy

signalling (preferred) or signaling rate (twice in this sentence). 'data streams' can become 'bit streams'.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **122** *L* **20** # 166
Lin, Rujian Shanghai Luster Terab

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

as a PMD transmitting and receiving at different data rates

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **122** *L* **23** # 276
Dawe, Piers Avago Technologies

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

This could be made easier to read, from:
Typically, in DS, 10GBASE–PR–D3 and 10/1GBASE–PRX–D3 PMDs use the 1574 – 1580 nm band, while 10GBASE–PR–D1, 10GBASE–PR–D2, 10/1GBASE–PRX–D1 and 10/1GBASE–PRX–D2 PMDs use the 1580 – 1600 nm band to transmit data. In US, 10GBASE–PR–U1 and 10GBASE–PR–U3 PMDs use the 1260 – 1280 nm band, while 10/1GBASE–PRX–U1, 10/1GBASE–PRX–U2 and 10/1GBASE–PRX–U3 PMDs use the 1260 – 1360 nm band to transmit data.
to:

SuggestedRemedy

Typically, in DS, 10GBASE–PR–D3 and 10/1GBASE–PRX–D3 PMDs (D3 PMDs) use the 1574 – 1580 nm band, while D1 and D2 PMDs use the 1580 – 1600 nm band to transmit data. In US, 10GBASE–PR PMDs use the 1260 – 1280 nm band, while 10/1GBASE–PRX PMDs use the 1260 – 1360 nm band to transmit data.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **122** *L* **23** # 101
Remein, Duane Alcatel-Lucent

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

Use of the abreviation "DS" degrades readability in the phrase Typically, in DS, 10GBASE–PR–D3 and 10/1GBASE–PRX–D3 PMDs use

SuggestedRemedy

Replace DS with the words "down stream" and add the word "direction" so the phrase becomes "Typically, in the down stream direction, 10GBASE–PR–D3 and 10/1GBASE–PRX–D3 PMDs use ..."

Globally apply to document

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **122** *L* **3** # 275
Dawe, Piers Avago Technologies

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

10/1GBASE–PR PMA

SuggestedRemedy

10GBASE–PR or 10/1GBASE–PRX PMA ?

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **122** *L* **33** # 167
Lin, Rujian Shanghai Luster Terab

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

which transmit in thesethis directions and receive in the opposite directions.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **122** *L* **34** # 306
Dawe, Piers Avago Technologies

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

Draft says: 'The splitting ratio or reach length is increased in symmetric 10 Gbps / asymmetric 10 / 1 Gbps capable PONs thanks to application of FEC enabled link.' Unless FEC is optional, or absent in e.g. PBC PR10 or PRX10, increased as compared with what? What is the status of FEC on the 1G side?

SuggestedRemedy

You might want to add an FEC row to tables 91-1 and 91-2. Rewrite this sentence: here's just a suggestion 'Forward error correction (FEC) is used the situations specified in Table ... to obtain a low error rate at the PHY service interface in spite of a high splitting ratio or reach. FEC for 10GBASE–PR and 10/1GBASE–PRX is defined in 92.2 and 65.2. FEC is used in 10GBASE-PR-2 and 10GBASE-PR-3 links and is optional for 10GBASE-PR-1 links. ... FEC is optional for the 1 Gb/s side
(or whatever is decided)

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **122** *L* **35** # 168
Lin, Rujian Shanghai Luster Terab

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

10/1 Gbps capable PONs

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **122** *L* **38** # 182
Lin, Rujian Shanghai Luster Terab

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

Two optional temperature ranges are defined, see 91.8.4 for further details.
Implementations may be declared as compliant over one or both complete ranges.

SuggestedRemedy

Add temperature statement.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **122** *L* **48** # 307

Dawe, Piers Avago Technologies

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

Note 6 says: Verify what is meant by the 'Maximum channel insertion loss' row in the Table 91–1 – only ChIL with no penalties, ChIL with penalties or total power budget. This is confusing in IEEE 802.3ah.'
I'm not confused about this. See '1.4.95 channel insertion loss: As used in IEEE 802.3 Clause 38 for fiber optic links, the static loss of a link between a transmitter and receiver. It includes the loss of the fiber, connectors, and splices.'
Insertion loss of the Fiber optic cabling (Channel) is the ratio of the light that would come out of the ODN including patchcords at one MDI to the light injected at another MDI, using normal loss test set methods at the usual measurement wavelengths (1310 or 1550 nm).
As Clause 60 says, 'the channel insertion loss includes the loss for connectors, splices and other passive components such as splitters'. Penalties such as transmitter penalty or dispersion penalties, are not loss, although they are part of the 'budget' the 802.3 way.

SuggestedRemedy

Remove the note. Create a new 91.8 'Definitions of optical parameters and measurement methods', and a sub-subclause 'Insertion loss', contents 'Insertion loss for SMF Fiber optic cabling (Channel) is defined at 1310 or 1550 nm. A suitable test method is described in .... [provide ITU-T or IEC reference].'
Start a 1.4.n section of the draft. Modify 1.4.95 channel insertion loss: As used in IEEE 802.3 Clause 38, Clause 52, Clause 53, Clause 58, Clause 59, Clause 60, Clause 68 and Clause 91 for fiber optic links, the loss of light through a link between a transmitter and receiver. It includes the loss of the fiber, connectors, and splices. (See IEEE Std 802.3, Clause 91.8.n.)
Other clauses from 9 onwards use the term; do they mean the same?

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **122** *L* **7** # 302

Dawe, Piers Avago Technologies

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

Draft says: NOTE—PMDs defined in this Clause support the coexistence with Clause 60 PMDs as described in detail in informative Annex A1. I'm surprised that there isn't a coexistence objective. I think that clearly and normatively defining what coexistence is supported/unadvisable/beyond the scope... between GEPON and 10GEPON is a required piece of 802.3av. If you want to make further material about coexistence with ITU PON or video overlay, informative, that's more justifiable.

SuggestedRemedy

Create a coexistence table. Later as the Clause 30 management attributes and clause 45 registers are worked out, the draft will have to be much more clear about static and dynamic dual-speed capabilities.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **122** *L* **7** # 277

Dawe, Piers Avago Technologies

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

It might be Clause 91, but not 'this Clause'

SuggestedRemedy

this clause. Global search and replace.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **123** *L* **10** # 280

Dawe, Piers Avago Technologies

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

'Number of fibers' doesn't seem right for a PON: there isn't just one fibre

SuggestedRemedy

Number of fibers at a MDI?

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **123** *L* **16** # 330

Dawe, Piers Avago Technologies

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

If all the channel insertion loss will be splitting loss, the losses at 1270 and 1590/1577 nm will be much the same as each other (does connector loss depend on wavelength?). But if a significant part of the insertion loss will be distance-based fibre attenuation, the loss at 1590/1577 nm will be less than at 1270 nm. GEPON has a 0.5 dB difference.

SuggestedRemedy

Is the same appropriate here?

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **123** *L* **16** # 309

Dawe, Piers Avago Technologies

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

A link consisting of 10GBASE-PR-U1 and 10GBASE-PR-D2 would be PR20, max/min loss 24/10 dB, not 5/20 as shown? I think insertion loss classes map 1:1 to the PBCs but not to the PMDs.

SuggestedRemedy

Remove the range and loss rows from table 91-1 and 91-2 and move them to 91-4 and 91-5. You might then want to present 91.3 before these tables. Add rows for these tables for which PBCs these PMDs can be used with: more than one option sometimes depending on PMD at the other end.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **123** *L* **18** # 410

Chang, Frank Vitesse

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

The temperature ranges should be pointed out in the Overview, which is critical in making sure the task force is defining the worst-case specs with the consideration of specific environment conditions.

SuggestedRemedy

Add what is similar to 60.1, referring to 60.8.4 for further details. The Task force take action to define the case temperature classes similar to Table 60-13.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **123** *L* **20** # 113

Remein, Duane Alcatel-Lucent

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

Table 91–1 note b is incorrect. If FEC is already accounted for then minimum range will not be increased by "extended" FEC.

Same comment on table 91-2.

SuggestedRemedy

Remove pharse "The upper bound on minimum range may be increased by application on extended FEC." from note b.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **123** *L* **21** # 308

Dawe, Piers Avago Technologies

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

'The upper bound on minimum range may be increased by application on extended FEC.': What 'extended FEC.'

SuggestedRemedy

Unless a stronger FEC variant appears in the draft, delete the sentence.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **123** *L* **21** # 4

Lynskey, Eric Teknovus

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

In Table 91-1 and Table 91-2 footnote B, it mentions that two types of FEC are supported. The Task Force has not made this decision, and as of now, only a single FEC, RS(255, 223), has been voted on.

SuggestedRemedy

Remove the second sentence of footnote B for both tables.

Response *Response Status* **C**

ACCEPT.

Cl **91** *SC* **91.1** *P* **123** *L* **5** # 118

Kramer, Glen Teknovus, Inc.

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

Tables 91-1 and 91-2 are confusing. It does not make sense to talk about distance or channel insertion loss for a single PMD. These tables should describe power budget classes, not PMDs.

SuggestedRemedy

Modify the tables as shown in the attached document 3av_0801_kramer_1.pdf.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **123** *L* **6** # 359

Suzuki, Ken-Ichi NTT

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

10GBASE-PR-U1 can be also used for PR20.

SuggestedRemedy

Add the description of "10GBASE-PR-U1" to the left of "10GBASE-PR-D2" on Table 91-1.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **123** *L* **6** # 278

Dawe, Piers Avago Technologies

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

Cramped table

SuggestedRemedy

Select table, size column widths to contents, with maximum (432?). Also Tables 91-3, 91-12.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1** *P* **124** *L* # 407

Chang, Frank Vitesse

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

In Table 91-2, 91-4 for co-existence cases with 1G PX10, PX20, the losses are indicated as the same for different wavelengths, this is different from what is already specified by 802.3ah.

SuggestedRemedy

Suggest to follow 802.3ah definition (where the loss for 1590nm or 1577nm should be even slightly smaller than 1490nm).

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1,Table 91-2** *P* **123** *L* **3941** # 183

Lin, Rujian Shanghai Luster Terab

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

TBD 29
TBD 15

SuggestedRemedy

Define the Maximum channel insertion loss and Minimum channel insertion loss.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.1** *P* **123** *L* **50** # 279

Dawe, Piers Avago Technologies

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

The following are the objectives of PR10, PR20, PR30, PRX10, PRX20 and PRX30:

SuggestedRemedy

The following are the objectives of this clause: ?

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.2** *P* **124** *L* **18** # 281
Dawe, Piers Avago Technologies

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

SuggestedRemedy
hatched

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.2** *P* **124** *L* **19** # 174
Lin, Rujian Shanghai Luster Terab

Comment Type **ER** *Comment Status* **X**
Figure 91-1 depicts the relationships of the PMD (shown hashed) with other sublayers and the ISO/IEC Open System Interconnection (OSI) reference model. The OLT has two interfaces between the sublayers of RS and PCS-XGMII and GMII along with the respective stacks and indication of appropriate clauses where the given entities are defined. Two types of ONU are depicted i.e. symmetric 10/10G ONU and asymmetric 10/1G ONU.
Optional sublayers of the stack required to assure coexistence with Clause 60 PMDs are presented in the figure in an informative way, refer to Annex A1 for detailed description of the coexistence options.

SuggestedRemedy
Insert a description on Figure 91-1.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.2** *P* **125** *L* **12** # 287
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **X**
Shading doesn't work well after pdf and printer translation

SuggestedRemedy
Can you hatch in the other direction?

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.2** *P* **125** *L* **19** # 310
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **X**
Fibre does not go past the MDI: this isn't classic Ethernet on coax. Compare Fig 60-1.

SuggestedRemedy
Make the fibres go to the two MDIs not past them

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.2** *P* **125** *L* **2** # 286
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **X**
Font too small: 7 point

SuggestedRemedy
Change to 8 point. There'll be room when it isn't all in capitals.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.2** *P* **125** *L* **2** # 285
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **X**
Shouldn't write WORDS in CAPITALS: only abbreviations and such

SuggestedRemedy
Change the words to lower case, with leading capital where needed

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.2** *P* **125** *L* **31** # 311
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **X**
'PON Medium' appears to include the ONU

SuggestedRemedy
Shorten the bracket to span the Optical distributor combiner(s)

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.2** *P* **125** *L* **31** # 288
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **X**
'PON Medium': not a non-ordinary-English term

SuggestedRemedy
PON medium

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.4** *P* **124** *L* **42** # 282
Dawe, Piers Avago Technologies

Comment Type **E** *Comment Status* **X**
by the all the PMDs

SuggestedRemedy
by the PMDs

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.4** *P* **124** *L* **42** # 169
Lin, Rujian Shanghai Luster Terab

Comment Type **E** *Comment Status* **X**
The following specifies the services provided by the all the PMDs defined in this Clause.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.4** *P* **124** *L* **45** # 102
Remein, Duane Alcatel-Lucent

Comment Type **E** *Comment Status* **X**
The sentance "The PMD Service Interface supports the exchange of a continuous stream of bits, representing either 64B/66B (...) or 8B/10B (...) code–groups encoded, scrambled and serialized in Clause 92 PMA, between the Clause 92 PMA and PMD entities." makes it sound like C92 deals with either 64B/66B or 8B/10B when in fact it only deals with 64B/66B.

SuggestedRemedy
Change to read: "The PMD Service Interface supports the exchange of a continuous stream of bits, representing either 64B/66B encoding (...) as described in Clause 92 PMA entities or 8B/10B encoding(...) as described in Clause 65 PMA entities."

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.4** *P* **124** *L* **45** # 175
Lin, Rujian Shanghai Luster Terab

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

SuggestedRemedy
Agree on the insertion from Line 45 to Line 49 on Page 124 in Draft 1.0

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.4** *P* **124** *L* **45** # 283

Dawe, Piers Avago Technologies

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

This can be simplified (as can 91.1.5.n):
The PMD Service Interface supports the exchange of a continuous stream of bits, representing either 64B/66B (the transmit and receive paths in the 10GBASE–PR–D and 10GBASE–PR–U type PMDs, receive path in 10/1GBASE–PRX–D type PMDs) or 8B/10B (transmit path in 10/1GBASE–PRX–U type PMDs) code–groups encoded, scrambled and serialized in Clause 92 PMA, between the Clause 92 PMA and PMD entities.

SuggestedRemedy

The PMD Service Interface supports the exchange of a continuous stream of bits, representing either 64B/66B blocks (the transmit and receive paths in 10GBASE–PR PMDs, transmit path in 10/1GBASE–PRX–D PMDs) or 8B/10B (transmit path in 10/1GBASE–PRX–U PMDs, receive path in 10/1GBASE–PRX–D PMDs) code–groups encoded, scrambled and serialized in a?the? Clause 92 PMA, between the PMA and PMD entities.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.4** *P* **124** *L* **49** # 284

Dawe, Piers Avago Technologies

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

a compatibile PMA - spelling. Match or change 'The' PMD at the beginning of the sentence?

SuggestedRemedy

the PMA? the specified PMA?

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.4** *P* **124** *L* **49** # 12

Jiang, Jessica Salira

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

Typo error: "compatibile" should be "compatible"

SuggestedRemedy

"compatibile" should be "compatible"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **91** *SC* **91.1.4** *P* **125** *L* **1** # 119

Kramer, Glen Teknovus, Inc.

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

Figure 91-1 is unclear as to whether PRX type PMDs use only GMII or GMII and XGMII together.

SuggestedRemedy

Replicate figure 91-1 for PR and PRX types separately. Show XGMII and GMII for PRX and only XGMII for PR. Call the shaded box "PMD, PRX type (Clause 91)" in one figure and "PMD, PR type (Clause 91)" in another figure.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.5** *P* **126** *L* **9** # 312

Dawe, Piers Avago Technologies

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

It doesn't belong here, but remember FEC delay (see e.g. 74.6). If delay is done by reference to 36.5, I wouldn't call a PON 'half duplex or 'full duplex' so some clarification would be needed.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.5** *P* **126** *L* **9** # 289

Dawe, Piers Avago Technologies

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

Are delay constraints and the primitives are not related, so should they be grouped together? Clause 52 and 60 are different

SuggestedRemedy

?

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.5.1** *P* **126** *L* **21** # 176
Lin, Rujian Shanghai Luster Terab

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

SuggestedRemedy
Agree on the insertion from Line 21 to Line 25 on page 126 in Draft 1.0.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.1.5.2** *P* **126** *L* **36** # 177
Lin, Rujian Shanghai Luster Terab

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

SuggestedRemedy
Agree on the insertion from Line 36 to Line 40 on page 126 in Draft 1.0

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.2.1** *P* **127** *L* **24** # 178
Lin, Rujian Shanghai Luster Terab

Comment Type **ER** *Comment Status* **X**
The PMD block diagram is absent.

SuggestedRemedy
Add Figure 91-2 PMD block diagram.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.2.1** *P* **127** *L* **25** # 313
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **X**
re which figure, 52-2 or 60-2. What do you mean, 'and meeting the ITU–T specifications.'?

SuggestedRemedy
Figure 60-2 looks suitable. Can you show the extent of the ODN on it, or on the equivalent of Figure 60-10, Fiber optic cable model?

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.2.1** *P* **130** *L* **1** # 411
Chang, Frank Vitesse

Comment Type **TR** *Comment Status* **X**
Editor notes #16 indicate two options for PMD block diagrams.

SuggestedRemedy
Suggest to follow Clause 60 particularly for P2MP case, where Figure 91-3 (which is crossed out) must be modified.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.2.4.1** *P* **127** *L* **45** # 314
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **X**
Can we make this less confusing: 'ONU PMD signal detect (downstream)'?

SuggestedRemedy
U (ONU) PMD signal detect of DS signal? Similarly for 91.2.4.2.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.2.4.1** *P* **127** *L* **52** # 315
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **X**
Simplify: no receiver is required to verify whether a compliant 10GBASE–R signal is being received.

SuggestedRemedy
Change 'The 10GBASE–PR–U1, 10GBASE–PR–U3, 10/1GBASE–PRX–U1, 10/1GBASE–PRX–U2 and 10/1GBASE–PRX–U3 PMD receiver is not required to verify whether a compliant 10GBASE–R signal is being received.' to 'The PMD receiver is not required to verify whether a compliant 10GBASE–R signal is being received.'

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.2.4.2** *P* **128** *L* **9** # 316

Dawe, Piers Avago Technologies

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

Simplifying

SuggestedRemedy

Change 'The 10GBASE–PR–D1, 10GBASE–PR–D2, 10GBASE–PR–D3 PMD receiver is not required to verify whether a compliant 10GBASE–R signal is being received. Similarly, the 10/1GBASE–PRX–D1, 10/1GBASE–PRX–D2 and 10/1GBASE–PRX–D3 PMD receiver is not required to verify whether a compliant 1000BASE–X signal is being received.'
to
'The 10GBASE–PR–D PMD receiver is not required to verify whether a compliant 10GBASE–R signal is being received. Similarly, the 10/1GBASE–PRX–D PMD receiver is not required to verify whether a compliant 1000BASE–X signal is being received.'

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.2.4.3** *P* **128** *L* **20** # 290

Dawe, Piers Avago Technologies

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

'Receive conditions for PR and PRX PMD types'

SuggestedRemedy

Just 'Receive conditions' will do: PR and PRX PMD types are all that there could be in this clause.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.2.5** *P* **128** *L* **41** # 291

Dawe, Piers Avago Technologies

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

the three ONU PMDs

SuggestedRemedy

the five ONU PMDs? the five -U (ONU) PMD types?

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.3** *P* **128** *L* **44** # 120

Kramer, Glen Teknovus, Inc.

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

Section 91.3 is out of place. It should be part of Introduction, not be stack between two sections describing PMD specification.

Section 91.3 explains how we combine PMDs to satisfy our objectives of having 3 power budget classes. This section should follow immediately after the Goals and Objectives section.

SuggestedRemedy

Use the following outline for the clause 91:

91.1 Overview
91.1.1. Terminology and conventions
91.1.2. Goals and objectives
91.1.3. Power Budget Classes
91.1.4. Positioning of PMD sublayer within the IEEE 802.3 architecture
91.2 PMD Types
91.2.1. Mapping of PMDs to Power Budgets
91.3 PMD functional specifications
91.4 PMD to MDI Optical Specifications ... (OLT PMDs)
91.5 PMD to MDI Optical Specifications ... (ONU PMDs)
....

Move section 91.1.4 Physical Medium Dependent (PMD) sublayer service interface to be the first subsection under PMD functional specifications. Refer to attached file 3av_0801_kramer_1.pdf for proposed section introduction corresponding to the above outline.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.3** *P* **129** *L* **1** # 317

Dawe, Piers Avago Technologies

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

In my mind, there are three loss classes (not 6) - for the ODN: and PMDs which may be used on them according to these tables. The loss classes are the same for 1/10G as for 10G (and compatible(?), and very nearly the same, for Clause 60 GEPON).

SuggestedRemedy

Change '91.3.1 Symmetric, 10 Gbps PBCs (PR type)
The symmetric data rate PBCs comprise two symmetric data rate PMDs, i.e. 10GBASE–PR–D1, 10GBASE–PR–D2 or 10GBASE–PR–D3 on the OLT side and 10GBASE–PR–U1 or 10GBASE–PR–U3 on the ONU side. There is a strict mapping between the said PMDs and the individual PBCs, as presented in
Table 91–4.'
to
'91.3.1 Power budget classes for symmetric and asymmetric PMDs
There are three PBCs. The PMDs to be used with each PBC are shown in Table 91-4 and Table 91-5.' Note that there is no 10GBASE–PR–U2 PMD type.'
Delete the title and text of 91.3.2.
And see other comments.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.3** *P* **129** *L* **16** # 326

Dawe, Piers Avago Technologies

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

One of the nice innovations in Clause 68 is 68.5.2 Characteristics of signal within, and at the receiving end of, a compliant 10GBASE-LRM
channel. 10GEPON will need such a table; network maintenance will require it.

SuggestedRemedy

Add extra rows to Tables 91-4 and 91-5, Highest power in OMA max, Lowest power in OMA min, Highest average power max, Lowest average power. For each, there are two numbers: the highest/lowest anywhere in the link, and the highest/lowest at the receiving MDI. Populate table from numbers in the other tables. This may be something a determined reader could puzzle out for himself, but with so many variants, it will be worthwhile to tabulate it!

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4** *P* **129** *L* **39** # 179

Lin, Rujian Shanghai Luster Terab

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

SuggestedRemedy

Agree on the insertion fron Line 39 to Line 42 on Page 129 in Draft 1.0.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4** *P* **129** *L* **45** # 292

Dawe, Piers Avago Technologies

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

Editors Note 15

SuggestedRemedy

The blue text makes sense to me.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4** *P* **129** *L* **49** # 293

Dawe, Piers Avago Technologies

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

Transceivers don't support media. It's the other way round; media are at the bottom of the layer stack. And there are only two types shown for any PMD (B1.1 and B1.3 SMF)

SuggestedRemedy

Change 'transceiver supports all media types' to 'transceiver operates over the media types'. Same in 91.5.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4** *P* **130** *L* **42** # 391
Hiroshi, Hamano Fujitsu Labs. Ltd.

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

In Table 91-6, Transmitter and dispersion penalty (TDP) values still remain TBD.

SuggestedRemedy

I propose 1.5dB as baseline TDP values for the PR and PRX type OLT PMD transmit classes, following the presentation 3av_0711_hamano_1.pdf.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4** *P* **134** *L* **19** # 413
Chang, Frank Vitesse

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

Donot think RMS spectral width (max) is a good parameter.

SuggestedRemedy

Suggest to change to SMSR (min) = 30dB as EML is assumed.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4** *P* **135** *L* # 415
Chang, Frank Vitesse

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

Table 91-10, -11, -12, not needed for DFB type lasers.

SuggestedRemedy

Take out Table 91-10, -11, -12.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4** *P* **137** *L* **17** # 417
Chang, Frank Vitesse

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

Do we want to specify RX sens (max) as -27.6dBm OMA for B++ 29dB??

SuggestedRemedy

Change.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1** *P* **130** *L* **12** # 170
Lin, Rujian Shanghai Luster Terab

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

fanally 10GBASE-PR-D3 and 10/1GBASE-PRX-D43 share the same transmit parameters.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1** *P* **130** *L* **20** # 318
Dawe, Piers Avago Technologies

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

I don't like the 'Nominal transmitter type' table entry. It's not required so why is it here?

SuggestedRemedy

Delete this row and its note from each table. Earlier in the clause, add a sentence such as 'While it is not required, it is expected that PMD transmitters of this clause will use lasers, and amongst them, 10G transmitters and transmitters in the 1574-1600 nm range will use single longitudinal mode lasers.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1** *P* **130** *L* **23** # 9
Jiang, Jessica Salira

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

In table 91-6, the unit for signaling speed (range) use "GBd" instead of "Gb/s" or "Gbps". Typically, baud rate is for parallel data which consists more than one value, for serial data, suggest to use bit rate "b/s" or "bps".

There are more than one place use "GBd". The change should be apllied to all.

SuggestedRemedy

Change "GBd" to "Gbps" or "Gb/s"

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1** *P* **130** *L* **31** # 334

Dawe, Piers Avago Technologies

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

An extinction ratio spec of 9 dB minimum seems unnecessary and constraining to innovation. I thought the 9 dB was only a number to be used in calculation. I've made this comment a TR because it may take more than one ballot cycle to get to a complete set of spec numbers for these tables.

SuggestedRemedy

Unless there is a demonstrated reason for such a high extinction ratio, change the limit to something more moderate, e.g. 6 dB if there is no hope of using direct modulation (lower if there is). Remember, you don't have to have the OMA spec and the average power spec intercept at the extinction ratio spec.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1** *P* **130** *L* **33** # 323

Dawe, Piers Avago Technologies

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

Specs to 1/100 dBm; that's 0.23%. Not a realistic accuracy

SuggestedRemedy

Round them off to 1/10 dB. Round the mW to similar precision. All tables.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1** *P* **130** *L* **33** # 362

Suzuki, Ken-Ichi NTT

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

Values of Launch OMA (min) (dBm) are not coincident with those of Launch OMA (min) (mW)

SuggestedRemedy

Check and correct the equation on the spread sheet.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1** *P* **130** *L* **37** # 319

Dawe, Piers Avago Technologies

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

Ton, Toff not of interest for OLT transmitters

SuggestedRemedy

Delete the rows, here and in Table 91-12 and Table 91-13.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1** *P* **130** *L* **39** # 322

Dawe, Piers Avago Technologies

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

Optical return loss tolerance should be the same as the subscript in RINxOMA

SuggestedRemedy

e.g. if you mean 15, enter 15 three times. If not decided, change RIN15OMA to RINxOMA.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1** *P* **130** *L* **40** # 320

Dawe, Piers Avago Technologies

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

Optical return loss of ODN: ODN is not part of the transmitter. (I wonder how it got there in Clause 60.)

SuggestedRemedy

Delete this row, here and in Table 91-12 and Table 91-13. There's another table for the ODN.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1** *P* **130** *L* **44** # 321

Dawe, Piers Avago Technologies

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

Decision timing offset for transmitter and dispersion penalty (min): as these are the continuous-mode transmitters, can use the value in 52.9.10.4. Also, it shouldn't be a minimum; it's what the test equipment is set AT, not below or above.

SuggestedRemedy

+/-0.05 UI. Delete '(min)'. In Table 91-12 it should be a little higher. In Table 91-13 it might be same as 1000BASE-PX10-U (+/-0.125 UI if that does not cost too much performance).

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1** *P* **130** *L* **47** # 110

Remein, Duane Alcatel-Lucent

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

Note b of table 91-6 "centre" should be "center".
In general spelling follows american standard.

SuggestedRemedy

Change to "center"
Change spell check dictionary to American English

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1** *P* **130** *L* **49** # 294

Dawe, Piers Avago Technologies

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

10GBASE–PR–D1 / 10/1GBASE–PRX–D1

SuggestedRemedy

This is another reason not to use / in these type names.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1** *P* **130** *L* **9** # 331

Dawe, Piers Avago Technologies

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

Reference to section that's gone AWOL.

SuggestedRemedy

Create a new 91.8 'Definitions of optical parameters and measurement methods' (much better title and concept that 'Optical measurement requirements' because optical measurement is not required, although performance is). Contents can mainly refer to 58.7.n and occasionally to 68.6 or 52.9.n.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1** *P* **131** *L* **4** # 295

Dawe, Piers Avago Technologies

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

Because all these wavelengths are 274 to 300 nm from the furthest zero dispersion wavelength (i.e. see similar chromatic dispersion) , there is little point in having the spectral width depend on wavelength.

SuggestedRemedy

Get rid of the three tables and most of the text. Add two rows to Table 91-6. 'The equation used to calculate these values is detailed in 91.8.2.' can become a footnote. Provide a 91.8.2 or refer to 60.7.2 or equation (60-3).
This remedy does NOT necessarily apply to the U transmitters.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1** *P* **131** *L* **4** # 103

Remein, Duane Alcatel-Lucent

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

Combine Tables 91-7, 91-8 and 91-9 (increased readability)

SuggestedRemedy

Combine Tables 91-7, 91-8 and 91-9

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1** *P* **132** *L* **22** # 363

Suzuki, Ken-Ichi NTT

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

Values of Stressed receive sensitivity OMA (max) (dBm) are not coincident with those of Stressed receive sensitivity OMA (max) (uW)

SuggestedRemedy

Check and correct the equation on the spread sheet.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.1 ,Table91-6** *P* **130** *L* **42** # 188

Lin, Rujian Shanghai Luster Terab

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

Set Transmitter and dispersion penalty(max) to be 1.5dB

SuggestedRemedy

In measurement on TDP, it is important, but difficult to define an ideal transmitter which in theoretic concept is a transmitter with perfect driving waveform, perfect laser response, no optical delay, minimum line-width, no chirp and minimum relative intensity noise, because TDP = Receiver sensitivity in the case of test Tx with the worst fiber link £¤
Receiver sensitivity in the case of ideal Tx with pure attenuation (without fiber chromatic dispersion, PMD and optical reflection)
So I think that in the Draft we need to set up a definition on ideal Tx for TDP test.
For the TDP values I think that the data proposed by Dr. Hiroshi Hamano- 1.5dB for 1574-1580nm downstream and 3.0dB for 1260-1360nm upstream- is reasonable and a good start point for further investigation.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.2** *P* **131** *L* **47** # 324

Dawe, Piers Avago Technologies

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

As 10GEPON is going further and faster than GEPON, dispersion penalty is a serious issue. Stressed receive performance should not be optional here. But in return, to keep the burden of testing and reporting down, unstressed sensitivity can become optional.

SuggestedRemedy

Change 'overload, sensitivity, reflectivity' to 'overload, stressed sensitivity, reflectivity.'
Change 'Its stressed receive characteristics should' to 'Its (unstressed) sensitivity should'.
Same for 91.5.2 type PR.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.2** *P* **131** *L* **48** # 171

Lin, Rujian Shanghai Luster Terab

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

per measurement techniques described in 91.8.11. Either

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.2** *P* **132** *L* **10** # 104

Remein, Duane Alcatel-Lucent

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

It seems odd the 10-12 BER spec is entered once for each column whereas other common specifications are discretely spelled out. Recommend consistency by entering 10-12 for each column.

Also applies to Table 91-17 c91 subc91.5.1 pg 136 line 37.

SuggestedRemedy

enter 10-12 in separate cell for each column

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.2** *P* **132** *L* **10** # 390

Tsuji, Shinji Sumitomo Electric

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

Table 91-10.
Receiver sensitivity is defined at the BER of 10^-3 in the baseline reference presentation.

SuggestedRemedy

Please modify 10^-12 to 10^-3.
The same modification should be done at Table 91-17 page 136 line 48.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.2** *P* **132** *L* **13** # 325

Dawe, Piers Avago Technologies

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

Damage threshold for 10GBASE–PR–D3 should be Tx max for 10GBASE–PR–U3 + 1. For the others, it could be the same, or Tx max for 10GBASE–PR–U1 + 1 (i.e. +5 dBm).

SuggestedRemedy

That's +10 dBm for 10GBASE–PR–D3.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.2** *P* **132** *L* **23** # 327

Dawe, Piers Avago Technologies

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

VECP and stressed eye jitter are set points that the stressed receiver conformance test should be set AT, not above or below

SuggestedRemedy

Delete '(min)' for these two, all receiver tables.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.2** *P* **132** *L* **28** # 329

Dawe, Piers Avago Technologies

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

Jitter corner frequency

SuggestedRemedy

Probably 4 MHz for 10GBASE–PR–U (continuous mode: same as Clause 52), in the range 4-8 MHz TBD for 10GBASE–PR–U, 637 kHz for 10/1GBASE–PRX–D3 (like Clause 60 - maybe could be increased a little).

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.2** *P* **132** *L* **34** # 328

Dawe, Piers Avago Technologies

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

Consistency with current Clause 60. See http://ieee802.org/3/maint/requests/maint_1171.pdf

SuggestedRemedy

Note that following a maintenance request, note c has disappeared from Tables 60-5 and 60-8.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.4.2** *P* **136** *L* **2122** # 416

Chang, Frank Vitesse

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

I donot think Stressed Rx Sens (AOP or OMA) is properly used in the table.

SuggestedRemedy

1) Suggest to put Stressed Rx sens in AOP and OMA into TBD, while move the corrected numbers to the rows for receiver sens.
2) In footnote, change stress receiver sens as optional or to be defined later once the stress test method is defined.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5** *P* **132** *L* **41** # 180

Lin, Rujian Shanghai Luster Terab

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

SuggestedRemedy

Agree on the insertion from Line 41 to Line 44 on Page 132 in Draft 1.0

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5** *P* **134** *L* **21** # 361
Suzuki, Ken-Ichi NTT

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

"Unit" of "Launch OMA (min)", dBm(wW), must be a typo.

SuggestedRemedy

Replace "dBm(wW)" by "dBm(mW)".

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5** *P* **134** *L* **3** # 360
Suzuki, Ken-Ichi NTT

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

"Uescription" must be a typographical error.

SuggestedRemedy

Replace "Uescription" by "Description".

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5** *P* **134** *L* **30** # 392
Hiroshi, Hamano Fujitsu Labs. Ltd.

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

In Table 91-12, Transmitter and dispersion penalty (TDP) values still remain TBD.

SuggestedRemedy

I propose 3.0dB as baseline TDP values for the PR type ONU PMD transmit classes, following the presentation 3av_0711_hamano_1.pdf.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.1** *P* **133** *L* **44** # 296
Dawe, Piers Avago Technologies

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

Table 91–12 for PR type OLT PMDs

SuggestedRemedy

Table 91–12 for PR type ONU PMDs? And p134 line 1.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.1** *P* **134** *L* **19** # 335
Dawe, Piers Avago Technologies

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

An extinction ratio spec of 6 dB minimum seems too constraining for 10G, 1310 nm band. I thought the 6 dB was only a number to be used in calculation. I've made this comment a TR because it may take more than one ballot cycle to get to a complete set of spec numbers for these tables.

SuggestedRemedy

Unless there is a demonstrated reason for such a high extinction ratio, change the limit to something more moderate, e.g. 3.5 or 4 dB. Remember, you don't have to have the OMA spec and the average power spec intercept at the extinction ratio spec.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.1** *P* **134** *L* **21** # 364
Suzuki, Ken-Ichi NTT

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

Values of Launch OMA (min) (dBm) are not coincident with those of Launch OMA (min) (mW)

SuggestedRemedy

Check and correct the equation on the spread sheet.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.1** *P* **134** *L* **24** # 114
Remein, Duane Alcatel-Lucent

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

My understanding is that MAC timing requirements were to remain unchanged. Given that Toff (max) is an integral part of MAC timing this parameter should be 512 ns (same as c60 upstream PMDs).

SuggestedRemedy

Set Toff in Table 91-12 to 512 (ns) for both 10GBASE–PR–U1 and 10GBASE–PR–U3.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.1** *P* **135** *L* **22** # 115

Remein, Duane Alcatel-Lucent

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

My understanding is that MAC timing requirements were to remain unchanged. Given that Toff (max) is an integral part of MAC timing this parameter should be 512 ns (same as c60 upstream PMDs).

SuggestedRemedy

Set Toff in Table 91-13 to 512 (ns) for both 10/1GBASE–PRX–U3.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.1** *P* **135** *L* **34** # 297

Dawe, Piers Avago Technologies

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

for 10GBASE–PR–U1, 10GBASE–PR–U3, 10/1GBASE–PRX–U1 and 10/1GBASE–PRX–U3 PMDs are shown, respectively, in Table 91–14, Table 91–15, Table 91–16, Table 91–18 and Table 91–19.

SuggestedRemedy

for 10GBASE–PR–U1, 10GBASE–PR–U3, 10/1GBASE–PRX–U1, 10/1GBASE–PRX–U2 and 10/1GBASE–PRX–U3 PMDs are shown, respectively, in Table 91–14, Table 91–15, Table 60-4, Table 60-7 and Table 91–16.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.1** *P* **135** *L* **39** # 105

Remein, Duane Alcatel-Lucent

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

Recommend combining Tables 91-14, 91-15 and 91-16 (readability).

SuggestedRemedy

Combine Tables 91-14, 91-15 and 91-16.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.1** *P* **137** *L* **13** # 365

Suzuki, Ken-Ichi NTT

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

Values of Stressed receive sensitivity OMA (max) (dBm) are not coincident with those of Stressed receive sensitivity OMA (max) (uW)

SuggestedRemedy

Check and correct the equation on the spread sheet.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.1** *P* **138** *L* **47** # 405

Chang, Frank Vitesse

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

Same as comment #5.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.1** *P* **139** *L* # 418

Chang, Frank Vitesse

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

B++ 29dB??

SuggestedRemedy

Suggest add ER=6dB and calculate launching power accordingly.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.1** *P* **140** *L* # 412

Chang, Frank Vitesse

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

same as comment #7.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.1 ,Table 91-12** *P* **134** *L* **30** # 189

Lin, Rujian Shanghai Luster Terab

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

Set Transmitter and dispersion penalty(max) to be 3.0dB

SuggestedRemedy

In measurement on TDP, it is important, but difficult to define an ideal transmitter which in theoretic concept is a transmitter with perfect driving waveform, perfect laser response, no optical delay, minimum line-width, no chirp and minimum relative intensity noise, because TDP = Receiver sensitivity in the case of test Tx with the worst fiber link £¤
Receiver sensitivity in the case of ideal Tx with pure attenuation (without fiber chromatic dispersion, PMD and optical reflection)
So I think that in the Draft we need to set up a definition on ideal Tx for TDP test.
For the TDP values I think that the data proposed by Dr. Hiroshi Hamano- 1.5dB for 1574-1580nm downstream and 3.0dB for 1260-1360nm upstream- is reasonable and a good start point for further investigation.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.1, Table 91-13** *P* **135** *L* **27** # 190

Lin, Rujian Shanghai Luster Terab

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

Set Transmitter and dispersion penalty(max) to be 3.0dB

SuggestedRemedy

In measurement on TDP, it is important, but difficult to define an ideal transmitter which in theoretic concept is a transmitter with perfect driving waveform, perfect laser response, no optical delay, minimum line-width, no chirp and minimum relative intensity noise, because TDP = Receiver sensitivity in the case of test Tx with the worst fiber link £¤
Receiver sensitivity in the case of ideal Tx with pure attenuation (without fiber chromatic dispersion, PMD and optical reflection)
So I think that in the Draft we need to set up a definition on ideal Tx for TDP test.
For the TDP values I think that the data proposed by Dr. Hiroshi Hamano- 1.5dB for 1574-1580nm downstream and 3.0dB for 1260-1360nm upstream- is reasonable and a good start point for further investigation.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.2** *P* **136** *L* **34** # 173

Lin, Rujian Shanghai Luster Terab

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

91.8.11. Either

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.2** *P* **137** *L* **1** # 298

Dawe, Piers Avago Technologies

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

Run-on part of table split over a page break should be titled Table n-n ... (continued)

SuggestedRemedy

Assuming the editor used the current template - get the template keeper to fix it.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.2** *P* **141** *L* # 408

Chang, Frank Vitesse

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

same as comment #8

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.6** *P* **138** *L* **21** # 336
Dawe, Piers Avago Technologies

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

The allocations for penalties are too small. Remember, in 802.3 it's all penalties including those in the transmitter - not just path penalty/dispersion penalty. I've made this comment a TR because it may take more than one ballot cycle to get to a complete set of spec numbers for these tables.

SuggestedRemedy

Assuming channel insertion loss (max) is as intended, increase the allocations for penalties and increase the available power budget in step. Here and DS allocations in Table 19.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.6** *P* **138** *L* **5** # 106
Remein, Duane Alcatel-Lucent

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

Table 91-18; Nominal distance is a misleading term to the casual user.

This comment also applies to Table 91-19

SuggestedRemedy

Add a note the "Nominal distance refers to the expected maximum distance a PMD will be capable of achieving in a typical ODN, numerous ODN implementation practices may result is longer or shorter distances being actually achievable in a users' network."

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.6** *P* **141** *L* # 419
Chang, Frank Vitesse

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

Nowhere indicate assumptions on optical loss and attn. calculated in spreadsheet.

SuggestedRemedy

Suggest to add optical loss and attn. table with assumptions of the number of connectors.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.6** *P* **142** *L* # 409
Chang, Frank Vitesse

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

Same as comment #2.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.6** *P* **142** *L* # 406
Chang, Frank Vitesse

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

Is the link closed with allocation for penalties?

SuggestedRemedy

Add DS/US jitter budget table and revisit the allocation for penalties.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.8** *P* **139** *L* **22** # 332
Dawe, Piers Avago Technologies

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

For this 'Environmental, safety, and labeling' section you might start by copying 68.7 (except the NOTE) - it's short and simple.

SuggestedRemedy

For this section you might start by copying 68.7 (except the NOTE) - it's short and simple. Then you can choose to say 'as defined in 52.10.1' or 'as defined in 60.8.1' and so on - the differences are not great.

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.9** *P* **139** *L* **26** # 333
Dawe, Piers Avago Technologies

Comment Type **T** *Comment Status* **X**
For this 'Characteristics of the fiber optic cabling' section

SuggestedRemedy
Copy or reference 60.9 or its sections?

Proposed Response *Response Status* **O**

Cl **91** *SC* **91-9** *P* **134-5** *L* # 414
Chang, Frank Vitesse

Comment Type **TR** *Comment Status* **X**
Table 91-9, 9-13 Wavelength (range) not appropriate.

SuggestedRemedy
Change Wavelength (range) to Center wavelength (range), typically for DFB type lasers.

Proposed Response *Response Status* **O**

Cl **91** *SC* **Table 91-14** *P* **135** *L* **48** # 172
Lin, Rujian Shanghai Luster Terab

Comment Type **E** *Comment Status* **X**
These limits for 10GBASE-PR10-U transmitter are illustrated in Figure 91-34.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **91** *SC* **Table 91-15,91-16** *P* **136** *L* **1021** # 181
Lin, Rujian Shanghai Luster Terab

Comment Type **ER** *Comment Status* **X**
These limits for 10GBASE-PR10-U transmitter are illustrated in Figure 91-34.

SuggestedRemedy
Add Figure 91-4 10GBASE-PR-U transmitter spectral limits on Page 136.

Proposed Response *Response Status* **O**

Cl **91** *SC* **Table 91-7,91-8,91-9** *P* **131** *L* **1324** # 184
Lin, Rujian Shanghai Luster Terab

Comment Type **T** *Comment Status* **X**
This limits for the 10GBASE-PR10-U-D transmitter are illustrated in Figure 91-3.

SuggestedRemedy
Add Figure 91-3 10GBASE-PR-D transmitter spectral limits on page 131 in Draft 1.0.

Proposed Response *Response Status* **O**

Cl **92** *SC* **1.1** *P* **299** *L* **12** # 68
Marek, Hajduczenia Nokia Siemens Networ

Comment Type **E** *Comment Status* **X**
The initial description of the system should be more specific i.e. "This subclause extends Clause 46 to enable multiple data link layers to interface with a single physical layer. This subclause also extends Clause 65 to enable asymmetrical data links which transmit at one rate and receive at a different rate." needs changes

SuggestedRemedy
Change to ""This subclause extends Clause 46 to enable multiple data link layers to interface with a single physical layer and Clause 65 to enable asymmetrical data links, transmitting at one data rate (e.g. 10 Gb/s) and receive in another data rate (e.g. 1 Gb/s)."

Proposed Response *Response Status* **O**

Cl **92** *SC* **1.1** *P* **300** *L* **1** # 80
Marek, Hajduczenia Nokia Siemens Networ

Comment Type **ER** *Comment Status* **X**
Figure 92-1 is not correct - in the case of symmetric data rate PMD, only XGMII will be available, in the case of asymmetric data rate PMD, the XGMII and GMII will be used in only one transmission direction e.g. GMII for Tx and XGMII for Rx or vice versa.

SuggestedRemedy
Correct the figure to reflect the connection between the PMD and the RS. It is suggested to split the figure into 2 and depict the symmetric and asymmetric data rate PMD connection separately.

Proposed Response *Response Status* **O**

Cl **92** *SC* **1.2.3.3.2** *P* **303** *L* **22** # 81

Marek, Hajduczenia Nokia Siemens Networ

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

"If the received logical_link_id value matches 0x7FFF or 0x7FFE and an enabled MAC exists with a logical_link_id variable with the same value then the comparison is considered a match to that MAC." - hexadecimal numbers are represented in the xx-xx-...-xx format.

SuggestedRemedy

replace all 0x7FFF with 07-FF and 0x7FFE with 7F-FE.

Proposed Response *Response Status* **O**

Cl **92** *SC* **2.2.1** *P* **306** *L* **14** # 69

Marek, Hajduczenia Nokia Siemens Networ

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

In the Figure 92-4, there is a spelling mistake in one of the blocks i.e. "SYNCRONIZER". The same holds true for Figure 92-5.

SuggestedRemedy

Replace with the "SYNCHRONIZER"

Proposed Response *Response Status* **O**

Cl **92** *SC* **2.2.1** *P* **308** *L* **5** # 70

Marek, Hajduczenia Nokia Siemens Networ

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

"The SOD is followed by @tbd (two)@ IDLE blocks which are used to synchronize the SCRAMBLER at the OLT."

SuggestedRemedy

Replace with "The SOD is followed by two IDLE blocks which are used to synchronize the SCRAMBLER at the OLT."

Proposed Response *Response Status* **O**

Cl **92** *SC* **2.2.1** *P* **309** *L* **15** # 82

Marek, Hajduczenia Nokia Siemens Networ

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

"Required number of sync blocks per burst. The value of this constant is derived from Sync-Time parameter passed from the OLT to ONUs.64.3.3.2" - incomplete. Additonally, 64.3.3.2 defines syncTime and not Sync-Time variable.

SuggestedRemedy

Change to something like this "Required number of sync blocks per burst. The value of this constant is derived from syncTime parameter passed from the OLT to ONUs. See 64.3.3.2 for details."

Proposed Response *Response Status* **O**

Cl **92** *SC* **2.2.2.1** *P* **309** *L* **6** # 64

Marek, Hajduczenia Nokia Siemens Networ

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

The Constants and Variables are typically started with lower case ...

SuggestedRemedy

Align with the capitalization in Caluse 65, 64 and others.

Proposed Response *Response Status* **O**

Cl **92** *SC* **2.2.2.3** *P* **310** *L* **24** # 83

Marek, Hajduczenia Nokia Siemens Networ

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

"IsIdle(tx_code-group) This function is used to determine whether tx_code-group is a code-group in /I/, the IDLE ordered_set, or /C/, the Configuration ordered_set. This function returns true if tx_code-group is /K28.5/ or any code-group that follows a /K28.5/ or any two consecutive /D/ code-groups
that follow /K28.5/D21.5/ or /K28.5/D2.2/. Otherwise, the IsIdle function returns false." - this definition needs to be different for 64B/66B code since the IDLE code group is encoded in a different way.

SuggestedRemedy

Aling with the 64B/66B code words definition for IDLE character, as defined in Table 49–1—Control codes. Observe that this function will work on the 64B/66B code words in the case of 10G transmision and 8B/10B code words in the case of 1G transmission. This needs to be reflected properly in the function definition.

Proposed Response *Response Status* **O**

Cl **92** *SC* **2.2.2.3** *P* **311** *L* **6** # 71

Marek, Hajduczenia Nokia Siemens Networ

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

Pseudo-code placement is not typical in the standard. What is the purpose of this code in this location?

SuggestedRemedy

Either keep it and format it accordingly, and refer to it in the text or replace with the text description. A flow chart could also be used to express the same processing step.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92** *P* **299** *L* **1** # 338

Lynskey, Eric Teknovus

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

The headings on even and odd pages are not consistent. On all odd pages, the header uses "EEE" instead of IEEE. On all even pages, the header uses Draft 0.91 instead of 1.0.

SuggestedRemedy

Replace "EEE" with "IEEE". Modify headings so that both even and odd pages use the same header information and are updated appropriately for the next draft number.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.1** *P* **299** *L* **1** # 1

Lynskey, Eric Teknovus

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

Every line of text does not have a line number. In addition, each page has two lines marked as line number 24.

SuggestedRemedy

Fix line numbering to match that of Clause 64 and 91.

Response *Response Status* **C**

ACCEPT.

Cl **92** *SC* **92.1.1.1** *P* **300** *L* **18** # 400

Mandin, Jeff PMC Sierra

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

Description of transmit direction behaviour of an asymmetric RS is unclear.

SuggestedRemedy

Modify as follows:

As described in 64.1.2, multiple MACs within an OLT are bound to a single GMII, while at the ONU a single MAC is bound to the GMII. The multipoint control protocol (MPCP) ensures that only one MAC is transmitting at any one time. Correspondingly, only one PLS_DATA.request primitive is active at any time.

This For 10G links, the mechanism is extended to allow the MAC to be bound to a single XGMII, or to a GMII transmit path and an XGMII receive path (in the case of an asymmetric ONU), or to an XGMII transmit path and a GMII receive path (in the case of an asymmetric OLT). Only one PLS_DATA.request primitive is active at any time.

In the transmit direction, the RS maps the active PLS_DATA.request is mapped to either the GMII signals (TXD<7:0>, TX_EN, TX_ER, and GTX_CLK) or the XGMII signals (TXD<31:0>, TXC<3:0>, and TX_CLK) according to the MAC instance generating the request. The RS replaces octets of preamble with the values of the transmitting MAC's MODE and LLID variables.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.1.1.3** *P* **301** *L* **1** # 396

Mandin, Jeff PMC Sierra

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

The "Rate of operation" subclause does not belong here.

The parallel subclause of clause 46 pertains to the rate of the XGMII and is still applicable to 10GEPON.

SuggestedRemedy

1. Delete 92.1.1.3 (line rates are specified in the appropriate PMD clauses)

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.1.2.2** *P* **301** *L* **11** # 398
Mandin, Jeff PMC Sierra

Comment Type **T** *Comment Status* **X**
Carrier Sense backoff is used in both directions not just downstream

SuggestedRemedy
Modify text:

For 10 GEPON the CRS signal is used to
defer the MAC in the downstream direction to allow the PCS to insert FEC parity bytes.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.1.2.2** *P* **301** *L* **8** # 368
Suzuki, Ken-Ichi NTT

Comment Type **E** *Comment Status* **X**
"Mapping of" of Sub-clause title "Mapping of PLS_CARRIER.indication in XGMII Structure" may be written in a different font.

SuggestedRemedy
Check the font style. If so, rewrite "UnprotectedBlockCount -= 28" in the same font.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.1.2.2** *P* **301** *L* **9** # 369
Suzuki, Ken-Ichi NTT

Comment Type **E** *Comment Status* **X**
"The XGMII Structure" may be a typo.

SuggestedRemedy
Recommend you replace "Structure" by "structure".

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.1.2.2** *P* **304** *L* **2** # 370
Suzuki, Ken-Ichi NTT

Comment Type **E** *Comment Status* **X**
"0x7FFE or 0xFFE a" may be a type.

SuggestedRemedy
Replace ""0x7FFE or 0xFFE a" by ""0x7FFF or 0xFFE"

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.1.2.2.5** *P* **302** *L* **8** # 339
Lynskey, Eric Teknovus

Comment Type **E** *Comment Status* **X**
In Figure 92-2, the acronym UTC is incorrect, and should be replaced with UCT.

SuggestedRemedy
Replace UTC with UCT on lines 8 (leaving INIT state), and twice on line 22 (leaving Clear CRS state and Set CRS state).

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.1.2.3.2** *P* **303** *L* **2** # 399

Mandin, Jeff PMC Sierra

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

No need to discuss 66b code position in 10G RS transmit text.

Just point back to the EPON text.

In 1G this discussion was needed because 8b/10b code caused variable preamble length.

SuggestedRemedy

Modify text:

92.1.2.3.2 Transmit
The transmit function is as described in 65.1.3.2 except as noted below.

92.1.2.3.2.1 SLD

The SLD field is one octet in length and replaces the third octet of the preamble.

When using the GMII this field is as described in 65.1.3.2.1.

When using the XGMII the /S/ code-group normally is transmitted in Lane 0 and thus SLD will appear in Lane 3. Alternatively, if the SGMII implementation supports the Deficit Idle Count as described in 46.3.1.4 the /S/ code-group may be transmitted in lanes 1, 2, or 3 (see 46.3.1.4).

92.1.2.3.2.2 LLID
The LLID field is as described in 65.1.3.2.2.

92.1.2.3.2.3 CRC-8
The CRC8 field is as described in 65.1.3.2.3.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.1.2.3.2.1** *P* **303** *L* **6** # 350

Lynskey, Eric Teknovus

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

A compliant 10G reconciliation sublayer will always align the Start control character to lane 0. This does not depend on whether or not deficit idle count is supported. Also, the third byte of preamble will be in lane 2 and not lane 3.

The extra text in this subclause seems overly confusing and is not necessary. The first sentence of the subclause is all that is needed, and this is already captured in Clause 65. Like we are doing with some of the other fields, we should just reference Clause 65 here.

SuggestedRemedy

Option 1: Remove all text from this subclause and insert the following sentence, "The SLD field is as described in 65.1.3.2.1".

Option 2: Replace third paragraph in this subclause with the following: "When using the XGMII, the Start control character replaces the first preamble octet and is always aligned to lane 0. Therefore, the SLD will appear in lane 2 of the same column containing the Start control character."

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.1.2.3.2.1** *P* **303** *L* **6** # 340

Lynskey, Eric Teknovus

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

SGMII is not a valid interface.

SuggestedRemedy

Replace SGMII with XGMII.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.1.2.3.2.1** *P* **303** *L* **6** # 2

Lynskey, Eric Teknovus

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

The /S/ code-group may only be transmitted in lane 0.

SuggestedRemedy

Replace paragraph with the following. "When using the XGMII, the Start control character will be transmitted in lane 0, and thus the SLD will appear in lane 3 in the same column that contains the start control character."

Response *Response Status* **C**

ACCEPT.

Cl **92** *SC* **92.1.2.3.3.1** *P* **303** *L* **14** # 401

Mandin, Jeff PMC Sierra

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

No need to discuss 66b code position in 10G RS receive text.

In 1G this discussion was needed because the amount of preamble received actually varies when the 8b/10b code is employed.

LLID text is needed however as it is different from GEPON.

SuggestedRemedy

Delete 92.1.2.3.3.1 ("SLD" subclause)

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.1.2.3.3.1** *P* **303** *L* **16** # 3

Lynskey, Eric Teknovus

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

The SLD should only be received in lane 3 of the same column that contains the start control character.

SuggestedRemedy

Replace paragraph with, "When using the XGMII, the start control character will be received in lane 0, and the SLD will be received in lane 3 of the same column that contains the start control character."

Response *Response Status* **C**

ACCEPT.

Cl **92** *SC* **92.1.2.3.3.2** *P* **304** *L* **1** # 393

Mandin, Jeff PMC Sierra

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

Duplicate text

SuggestedRemedy

Modify text:

b) If the received mode bit is 1 and the received logical_link_id value does not match the logical_link_id variable, or the received logical_link_id matches 0x7FFE or 0x7FFE a, then the comparison is considered a match.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.1** *P* **304** *L* **10** # 395

Mandin, Jeff PMC Sierra

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

Incorrect clause reference

SuggestedRemedy

Change:

This subclause extends the physical coding sublayer described in Clause 49 46 to support burst mode operation

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.1** *P* **304** *L* **12** # 351

Lynskey, Eric Teknovus

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

Auto-Negotiation, as defined in Clause 37, is only applicable for devices with a Clause 36 PCS. There is currently no Auto-Negotiation defined for 10 Gb/s devices using a fiber network. Since this subclause is dealing with extensions of the Clause 49 PCS, there is no need to mention Auto-Negotiation.

SuggestedRemedy

Remove the two sentences referring to Auto-Negotiation.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.1** *P* **304** *L* **13** # 358

Lynskey, Eric Teknovus

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

The sentence prohibiting the use of a XAUI interface within the ONU seems overly forceful and inappropriate. The combination of XGXS and XAUI layers are meant to be transparent to the rest of the stack. It is not a good idea to specifically prohibit this optional, and highly used, interface.

The original motion for this came about because there was some concern that errors occurring on the XAUI interface could mistakenly cause the ONU laser to turn on out of its slot. In practical implementations, this will not be an issue.

SuggestedRemedy

Remove this sentence.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.1** *P* **304** *L* **24** # 371

Suzuki, Ken-Ichi NTT

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

"GMII/XGMII" is not coincident with the abbreviation for "GIGABIT MEDIA INDEPENDENT INTEFASES" and I do not think Figure 92.3 needs the description of GMII.

SuggestedRemedy

Replace "GMII/XGMII == GIGABIT MEDIA INDEPENDENT INTEFASES" by "XGMII = GIGABIT MEDIA INDEPENDENT INTEFASES"

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.1** *P* **305** *L* **8** # 341

Lynskey, Eric Teknovus

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

Typo.

SuggestedRemedy

Replace "ts-raw" with "tx_raw".

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.2** *P* **305** *L* **5** # 352

Lynskey, Eric Teknovus

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

The start of frame is always aligned to Lane 0 of the XGMII interface. There are two possible locations for a start of frame when talking about the 64-bit blocks used in Clause 49. The proposal is to align to the first of these locations.

SuggestedRemedy

Replace first sentence of this paragraph with, "Two consecutive XGMII transfers provide eight characters that are encoded into one 66-bit transmission block. To increase burst efficiency the start of a burst is aligned to the first of these two transfers."

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.2.1** *P* **307** *L* **22** # 353

Lynskey, Eric Teknovus

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

There is no such thing as an /I/ ordered_set in the Clause 49 PCS. Another thing to think about is whether we need to have idle here or if other control codes, such as sequence ordered sets, can also be used.

SuggestedRemedy

Replace /I/ ordered_sets with "idle control characters".

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.2.1** *P* **307** *L* **24** # 112

Remein, Duane Alcatel-Lucent

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

Figiure regerences appear to be out of sequence (1 off) example: "... to start the process of turning the laser on (see
Figure 92–5)". should be Figure 92-6.

SuggestedRemedy

Correct references.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.2.1** *P* **308** *L* **3** # 8

Effenberger, Frank Huawei Technologies,

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

The paragraph mentions the synchronization pattern as "1010..." and the SOD as a "Barker link sequence." The former is inaccurate in comparison with the baseline (which used 0101...), and the later is non-specific, since we definitely need to specify the SOD.

SuggestedRemedy

We recommend changing the synchronization pattern to "0101...".

Also, we recommend specifying the SOD to be the pattern "0x 1 16A2 DC69 F0CD EE40" This pattern, which is different from the example given in the baseline, has a hamming distance of 32 from all shifts of itself and the synchronization pattern 0101..., which seems to be the best possible distance for a 66 bit pattern. It has a max run length of 6, and is has a balance of 32/34 bits of 1/0.

Response *Response Status* **C**

ACCEPT.
Change para from "The ONU burst transmission begins with a synchronization patter (binary 1010…) which facilitates receiver clock recovery and gain control at the OLT. To facilitate byte level synchronization the ONU transmits a 66 bit Start of Data (SOD) delimiter composed of a Barker link sequence (see Figure 92–7). When received at the OLT the delimiter allows byte alignment of the incoming data stream, even in the presence of bit errors. The SOD is followed by @tbd (two)@ IDLE blocks which are used to synchronize the SCRAMBLER at the OLT.

To:
"The ONU burst transmission begins with a synchronization pattern 0x55.. (binary 0101…) which facilitates receiver clock recovery and gain control at the OLT. To facilitate FEC codeword synchronization the ONU transmits a 66-bit BURST_DELIMITER (see Figure 92–7). When received at the OLT the delimiter allows FEC codeword alignment of the incoming data stream, even in the presence of bit errors. The BURST_DELIMITER is followed by one IDLE block which is used to synchronize the descrambler and one IDLE block to provide IPG at the OLT. These two IDLE blocks are part of the FEC codeword."

Cl **92** *SC* **92.2.2.1** *P* **308** *L* **3** # 372

Suzuki, Ken-Ichi NTT

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

"patter" must be a typo.

SuggestedRemedy

Replace "patter" by "pattern".

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.2.1** *P* **308** *L* **7** # 343

Lynskey, Eric Teknovus

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

Figure 92-6 has been copied from Clause 65 but is not correct for 10G FEC operation.

SuggestedRemedy

Replace figure.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.2.2.1** *P* **305** *L* **8** # 107

Remein, Duane Alcatel-Lucent

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

Typo "ts-raw,71:0>"

SuggestedRemedy

Replace with "ts-raw<71:0>"

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.2.2.1** *P* **309** *L* **13** # 7

Effenberger, Frank Huawei Technologies,

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

The constant "BURST_DELIMITER" is defined, but this is substantially the same as the "Start of Data" concept. Also, the definition is incomplete.

SuggestedRemedy

We should change all occurences of "BURST_DELIMITER" to "SOD", or alternatively we change "SOD" to "BURST_DELIMITER". One way or the other, I don't care.

Change definition to read:
BURST_DELIMITER
TYPE: 66 bit unsigned
A 66-bit value used to find the beginning of the first FEC codeword in the upstream burst
Default: 0x 1 16A2 DC69 F0CD EE40

Response *Response Status* **C**

ACCEPT.
Will Globaly replace "SOD" to "BURST_DELIMITER"

Change definition to read:
BURST_DELIMITER
TYPE: 66 bit unsigned
A 66-bit value used to find the beginning of the first FEC codeword in the upstream burst
Default: 0x 1 16A2 DC69 F0CD EE40

Cl **92** *SC* **92.2.2.2.6** *P* **312** *L* **16** # 94

Daido, Fumio Sumitomo Electric Ind

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

The mathematical formula in the Delete IDLE state is wrong.

SuggestedRemedy

Please change "VectorCount = FecRatio" to "VectorCount = VectorCount - FecRatio" or "VectorCount -= FecRatio".

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.2.3** *P* **315** *L* **17** # 193

Effenberger, Frank Huawei Technologies,

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

A description of the "Synchronizer function" is needed.

SuggestedRemedy

I offer the following text as a building block, however, I leave it to the editors to determine how to splice this into the chapter, because the current outline structure is completely baffling to me. I suggest that it needs a thorough re-structure, maybe on the next go around, once we have all the parts.

The general approach taken here is to reuse the material from clause 49.2.9 and 49.2.13 as much as possible, with the minimum of additions. I have left the original section numbering intact, so the reader can see its source.

Subject to task-force motions, I assume that we are using RS(255,223) code, and so we are synchronizing to codewords that are 31 blocks long, and contain 4 blocks of parity. Also, we are using a parity block sync header pattern of 00, 11, 11, 00. This provides maximum Hamming distance, which is important for making this framing scheme provide lower false locking probability.

Add the following text where appropriate:
49.2.9 Codeword Synchronization
When the receive channel is operating in normal mode, the codeword synchronization function receives data via 16-bit PMA_UNITDATA.request primitive. It shall form a bit stream from the primitives by concatenating requests with the bits of each primitive in order from rx_data-group<0> to rx_data-group<15> (see Figure 49-6). It obtains lock to the 31*66-bit blocks in the bit stream using the sync headers and outputs 66-bit blocks, with the codeword structure being indicated by a locally generated sync header pattern. Lock is obtained as specified in the codeword lock state machine shown in Figure 92-X.

The incoming sync header pattern is 27 conventional (clause 49) sync headers (01 or 10), and then 00, 11, 11, and 00. The state machine performs a search for this pattern, and when it finds a perfect match of two full codewords (62 blocks), it then asserts codeword lock.

When codeword lock is true, the decoder guarantees that the sync header of the last block in the codeword will be "11", and that no other sync header will have this pattern, even in the face of errors. This is achieved by forcing the first 27 sync headers to be conventional headers, and forcing the last four headers to be 00, 00, 00, and 11. This locally forced pattern then allows the subsequent FEC decoder logic to find the last block in the codeword with a trivial match of the sync header to 11.

When in codeword lock, the state machine continues to check for sync header validity. If 16 or more sync headers in a codeword pair (62 blocks) are invalid, then the state machine deasserts codeword lock.

Add the following text where appropriate:

49.2.13 Detailed functions and state diagrams
49.2.13.1 State diagram conventions
The body of this subclause is comprised of state diagrams, including the associated definitions of variables, constants, and functions. Should there be a discrepancy between a state diagram and descriptive text, the state diagram prevails.
The notation used in the state diagrams follows the conventions of 21.5. State diagram timers follow the conventions of 14.2.3.2. The notation ++ after a counter or integer variable indicates that its value is to be incremented.
49.2.13.2 State variables
49.2.13.2.1 Constants
All the relevant constants defined in 49.2.13.2.1 are inherited. In addition, the following items are defined.
SH_CW_PATTERN[0..30]
31 element array of codeword sync header bit counts, where each element is set to the value 1 except for:
SH_CW_PATTERN[27]=0
SH_CW_PATTERN[28]=2
SH_CW_PATTERN[29]=2
SH_CW_PATTERN[30]=0

49.2.13.2.2 Variables
All the relevant variables defined in 49.2.13.2.2 are inherited. In addition, the following items are defined.
sh_valid[i]
Boolean indication that is set true if received block rx_coded has valid sync header bits for the supposed current position in the FEC codeword. That is,
sh_valid[i] is asserted if (rx_coded<0> + rx_coded<1>) == SH_CW_PATTERN[i mod 31] and de-asserted otherwise.
cword_lock
Boolean variable that is set true when receiver acquires codeword delineation.

49.2.13.2.3 Functions
All the relevant functions defined in 49.2.13.2.3 are inherited. In addition, the following items are defined.
Force(i)
Forces the sync header to the state that preserves FEC frame lock. Note that for parity blocks, the pattern is known a priori. For payload blocks, the first bit is forced to be the complement of the second bit. While this may duplicate a bit error, it will not propagate, as the FEC decoder discards the first bit before decoding.
Force(i)
{
If (cword_lock == true)
If (i>26)
If (i==30)
rx_coded<0>=1
rx_coded<1>=1
else
rx_coded<0>=0
rx_coded<1>=0
else
rx_coded<0>=!rx_coded<1>
}

49.2.13.2.4 Counters
All the relevant counters defined in 49.2.13.2.4 are inherited.

49.2.13.2.5 Timers
No timers are needed.

49.2.13.3 State diagrams
The Lock state machine shown in Figure 92-X determines when the PCS has obtained lock to the received data stream. The BER is determined by the FEC decoder function, and so a separate state machine is not required.

Add the figure, as provided in attachment...

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.3** *P* **313** *L* **7** # 11

Jiang, Jessica Salira

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

In Edit comments, 10GBASE-RR should be 10GBASE-PR

SuggestedRemedy

"10GBASE-RR" should be "10GBASE-PR"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **92** *SC* **92.2.3.1** *P* **313** *L* **10** # 98

FENG, Dongning Huawei Technologies

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

Since RS(255,223) is selected as a baseline proposal, a more detail description should be defined.

SuggestedRemedy

The FEC code used is a linear cyclic block code - the Reed-Solomon code (255, 223, 16) over the Galois Field of GF(28) - a non-binary code operating on 8-bit symbols. The code encodes 223 information symbols and adds 32 parity symbols. The code is systematic-meaning that the information symbols are not disturbed in any way in the encoder and the parity symbols are added separately to each block.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.3.1** *P* **313** *L* **9** # 95

Daido, Fumio Sumitomo Electric Ind

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

I would like to provide general description of RS(255,223).

SuggestedRemedy

The following paragraph is a general description of RS(255,223). Please replace 92.2.3.1 with this. But it is difficult to describe the mathematical expression in plain text, so I will attach the PDF format file which includes this description.

92.2.3.1 FEC code

The FEC code used is a linear cyclic block code - the Reed-Solomon code (255, 223) over the Galois Field of GF(28) - a non-binary code operating on 8-bit symbols. The code encodes 223 information symbols and adds 32 parity symbols. The code is systematic-meaning that the information symbols are not disturbed in any way in the encoder and the parity symbols are added separately to each block.

The code is the systematic form of the RS code based on the generating polynomial

G(x)=PI(x-alpha i) (i=0,1,2,...,30, 31)

where alpha is equal to 0x02 and is a root of the binary primitive polynomial x8+x4+x3+x2+1.

A codeword of the systematic code is presented by D(x) + P(x) = G(x) * L(x) where:

D(x) is the data vector - D(x)=D222X254 + ... + D0X32. D222 is the first data octet and D0 is the last.

P(x) is the parity vector - P(x)=P31X31 + ... + P0. P31 is the first parity octet and P0 is the last.

A data octet (d7, d6, ..., d1, d0) is identified with the element: d7* + d6* + ... d1* + d0 in GF(28), the finite field with 28 elements. The code has a correction capability of up to sixteen symbols.

For the (255,223) Reed-Solomon code, the symbol size equals one octet. d0 is identified as the LSB and d7 is identified as the MSB bit in accordance with the conventions of 3.1.1.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.3.2.1** *P* **313** *L* **13** # 99

FENG, Dongning Huawei Technologies

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

Since RS(255,223) is selected as a baseline proposal, a more detail description under this section should be defined.

SuggestedRemedy

Padding of FEC codewords and appending of FEC parity bytes is illustrated in Figure 92-10. Ethernet packets are received from the PCS scrambler in blocks of 66 bits. The data is partitioned into 27 blocks. Each partition of 27 blocks is then encoded using the RS(255,223) FEC encoder, which results in an additional 4 parity symbols for each block. The block, minus any padding, plus the associated 4 parity symbols form the @tbd@ byte FEC codeword. The additional 4 parity blocks, which are generated from this encoding process for each block, are gathered and added at the end of FEC code word to be transmitted. Note that parity is not calculated over the first bit of each 66 bit from the scramble as this bit is redundant. However this first bit is always transmitted over the link.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.3.2.1** *P* **313** *L* **14** # 404

Mandin, Jeff PMC Sierra

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

Descriptive text related to figure 92-10 is somewhat unclear and lacks some details.

To describe the FEC frame, you really have to describe transmitter behaviour. And if you describe the FEC transmitter then the FEC receiver should be described also.

SuggestedRemedy

Modify text:

92.2.3.2.1 Placing Calculation of Parity Octets by Transmitter

Padding of FEC codewords and appending of FEC parity bytes is illustrated in Figure 92–10. Ethernet packets are received from the PCS scrambler in blocks of 66 bits. The data is partitioned into 27 blocks. The FEC encoder accumulates 27 66b blocks and removes the first bit of each block (ie. the redundant sync bit). The FEC encoder then prepends 29 '0' bits (called PAD) to the 27 65 bit blocks form the data portion of a FEC codeword. Each partition of 27 blocks is then encoded using the RS(255,223) FEC encoder, The data is FEC-encoded, which results in an additional 4 parity symbols for each block - completing the 255-byte Reed-Solomon codeword.

The block, minus any padding, plus the associated 4 parity symbols form the @tbd@ byte FEC codeword. The additional 4 parity blocks, which are generated from this encoding process for each block, are gathered and added at the end of FEC code word to be transmitted. note that parity is not calculated over the first bit of each 66 bit from the scramble as this bit is redundant. However this first bit is always transmitted over the link.

92.2.3.2.2 FEC Frame for Transmission

As shown in figure 92-10, after the Reed-Solomon codeword has been computed, the FEC encoder constructs the transmittable FEC frame with the original sequence of 27 66bit blocks (including the redundant sync bit and not including the pad bits). The FEC encoder then prepends a 2bit sync header (described below) to each of the parity octets, and then finally places the four 66bit parity blocks following the 27 66bit data blocks.

The total length of the FEC Frame is thus 2046 bits. The FEC encoder only transmits full 2046-bit frames to the gearbox.

92.2.3.2.3 Parity Block Sync Header

Format of sync header of parity blocks is TBD.

92.2.3.2.3 Processing of the FEC Frame upon Reception

The FEC decoder employs the RS(255,223) algorithm to correct of confirm correctness of the 27 66b blocks contained in the frame. The decoder then forwards the 66bit data blocks

to the descrambler and discards the parity blocks

If the FEC decoder determines that the frame is not correctable (due to an excess of symbols containing errors), the data blocks are nevertheless passed to the descrambler to maintain descrambling synchronization. The data blocks of the frame must then be replaced by /E/ blocks before being passed to the PCS.

92.2.3.2.2 Codeword Padding

When dividing the data into FEC payloads there might be a case where the last partition is shorter than the required @tbd@ symbols. In this case sufficient padding of zero bits is added to the font of the payload to fill the payload container. Parity is then calculated as defined in @tbd@. When transmitted across the link the padding is stripped to reduce transmission of the null information.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.3.2.1** *P* **313** *L* **17** # 373

Suzuki, Ken-Ichi NTT

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

At the beginning of a sentence, "note" should be replaced by "Note".

SuggestedRemedy

Replace "note" by "Note".

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.3.2.1** *P* **315** *L* # 10

Jiang, Jessica Salira

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

Figure 92-10 is not the same as baseline file -- 3av_0705_effenberger_4.pdf. It is missing two bits between the last blocks and FEC parity.

SuggestedRemedy

Make the correction based on baseline file

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **92** *SC* **92.2.3.2.1** *P* **315** *L* **11** # 342

Lynskey, Eric Teknovus

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

Now that we have agreed on the FEC code, we can replace N and M with appropriate constants.

SuggestedRemedy

Replace N with 27 and replace M with 4.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.2.3.2.2** *P* **315** *L* **15** # 379

Suzuki, Ken-Ichi NTT

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

"font" of " to the font of the payload" must be a typo.

SuggestedRemedy

Replace "font" by "front".

Proposed Response *Response Status* **O**

Cl **92** *SC* **Figure 92-1** *P* **300** *L* **12** # 367

Suzuki, Ken-Ichi NTT

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

In Figure 92-1, "GMIII" must be a typo.

SuggestedRemedy

Replace "GMIII" by "GMII".

Proposed Response *Response Status* **O**

Cl **92** *SC* **Figure 92-9** *P* **314** *L* **10** # 374

Suzuki, Ken-Ichi NTT

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

In Figure 92-9, "UnprotectedBlockCount -= 28" inside the block of "Laser_Is_Off" may be written in a different font.

SuggestedRemedy

Check the font style. If so, rewrite "UnprotectedBlockCount -= 28" in the same font.

Proposed Response *Response Status* **O**

Cl **92** *SC* **Figure 92-9** *P* **314** *L* **114** # 376

Suzuki, Ken-Ichi NTT

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

In Figure 92-9,"ProtectedBlockCount -= 0" inside the right block of "Transmit_Burst_Preamble" may be written in a different font.

SuggestedRemedy

Check the font style. If so, rewrite "ProtectedBlockCount -= 28" in the same font.

Proposed Response *Response Status* **O**

Cl **92** *SC* **Figure 92-9** *P* **314** *L* **14** # 377

Suzuki, Ken-Ichi NTT

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

In Figure 92-9, "PMD_SIGNAL.Request" is different from the definition of Sub-clause 92.2.2.2.4.

SuggestedRemedy

Replace "PMD_SIGNAL.Request" bye ""PMD_SIGNAL.request" defined on the line 13 of page 311.

Proposed Response *Response Status* **O**

Cl **92** *SC* **Figure 92-9** *P* **314** *L* **21** # 378

Suzuki, Ken-Ichi NTT

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

In Figure 92-9, "PMD_SIGNAL.Request" is different from the definition of Sub-clause 92.2.2.2.4.

SuggestedRemedy

Replace "PMD_SIGNAL.Request" bye ""PMD_SIGNAL.request" defined on the line 13 of page 311.

Proposed Response *Response Status* **O**

Cl **92** *SC* **Figure 92-9** *P* **314** *L* **21** # 375

Suzuki, Ken-Ichi NTT

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

In Figure 92-9,"UnprotectedBlockCount -= 28" inside the left side block of "Transmit_Burst_Preamble" may be written in a different font.

SuggestedRemedy

Check the font style. If so, rewrite "UnprotectedBlockCount -= 28" in the same font.

Proposed Response *Response Status* **O**

Cl **92** *SC* **general** *P* *L* # 109

Remein, Duane Alcatel-Lucent

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

No explaination of use of "??" symbols as in pg 309 line 11 "TYPE: ??"

SuggestedRemedy

add editors note at the front of the document "Editors Note: double question marks is used to denote missing content (as in "TYPE: ??", the final text will be updated in a later edition."

add similare note for other instances of "??"

Proposed Response *Response Status* **O**

Cl **92** *SC* **general** *P* **308** *L* # 108

Remein, Duane Alcatel-Lucent

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

No explaination of use of "@" symbols as in pg line 5 "@tbd (two)@"

SuggestedRemedy

add editors note "Editors Note: the text "@tbd (two)@" is temporary, the final text will be updated in a later edition."

add similare note for other instances of "@ text @"

Proposed Response *Response Status* **O**

Cl **92** *SC* **Header** *P* **even** *L* # 366

Suzuki, Ken-Ichi NTT

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

In header of even pages, The header caption still show the old draft version.

SuggestedRemedy

Correct the draft version.

Proposed Response *Response Status* **O**

Cl **92** *SC* **Header** *P* **odd** *L* # 380

Suzuki, Ken-Ichi NTT

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

In header of odd pages, "I" is missing on the header caption.

SuggestedRemedy

Add "I" ahead of the header caption "EEE Draft P802.3avTM/D1.0"

Proposed Response *Response Status* **O**