

Cl 00 SC 0 P L # 825  
Mandin, Jeff PMC Sierra

Comment Type **TR** Comment Status **X**  
There should be test vectors for the RS(255, 223) code

SuggestedRemedy  
Incorporate 3av\_0308\_mandin\_4.pdf as an informative annex.

Proposed Response Response Status **O**

Cl 00 SC 0 P1 L 54 # 922  
Lynskey, Eric Teknovus

Comment Type **E** Comment Status **X**  
Copyright year may need to be updated.

SuggestedRemedy  
Replace Copyright year with 2008.

Proposed Response Response Status **O**

Cl 00 SC 0 P1 L 1 # 789  
Remein, Duane Alcatel-Lucent

Comment Type **ER** Comment Status **X**  
Open c56. "Introduction to Ethernet for subscriber access networks" for changes.

SuggestedRemedy  
Add change clause for c56

Proposed Response Response Status **O**

Cl 00 SC 56.1.2 P2 L 35 # 971  
Lynskey, Eric Teknovus

Comment Type **T** Comment Status **X**  
Response to comment 299 against D1.0 not present in current draft.

SuggestedRemedy  
Implement accepted response to comment 299 as written in  
3av\_0801\_comments\_d1\_0\_accepted.pdf.

Proposed Response Response Status **O**

Cl 00 SC 0 P1 L 1 # 918  
Lynskey, Eric Teknovus

Comment Type **E** Comment Status **X**  
The headers and line numbers for the different clauses are not consistent. Clause 92 has a different header than Clauses 91 and 93. Similarly, Clause 92 uses a different line numbering scheme than the other two clauses (alternating left and right side instead of always on the right side).

SuggestedRemedy  
Suggest that the Editors agree upon a single consistent header and line numbering scheme to be used on all documents. Or, merge everything into a single document. This may make life easier in the future for changes that need to be applied to the whole document.

Proposed Response Response Status **O**

Cl 01 SC 01 P11 L 1 # 778  
Remein, Duane Alcatel-Lucent

Comment Type **E** Comment Status **X**  
"1. Management Data Input/Output (MDIO) Interface" is incorrect.

SuggestedRemedy  
Change to:  
"1. Introduction"

Proposed Response Response Status **O**

CI 01 SC 1 P10 L1 # 698  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Align the format of the Clause 1 with 802.3-2005 (and 802.3av)

SuggestedRemedy  
 Align the format of Clause 1 as presented in 3av\_0803\_hajduczenia\_1.pdf (see also the 3av\_0803\_hajduczenia\_1.fm for source file).

Proposed Response Response Status O

CI 30 SC 30 P31 L1 # 775  
 Remein, Duane Alcatel-Lucent

Comment Type E Comment Status X  
 "30. Management Data Input/Output (MDIO) Interface" is incorrect.

SuggestedRemedy  
 Change to:  
 "30. Management"

Proposed Response Response Status O

CI 01 SC 1.4 P11 L12 # 746  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type TR Comment Status X  
 Missing resolution of the comment #307, which reads "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.)"

SuggestedRemedy  
 Insert a new entry in Clause 1.4 in draft D1.1:  
 "Replace definition 1.4.93 to read as follows:  
 channel insertion loss: As used in IEEE 802.3-2005 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, splices and optional power splitter / combiner (for details, see Clause 91.8.1)."

Proposed Response Response Status O

CI 30 SC 30.6 P31 L18 # 995  
 Lin, Rujian Shanghai Luster Terab

Comment Type E Comment Status X  
 Management for link Auto-Negotiation

SuggestedRemedy  
 Management for Link Auto-Negotiation

Proposed Response Response Status O

CI 01 SC 1.4 P11 L16 # 671  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 The use of terms "point to multipoint" and "point-to-multipoint" is inconsistent throughout the 802.3-2005 and in changes to Clause 1.  
 Other lines affected: clause 1, subclause 1.4, page 11, line 22.

SuggestedRemedy  
 Suggest to select one form of the term ("point-to-multipoint" is advised), update line 16 and 22 as well as perform a global search for all clauses in 802.3-2005.

Proposed Response Response Status O

CI **64** SC P L # **10403**  
Mandin, Jeff PMC Sierra

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

The state diagrams in clause 64 become very complex when GEAPON, 10GEAPON, 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 10GEAPON MAC Control.

- 10GEAPON MAC control is a revision of Clause 64 which enables coexistence on the same PON with an OLT and 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.

Response Response Status **W**

ACCEPT IN PRINCIPLE.

The proposed scope of changes is as follows:

- fall back with clause 64 to the version from IEEE 802.3-2005.
- create a new clause (tentative number 93) based on the existing document 3av\_c64\_1\_0.pdf
- create an ad hoc chartered with the creation of a prototype of solution #2 as presented in 3av\_0801\_kramer\_5.pdf, slide 3. Ad hoc participants: Marek, Jeff, Glen, Eric.

CI **64** SC P L # **818**  
Mandin, Jeff PMC Sierra

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

Placeholder for changes in clause 64 structure:

So far there are two proposals as outlined in  
[http://www.ieee802.org/3/10GEAPON\\_study/email/msg00935.html](http://www.ieee802.org/3/10GEAPON_study/email/msg00935.html)

#### SuggestedRemedy

Proposed Response Response Status **O**

CI **64** SC **64.3.6.1** P **288** L **7** # **10347**  
Lynskey, Eric Teknovus

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

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.

Response Response Status **W**

ACCEPT IN PRINCIPLE.

Clause 93 will include a 10 Gb/s GATE MPCPDU only (with Discovery Information field) -  
Option 1. Figure 64-32 is probably referred to - see 3av\_c64\_d1\_0\_markup.pdf.

CI 64 SC 64.3.6.3 P 293 L 41 # 10357  
Lynskey, Eric Teknovus

Comment Type T Comment Status A Deferred

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.

Response Response Status W

ACCEPT IN PRINCIPLE.  
Commenter refers to Table 64-5.  
For resolution, see comment #91.

CI 91 SC 4.2 P 15 L 1 # 1040  
Effenberger, Frank Huawei Technologies,

Comment Type T Comment Status X

In tables 91-6 and 91-7, the value of Treceiver\_settling (max) is "TDB".  
We propose to set the maximum to be the value from 1G EPON, and then allow the OLT to set the actually achieved value via the sync\_time parameter.

*SuggestedRemedy*

In table 91-6 and 91-7, put 400ns in each of the Treceiver\_settling cells.

Modify the notes that correspond to the settling time to read:  
Transceiver\_settling is informative, and is intended as a loose upper bound. Optics with better performance is an implementation choice, with the OLT able to dictate its capabilities and requirements to the ONUs via the SYNCTIME parameter.

Proposed Response Response Status O

CI 91 SC 5.1 P 17 L 46 # 1041  
Effenberger, Frank Huawei Technologies,

Comment Type T Comment Status X

At 10G, our power budget is very challenging, and the detector circuits are difficult. As a result, the possibility of dynamic overload is raised. To avoid this, we think that controlling the turn-on and turn-off time of the transmitter could be beneficial for those OLT Rx types that are susceptible to such problems.

*SuggestedRemedy*

Add two rows to table 91-8:  
Description 10GBASE-PR-U1 10GBASE-PR-U3 Unit  
Ton (min) 0 or 18 0 or 18 (a) ns  
Toff (min) 0 or 18 0 or 18 (a) ns

Add a note at the bottom of the table:  
(a) Minimum Ton and Toff is selectable by the OLT during discovery using the SLOWSTART parameter.

Proposed Response Response Status O

CI 91 SC 91 P 3 L 16 # 699  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X

Introduce a version tracking box as proposed in 3av\_0803\_hajduczenia\_1.pdf (see also the 3av\_0803\_hajduczenia\_1.fm for source file).

*SuggestedRemedy*

Introduce a version tracking box as proposed in 3av\_0803\_hajduczenia\_1.pdf (see also the 3av\_0803\_hajduczenia\_1.fm for source file).

Proposed Response Response Status O

CI 91 SC 91 P3 L6 # 793  
 Remein, Duane Alcatel-Lucent

Comment Type ER Comment Status X

Also applies to c93 and Annex 91A

Lead-in Editors Note  
 Align with 802.3ah drafts

*SuggestedRemedy*

Change from:

"NOTE—The editing instructions contained in this amendment define how to merge the material contained therein into the existing base standard and its amendments to form the comprehensive standard.

The editing instructions are shown in bold italic. Four editing instructions are used: change, delete, insert, and replace. Change is used to make corrections in existing text or tables. The editing instruction specifies the location of the change and describes what is being changed by using strikethrough (to remove old material) and underscore (to add new material). Delete removes existing material. Insert adds new material without disturbing the existing material. Insertions may require renumbering. If so, renumbering instructions are given in the editing instruction. Replace is used to make changes in figures or equations by removing the existing figure or equation and replacing it with a new one. Editorial notes will not be carried over into future editions because the changes will be incorporated into the base standard."

To:

"Editors Notes are marked in red italics and are to be removed prior to final publication.

"

Include any clause specific remarks such as explanation of color usage etc. here.

"

Revision History:

Draft 1.0 November 2007 Preliminary draft for IEEE802.3av Task Force Review.

Draft 1.1 February 2008 Draft for IEEE802.3av Task Force Review incorporating comments received at November 2007 meeting in Portland OR."

Continue updating Revision History as needed.

Proposed Response Response Status O

CI 91 SC 91 P3 L6 # 799  
 Remein, Duane Alcatel-Lucent

Comment Type E Comment Status X

"NOTE—The editing instructions ..." is inappropriate for a new clause.

*SuggestedRemedy*

Remove note

Proposed Response Response Status O

CI 91 SC 91.00 P9 L45 # 791  
 Remein, Duane Alcatel-Lucent

Comment Type ER Comment Status X

Lists that are not explicitly required should be avoided as they detract from the readability of the spec.

(example see 91 pg 9 line 45 "at a nominal signaling speed of 10.3125 GBd in the case of 10GBASE-PR-D1, 10GBASE-PR-D2, 10GBASE-PR-D3, 10GBASE-PR-U1, 10GBASE-PR-U3, 10/1GBASE-PRX-D1, 10/1GBASE-PRX-D2 and 10/1GBASE-PRX-D3 PMDs or 1.25 GBd in the case of 10/1GBASE-PRX-U1, 10/1GBASE-PRX-U2 and 10/1GBASE-PRX-U3 PMDs.")

*SuggestedRemedy*

Remove as many lists as possible using generic references such as "asymmetric ONU PMDs, asymmetric OLT PMDs, symmetric ONU PMDs and symmetric OLT PMDs", which are defined in c91.2.1.1 and c91.2.1.2.

Proposed Response Response Status O

CI 91 SC 91.1 P 121 L 48 # 10300  
Dawe, Piers Avago Technologies

Comment Type T Comment Status D Deferred

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 W

PROPOSED REJECT.

Underscore can be discussed by the TF. We have motions #5 and #6 approved by the TF - see the document at [http://www.ieee802.org/3/av/public/2007\\_11/3av\\_0711\\_minutes\\_unapproved.pdf](http://www.ieee802.org/3/av/public/2007_11/3av_0711_minutes_unapproved.pdf) for details. The idea of 11GBASE was discussed and rejected since the resulting link operates at 10G DS and 1G US and not 11G in the same direction(s), what would be suggested by the name. 10/1GBASE was found to be more informative.

CI 91 SC 91.1 P 122 L 38 # 10182  
Lin, Rujian Shanghai Luster Terab

Comment Type T Comment Status D Deferred

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 W

PROPOSED ACCEPT IN PRINCIPLE.

Adopt the text in the editorial note. Replace reference to 91.8.4 with reference to 60.8.4.

Accept the proposed response

Yes: \_14\_

No: \_6\_

Abstain: \_10\_

Motion fails

Straw poll:

\_16\_ 1) I prefer to keep reference to 60.8.4

\_11\_ 2) I prefer to remove mention of the temperature ranges from Clause 91

\_0\_ 3) I prefer to define new temperature ranges (different than 60.8.4)

CI 91 SC 91.1 P 123 L 18 # 10410  
Chang, Frank Vitesse

Comment Type TR Comment Status D Deferred

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 W

PROPOSED ACCEPT IN PRINCIPLE.

See comment #182.

CI 91 SC 91.1.1 P 3 L 20 # 700  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X

Language revision.

*SuggestedRemedy*

Change "operating at 10.3125 GBd line rate in either only one or both directions" to "operating at the line rate of 10.3125 GBd in either downstream or in both downstream and upstream directions."

Proposed Response Response Status O

CI 91 SC 91.1.2 P 3 L 49 # 701  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X

"single single-mode fiber" looks weird. Why not use the SMF acronym which is commonly accepted ?

*SuggestedRemedy*

Change "single-mode fiber" to "SMF". Global search and replace in Clause 91.

Proposed Response Response Status O

CI 91 SC 91.1.2 P3 L 49 # 643  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision

SuggestedRemedy  
 Change "single SMF" to "a single SMF". Global search and replace

Proposed Response Response Status O

CI 91 SC 91.1.2 P3 L 53 # 710  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type TR Comment Status X  
 The splitting ratios as per our PAR are defined as "at least 1:16 and at least 1:32"

SuggestedRemedy  
 Change "split ratios of 1:16 and 1:32," to "split ratios of at least 1:16 and at least 1:32,"

Proposed Response Response Status O

CI 91 SC 91.1.3 P4 L # 672  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X  
 Table 91-1 does not include information on the size of the downstream and upstream transmission window size i.e. in the downstream, 20 nm for PR(X)10 and PR(X)20 and 6 nm for downstream in PR(X)30.

SuggestedRemedy  
 Insert a new row in Table 91-1 with the following contents:

Place under the row "Nominal downstream wavelength"  
 Description = Downstream wavelength band width  
 PRX10 = 20  
 PR10 = 20  
 PRX20 = 20  
 PR20 = 20  
 PRX30 = 6  
 PR30 = 6  
 Units = nm

Place under the row "Nominal upstream wavelength"  
 Description = Upstream wavelength band width  
 PRX10 = 100  
 PR10 = 20  
 PRX20 = 100  
 PR20 = 20  
 PRX30 = 100  
 PR30 = 20  
 Units = nm

Proposed Response Response Status O

CI 91 SC 91.1.3 P4 L 12 # 705  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision

SuggestedRemedy  
 Change "Each power budget class is represented by PRX-type power budget and PR-type power budget." to "Each power budget classcomprises a PRX-type power budget and a PR-type power budget."

Proposed Response Response Status O

CI 91 SC 91.1.3 P4 L25 # 707  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision

SuggestedRemedy  
 Change "asymmetric low power budget, compatible with PX10 power budget defined in Clause 60;" to "asymmetric, low power budget, compatible with PX10 power budget defined in Clause 60;". This way it will be compliant with the remaining descriptions in lines 26 - 30.

Proposed Response Response Status O

CI 91 SC 91.1.3 P4 L32 # 706  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision

SuggestedRemedy  
 Change "shows primary attributes of all power budget types defined in Clause 91." to "shows the primary attributes of all power budget types defined in Clause 91."

Proposed Response Response Status O

CI 91 SC 91.1.3 P4 L5 # 702  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision  
 Lines 5-6 are affected.

SuggestedRemedy  
 Change "Low power budget class supports P2MP media with split ratio of 1:16 and distance of at least 10 km (channel insertion loss <= 20 dB)" to "Low power budget class supports P2MP media channel insertion loss <= 20 dB, e.g. a PON with the split ratio of at least 1:16 and the distance of at least 10 km"

Proposed Response Response Status O

CI 91 SC 91.1.3 P4 L7 # 703  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision  
 Lines 7-8 are affected.

SuggestedRemedy  
 Change "Medium power budget class supports P2MP media with split ratio of 1:16 and distance of at least 20 km or split ratio of 1:32 and distance of at least 20 km (channel insertion loss <= 24 dB)" to "Medium power budget class supports P2MP media channel insertion loss <= 24 dB, e.g. a PON with the split ratio of at least 1:16 and the distance of at least 20 km or a PON with the split ratio of 1:32 and the distance of at least 10 km"

Proposed Response Response Status O

CI 91 SC 91.1.3 P4 L9 # 704  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision  
 Lines 9-10 are affected.

SuggestedRemedy  
 Change "High power budget class supports P2MP media with split ratio of 1:32 and distance of at least 20 km (channel insertion loss <= 29 dB)" to "High power budget class supports P2MP media channel insertion loss <= 29 dB, e.g. a PON with the split ratio of at least 1:32 and the distance of at least 20 km"

Proposed Response Response Status O

CI 91 SC 91.1.4 P5 L13 # 673  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X  
 Language revision

SuggestedRemedy  
 Change "depicts" to "depict". There are two Figures in there ...

Proposed Response Response Status O



CI 91 SC 91.10 P 23 L 33 # 726  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X

Figure 91-6 is very similar to 91-3 and there is no need for both of them in the same document. Merge 91-6 and 91-3. See 3av\_0803\_hajduczenia\_2.pdf for the proposed Figure 91-3 (3av\_0803\_hajduczenia\_2.fm for source file).

*SuggestedRemedy*

Merge 91-6 and 91-3. See 3av\_0803\_hajduczenia\_2.pdf for the proposed Figure 91-3 (3av\_0803\_hajduczenia\_2.fm for source file).

Replace all references to Figure 91-6 with a reference to Figure 91-3.

Proposed Response Response Status O

CI 91 SC 91.10.3 P 24 L 28 # 727  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X

Table 91-14 is affected.

The table contains the values for 1310 and 1550 nm attenuation figures. It would be reasonable to add 1270, 1577 and 1590 nm values as well, since the system is transmitting in those windows.

*SuggestedRemedy*

Change Table 91.14 as presented in 3av\_0803\_hajduczenia\_3.pdf (for source, see 3av\_0803\_hajduczenia\_3.fm)

Proposed Response Response Status O

CI 91 SC 91.10.3 P 24 L 50 # 728  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X

The text in this block is not compliant with the current channel link model assumptions for 10G EPON systems.

*SuggestedRemedy*

Change the lines 50-54 on page 24 and lines 1-3 on page 25 to the following text:

"The channel insertion loss was calculated under the assumption of 14.5 loss for a 1:16 splitter / 18.1 dB loss for a 1:32 splitter (G.671 am 1). Unitary fibre attenuation for particular transmission wavelength is provided in Table 91-14. 1.5 dB. The number of splices / connectors is not predefined - the number of individual fiber sections between the OLT MID and the ONU MID is not defined as long as the resulting channel insertion loss is within the limits specified in Table 91-1. Other fibre arrangements i.e. increasing the split ratio while decreasing the fibre length or vice versa are supported as long as the limits for the channel insertion loss specified in Table 91-1 are observed."

Proposed Response Response Status O

CI 91 SC 91.11 P 25 L 22 # 729  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X

Remove Editors Note #7 and insert the proposed structure of PICS.

*SuggestedRemedy*

See 3av\_0803\_hajduczenia\_4.pdf (for source, see 3av\_0803\_hajduczenia\_4.fm) for the proposed structure of the PICS.

Proposed Response Response Status O

CI 91 SC 91.2 P5 L 22 # 794  
 Remein, Duane Alcatel-Lucent

Comment Type T Comment Status X

The use of the term asymmetric in the statement "The asymmetry of the P2MP topology results in the EPON PMDs being inherently asymmetric. For example, ..." is confusing.

SuggestedRemedy

Replace the phrase  
 "The asymmetry of the P2MP topology results in the EPON PMDs being inherently asymmetric."  
 with  
 "The asymmetry nature of the P2MP topology results in the EPON PMDs that significantly differ between OLT and ONU."

Proposed Response Response Status O

CI 91 SC 91.2 P5 L 23 # 709  
 Hajduczenia, Marek Nokia Siemens Network

Comment Type E Comment Status X

Language revision

SuggestedRemedy

Change "in continuous mode" to "in a continuous mode". Change "uses burst mode" to "uses a burst mode"

Proposed Response Response Status O

CI 91 SC 91.2 P5 L 24 # 708  
 Hajduczenia, Marek Nokia Siemens Network

Comment Type E Comment Status X

Language revision

SuggestedRemedy

Change "The ONU PMD, on the contrary, receives data in a continuous mode, but transmits in burst mode." to "On the other hand, the ONU PMD receives data in a continuous mode, but transmits in a burst mode."

Proposed Response Response Status O

CI 91 SC 91.2 P5 L 30 # 642  
 Hajduczenia, Marek Nokia Siemens Network

Comment Type E Comment Status X

Language revision

SuggestedRemedy

Change "from each of U-type PMDs" to "from all U-type PMDs"

Proposed Response Response Status O

CI 91 SC 91.2 P5 L 32 # 839  
 Ryan, Hirth Teknovus

Comment Type E Comment Status X

"Clause 91 defines several D-type and several U-type PMDs."The word "several" is vague and unnecessary.

SuggestedRemedy

"Clause 91 defines D-type and U-type PMDs."

Proposed Response Response Status O

**Cl 91**    **SC 91.2**    **P7**    **L33**    # **968**  
 Lynskey, Eric    Teknovus

**Comment Type**    **E**    **Comment Status**    **X**  
 There seems to be a lot of repeated text here.

**SuggestedRemedy**  
 Replace with the following:

The following OLT PMDs (D-type) are defined in this section:

Those that transmit at 10.3125 GBd continuous mode and receive at 1.25 GBd burst mode:  
 1) 10/1 GBASE-PRX-D1  
 2) 10/1 GBASE-PRX-D2  
 3) 10/1 GBASE-PRX-D3

Those that transmit at 10.3125 GBd continuous mode and receive at 10.3125 GBd burst mode:  
 1) 10GBASE-PR-D1  
 2) 10GBASE-PR-D2  
 3) 10GBASE-PR-D3

The following ONU PMDs (U-type) are defined in this section:

Those that transmit at 1.25 GBd burst mode and receive at 10.3125 GBd continuous mode:  
 1) 10/1GBASE-PRX-U1  
 2) 10/1GBASE-PRX-U2  
 3) 10/1GBASE-PRX-U3

Those that transmit at 10.3125 GBd burst mode and receive at 10.3125 GBd continuous mode:  
 1) 10GBASE-PR-U1  
 2) 10GBASE-PR-U3

**Proposed Response**    **Response Status**    **O**

**Cl 91**    **SC 91.2.1**    **P8**    **L21**    # **644**  
 Hajduczenia, Marek    Nokia Siemens Networ

**Comment Type**    **E**    **Comment Status**    **X**  
 Language revision.

**SuggestedRemedy**  
 Change "located at each end of the physical media" to "located at the ends of the physical media"

**Proposed Response**    **Response Status**    **O**

**Cl 91**    **SC 91.2.1.1**    **P8**    **L24**    # **674**  
 Hajduczenia, Marek    Nokia Siemens Networ

**Comment Type**    **ER**    **Comment Status**    **X**  
 Inconsistent designation of the data rates. All 1 Gb/s PMDs are referred to as 1000 Mb/s.

**SuggestedRemedy**  
 Change "1 Gb/s" to "1000 Mb/s". Global search and replace in Clause 91.

**Proposed Response**    **Response Status**    **O**

**Cl 91**    **SC 91.2.1.1**    **P8**    **L26**    # **780**  
 Remein, Duane    Alcatel-Lucent

**Comment Type**    **E**    **Comment Status**    **X**  
 Clarification: add phrase "the complementary".

Also in 91.2.1.2

**SuggestedRemedy**  
 Replace  
 "The asymmetric power budgets are created by combining asymmetric ONU PMDs (...) with asymmetric OLT PMDs (...) as presented in Table 91-2"  
 with  
 "The asymmetric power budgets are created by combining asymmetric ONU PMDs (...) with the complementary asymmetric OLT PMDs (...) as presented in Table 91-2"

And Replace  
 "The symmetric power budgets are created by combining symmetric ONU PMDs (...) with symmetric OLT PMDs (...) as presented in Table 91-3."  
 with  
 "The symmetric power budgets are created by combining symmetric ONU PMDs (...) with the complementary symmetric OLT PMDs (...) as presented in Table 91-3."

**Proposed Response**    **Response Status**    **O**

CI 91 SC 91.3.1 P9 L13 # 781  
 Remein, Duane Alcatel-Lucent  
 Comment Type E Comment Status X  
 Typo  
 SuggestedRemedy  
 replace:  
 "... services provided by the all the PMDs defined ..."  
 with  
 "... services provided by the PMDs defined ..."  
 Proposed Response Response Status O

CI 91 SC 91.3.1.1 P9 L25 # 969  
 Lynskey, Eric Teknovus  
 Comment Type E Comment Status X  
 How do we want to handle references to Clause 64? For now, it probably makes sense to  
 move them over to Clause 93.  
 SuggestedRemedy  
 Update references to Clause 93.3.2.4 and 93.2.2.1.  
 Proposed Response Response Status O

CI 91 SC 91.3.1.1 P9 L35 # 645  
 Hajduczenia, Marek Nokia Siemens Networ  
 Comment Type E Comment Status X  
 Language revision  
 SuggestedRemedy  
 Change "of overall system" to the "of the overall system"  
 Proposed Response Response Status O

CI 91 SC 91.3.1.2 P8 L48 # 646  
 Hajduczenia, Marek Nokia Siemens Networ  
 Comment Type E Comment Status X  
 Language revision  
 Also affected: subclause 91.3.1.4, page 10, line 18  
 SuggestedRemedy  
 Change "Upon receipt of this primitive" to "Upon the receipt of this primitive". Global search  
 and replace  
 Proposed Response Response Status O

CI 91 SC 91.3.1.2 P9 L40 # 795  
 Remein, Duane Alcatel-Lucent  
 Comment Type T Comment Status X  
 PMD\_UNITDATA.request also applies to c 65 PMA  
 same for PMD\_UNITDATA.indication  
 (line 51)  
 SuggestedRemedy  
 Change from  
 "This primitive defines the transfer of a serial data stream from the Clause 92 PMA to the  
 PMD."  
 To  
 "This primitive defines the transfer of a serial data stream from the Clause 65 or Clause 92  
 PMA to the PMD."  
 And change from  
 "This primitive defines the transfer of data from the PMD to the Clause 92 PMA."  
 To  
 "This primitive defines the transfer of data from the PMD to the Clause 65 or Clause 92  
 PMA."  
 Proposed Response Response Status O

CI 91 SC 91.3.1.4 P 10 L 11 # 782  
 Remein, Duane Alcatel-Lucent  
 Comment Type E Comment Status X  
 Meaning of red text "92.3.1.1" not specified.  
 SuggestedRemedy  
 Editors to agree on how to annotate cross-references which will need updating in future drafts.  
 Suggest use something like "@@92.3.1.1" with leadin editros note explaining meaning of "@@"  
 Proposed Response Response Status O

CI 91 SC 91.3.1.4 P 10 L 12 # 997  
 Lin, Rujian Shanghai Luster Terab  
 Comment Type E Comment Status X  
 92.3.1.1 for cause 92 PCS.  
 SuggestedRemedy  
 Cause 92.2.3.5 for cause 92 PCS.  
 Proposed Response Response Status O

CI 91 SC 91.3.2 P 10 L 37 # 796  
 Remein, Duane Alcatel-Lucent  
 Comment Type T Comment Status X  
 Suggested text  
 SuggestedRemedy  
 The PMD sublayer is defined at the four reference points shown in Figure 91-3 where the first digit represents the downstream direction and the second the upstream. Two points, TP2 and TP3, are compliance points. TP1 and TP4 are reference points for use by implementors. The optical transmit signal is defined at the output end of a patch cord (TP2), between 2 m and 5 m in length, of a fiber type consistent with the link type connected to the transmitter. Unless specified otherwise, all transmitter measurements and tests defined in 91.8 are made at TP2. The optical receive signal is defined at the output of the fiber optic cabling (TP3) connected to the receiver. Unless specified otherwise, all receiver measurements and tests defined in 91.8 are made at TP3. The electrical specifications of the PMD service interface (TP1 and TP4) are not system compliance points (these are not readily testable in a system implementation). It is expected that in many implementations, TP1 and TP4 will be common between Clause 91 PMDs.  
 Proposed Response Response Status O

CI 91 SC 91.3.3 P 10 L 42 # 783  
 Remein, Duane Alcatel-Lucent  
 Comment Type E Comment Status X  
 Ambiguous statememt "The higher optical power level shall correspond to tx\_bit = ONE." in this context.  
 SuggestedRemedy  
 Move statement to the next paragraph so the section reads:  
 "The PMD Transmit function shall convey the bits requested by the PMD service interface message  
 PMD\_UNITDATA.request(tx\_bit) to the MDI according to the optical specifications in Clause 91.  
 In the upstream direction, the flow of bits is interrupted according to  
 PMD\_SIGNAL.request(tx\_enable). This implies three optical levels, 1, 0, and dark, the latter corresponding to the transmitter being in the OFF state. The higher optical power level shall correspond to tx\_bit = ONE."  
 Proposed Response Response Status O

CI 91 SC 91.3.5.1 P 11 L 30 # 970  
 Lynskey, Eric Teknovus

Comment Type T Comment Status X  
 1000BASE-X is more of a PCS term and not representative of a specific PMD signaling.  
 Similarly on line 42.

SuggestedRemedy  
 Replace with 10GBASE-PR on line 30. Replace with 1000BASE-PX on line 42.

Proposed Response Response Status O

CI 91 SC 91.3.5.1 P 11 L 34 # 647  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision  
 Also affected: subclause 91.3.5.2, page 11, line 42

SuggestedRemedy  
 Change "an indicator of optical signal presence" to "an indicator of the presence of the optical signal". Global search and replace.

Proposed Response Response Status O

CI 91 SC 91.3.5.1 P 11 L 37 # 797  
 Remein, Duane Alcatel-Lucent

Comment Type T Comment Status X  
 Copy past errors?  
 Also line 49 & 52  
 Also pg 12 line 20

or undefined terms "10GBASE-PR" and "1000BASE-X"

SuggestedRemedy  
 Line 337 change  
 "... whether a compliant 10GBASE-R signal is being received."  
 to  
 "... whether a compliant 10GBASE-PR or 10/1GBASE-PRX signal is being received

Line 49 change  
 "... whether a compliant 1000BASE-X signal is being ..."  
 To  
 "... whether a compliant 10/1GBASE-PRX signal is being ..."

Pg 12 line 20  
 change "10GBASE-R" to "10GBASE-PR" (2 places)  
 change "1000BASE-X" tp "10/1GBASE-PRX"

Line 52 change  
 "10GBASE-R and 1000BASE-X Signal detect functions"  
 to  
 "10GBASE-PR and 10/1GBASE-PRX Signal detect functions"

Proposed Response Response Status O

CI 91 SC 91.3.5.2 P 11 L 44 # 998  
 Lin, Rujian Shanghai Luster Terab

Comment Type E Comment Status X  
 PMA layer.

SuggestedRemedy  
 PMA sub-layer.

Proposed Response Response Status O

CI 91 SC 91.3.5.3 P 12 L 1 # 648  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Simplifying

SuggestedRemedy  
 Change "10GBASE-PR and 10/1GBASE-PRX type" to "Clause 91"

Proposed Response Response Status O

CI 91 SC 91.3.6 P 15 L 25 # 840  
 Ryan, Hirth Teknovus

Comment Type E Comment Status X  
 "Treceiver\_settling" should be "Transceiver\_settling" to be consistent with footnote d.

SuggestedRemedy  
 Change text in table 91-6 and 91-7.

Proposed Response Response Status O

CI 91 SC 91.4 P 13 L 13 # 999  
 Lin, Rujian Shanghai Luster Terab

Comment Type E Comment Status X  
 91.10.

SuggestedRemedy  
 Cause 91.10.

Proposed Response Response Status O

CI 91 SC 91.4 P 13 L 18 # 996  
 Lin, Rujian Shanghai Luster Terab

Comment Type E Comment Status X  
 58.76.

SuggestedRemedy  
 Cause 58.76.

Proposed Response Response Status O

CI 91 SC 91.4.1 P 13 L 21 # 694  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X  
 The OLT transmitters are not characterized using the RMS spectral width anymore. The SMSR was introduced in this place.

SuggestedRemedy  
 Replace the ", spectral width," with "side mode suppression ratio"

Proposed Response Response Status O

CI 91 SC 91.4.1 P 13 L 41 # 719  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X  
 Table 91-5 is affected.  
 Footnote (a) does not make any sense. There is no RMS spectral width defined for PR and PRX type OLT transmitters. The same holds true for Table 91.8 and PR type ONU transmitters.

SuggestedRemedy  
 Remove footnote (a) in Table 91-5 and (b) in Table 91-8.

Proposed Response Response Status O

CI 91 SC 91.4.1 P 13 L 44 # 713  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type TR Comment Status X

The min average launch power is calculated for the ER = 9 dB and not 6 dB. It is not clear from the table. The same is true for the parameter "Launch OMA (min)"

Tables affected:

Table 91-5, page 13

Table 91-8, page 17

Table 91-9, page 18

*SuggestedRemedy*

Add a footnote to the parameter "Average launch power (min)" and "Launch OMA (min)" with the following contents "x) Minimum average launch power and minimum launch OMA are valid for ER = 9 dB (see Figure 91-4 for details)."

Tables affected:

Table 91-5, page 13

Table 91-8, page 17

Table 91-9, page 18

Use the same footnote for both parameters.

Update the channel link model accordingly

Proposed Response Response Status O

CI 91 SC 91.4.1 P 13 L 46 # 1021  
 Hamano, Hiroshi Fujitsu Labs.

Comment Type T Comment Status X

In Table 91-5, 'Average launch power of OFF transmitter (max)' numbers should be defined. It seems logical for 10G systems to take the same numbers of 802.3ah GE-PONs, at least for upstream, because of the co-existence case.

It should be noticed that TX-enable/disable control signal from the upper layer is definitely necessary to achieve such a TX power-down scheme of both upstream and downstream, and with that control, 10G TXs can also shut the output powers down to the similar level of 1Gs.

*SuggestedRemedy*

The same numbers of 802.3ah should be defined, such as, '-39 dBm' for PR-D1, PR-D2, and PR-D3.

Proposed Response Response Status O

CI 91 SC 91.4.1 P 13 L 52 # 1024  
 Hamano, Hiroshi Fujitsu Labs.

Comment Type T Comment Status X

In Table 91-5, 'Optical return loss tolerance (max)' numbers should be defined.

*SuggestedRemedy*

The same numbers of 802.3ah should be defined, such as, '15 dB' for PR-D1, PR-D2, and PR-D3.

Proposed Response Response Status O

CI 91 SC 91.4.1 P 13 L 54 # 1027  
 Hamano, Hiroshi Fujitsu Labs.

Comment Type T Comment Status X

In Table 91-5, 'Transmitter reflectance (max)' numbers should be defined.

*SuggestedRemedy*

The same numbers of 802.3ah should be defined, such as, '-10 dB' for PR-D1, PR-D2, and PR-D3.

Proposed Response Response Status O

CI 91 SC 91.4.1 P 14 L 12 # 990  
 Lynskey, Eric Teknovus

Comment Type E Comment Status X

Typo in footnote B after Table 91-5. Also on page 18 line 4 following Table 91-8.

*SuggestedRemedy*

Replace with "longitudinal".

Proposed Response Response Status O



CI 91 SC 91.4.1 P 14 L 15 # 722  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X

Remove the Editors Note #2 and replace it with the description of Figure 91-4 as proposed in the Suggested Remedy field.

*SuggestedRemedy*

Suggested text to replace Editors Note #2:

"The relationship between OMA, extinction ratio and average power is described in 58.7.6 and illustrated in Figure 91-4 for a compliant transmitter. Note that the OMAmin and AVEmin are calculated for the ER = 9 dB. The transmitter specifications are further relaxed by allowing lower ER = 6 dB while maintaining the OMAmin and AVEmin intact."

Proposed Response Response Status O

CI 91 SC 91.4.1 P 14 L 40 # 784  
Remein, Duane Alcatel-Lucent

Comment Type E Comment Status X

Figure 91-4  
No indication of what the shaded are means.

*SuggestedRemedy*

Add note to Figure:  
"Shaded area indicates compliant part."

Proposed Response Response Status O

CI 91 SC 91.4.2 P 15 L 13 # 1016  
Hamano, Hiroshi Fujitsu Labs.

Comment Type T Comment Status X

In Table 91-6, 'Damage threshold (max)' numbers should be defined. For 10GE-PON, it seems difficult to guarantee the TX-RX direct connection without damage, because of higher TX launch power compared to 1G systems, to compensate the relatively low sensitivity of 10G RX and to achieve the crucial PR30 power budget or to utilize pin-RX, and also of relatively low durability of 10G components. Even for 1G upstream in the co-existence case, GE-PON and 10GE-PON, 10G RX is supposed to be utilized for 1G/10G dual-mode RX, and the Damage threshold specs. should follow those of 10G RXs. It is not desirable to leave the specs. unrealistic numbers like +6 to +10 dBm, and it seems important to warn users properly that TX-RX direct connection will make damage.

*SuggestedRemedy*

RX overload or 'Average receive power (max)' plus 1dB can be a good candidate, such as, '0 dBm' for PR-D1, and '-5 dBm' for PR-D2, PR-D3. Notification, like 'ONU-OLT direct connection will make damage', is also desirable.

Proposed Response Response Status O

CI 91 SC 91.4.2 P 15 L 17 # 1018  
Hamano, Hiroshi Fujitsu Labs.

Comment Type T Comment Status X

In Table 91-6, 'Signal detect threshold (min)' numbers should be defined. If 'Average launch power of OFF transmitter (max)' numbers of 802.3ah GE-PON systems can be applied to those of 10Gs, 'Signal detect threshold (min)' numbers of 1Gs and 10Gs can also be the same.

*SuggestedRemedy*

The same numbers of 802.3ah should be defined, such as, '-45 dBm' for PR-D1, PR-D2, and PR-D3.

Proposed Response Response Status O

CI 91 SC 91.4.2 P 15 L 19 # 1030  
 Hamano, Hiroshi Fujitsu Labs.  
 Comment Type T Comment Status X  
 In Table 91-6, 'Receiver reflectance (max)' numbers should be defined.  
 SuggestedRemedy  
 The same numbers of 802.3ah should be defined,  
 such as, '-12 dB' for PR-D1, PR-D2, and PR-D3.  
 Proposed Response Response Status O

CI 91 SC 91.4.2 P 15 L 25 # 675  
 Hajduczenia, Marek Nokia Siemens Networ  
 Comment Type ER Comment Status X  
 Footnote (d) contains a spelling mistake. Is "Transceiver\_settling is informative" and should  
 be "Treceiver\_settling is informative".  
 Other tables affected:  
 Table 91-7, page 16, line 25 (footnote (c))  
 Table 91-11, page 20, line 13 (footnote (d))  
 SuggestedRemedy  
 Change "Transceiver\_settling is informative" to "Treceiver\_settling is informative".  
 Proposed Response Response Status O

CI 91 SC 91.4.2 P 15 L 25 # 1000  
 Lin, Rujian Shanghai Luster Terab  
 Comment Type E Comment Status X  
 Treceiver\_settling(max)  
 SuggestedRemedy  
 Transceiver\_settling(max)  
 Proposed Response Response Status O

CI 91 SC 91.4.2 P 16 L 17 # 1019  
 Hamano, Hiroshi Fujitsu Labs.  
 Comment Type T Comment Status X  
 In Table 91-7, 'Signal detect threshold (min)' numbers should be defined.  
 SuggestedRemedy  
 The same numbers of 802.3ah should be defined,  
 such as, '-45 dBm' for PRX-D3.  
 Proposed Response Response Status O

CI 91 SC 91.4.2 P 16 L 19 # 1031  
 Hamano, Hiroshi Fujitsu Labs.  
 Comment Type T Comment Status X  
 In Table 91-7, 'Receiver reflectance (max)' numbers should be defined.  
 SuggestedRemedy  
 The same numbers of 802.3ah should be defined,  
 such as, '-12 dB' for PRX-D3.  
 Proposed Response Response Status O

CI 91 SC 91.4.2 P 16 L 25 # 1001  
 Lin, Rujian Shanghai Luster Terab  
 Comment Type E Comment Status X  
 Treceiver\_settling(max)  
 SuggestedRemedy  
 Transceiver\_settling(max)  
 Proposed Response Response Status O

CI 91 SC 91.5 P 17 L 15 # 723  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X

The note "The specifications for OMA have been derived from extinction ratio and average launch power (minimum) or receiver sensitivity (maximum). The calculation is defined in 58.7.6" is not precise any more. The OMA specifications are derived for ER = 9 dB and not the ER provided in the table (6dB). The text must be modified.

Other occurrences of the same text:

Clause 91.4, page 13, line 17

*SuggestedRemedy*

Change the text of the note as follows: "The specifications for OMA have been derived from extinction ratio of 9 dB and average launch power (minimum) or receiver sensitivity (maximum). The calculation is defined in 58.7.6"

Proposed Response Response Status O

CI 91 SC 91.5.1 P 134 L 19 # 10335  
 Dawe, Piers Avago Technologies

Comment Type TR Comment Status D Deferred

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 W

PROPOSED ACCEPT IN PRINCIPLE.

While keeping the minimum OMA and minimum average power unchanged, I prefer the minimum upstream ER to be:

- 1) 6 dB \_20\_
- 2) 4 dB \_10\_

I prefer to:

- 1) relax upstream Tx specification by relaxing minimum ER \_11\_
- 2) relax upstream Tx specification by relaxing minimum average power \_19\_
- 3) not relax upstream Tx specification \_8\_

I prefer to relax upstream Tx specification by relaxing both the minimum ER and minimum average power:

- 1) Yes: \_10\_
- 2) No: \_11\_

Resolve comment #335 by relaxing the minimum average power:

- 1) Yes: \_11\_
  - 2) No: \_5\_
  - 3) Abstain: \_8\_
- (technical >=75%) Fails

CI 91 SC 91.5.1 P 135 L 27 # 10190  
Lin, Rujian Shanghai Luster Terab

Comment Type T Comment Status A Deferred

MH: Table 91-13 is affected  
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 ũñ 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.

Response Response Status W

ACCEPT IN PRINCIPLE.  
See comment #417.

CI 91 SC 91.5.1 P 139 L # 10418  
Chang, Frank Vitesse

Comment Type TR Comment Status A Deferred

B++ 29dB??

*SuggestedRemedy*

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

Response Response Status W

ACCEPT.  
See comment #417.  
Commenter refers to 3av\_c91\_1\_0\_markup.pdf, Table 91ũ17.  
The launch power will be calculated using the approved version of the channel link model (v2.1).

CI 91 SC 91.5.1 P 17 L 20 # 720  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X

The ONU transmitters have either RMS or SMSR defined. Need to align the text with the contents of the tables.

*SuggestedRemedy*

Change "operating wavelength, spectral width," to "operating wavelength, spectral width (for PRX type PMDs) or side mode suppression ratio (for PR type PMDs),"

Proposed Response Response Status O

CI 91 SC 91.5.1 P 17 L 26 # 695  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X

Table 91-8 is affected. Table 91-9 is affected.  
The row "Nominal transmitter type" was removed from Table 91-5. Align with the changes

*SuggestedRemedy*

Remove the row "Nominal transmitter type" in Table 91-8. Add "While it is not required, it is expected that PMD transmitters of Clause 91 will use lasers, and amongst them, 10G transmitters and transmitters in the 1574–1600 nm range will use single longitudinal mode lasers." before the table 91-8.  
Remove the row "Nominal transmitter type" in Table 91-9. Add "While it is not required, it is expected that PMD transmitters of Clause 91 will use lasers, and amongst them, 1.25 GBd transmitters and transmitters in the 1260-1360 nm range will use single longitudinal mode lasers." before the table 91-9.

Proposed Response Response Status O

CI 91 SC 91.5.1 P 17 L 40 # 1022  
Hamano, Hiroshi Fujitsu Labs.

Comment Type T Comment Status X

In Table 91-8, 'Average launch power of OFF transmitter (max)' numbers should be defined. See my comment SC 91.4.1 P 13ũ L 46.

*SuggestedRemedy*

The same numbers of 802.3ah should be defined, such as, '-45 dBm' for PR-U1, and PR-U3.

Proposed Response Response Status O

CI 91 SC 91.5.1 P 17 L 41 # 831  
TSUJI, SHINJI SUMITMO ELECTRIC

Comment Type T Comment Status X

This comment is concerned with Extinction ratio (min) in Table 91-8.  
Relaxed extinction ratio is commonly found in 10GBASE PMD and does not extend receive dynamic range even for the burst receiver which has peak/bottom detector. The value of 4.5dB is just 1dB difference in average\_power-OMA relationship from 6dB ER.

*SuggestedRemedy*

4.5dB Extinction ratio (min) for both 10GBASE-PR-U1 and 10GBASE-PR-U3 in Table 91-8.

Proposed Response Response Status O

CI 91 SC 91.5.1 P 17 L 49 # 1025  
Hamano, Hiroshi Fujitsu Labs.

Comment Type T Comment Status X

In Table 91-8, 'Optical return loss tolerance (max)' numbers should be defined.

*SuggestedRemedy*

The same numbers of 802.3ah should be defined, such as, '15 dB' for PR-U1, and PR-U3.

Proposed Response Response Status O

CI 91 SC 91.5.1 P 17 L 50 # 1028  
Hamano, Hiroshi Fujitsu Labs.

Comment Type T Comment Status X

In Table 91-8, 'Transmitter reflectance (max)' numbers should be defined.

*SuggestedRemedy*

The same numbers of 802.3ah should be defined, such as, '-10 dB' for PR-U1, and PR-U3.

Proposed Response Response Status O

CI 91 SC 91.5.1 P 18 L 15 # 802  
Remein, Duane Alcatel-Lucent

Comment Type TR Comment Status X

Table 91-1 suggests but does not elaborate on the two wavelength bands for Upstream (nominally 1270 for 10G and 1310 for 1G). Table 91-8 is consistent with the modified plan, but Table 91-9 is not, even for the PRX-U3 entry. Furthermore there should be some consideration in the text of the isolation gap of the two windows (1270 and future adjacent). Some guidance should be given so as to have the lasers and filters optimized if vendors are going to support this feature.  
js

*SuggestedRemedy*

Change Wavelength parameter in Table 91-9 from:  
"1260 to 1360"  
to  
"1260 to 1280"  
Add a guard band parameter with a value of 1280-1290 nm

Proposed Response Response Status O

CI 91 SC 91.5.1 P 18 L 20 # 1023  
Hamano, Hiroshi Fujitsu Labs.

Comment Type T Comment Status X

In Table 91-9, 'Average launch power of OFF transmitter (max)' numbers should be defined.

*SuggestedRemedy*

The same numbers of 802.3ah should be defined, such as, '-45 dBm' for PRX-U3.

Proposed Response Response Status O

CI 91 SC 91.5.1 P 18 L 29 # 1026  
Hamano, Hiroshi Fujitsu Labs.

Comment Type T Comment Status X

In Table 91-9, 'Optical return loss tolerance (max)' numbers should be defined.

*SuggestedRemedy*

The same numbers of 802.3ah should be defined, such as, '15 dB' for PRX-U3.

Proposed Response Response Status O

CI 91 SC 91.5.1 P 18 L 3 # 991  
 Lynskey, Eric Teknovus

Comment Type T Comment Status X

Does it still make sense to maintain footnote B for Table 91-8 when we removed the specification for RMS spectral width? Also applies to Table 91-5.

SuggestedRemedy  
 Remove footnote b from Table 91-8 and 91-5.

Proposed Response Response Status O

CI 91 SC 91.5.1 P 18 L 31 # 1029  
 Hamano, Hiroshi Fujitsu Labs.

Comment Type T Comment Status X

In Table 91-9, 'Transmitter reflectance (max)' numbers should be defined.

SuggestedRemedy  
 The same numbers of 802.3ah should be defined, such as, '-10 dB' for PRX-U3.

Proposed Response Response Status O

CI 91 SC 91.5.1 P 18 L 40 # 676  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X

Language revision

SuggestedRemedy  
 Change "Table 60–7and" to "Table 60–7 and" (space was missing)

Proposed Response Response Status O

CI 91 SC 91.5.2 P 19 L 48 # 1017  
 Hamano, Hiroshi Fujitsu Labs.

Comment Type T Comment Status X

In Table 91-11, 'Damage threshold (max)' numbers should be defined. See my comment SC 91.4.2 P 15 L 13.

SuggestedRemedy  
 RX overload or 'Average receive power (max)' plus 1dB can be a good candidate, such as, '0 dBm' for PR-U1, and '-9 dBm' for PR-U3. Notification, like 'OLT-ONU direct connection will make damage', is also desirable.

Proposed Response Response Status O

CI 91 SC 91.5.2 P 19 L 53 # 1020  
 Hamano, Hiroshi Fujitsu Labs.

Comment Type T Comment Status X

In Table 91-11, 'Signal detect threshold (min)' numbers should be defined. See my comment SC 91.4.2 P 15 L 17.

SuggestedRemedy  
 The same numbers of 802.3ah should be defined, such as, '-44 dBm' for PR-U1, and PR-U3.

Proposed Response Response Status O

CI 91 SC 91.5.2 P 20 L 13 # 1002  
 Lin, Rujian Shanghai Luster Terab

Comment Type E Comment Status X

Treceiver\_settling(max)

SuggestedRemedy  
 Transceiver\_settling(max)

Proposed Response Response Status O

CI 91 SC 91.5.2 P 20 L 7 # 1032  
 Hamano, Hiroshi Fujitsu Labs.  
 Comment Type T Comment Status X  
 In Table 91-11, 'Receiver reflectance (max)' numbers should be defined.  
 SuggestedRemedy  
 The same numbers of 802.3ah should be defined, such as, '-12 dB' for PR-U1, and PR-U3.  
 Proposed Response Response Status O

CI 91 SC 91.6 P 142 L # 10406  
 Chang, Frank Vitesse  
 Comment Type TR Comment Status D Deferred  
 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 W  
 PROPOSED ACCEPT IN PRINCIPLE.  
 At the moment, the link is closed with allocation for penalties. The feedback from the jitter ad-hoc is expected at the March meeting, when the appropriate allocation for jitter can be added.

CI 91 SC 91.6 P 21 L 24 # 711  
 Hajduczenia, Marek Nokia Siemens Networ  
 Comment Type TR Comment Status X  
 Table 91-12 provides the nominal measurement wavelengths for the fiber as 1550 nm, yet the transmission is performed at 1590 or 1577 nm in the downstream. In the upstream, transmission is carried out at 1270 nm, while the nominal measurement is done at 1310 nm. These values are not aligned.  
 SuggestedRemedy  
 Change the "measurement wavelength for fiber" to the following values:  
 1270 for PR10 US  
 1590 for PR10 DS  
 1270 for PR20 US  
 1590 for PR20 DS  
 1270 for PR30 US  
 1577 for PR30 DS  
 Proposed Response Response Status O

CI 91 SC 91.6 P 21 L 39 # 724  
 Hajduczenia, Marek Nokia Siemens Networ  
 Comment Type T Comment Status X  
 The comment says "Further details are given in 91.8.2.". There is no 91.8.2.  
 SuggestedRemedy  
 Create a stub for subclause 91.8.2 entitled "Allocation for penalties in 10G EPON PMDs" with the following text "The Clause 91 receivers are required to tolerate a path penalty not exceeding 1 dB to account for total degradations due to reflections, intersymbol interference, mode partition noise, laser chirp and detuning of the central wavelength. All the transmitter types specified in Clause 91 produce less than 1 dB of optical path penalty over the PON plant. An increase in the optical path penalty is acceptable, provided that any increase in optical path penalty over 1 dB is compensated by an increase of the minimum transmitted launch power, or an increase of the minimum receiver sensitivity."  
 Proposed Response Response Status O

CI 91 SC 91.6 P 22 L 9 # 712  
 Hajduczenia, Marek Nokia Siemens Networ  
 Comment Type TR Comment Status X  
 Table 91-13 provides the nominal measurement wavelengths for the fiber as 1550 nm, yet the transmission is performed at 1590 or 1577 nm in the downstream.  
 SuggestedRemedy  
 Change the "measurement wavelength for fiber" to the following values:  
 1590 for PRX10 DS  
 1590 for PRX20 DS  
 1577 for PRX30 DS  
 Proposed Response Response Status O

CI 91 SC 91.6.3 P 21 L 24 # 800  
 Remein, Duane Alcatel-Lucent  
 Comment Type T Comment Status X  
 Table 91-5 specifies D/S penalties of 1.5dB for all (10G) cases. However, summary table 91-12 specifies 1dB for all cases.  
 SuggestedRemedy  
 Change Table 91-12 from 1 db to 1.5 db.  
 Proposed Response Response Status O

CI 91 SC 91.8.1 P 22 L 48 # 714  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type TR Comment Status X

The text says "Insertion loss for SMF fiber optic cabling (channel) is defined at 1310 or 1550 nm". However, the transmission windows for the 10G PMDs are set at 1580 - 1600 (1590 centre) and 1574 - 1580 (1576 centre) in the downstream and 1260 - 1280 (1270 centre) and 1260 - 1360 (1310 centre) in the upstream. This means that the fibre attenuation should be measured at 1270, 1310, 1590 and 1576 nm. G.650.1 does not specify the measurement wavelengths, thus we should strive to provide precise values rather than measure at 1550 and use the fibre at 1590.

SuggestedRemedy

Change "is defined at 1310 or 1550 nm" to "is defined at 1270, 1310, 1577 or 1590 nm, depending on the particular PMD."

Proposed Response Response Status O

CI 91 SC 91.8.1 P 22 L 49 # 721  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X

Missing ITU-T/IEC reference

SuggestedRemedy

ITU-T G.650 or IEC 60793-1.  
Select the more appropriate one. G.650.1 is suggested.

Proposed Response Response Status O

CI 91 SC 91.9.2 P 23 L 11 # 696  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X

The note in red does not make sense.

SuggestedRemedy

Remote the note in red.

Proposed Response Response Status O

CI 91 SC 91.9.3 P 23 L 14 # 801  
Remein, Duane Alcatel-Lucent

Comment Type TR Comment Status X

Add two temperature ranges to this sub-clause similar to that in c60.8.4.

SuggestedRemedy

Add text:

"Reference Annex 67A for additional environmental information.

Two optional temperature ranges are defined in Table 60-13. Implementations shall be declared as compliant over one or both complete ranges, or not so declared (compliant over parts of these ranges or another temperature range)."

Proposed Response Response Status O

CI 91 SC 91.9.4 P 23 L 24 # 725  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X

Remove Editors Note #6. Extend the text of the subclause as follows

SuggestedRemedy

Extend "The 10GBASE-PR and 10/1GBASE-PRX labeling recommendations and requirements are as defined in 52.12." to "The 10GBASE-PR and 10/1GBASE-PRX labeling recommendations and requirements are as defined in 52.12, e.g. 10/1GBASE-PRX-D1 for the OLT PMD supporting the channel insertion loss <= 20 dB."  
Remove Editors Note #6.

Proposed Response Response Status O

CI 91 SC 91.9.4 P 23 L 24 # 790  
Remein, Duane Alcatel-Lucent

Comment Type ER Comment Status X

Provide list of Port Types

SuggestedRemedy

Add text:

"Defined port types are: 10/1GBASE-PRX-D1, 10/1GBASE-PRX-D2, 10/1GBASE-PRX-D3, 10GBASE-PR-D1, 10GBASE-PR-D2, 10GBASE-PR-D3, 10/1GBASE-PRX-U1, 10/1GBASE-PRX-U2, 10/1GBASE-PRX-U3, 10GBASE-PR-U1 and 10GBASE-PR-U3."

Proposed Response Response Status O



**Cl 91**    **SC 91A**                      **P 27**            **L 1**            # **955**  
 Lynskey, Eric                              Teknovus

**Comment Type**    **T**            **Comment Status**    **X**                      **Annex 91A**

Annex 91A is empty and could use some text. I'd like to thank everyone that helped put this together, including Glen Kramer, Frank Effenberger, and Quanbo Zhao.

**SuggestedRemedy**  
 Add the material in 3av\_0703\_lynskey\_3.pdf to Annex 91A.

**Proposed Response**                      **Response Status**    **O**

**Cl 92**    **SC 2.3.4.2**                      **P 310**            **L 51**            # **1033**  
 Effenberger, Frank                              Huawei Technologies,

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

The first bit of each block is never explained why it is a redundant sync bit of the 66b word.

**SuggestedRemedy**  
 Change (ie. The redundant sync bit of the 66b word) to (ie. The redundant sync bit of the 66b word (the first bit is guaranteed to be the complement of the second bit).

**Proposed Response**                      **Response Status**    **O**

**Cl 92**    **SC 2.3.4.2**                      **P 311**            **L 1**            # **1034**  
 Effenberger, Frank                              Huawei Technologies,

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

The data is then FEC-encoded, which results in an additional 4 parity symbols for each block - completing the 255-byte Reed-Solomon codeword.

**Comment:**  
 The above sequence is wrong. According to the first sentence of the paragraph, each block means a 66-bit block. 4 parity symbols means 32 bits.

**SuggestedRemedy**  
 Replace the sentence above with:

The data is then FEC-encoded, which results in an additional 4 64b blocks for each 27 66b blocks - completing the 255-byte Reed-Solomon codeword.

**Proposed Response**                      **Response Status**    **O**

**Cl 92**    **SC 2.3.5**                              **P 313**            **L 18**            # **1037**  
 Effenberger, Frank                              Huawei Technologies,

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

The draft reads:  
 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.

**OUR Comments:**  
 The synchronization pattern 0x55 is interpreted as 1010... ended with a 0 in Clause4 (4.2.5? p71), which is different to our current binary form 0101... ended with a 1.

**SuggestedRemedy**  
 Suggested Remedy  
 Change (binary 0101...) to (binary 1010).

**Proposed Response**                      **Response Status**    **O**

CI 92 SC 2.3.7.1 P 314 L 1 # 1038  
 Effenberger, Frank Huawei Technologies,

Comment Type T Comment Status X

The text current reads:

Default: ??

SYNC\_LENGTH

TYPE: ??

Required number of sync blocks per burst. The value of this constant is derived from Sync-Time parameter passed from the OLT to ONUs. See 64.3.3.2 for details.

Default: 0x 1 16A2 DC69 F0CD EE40

Our Comments

The Default value of line 1 (the burst delimiter) is written in line 6. (for the SYNC\_LENGTH) Nevertheless, since the synchronization pattern 0x55 shall be 1010..., the corresponding 66 bit BURST\_DELIMITER shall be the complement of what is in Draft 1.1 so that the BURST\_DELIMITER could provide a large MinHD=32 for burst synchronization.

SuggestedRemedy

Change the Default: to

Default: 0x 4 97 BA C4 69 F0 4C 88 FD (Binary: 10 11101001 01011101 00100011 10010110 00001111 00110010 00010001 10111111)

The least significant bit of binary bits and field (8 bits per field) positions is on the left. Hexadecimal numbers are shown in a normal hexadecimal form and two hexadecimal numbers represent one corresponding field. For example, the field "0x BA" (shown in Table 3) is sent as 01011101, representing 11th to 18th bits of the 66 bits SOD delimiter 1. The LSB for each field is placed in the lowest number position of the field and is the first transmitted bit of the field. It is noted that a hexadecimal number represents 4 binary bits, except the first hexadecimal number or the leading number, which represents 2 MSBs of corresponding four binary bit representation. For example, the binary representation of "0x 4" is "0010" and the first hexadecimal number "0x 4" represents 10.

Proposed Response Response Status O

CI 92 SC 2.4.1 P 317 L 30 # 1035  
 Effenberger, Frank Huawei Technologies,

Comment Type T Comment Status X

An analysis of the state machine as given in this section is attached (and will be presented if there is suitable interest). The current parameter settings seem satisfactory.

However, there is one small problem. Assume that the receiver is operating normally in the locked state. Then, for some reason the receiver slips one full block. The number of errors that will occur in a 62 block cycle is only 8, which is below the threshold for unlock. So, a receiver that manages to get itself into this falsely locked state will stay there forever.

Therefore, we recommend that an additional reset mechanism is added, that uses the FEC decoder's "Persistent decode failure" signal to force an unlock event. Said signal will be defined in comment on section 92.2.4.2.

SuggestedRemedy

At last paragraph in section 92.2.4.1, add the following sentence:

"In addition, if the Persistent decode failure signal becomes set, then codeword lock is deasserted (this check insures that certain false-lock cases are not persistent.)"

Modify figure 92-10 to change the condition on the transition between "INVALID\_SH" and "SLIP" to read: "sh\_invalid\_cnt=16 + !cword\_lock + persist\_dec\_fail"

Proposed Response Response Status O

CI 92 SC 2.4.2 P 317 L 35 # 1036  
 Effenberger, Frank Huawei Technologies,

Comment Type T Comment Status X

The description of the FEC decoder needs more full development, in terms of defining how the 66b blocks that are received are ordered into the 255 byte "full codeword", and then how the resulting corrected codeword is divided back into 66b blocks to be sent to the idle-insertion logic.

In addition, the handling of the decoding failure signal from the decoder must be described, including the "Persistent decode failure" signal, which is used in the codeword locking state machine.

#### Suggested Remedy

Insert the following text at the end of first paragraph in section 92.2.4.2:  
 "The exact handling of data through the FEC decoder is specified in the FEC-decoder state machine shown in Figure 92-X. It should be noted that there are two separate threads of execution in this state machine, to reflect the fact that the FEC decoding process takes considerable time.

When the synchronizer is in the unlocked state, the FEC decoder is inactive. When the synchronizer is in the locked state, the 66 bit blocks that are arriving from the synchronizer are added to a buffer that accumulates only the bits that are considered by the FEC algorithm (see figure 92-6). The FEC algorithm then processes the buffer. The algorithm produces two outputs: the Decode\_success signal and (if successful) the corrected buffer. The data portion of the buffer is then read out to the descrambler logic in 66 bit blocks, as normal. Note that the rate of 66 bit transfers is lower than normal here. This is corrected in the idle insertion step.

If the Decode\_success is false, then a counter is incremented. If there are three decoding failures in a row, then the Persist\_dec\_fail signal is asserted. This signal will then reset the synchronizer."

Add the following variables to section 92.2.3.6.2

decode\_success

Boolean indication that is set true if the codeword was successfully decoded by the FEC algorithm, and false otherwise.

decode\_failures

Counter that holds the number of consecutive decoding failures.

persist\_dec\_fail

Boolean indication that is set when three consecutive decoding failures have occurred.

decode\_done

Boolean indication that is transiently set when the FEC decoder algorithm has completed its processing and the corrected data is present in the output buffer.

input\_buffer[]

An array of 2040 bits.

input\_buffer\_location

An integer that points to the next appending location in the input buffer.

output\_buffer[]

An array of 2040 bits.

Add the following functions to section 92.2.3.6.3

Flush\_inbuffer()

Flushes the input buffer of the FEC decoding algorithm block.

Flush\_inbuffer()

```
{
  for(i=0, i<2040, i++) {
    inbuffer[i]=0
  }
  input_buffer_location = 29
}
```

Append\_inbuffer()

Appends the newly arrived 66b bit block into the input buffer of the FEC decoding algorithm, taking care to only insert the bits to be protected, and discarding the unwanted bits.

Append\_inbuffer()

```
{
  BlockFromSynchronizer()

  if(rx_coded<0> <> rx_coded<1>) {
    inbuffer[input_buffer_location]=rx_coded<1>
    input_buffer_location++
  }
  for(i=2, i<66, i++) {
    inbuffer[input_buffer_location]=rx_coded<i>
    input_buffer_location++
  }
  if(rx_coded<0>>=1 and rx_coded<1>>=1) {
    cword_done=true
  }
}
```

Decode()

Triggers the FEC decoding algorithm to accept the contents of the input buffer, and do its decoding work. Note that this function is not blocking, and returns immediately. It is assumed that the FEC decoding algorithm copies the input buffer contents into its own internal memory, so that the input buffer is released to accept the next codeword.

Read\_outbuffer(i)

Passes output buffer contents to the descrambler, with the appropriate format.

```
Read_outbuffer[i]
{
  int offset = 29+i*65
  for(j=0, j<65, j++) {
    rx_coded_corrected<j+1> = out_buffer[j+offset]
  }
  rx_coded_corrected<0>=!rx_coded_corrected<1>
  BlockToDescrambler()
}
```

#### BlockFromSynchronizer

Function that accepts the next rx\_coded<0..65> block of data from the synchronizer. It does not return until the transfer is completed.

#### BlockToDescrambler

Function that sends the next rx\_coded\_corrected<0..65> block to the scrambler. It does not return until the transfer is completed.

Add the attached figure to section 92.2.3.7.6.

*Proposed Response*      *Response Status* **O**

<b>CI 92</b>	<b>SC 2.4.2</b>	<b>P 317</b>	<b>L 38</b>	# 1039
Effenberger, Frank		Huawei Technologies,		

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

The text currently reads  
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.

#### Our Comments:

46.3.3.1 Response to error indications by the XGMII If, during frame reception (i.e., when DATA\_VALID\_STATUS = DATA\_VALID), a control character other than a Terminate control character is signaled on a received lane, the RS shall ensure that the MAC will detect a FrameCheckError in that frame. This requirement may be met by incorporating a function in the RS that produces a received frame data sequence delivered to the MAC sublayer that is guaranteed to not yield a valid CRC result, as specified by the frame check sequence algorithm (see 3.2.8). This data sequence may be produced by substituting data delivered to the MAC. The RS generates eight PLS\_DATA.indication primitive for each Error control character received within a frame, and may generate eight PLS\_DATA.indication primitives to ensure FrameCheckError when a control character other than Terminate causes the end of the frame.

Clause 46.3.3.1 states that errors should be guaranteed not to pass the CRC in MAC. Instead of doing nothing when the FEC decoder has signaled a decode failure. It should report this so that error will not be able to pass to the MAC.

#### *Suggested Remedy*

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 FEC decoder module shall set the sync header of every block within the uncorrectable codeword to be 11.

*Proposed Response*      *Response Status* **O**

CI 92 SC 52.2.3 P 309 L 51 # 679  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X

The comment refers to clause 92 !!!  
 Line 51 contains errored subclause number.

*SuggestedRemedy*

Correct to 92.2.3 (probably ?)  
 Use the automatic numbering instead of hand-assigned numbers.

Proposed Response Response Status O

CI 92 SC 59.2.3 P 309 L 51 # 942  
 Lynskey, Eric Teknovus

Comment Type E Comment Status X

A clause 59 heading? Also on page 317 line 7.

*SuggestedRemedy*

Covert headings to Clause 92.

Proposed Response Response Status O

CI 92 SC 59.2.4 P 317 L 7 # 697  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X

The comment refers to clause 92 !!!  
 Line 7 contains errored subclause number.

*SuggestedRemedy*

Correct to 92.2.4 (probably ?)  
 Use the automatic numbering instead of hand-assigned numbers.

Proposed Response Response Status O

CI 92 SC 92 P 300 L 1 # 664  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X

Language consistency ...  
 Throughout this clause, the text uses "IDLE code characters", idle code characters", "idle characters" etc. They all mean the same. Align the spelling of this term

*SuggestedRemedy*

Throughout this clause, the text uses "IDLE code characters", idle code characters", "idle characters" etc. They all mean the same. Align the spelling of this term, do the global search and replace with the target spelling selected.  
 Personal suggestion: use "IDLE control character". Seems most appropriate.

Proposed Response Response Status O

CI 92 SC 92 P 300 L 18 # 925  
 Lynskey, Eric Teknovus

Comment Type E Comment Status X

References to Clause 64 instead of Clause 93.

Page 300 line 18  
 Page 303 line 3  
 Page 303 line 8  
 Page 303 line 34  
 Page 314 line 5  
 Page 314 line 18  
 Page 314 line 19

*SuggestedRemedy*

Replace all references to Clause 64 with a reference to Clause 93.

Proposed Response Response Status O

**Cl 92**    **SC 92**                    **P 300**    **L 5**                    # **677**  
Hajduczenia, Marek                    Nokia Siemens Networ

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

Align all the clauses in the 802.3av to use the same format of the editorial notes. Copy paste the initial section from Clause 91.

*SuggestedRemedy*  
Align all the clauses in the 802.3av to use the same format of the editorial notes. Copy paste the initial section from Clause 91.  
Align the master pages for all clauses in 802.3av.

*Proposed Response*                    **Response Status**    **O**

**Cl 92**    **SC 92**                    **P 300**    **L 5**                    # **792**  
Remein, Duane                            Alcatel-Lucent

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

Lead-in Editors Note  
Align with 802.3ah drafts

*SuggestedRemedy*  
Change from:  
"Changes from Clause 92 D1.0 have been marked with change bars.  
In general (except this note) Editors Notes are marked in red italics.  
This has been adapted from 3av\_0707\_c92\_d0\_9\_1  
10 GEAPON Clauses shall use Editorial Mark-up conventions used in 803.3ah in FUTURE drafts  
Double question marks is used to denote missing content (as in "TYPE: ??", the final text will be updated in a later edition."  
To:  
"Editors Notes are marked in red italics and are to be removed prior to final publication.

Double question marks is used to denote missing content (as in "TYPE: ??", the final text will be updated in a later edition.

Revision History:  
Draft 1.0    November 2007    Preliminary draft for IEEE802.3av Task Force Review.  
Draft 1.1    February 2008    Draft for IEEE802.3av Task Force Review incorporating comments received at November 2007 meeting in Portland OR."  
Continue updating Revision History as needed.

*Proposed Response*                    **Response Status**    **O**

**Cl 92**    **SC 92.1.1**                    **P 300**    **L 26**                    # **732**  
Hajduczenia, Marek                    Nokia Siemens Networ

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

There are two Figure i.e. 91-1 and 91-2 and only one is referenced.

*SuggestedRemedy*  
Change "Sublayer. Figure 92-1 shows the relationship" to "Sublayer. Figure 92-1 and Figure 92-2 show the relationship"

*Proposed Response*                    **Response Status**    **O**

**Cl 92**    **SC 92.1.1**                    **P 301**    **L 1**                    # **678**  
Hajduczenia, Marek                    Nokia Siemens Networ

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

Applicable to Figure 92-1 and 92-2.  
The text in the hatched fields is not readable.  
Clause 92 does not specify PMD and MDI as indicated in the figures.

*SuggestedRemedy*  
Place a white rectangle under the text as e.g. in Figure 91-1. See 3av\_0803\_hajduczenia\_5.pdf (3av\_0803\_hajduczenia\_5.fm for source files) for the proposed resolution.

*Proposed Response*                    **Response Status**    **O**

**Cl 92**    **SC 92.1.1.1**                    **P 303**    **L 20**                    # **650**  
Hajduczenia, Marek                    Nokia Siemens Networ

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

Language revision

*SuggestedRemedy*  
Change "In the receive direction, these MODE and LLID values, embedded within the preamble, identify" to "In the receive direction, the MODE and LLID values embedded within the preamble identify"

*Proposed Response*                    **Response Status**    **O**

CI 92 SC 92.1.1.1 P 303 L 3 # 649  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision

SuggestedRemedy  
 Change "A successful registration process, described in 64.3.3, results in the assignment of values to the MODE and LLID variables associated with a MAC. This may be one of many MACs in an Optical Line Terminal (OLT) or a single MAC in an Optical Network Unit (ONU)." to "A successful registration process, described in 64.3.3, results in the assignment of values to the MODE and LLID variables associated with a MAC - one of many MACs in an Optical Line Terminal (OLT) or a single MAC in an Optical Network Unit (ONU).".

Proposed Response Response Status O

CI 92 SC 92.1.1.1 P 303 L 8 # 927  
 Lynskey, Eric Teknovus

Comment Type T Comment Status X  
 These two paragraphs seem confusing, and it isn't clear whether it should be pointing to Clause 64 or to Clause 93.

SuggestedRemedy  
 Replace the two paragraphs from lines 8 - 14 with the following:

As described in 93.1.2, multiple MACs within an OLT are bound to a single XGMII, or to an XGMII transmit path and a GMII receive path. At the ONU, MACs are either bound to an XGMII or to an XGMII receive path and a GMII transmit path. Correspondingly, only one PLS\_DATA.request primitive is active at any time.

Proposed Response Response Status O

CI 92 SC 92.1.1.2 P 303 L 27 # 785  
 Remein, Duane Alcatel-Lucent

Comment Type E Comment Status X  
 Wording

SuggestedRemedy  
 Change from:  
 "is primarily intended as a chip-to-chip but may also be used"  
 To  
 "is primarily intended to be chip-to-chip but may also be used"

Proposed Response Response Status O

CI 92 SC 92.1.1.2 P 303 L 29 # 926  
 Lynskey, Eric Teknovus

Comment Type T Comment Status X  
 GEPON is a new acronym, so it should be spelled out if we intend to use it. Do we want to use 10G EPON, 10 GEAPON, 10 Gb/s EPON, or something else? The group should decide on a consistent name. I have made this technical so that it is brought in front of the Task Force.

SuggestedRemedy  
 Spell out GEAPON (Gigabit Ethernet Passive Optical Network) the first time it is used and/or choose a different name. 10 Gb/s EPON is probably the best choice.

Proposed Response Response Status O

CI 92 SC 92.1.2.2 P 303 L 44 # 651  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision

SuggestedRemedy  
 Change "In Clause 46 the PLS\_CARRIER.indication" to "In Clause 46, the PLS\_CARRIER.indication"

Proposed Response Response Status O

Cl 92 SC 92.1.2.2 P 303 L 47 # 652  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision

SuggestedRemedy  
 Change "For 10 GEAPON the CRS signal" to "For 10 GEAPON, the CRS signal"

Proposed Response Response Status O

Cl 92 SC 92.1.2.2.2 P 304 L 1 # 929  
 Lynskey, Eric Teknovus

Comment Type T Comment Status X  
 There is no CRS signal on the XGMII interface, so we need to properly describe how the PLS\_CARRIER.indication primitive is generated. What we want to say is that the CARRIER\_STATUS parameter is controlled by the CRS Generation state diagram.

SuggestedRemedy  
 Replace 92.1.2.2.2 and 92.1.2.2.3 with the following:

92.1.2.2.2 Semantics of the service primitive

PLS\_CARRIER.indication(CARRIER\_STATUS)

The CARRIER\_STATUS parameter can take one of two values: CARRIER\_ON or CARRIER\_OFF. CARRIER\_STATUS assumes the value CARRIER\_ON at the beginning of every frame and assumes the value of CARRIER\_OFF after frame transmission is complete and enough time has elapsed to allow for the insertion of FEC parity. Figure 92-3 controls the updating of the CARRIER\_STATUS parameter.

92.1.2.2.3 When generated  
 The PLS\_CARRIER.indication service primitive is generated by the Reconciliation sublayer whenever the CARRIER\_STATUS parameter changes from CARRIER\_ON to CARRIER\_OFF or vice versa.

Proposed Response Response Status O

Cl 92 SC 92.1.2.2.2 P 304 L 2 # 928  
 Lynskey, Eric Teknovus

Comment Type E Comment Status X  
 Should be CARRIER\_STATUS.

SuggestedRemedy  
 Replace CARRIER\_SENSE with CARRIER\_STATUS.

Proposed Response Response Status O

Cl 92 SC 92.1.2.2.2 P 304 L 3 # 798  
 Remein, Duane Alcatel-Lucent

Comment Type T Comment Status X  
 Typo

also line 15

SuggestedRemedy  
 Change "PLS\_CARRIER.indication (CARRIER\_SENSE)"  
 to: "PLS\_CARRIER.indication (CARRIER\_STATUS)"

line 15 Change: "CRS = carrier sense signal"  
 to: "CRS = carrier status signal"

Proposed Response Response Status O

Cl 92 SC 92.1.2.2.3 P 304 L 11 # 836  
 Ryan, Hirth Teknovus

Comment Type T Comment Status X  
 Carrier sense is asserted when a packet is transmitted and extended by the amount of time that is required to insert parity for FEC, not just for the time the parity is inserted.

SuggestedRemedy  
 The PLS\_CARRIER.indication service primitive is generated by the Reconciliation sublayer whenever the PCS layer is transmitting a packet and is extended by the amount of time that is required to insert parity information for FEC overhead.

Proposed Response Response Status O



CI 92 SC 92.1.2.2.4 P 304 L 14 # 730  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X  
 Variable and counter definitions are incomplete.

#### Suggested Remedy

Align the format definition with clause 64/93.

Use the following variable and counter definitions:

Create a subsection Variables and insert the following definition

#### CRS

This variable identifies whether the carrier\_sense signal is present or not. If set to true, the carrier\_sense

signal is said to be present.

TYPE:  boolean

#### new\_col

This variable identifies whether a new column of data is available for transmission or not. It set to true, a

new column of data is pending transmission.

TYPE:  boolean

#### byte\_cnt

This variable holds the number of transmitted bytes. This value includes the data and idle bytes.

TYPE:  8 bit unsigned

#### parity\_cnt

This variable holds the number of parity bytes which need to be inserted by the PCS sublayer.

TYPE:  8 bit unsigned

#### col

This variable represents a 0-based bit array corresponding to the column of data pending transmission.

TYPE:  bit array

Create a subsection Constants and insert the following definition

#### block\_size

This variable holds the number of bytes comprising a single FEC block.

TYPE:  8 bit unsigned

VALUE:  255 (0xFF)

#### parity\_ratio

This variable holds the number of parity bytes which need to be inserted every FEC block.

TYPE:  8 bit unsigned

VALUE:  32 (0x20)

Create a subsection Functions and insert the following definition

#### T\_Type()

This function is used to determine what type of column is pending transmission (S, C)

Proposed Response

Response Status

CI 92 SC 92.1.2.2.4 P 304 L 22 # 941  
 Lynskey, Eric Teknovus

Comment Type T Comment Status X

The variables and counters could use some more detail, and the fixed values can now be added. Also, perhaps it makes sense to have the counters operate in units of columns instead of units of bytes. This comment is also related to 3av\_0803\_lynkey\_1.pdf.

SuggestedRemedy

92.1.2.2.4 Conventions

The notation used in the state diagram follows the conventions of 21.5. The notation ++ after a counter indicates it is to be incremented. The notation -- after a counter indicates it is to be decremented. The notation += after a counter indicates it is to sum itself with the following value.

Unless otherwise stated within the state diagram, it advances between states at TX\_CLK rate (on both the rising and falling clock transitions).

92.1.2.2.5 Functions, variables, and counters

CRS  
 Alias for CARRIER\_STATUS in PLS\_CARRIER.indication primitive.  
 Values: CARRIER\_ON; Frame transmission is deferred.  
 CARRIER\_OFF; Frame transmission is allowed.

tx\_cnt  
 A count of the number of columns transmitted. This counter increments at TX\_CLK rate (on both the rising and falling clock transitions) unless reset.

parity\_cnt  
 A count of the number of parity bytes (in units of columns) to be inserted by the PCS.

block\_size  
 The size, in columns, of an FEC codeword.  
 Value: 54

parity\_ratio  
 The number of parity bytes (in units of columns) to be inserted for every FEC codeword.  
 Value: 8

T\_Type()  
 A function that determines what type of column is to be transmitted.  
 Values:  
 C; The column contains one of the following:  
 a) four valid control characters other than /Q/, /S/, /T/ and /E/;  
 b) one valid sequence ordered\_set.  
 S; The column contains an /S/ in lane 0, and all characters following the /S/ are data characters.

T; The column contains a /T/ in one of its lanes, all characters before the /T/ are data characters, and all characters following the /T/ are valid control characters other than /O/, /S/, and /T/.  
 D; The column contains four data characters.  
 E; The column does not meet the criteria for any other value.

col  
 This variable contains the contents of the current column.

Proposed Response Response Status O

CI 92 SC 92.1.2.2.5 P 305 L 1 # 930  
 Lynskey, Eric Teknovus

Comment Type T Comment Status X

Figure 92-3 contains a number of traditional style violations. In addition, the state diagram should be updated to count columns instead of bytes.

SuggestedRemedy

Replace Figure 92-3 with the figure shown in 3av\_0803\_lynkey\_1.pdf.

Proposed Response Response Status O

CI 92 SC 92.1.2.2.5 P 305 L 15 # 715  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type TR Comment Status X

Closing bracket missing in the this line (?)

SuggestedRemedy

Insert the missing closing bracket in the box UPDATE.  
 Probably "If (byte\_cnt >= block\_size)"

Proposed Response Response Status O

CI 92 SC 92.1.2.3.2.1 P 306 L 1 # 919  
 Lynskey, Eric Teknovus  
 Comment Type T Comment Status X  
 Per comment 399 against D1.0, this subclause should be deleted.  
 SuggestedRemedy  
 Delete subclause.  
 Proposed Response Response Status O

CI 92 SC 92.1.2.3.3.1 P 305 L 11 # 921  
 Lynskey, Eric Teknovus  
 Comment Type T Comment Status X  
 It is unnecessary to say that if using a GMII that the behavior is defined in 65.1.3.3.1, since this is already covered by subclause 92.1.2.3.3. Only additional behavior or behavior that overrides the original behavior needs to be specified here. I suggest indicating the full XGMII behavior here to make it very clear how the SLD should be parsed and what to do if it is not found.  
 SuggestedRemedy  
 Replace all text in this subclause with the following, "Recall that the 10Gb/s RS transmit function must maintain an alignment for its start control character to lane 0. The SLD is transmitted as the third octet and therefore is aligned to lane 2 in the same column containing the start control character. This is the only possibility considered when parsing the incoming octet stream for the SLD. If the SLD field is not found then the packet shall be discarded. If the packet is transferred, the SLD shall be replaced with a normal preamble octet and the one or two octets preceding the SLD and the two octets following the SLD are passed without modification."  
 Proposed Response Response Status O

CI 92 SC 92.1.2.3.3.1 P 306 L 11 # 653  
 Hajduczenia, Marek Nokia Siemens Networ  
 Comment Type E Comment Status X  
 Language revision  
 SuggestedRemedy  
 Change "When using a GMII interface the" to "When using a GMII interface, the"  
 Proposed Response Response Status O

CI 92 SC 92.1.2.3.3.1 P 306 L 13 # 809  
 Daido, Fumio Sumitomo Electric Ind  
 Comment Type T Comment Status X  
 The SLD is always received in lane 2 of the XGMII.  
 SuggestedRemedy  
 Replace "in lane 3" with "in lane 2".  
 Proposed Response Response Status O

CI 92 SC 92.1.2.3.3.1 P 306 L 14 # 841  
 Ryan, Hirth Teknovus  
 Comment Type T Comment Status X  
 The SLD is the 3 byte of the preamble and would thus appear in lane 2 of the XGMII interface.  
 SuggestedRemedy  
 change "lane 3" to "lane 2"  
 Proposed Response Response Status O

CI 92 SC 92.1.2.3.3.2 P 306 L 11 # 920  
 Lynskey, Eric Teknovus  
 Comment Type E Comment Status X  
 Using IEEE Std. 802.3-2005 as the original reference, the correct subclause is 65.1.3.3.1 SLD. Subclause 65.1.3.3.2 is for the LLID.  
 SuggestedRemedy  
 Verify that the base document hasn't changed and update reference to 65.1.3.3.1.  
 Proposed Response Response Status O

CI 92 SC 92.1.2.3.3.2 P 306 L 17 # 731  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X  
 Remove the editorial comment.

SuggestedRemedy  
 Replace the editorial comment with the following text "This section supersedes the stipulations of subclause 65.1.3.3.2."

Proposed Response Response Status O

CI 92 SC 92.1.2.3.3.2 P 306 L 20 # 654  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision

SuggestedRemedy  
 Change "These values are acted upon differently for OLTs and ONUs." to "OLTs and ONUs act upon these values in a different manner."

Proposed Response Response Status O

CI 92 SC 92.1.2.3.3.2 P 306 L 26 # 655  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision

SuggestedRemedy  
 Change "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." to "If the received logical\_link\_id value matches 0x7FFF or 0x7FFE and there is an enabled MAC with the logical\_link\_id variable assigned the same value, then the comparison is considered a match to that MAC."

Proposed Response Response Status O

CI 92 SC 92.1.2.3.3.2 P 306 L 29 # 656  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision

SuggestedRemedy  
 Change "If the received logical\_link\_id value is any value other than 0x7FFF or 0x7FFE and an enabled MAC exists with a mode variable with a value of 0 and a logical\_link\_id variable with a value matching the received logical\_link\_id value then the comparison is considered a match to that MAC" to "If the received logical\_link\_id has the value different than 0x7FFF and 0x7FFE and there is an enabled MAC with the mode variable set to 0 and the logical\_link\_id variable matching the value of the received logical\_link\_id, then the comparison is considered a match to that MAC."

Proposed Response Response Status O

CI 92 SC 92.1.2.3.3.2 P 306 L 34 # 657  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision

SuggestedRemedy  
 Change "If the received mode bit is 0 and the received logical\_link\_id value matches the logical\_link\_id variable then the comparison is considered a match" to "If the received mode bit is equal to 0 and the value of the received logical\_link\_id variable matches the value of the logical\_link\_id variable, then the comparison is considered a match."

Proposed Response Response Status O

CI 92 SC 92.1.2.3.3.2 P 306 L 36 # 658  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision

SuggestedRemedy  
 Change "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, then the comparison is considered a match" to "If the received mode bit is equal to 1 and the value of the received logical\_link\_id variable does not match the value of the logical\_link\_id variable, or the value of the received logical\_link\_id variable is equal to 0x7FFE, then the comparison is considered a match"

Proposed Response Response Status O

Cl 92 SC 92.1.2.3.3.3 P 306 L 47 # 810  
Mandin, Jeff PMC Sierra

Comment Type E Comment Status X

*SuggestedRemedy*

Change:

The receive CRC-8 is treated as described in 65.1.3.3.3.

to:

The CRC-8 field is as described in 65.1.3.3.3.

Proposed Response Response Status O

Cl 92 SC 92.2 P 307 L 1 # 813  
Mandin, Jeff PMC Sierra

Comment Type E Comment Status X

This subclause replaces (rather than extends) the 10GBASE-R lock state machine.  
Proposed BER Monitor is another instance of functionality replacement.

Are these actually extensions to 10GBASE-R? Or this really a new PCS (as in 802.3an) ?

*SuggestedRemedy*

Consider whether it's in fact correct to title this section "extensions" of the clause 49 PCS

Proposed Response Response Status O

Cl 92 SC 92.2 P 307 L 11 # 716  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type TR Comment Status X

What is the 10GBASE-PX PCS ?  
Also affected clause 92.2.2, page 309, line 47

*SuggestedRemedy*

Define which PCS is meant - there is no 10GBASE-PX PCS defined in any of the clauses.

Proposed Response Response Status O

Cl 92 SC 92.2.1 P 308 L 13 # 931  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

In Figure 92-4 and in Figure 92-5 there needs to be an IDLE INSERTION block on the receive PCS.

*SuggestedRemedy*

Add IDLE INSERTION block above the 64/66b DECODE blocks in both figures.

Proposed Response Response Status O

Cl 92 SC 92.2.1 P 308 L 13 # 819  
Mandin, Jeff PMC Sierra

Comment Type T Comment Status X

The "IDLE insertion" functional block is missing from figure 92-4 and 92-5

*SuggestedRemedy*

Add a functional block labelled "IDLE Insertion" at the top of ONU PCS (between decode and XGMII) in figures 92-4 and 92-5.

Proposed Response Response Status O

CI 92 SC 92.2.2.1 P 307 L 22 # 10353  
Lynskey, Eric Teknovus

Comment Type T Comment Status D House-keeping

There is no such thing as an // 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 // ordered\_sets with "idle control characters".

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

(Also see 3av\_0801\_remein\_2.pdf)

Change

From:

"Upon initialization, the FIFO buffer is filled with // ordered\_sets and the laser is turned off. When the first code-group that is not // arrives at the buffer, the Data Detector sets the PMD\_SIGNAL.request(tx\_enable) primitive to the value ON, instructing the PMD sublayer to start the process of turning the laser on (see Figure 92û5).

When the buffer empties of data (i.e., contains only // ordered\_sets), the Data Detector sets the PMD\_SIGNAL.request(tx\_enable) primitive to the value OFF, instructing the PMD sublayer to start the process of turning the laser off. Between packets, // or /R/ ordered\_sets will arrive at the buffer. If the number of these // or /R/ ordered\_sets is insufficient to fill the buffer then the laser is not turned off."

To:

"Upon initialization, the FIFO buffer is filled with idle control characters and the laser is turned off. When the first code-group that is not idle arrives at the buffer, the Data Detector sets the PMD\_SIGNAL.request(tx\_enable) primitive to the value ON, instructing the PMD sublayer to start the process of turning the laser on (see Figure 92û5).

When the buffer empties of data (i.e., contains only idle control characters), the Data Detector sets the PMD\_SIGNAL.request(tx\_enable) primitive to the value OFF, instructing the PMD sublayer to start the process of turning the laser off. Between packets, idle control characters will arrive at the buffer. If the number of these idle control characters is insufficient to fill the buffer then the laser is not turned off."

CI 92 SC 92.2.2.2.2 P 314 L 8 # 945  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

There are a number of unused variables listed here that appear to be carried over from Clause 65 and previous presentations.

*SuggestedRemedy*

Remove variables and definitions for DelayBound, dtx\_code-group, laser\_control, tx\_code-group, and Wp.

Proposed Response Response Status O

CI 92 SC 92.2.2.4.5 P 318 L 54 # 1014  
Lin, Rujian Shanghai Luster Terab

Comment Type E Comment Status X

Figure 92-9

*SuggestedRemedy*

Figure 92-10

Proposed Response Response Status O

CI 92 SC 92.2.3.1 P 310 L 3 # 680  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X

Language revision

*SuggestedRemedy*

Change the text "The ALIGNMENT / IDLE DELETION block receives tx\_raw,71:0> data from the XGMII interface. If the start control code is in lane 4 the burst will be shifted to align the start to lane 0. If the minimum IPG has been transmitted after a frame and 14 tx\_raw<71:0> transfers have occurred without deleting IDLE then 2 IDLE vectors shall be deleted for every 28 vectors transmitted." to "The ALIGNMENT / IDLE DELETION block receives tx\_raw<71:0> data vector from the XGMII interface. If the start control code is in lane 4, the burst will be shifted to align the start to lane 0. If the minimum IPG has been transmitted after a frame and 14 tx\_raw<71:0> transfers have occurred without deleting IDLE, then 2 IDLE characters shall be deleted for every 28 characters transmitted."

Proposed Response Response Status O

CI 92 SC 92.2.3.1 P 310 L 3 # 949  
 Lynskey, Eric Teknovus  
 Comment Type E Comment Status X  
 Missing "<", instead there is a ",".  
 SuggestedRemedy  
 Change to tx\_raw<71:0>.  
 Proposed Response Response Status O

CI 92 SC 92.2.3.1 P 310 L 3 # 786  
 Remein, Duane Alcatel-Lucent  
 Comment Type E Comment Status X  
 Typo  
 SuggestedRemedy  
 Replace "tx\_raw,71:0>"  
 with "tx\_raw<71:0>"  
 Proposed Response Response Status O

CI 92 SC 92.2.3.2 P 310 L 7 # 733  
 Hajduczenia, Marek Nokia Siemens Networ  
 Comment Type T Comment Status X  
 Missing contents of the Subclause 92.2.3.2  
 SuggestedRemedy  
 Since 64B/66B encoding is not changed from 10GBASE-R, we can reference clause  
 49.2.4.  
 Insert text as follows: "The 64B/66B encoding process is carried out as specified in  
 Subclause 49.2.4."  
 Proposed Response Response Status O

CI 92 SC 92.2.3.2 P 310 L 8 # 787  
 Remein, Duane Alcatel-Lucent  
 Comment Type E Comment Status X  
 Cross References.  
 SuggestedRemedy  
 Add cross references as follows:  
 Under 92.2.3.2 64B/66B Encode  
 "See subclause 49.2.4 64B/66B transmission code"  
 Under 92.2.3.3 Scrambler  
 "See subclause 49.2.6 Scrambler."  
 Under 92.2.3.6 Gearbox (pg 313)  
 "See subclause 49.2.7 Gearbox."  
 Proposed Response Response Status O

CI 92 SC 92.2.3.2.1 P 315 L 11 # 10342  
 Lynskey, Eric Teknovus  
 Comment Type T Comment Status D House-keeping  
 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 W  
 PROPOSED ACCEPT.  
 Also see Figure 92-10.

**Cl 92**    **SC 92.2.3.3**                      **P 310**    **L 12**                      # **734**  
 Hajduczenia, Marek                      Nokia Siemens Networ

**Comment Type**    **T**                      **Comment Status**    **X**  
 The Subclause 92.2.3.3 body is missing

**SuggestedRemedy**  
 Since the 10GEPONs will use the 10GBASE-R PCS (with modifications), the scrambler remains the same as defined in subclause 49.2.6.  
 Insert a text in the body of subclause 92.2.3.3 as follows:  
 "Clause 92 PCS sublayer will use the Scrambler function as defined in Subclause 49.2.6".

**Proposed Response**                      **Response Status**    **O**

**Cl 92**    **SC 92.2.3.4**                      **P 310**    **L 18**                      # **805**  
 Daido, Fumio                                      Sumitomo Electric Ind

**Comment Type**    **E**                      **Comment Status**    **X**  
 The 10GBASE-RS links don't exist in the standard.

"Other lines affected:  
 Sub-Clause 92.2.3.4.1, Page 310, line 22,  
 Sub-Clause 92.2.3.4.1, Page 310, line 50;"

**SuggestedRemedy**  
 Remove "for 10GBASE-RS links" for line 18 and 22.  
 Remove "10GBASE-RS" for line50.

**Proposed Response**                      **Response Status**    **O**

**Cl 92**    **SC 92.2.3.4**                      **P 310**    **L 18**                      # **717**  
 Hajduczenia, Marek                      Nokia Siemens Networ

**Comment Type**    **TR**                      **Comment Status**    **X**  
 What is a 10GBASE-RS link ?  
 The same comment is applicable to subclause 92.2.3.4.1, page 310, line 22.  
 The same comment is applicable to subclause 92.2.3.4.3, page 310, line 50.

**SuggestedRemedy**  
 Change the sentence to "Clause 92 PCS shall use the Reed-Solomon FEC code (255, 223)".  
 In subclause 92.2.3.4.1, page 310, line 22, change the text "The FEC code used for 10GBASE-RS links is a linear cyclic block code" to "Clause 92 PCS uses the linear cyclic block FEC code"  
 In subclause 92.2.3.4.1, page 310, line 22, change the text "bytes in the 10GBASE-RS PCS transmitter is" to "bytes in the Clause 92 PCS FEC encoder is"

**Proposed Response**                      **Response Status**    **O**

**Cl 92**    **SC 92.2.3.4**                      **P 312**    **L 22**                      # **938**  
 Lynskey, Eric                                      Teknovus

**Comment Type**    **E**                      **Comment Status**    **X**  
 Incorrect Figure number.

**SuggestedRemedy**  
 Change to Figure 92-7 and update subsequent figure numbers.

**Proposed Response**                      **Response Status**    **O**

**Cl 92**    **SC 92.2.3.4.1**                      **P 310**    **L 34**                      # **808**  
 Daido, Fumio                                      Sumitomo Electric Ind

**Comment Type**    **T**                      **Comment Status**    **X**  
 The generating polynomial G(x) should be used in a equation.

**SuggestedRemedy**  
 Replace "F(x) x L(x)" with "G(x) x L(x)" which is same as the equation in 65.2.3.1.

**Proposed Response**                      **Response Status**    **O**



CI 92 SC 92.2.3.4.1 P 310 L 38 # 806  
 Daido, Fumio Sumitomo Electric Ind

Comment Type E Comment Status X  
 The suffix of X parameter should be superscript.

"Other line affected:  
 Sub-Clause 92.2.3.4.1, Page 310, line 40;"

SuggestedRemedy  
 change the subscript of X32 in line 38 and X31 in line 40 to the superscript.

Proposed Response Response Status O

CI 92 SC 92.2.3.4.1 P 310 L 45 # 807  
 Daido, Fumio Sumitomo Electric Ind

Comment Type E Comment Status X  
 The word "octet" is redundant.

SuggestedRemedy  
 Remove "octet" following d0.

Proposed Response Response Status O

CI 92 SC 92.2.3.4.1 P 310 L 46 # 776  
 Remein, Duane Alcatel-Lucent

Comment Type E Comment Status X  
 Clarification

SuggestedRemedy  
 Change: "in accordance with the conventions of 3.1.1."  
 To: "in accordance with the conventions of subclause 3.1.1."

Proposed Response Response Status O

CI 92 SC 92.2.3.4.2 P 310 L 50 # 935  
 Lynskey, Eric Teknovus

Comment Type E Comment Status X  
 Typo with 10GBASE-RS on lines 18, 22, and 50.

SuggestedRemedy  
 Replace with 10GBASE-PR.

Proposed Response Response Status O

CI 92 SC 92.2.3.4.2 P 310 L 53 # 934  
 Lynskey, Eric Teknovus

Comment Type E Comment Status X  
 Should be 223 instead of 233 in the sentence containing "...27 blocks form the 233 byte data..."

SuggestedRemedy  
 Replace 233 with 223.

Proposed Response Response Status O

CI 92 SC 92.2.3.4.2 P 310 L 53 # 811  
 Mandin, Jeff PMC Sierra

Comment Type E Comment Status X  
 RS param is wrong

SuggestedRemedy  
 Change 233 to 223

Proposed Response Response Status O

CI 92 SC 92.2.3.4.2 P 310 L 54 # 1003  
 Lin, Rujian Shanghai Luster Terab

Comment Type E Comment Status X  
 form the 233 byte data

SuggestedRemedy  
 to form the 233 byte data

Proposed Response Response Status O

**Cl 92**    **SC 92.2.3.4.2**    **P 310**    **L 54**    # **933**  
 Lynskey, Eric    Teknovus

**Comment Type**    **T**    **Comment Status**    **X**  
 The terminology is confusing when going back and forth between blocks, codewords, and symbols.

**SuggestedRemedy**  
 Replace 92.2.3.4.2 with the following:

Padding of FEC codewords and appending FEC parity bytes in the 10GBASE-PR PCS transmitter is illustrated in Figure 92-6. The 64B/66B encoder and scrambler produce 66-bit blocks. The FEC encoder accumulates 27 of these 66-bit blocks to form the basis of an FEC codeword, removing the first bit of each block (ie. the redundant sync bit of the 66-bit word).

The FEC encoder then prepends 29 "0" padding bits to the 27 65-bit blocks to form the 223 byte data portion of an FEC codeword. This data is then FEC-encoded, resulting in the 32-byte parity portion of the FEC codeword. The 223-byte data portion and 32-byte parity portion combine to form the 255-byte Reed-Solomon codeword.

**Proposed Response**    **Response Status**    **O**

**Cl 92**    **SC 92.2.3.4.2**    **P 311**    **L 2**    # **837**  
 Ryan, Hirth    Teknovus

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

**SuggestedRemedy**  
 each

**Proposed Response**    **Response Status**    **O**

**Cl 92**    **SC 92.2.3.4.2**    **P 311**    **L 2**    # **932**  
 Lynskey, Eric    Teknovus

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

**SuggestedRemedy**  
 Replace with "each".

**Proposed Response**    **Response Status**    **O**

**Cl 92**    **SC 92.2.3.4.2**    **P 311**    **L 2**    # **1004**  
 Lin, Rujian    Shanghai Luster Terab

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

**SuggestedRemedy**  
 each

**Proposed Response**    **Response Status**    **O**

**Cl 92**    **SC 92.2.3.4.2**    **P 311**    **L 2**    # **659**  
 Hajduczenia, Marek    Nokia Siemens Networ

**Comment Type**    **E**    **Comment Status**    **X**  
 Typo "eech"

**SuggestedRemedy**  
 Change to "each"

**Proposed Response**    **Response Status**    **O**

**Cl 92**    **SC 92.2.3.4.2**    **P 311**    **L 23**    # **842**  
 Ryan, Hirth    Teknovus

**Comment Type**    **T**    **Comment Status**    **X**  
 The format of Figure 92-6 should align to the format of figure 49-5. Bits should be described at 0:65. Bytes should be described as S0 to S7 as in figure 49-5. Figure 92-6 also does not show the 8-bit RS code word alignment.

**SuggestedRemedy**  
 Include a modified version of Figure 49-5 showing the multiplexing of the Parity and Sync headers. Make a separate drawing that explicitly shows the FEC codeword. This figure must include the zero padding, packet data, and 8-bit Reed Solomon bit alignments.

**Proposed Response**    **Response Status**    **O**



CI 92 SC 92.2.3.4.3 P 311 L 36 # 820  
Mandin, Jeff PMC Sierra

Comment Type T Comment Status X  
The PCS is actually transmitting to the PMA, not the PON.

SuggestedRemedy  
Replace "transmitted to the PON" with "transmitted to the PMA"

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 311 L 22 # 682  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X  
Figure 92-1 is not numbered correctly. I believe it should be 92-7 ?

SuggestedRemedy  
Correct the number of the Figure to 92-7. Renumber the remaining figures.

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 311 L 40 # 681  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X  
Avoid the use of possessive forms in technical texts

SuggestedRemedy  
Change "the ONUs' lasers" to "the lasers in ONUs"

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 311 L 41 # 736  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X  
US? Like in USA ? Or upstream ?

SuggestedRemedy  
Change "the US PCS" to "the ONU PCS "

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 311 L 46 # 737  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X  
The length of the Data Detector is said to be fixed at some value. How is that compliant with the adjustable laser on/off times from our baseline proposals?

SuggestedRemedy  
Change the sentence "The length of the FIFO buffer shall be chosen such that the delay introduced by the buffer together with any delay introduced by the PMA sublayer is long enough to turn the laser on and to allow a laser synchronization pattern, Burst Delimiter pattern and a predefined number of IDLE characters to be transmitted." to "The length of the FIFO buffer shall be adjustable in such a way that the resulting delay introduced by the buffer together with any delay introduced by the PMA sublayer is long enough to turn the laser on and to allow a laser synchronization pattern, Burst Delimiter pattern and a predefined number of IDLE characters to be transmitted."

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 312 L 1 # 812  
Mandin, Jeff PMC Sierra

Comment Type E Comment Status X  
Figure 92-1 appears in between 92-6 and 92-7

SuggestedRemedy  
Renumber the figures

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 312 L 23 # 1005  
Lin, Rujian Shanghai Luster Terab

Comment Type E Comment Status X  
Figure 92-1

SuggestedRemedy  
Figure 92-7

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 312 L 26 # 956  
 Lynskey, Eric Teknovus

Comment Type E Comment Status X  
 Per comment 352 against D1.0, a reference to Figure 92-8 was to be added here.

SuggestedRemedy  
 If the reference is still wanted, add it.

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 312 L 26 # 663  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revisions

SuggestedRemedy  
 Change "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. If this is not done the burst transmitter may occasionally be required to transmit and extra 4 bytes of data, causing the data burst to extend into the next grant. To ensure the start of a burst aligns to lane 0 of the XGMII the PCS is extended to allow removal of leading IDLE control codes." to "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. Otherwise, the burst may potentially contain extra 4 bytes of data, causing it to extend beyond the allocated end of the slot. To ensure that the start of a burst is aligned, to lane 0 of the XGMII the PCS is extended to allow removal of the leading idle control charecters."

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 312 L 27 # 662  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision

SuggestedRemedy  
 Change "burst efficient the start" to "burst efficient, the start"

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 312 L 33 # 665  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision

SuggestedRemedy  
 Change "When the first code-group that is not idle" to "When the first, non-IDLE code group"

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 312 L 35 # 684  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X  
 Incorrect Figure reference. Figure 92-6 is referenced. Probably 92-7 is meant on page 312 ?

SuggestedRemedy  
 Correct the reference to point to Figure on page 312.

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 312 L 35 # 1006  
 Lin, Rujian Shanghai Luster Terab

Comment Type E Comment Status X  
 (see Figure 92-6)

SuggestedRemedy  
 (see Figure 92-7)

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 312 L 42 # 666  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision

SuggestedRemedy  
 Change "relationship of" to "relationship between"

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 313 L 10 # 815  
 Mandin, Jeff PMC Sierra

Comment Type ER Comment Status X  
 Depiction of IDLEs in figure 92-7 is misleading

SuggestedRemedy  
 In figure 92-7, show 4 IDLEs in each "IDLE block" rather than a single //.

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 313 L 10 # 939  
 Lynskey, Eric Teknovus

Comment Type E Comment Status X  
 Is Figure 92-7, SOD is not defined. This should be the BURST\_DELIMITER.

SuggestedRemedy  
 Replace SOD with BURST\_DELIMITER.

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 313 L 11 # 834  
 Ryan, Hirth Teknovus

Comment Type T Comment Status X  
 0x555.. is transmitted in the Laser ON time.

SuggestedRemedy  
 Change the shading of the 0x555 region to include the laser on region.

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 313 L 11 # 838  
 Ryan, Hirth Teknovus

Comment Type E Comment Status X  
 "FEC Codewords with Parity" would better be described as "802.3 frame with FEC parity codewords".

SuggestedRemedy  
 change text to:"802.3 frame with FEC parity codewords"

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 313 L 11 # 835  
 Ryan, Hirth Teknovus

Comment Type T Comment Status X  
 The vertical bar above the SOD and // blocks implies alignment with the vertical bar at the end of the Sync Time above it. This is not clear if the //, // characters are part of the Sync Time.

SuggestedRemedy  
 Move the vertical bar above SOD and // to after the second // character.

Proposed Response Response Status O

CI 92 SC 92.2.3.5 P 313 L 15 # 1007  
 Lin, Rujian Shanghai Luster Terab

Comment Type E Comment Status X  
 Figure 92-7

SuggestedRemedy  
 Figure 92-8

Proposed Response Response Status O



CI 92 SC 92.2.3.7 P 313 L 38 # 687  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X

Remove the default value. Variables, constants and cunTERS which do not need the default values should not have this entry at all.

*SuggestedRemedy*

Remove the default value. Variables, constants and cunTERS which do not need the default values should not have this entry at all.

Proposed Response Response Status O

CI 92 SC 92.2.3.7.1 P 313 L 38 # 668  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X

The format of Constant definitions.  
Other clauses affected: Clause 92.2.3.7.2 (Variables), 92.2.3.7.5 (Counters)

*SuggestedRemedy*

Align with the Clause 64 format i.e.  
Name  
Definition  
Type  
Value

Proposed Response Response Status O

CI 92 SC 92.2.3.7.1 P 313 L 47 # 943  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

The value for LsrOffBound should be defined and the LsrOffBound should be defined as a variable and not a constant. Possibly due to a cut and paste error, the value changed from "tbd" in D1.0 to "tbdBURST\_DELIMITER" in D1.1.

*SuggestedRemedy*

Move LsrOffBound from 92.2.3.7.1 Constants to 92.2.3.7.2 Variables.

LsrOffBound

Type: 16-bit unsigned  
DEFAULT VALUE: TBD

This represents the delay sufficient to initiate the laser and to stabilize the receiver at the OLT. The default value of LsrOffBound is based on default values of laserOnTime (93.3.5.1) and SyncTime (93.3.3.2). This variable is only used by the ONU.

Proposed Response Response Status O

CI 92 SC 92.2.3.7.1 P 313 L 49 # 739  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X

Type missing for Minlpg

*SuggestedRemedy*

Suggested to change it to 8 bit-unsigned. The value is small enough to be stored in a 8 bit wide unsigned integer.

Proposed Response Response Status O

CI 92 SC 92.2.3.7.1 P 314 L 1 # 718  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type TR Comment Status X

Missing default value for BURST\_DELIMITER

*SuggestedRemedy*

Suggestion to use the BURST\_DELIMITER of 0x041BDB2B3D5A7C8F0 as defined in 3av\_0711\_leung\_1.pdf. This delimiter has the shortest run lenght from all the found delimiters.

Proposed Response Response Status O



Cl 92 SC 92.2.3.7.1 P 314 L 5 # 740  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X  
 Default value for the SYNC\_LENGTH seems very large

SuggestedRemedy  
 provide the proper value of the SYNC\_LENGTH. This one seems incorrect (too large)

Proposed Response Response Status O

Cl 92 SC 92.2.3.7.2 P 314 L 16 # 685  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X  
 Representation of the hexadecimal numbers: 00-6A, is not correct. Align with 1.2.5  
 Hexadecimal notation

SuggestedRemedy  
 Correct the representation of all the hexadecimal numbers in Clause 92 to Clause 1.2.5  
 Hexadecimal notation.

Proposed Response Response Status O

Cl 92 SC 92.2.3.7.2 P 314 L 20 # 799  
 Remein, Duane Alcatel-Lucent

Comment Type T Comment Status X  
 dtx\_code-group obsolete in this clause (carried over from c64)

Also line 33: tx\_code-group

SuggestedRemedy  
 Remove paragraphs

Proposed Response Response Status O

Cl 92 SC 92.2.3.7.2 P 314 L 32 # 788  
 Remein, Duane Alcatel-Lucent

Comment Type E Comment Status X  
 Excess white space

SuggestedRemedy  
 Remove excess white space from "TYPE: boolean."

Proposed Response Response Status O

Cl 92 SC 92.2.3.7.2 P 314 L 49 # 741  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X  
 Lack of type and default value for the IdleBlockCount

SuggestedRemedy  
 Suggestion to use "16-bit unsigned" as the TYPE.  
 Remove the default value. Variables which do not need the default values should not have  
 this entry at all.

Proposed Response Response Status O

Cl 92 SC 92.2.3.7.2 P 314 L 52 # 686  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X  
 The syn header 10 is a binary representation. Lack of indication suggests decimal notation  
 ...

SuggestedRemedy  
 Change "header 10" to "header 10 (binary)"

Proposed Response Response Status O

*Cl* 92    *SC* 92.2.3.7.2    *P* 315    *L* 1    # 742  
 Hajduczenia, Marek    Nokia Siemens Networ  
*Comment Type*    **T**    *Comment Status*    **X**  
 Missing type for ProtectedBlockCount variable  
*SuggestedRemedy*  
 Suggested to change to "8-bit unsigned". 8 bit variable is sufficient to store the value of 28 maximum.  
*Proposed Response*    *Response Status*    **O**

*Cl* 92    *SC* 92.2.3.7.2    *P* 315    *L* 15    # 669  
 Hajduczenia, Marek    Nokia Siemens Networ  
*Comment Type*    **E**    *Comment Status*    **X**  
 Remove editorial note  
*SuggestedRemedy*  
 Editorial note is not needed anymore. Remove it.  
*Proposed Response*    *Response Status*    **O**

*Cl* 92    *SC* 92.2.3.7.2    *P* 315    *L* 6    # 743  
 Hajduczenia, Marek    Nokia Siemens Networ  
*Comment Type*    **T**    *Comment Status*    **X**  
 Missing type for UnprotectedBlockCount variable  
*SuggestedRemedy*  
 Suggested to change to "8-bit unsigned".  
*Proposed Response*    *Response Status*    **O**

*Cl* 92    *SC* 92.2.3.7.4    *P* 315    *L* 42    # 1009  
 Lin, Rujian    Shanghai Luster Terab  
*Comment Type*    **E**    *Comment Status*    **X**  
 (see Figure 92-9)  
*SuggestedRemedy*  
 (see Figure 92-10)  
*Proposed Response*    *Response Status*    **O**

*Cl* 92    *SC* 92.2.3.7.6    *P* 316    *L* 3    # 1010  
 Lin, Rujian    Shanghai Luster Terab  
*Comment Type*    **E**    *Comment Status*    **X**  
 Figure 92-8  
*SuggestedRemedy*  
 Figure 92-9  
*Proposed Response*    *Response Status*    **O**

*Cl* 92    *SC* 92.2.3.7.6    *P* 316    *L* 5    # 950  
 Lynskey, Eric    Teknovus  
*Comment Type*    **T**    *Comment Status*    **X**  
 Figure 92-8 contains a number of traditional style violations.  
*SuggestedRemedy*  
 Update Figure 92-8 as shown in 3av\_0803\_lynskey\_2.pdf  
*Proposed Response*    *Response Status*    **O**

*Cl* 92    *SC* 92.2.3.7.6    *P* 316    *L* 54    # 1011  
 Lin, Rujian    Shanghai Luster Terab  
*Comment Type*    **E**    *Comment Status*    **X**  
 Figure 92-8  
*SuggestedRemedy*  
 Figure 92-9  
*Proposed Response*    *Response Status*    **O**

CI 92 SC 92.2.3.7.6 P 316 L 6 # 688  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X  
 Boxes "INIT" and "RECEIVE AND CLASSIFY VECTOR" are broken. Text is shifted upwards.

SuggestedRemedy  
 See 3av\_0803\_hajduczenia\_6.pdf (source in 3av\_0803\_hajduczenia\_6.fm) for suggested remedy. Do not use ARIAL font in the state machine boxes !!

Proposed Response Response Status O

CI 92 SC 92.2.3.7.6 P 317 L 1 # 1012  
 Lin, Rujian Shanghai Luster Terab

Comment Type E Comment Status X  
 in Figure 92-9

SuggestedRemedy  
 in Figure 92-10

Proposed Response Response Status O

CI 92 SC 92.2.3.7.6 P 317 L 4 # 689  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X  
 Remove the editors note. Frame is sometimes problematic when it comes to figure placement.

SuggestedRemedy  
 See the solution proposed in 3av\_0803\_hajduczenia\_7.pdf (source is 3av\_0803\_hajduczenia\_7.fm). Do not use ARIAL fonts in boxes of the state machines.

Proposed Response Response Status O

CI 92 SC 92.2.3.8.1 P 314 L 6 # 944  
 Lynskey, Eric Teknovus

Comment Type T Comment Status X  
 That's a lot of sync blocks we need to send. The default value probably belongs with the BURST\_DELIMITER constant.

SuggestedRemedy  
 Move the default value of SYNC\_LENGTH to the default value of BURST\_DELIMITER. Make the default value of SYNC\_LENGTH TBD until another value is proposed.

Proposed Response Response Status O

CI 92 SC 92.2.4 P 317 L 41 # 994  
 Kozaki, Seiji Mitsubishi Electric

Comment Type T Comment Status X  
 The function replacing uncorrectable blocks with /E/ blocks should not be mandatory. The reason is as follow. In case that there are 2 or 3 Mac frames in the uncorrectable block and the errors are concentrated at only one frame, the other frame(s) might be forward correctly.

SuggestedRemedy  
 Change the sentence of "The data blocks of the frame must then be replaced by /E/ blocks before being passed to the PCS." into "The data blocks of the frame might then be replaced by /E/ blocks before being passed to the PCS. The replacing function is optional"

Proposed Response Response Status O

CI 92 SC 92.2.4 P 317 L 42 # 821  
Mandin, Jeff PMC Sierra

Comment Type T Comment Status X

1. Current there is no text about the BER monitor process
2. Previously there has been agreement that BER monitoring should use a particular threshold of uncorrectable-FEC-frame errors as the trigger for the hi\_ber flag (ie. we should use frame errors rather than raw BER as the measure of link quality).
3. An optimal way to do this is to utilize the existing 10GBASE-R BER monitor - in conjunction with the mechanism which writes an illegal value into the sync headers contained in a bad FEC block before passing them up from the descrambler.
4. Since we are interested in bad FEC frames, we need to use a different counter value than 10GBASE-R (since two bad FEC frames in 125 us should not trigger hi-ber). The appropriate threshold may vary according to deployment - so a variable is used rather than a constant. Consequently, we should reproduce the state diagram with the inclusion of the new variable.

SuggestedRemedy

Insert new paragraph after 92.2.4.2:

"92.2.4.3 BER Monitor Process

The BER monitor process is part of the 10GBASE-R PCS and is described in 49.2.13. The process monitors the signal quality and asserts hi\_ber if excessive errors are detected in the sync header fields of the 66b blocks.

In a 10GBASE-PR and 10/1GBASE-PRX PCS, BER Monitor operates on the corrected sync headers as output by the FEC decoder. These sync headers will be in error only if the FEC decoder was unable to correct a received FEC codeword, in which case all 27 66b blocks in the codeword will carry invalid sync header values (ie. 00).

In 10GBASE-PR and 10/1GBASE-PRX, the number of sync header errors which triggers a hi\_ber event is variable - with a default value of 432 (ie. 16 uncorrectable FEC codewords within a 125 us period).

92.2.4.1.1 Constants

92.2.4.1.2 Variables

ber\_test\_sh: Boolean variable that is set true when a new sync header is available for testing and false when BER\_TEST\_SH state is entered. A new sync header is available for testing when the FEC decoder provides a series of corrected 66b blocks.

hi\_ber: Boolean variable which is asserted true when the ber\_cnt exceeds ber\_threshold

ber\_threshold: parameter that stipulates the number of invalid sync headers to be received

in 125 us in order for hi\_ber status to be triggered. Default value: 432 (ie. 16 uncorrectable FEC codewords)

ber\_cnt: Count of the number of invalid sync headers (up to a maximum of ber\_threshold) within the current 125 us period.

sh\_valid: Boolean indication that is set true if received block rx\_coded has valid sync header bits. That is, sh\_valid is asserted if rx\_coded<0> != rx\_coded<1> and de-asserted otherwise.

test\_sh: Boolean variable that is set true when a new sync header is available for testing and false when TEST\_SH state is entered. A new sync header is available for testing when the FEC decoder provides a series of corrected 66b blocks.

Insert figure from 3av\_0803\_mandin\_3.jpg

Proposed Response Response Status O

CI 92 SC 92.2.4 P 321 L # 993  
Kozaki, Seiji Mitsubishi Electric

Comment Type T Comment Status X

In Figure92-10, additional conditions for sh\_cnt and sh\_invalid\_cnt are needed. Especially, it is necessary to clarify the function of Force(sh\_cnt) and condition of sh\_valid.

SuggestedRemedy

- (1) Add new constant parameters "d\_sh\_cnt" and "p\_sh\_cnt".  
d\_sh\_cnt : count number of sh at data block  
default value = 27  
p\_sh\_cnt : count number of sh at parity block  
default value = 4
- (2) Add new variable parameter "st\_data"  
st\_data : present state of checking data block(s)  
default value = 1
- (3) Add note for Force()  
Force(sh\_cnt) returns true if sh\_cnt%31 < 28, false if sh\_cnt%31 > 27
- (4) Add following formula in the VALID\_SH box and INVALID\_SH box, at the end.  
st\_data <= Force(sh\_cnt)
- (5) Change the conditions under the TEST\_SH box as follow.  
"sh\_valid[sh\_cnt]" to "sh\_valid[sh\_cnt]\*st\_data = 1"  
"!sh\_valid[sh\_cnt]" to "sh\_valid[sh\_cnt]\*st\_data = 0"  
(\* means Exclusive-or operation)

Proposed Response Response Status O

CI 92 SC 92.2.4.1 P 317 L 10 # 823  
Mandin, Jeff PMC Sierra

Comment Type T Comment Status X

The logical interface between the synchronizer and FEC decoder is simpler and more intuitive if the synchronizer presents an entire codeword's worth of 66b blocks to the decoder.

This is consistent with the approach taken in figure 49-6

SuggestedRemedy

1. Modify 92.2.4.1 so that it reads thus:

"The codeword synchronization function receives data via 16-bit PMA\_UNITDATA.request primitive.

The synchronizer 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 92-##). It obtains lock to the 31\*66-bit blocks in the bit stream using the sync headers and passes up a sequence of 31 66-bit blocks to the FEC decoder . Lock is obtained as specified in the codeword lock state machine shown in Figure 92-##.

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 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.

2. Delete all but the first sentence of 92.2.4.6.3

Proposed Response Response Status O

CI 92 SC 92.2.4.1 P 317 L 13 # 987  
Lynskey, Eric Teknovus

Comment Type E Comment Status X

Missing reference to figure on lines 13 and 17. Also on page 320 line 13.

SuggestedRemedy

Figure 92-10.

Proposed Response Response Status O

CI 92 SC 92.2.4.1 P 317 L 17 # 690  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X

Reference missing in the text

SuggestedRemedy

Change "Figure 92-##" to "Figure 92-10" (most likely). Use uniform designators of the missing value e.g. "?TBD?" or alike.

Proposed Response Response Status O

CI 92 SC 92.2.4.1 P 317 L 19 # 670  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type E Comment Status X  
 Language revision

*SuggestedRemedy*

Change "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." to "The incoming sync header pattern comprises 27 conventional (Clause 49) sync headers (binary 01 or binary 10), and then binary 00, binary 11, binary 11, and finally binary 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 the codeword lock.

When codeword lock is true, the decoder guarantees that the sync header of the last block in the codeword will be equal to the binary 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 equal to conventional headers, and forcing the last four headers to be binary 00, binary 00, binary 00, and finally binary 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 binary 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."

Proposed Response Response Status O

CI 92 SC 92.2.4.1 P 317 L 19 # 833  
 Ryan, Hirth Teknovus

Comment Type T Comment Status X  
 The parity sync header in line 18/19 of 00,11,11,00 does not match the sync header in line 24-26 of 00,00,00,11.

*SuggestedRemedy*

Change lines 24-26 to 00,11,11,00.

Proposed Response Response Status O

CI 92 SC 92.2.4.1 P 317 L 24 # 1013  
 Lin, Rujian Shanghai Luster Terab

Comment Type E Comment Status X  
 even in the face of errors

*SuggestedRemedy*

even in the case of errors

Proposed Response Response Status O

CI 92 SC 92.2.4.2 P 317 L 35 # 691  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X  
 Inconsistency in the naming ... "66b block" while in other places "66 bit blocks" are used.

*SuggestedRemedy*

Align "66b" to "66 bit". Global search and replace.

Proposed Response Response Status O

CI 92 SC 92.2.4.2 P 317 L 36 # 832  
 Ryan, Hirth Teknovus

Comment Type T Comment Status X

The FEC decoder is also responsible for correcting bit 65 of the 66-bit code word. If bit 65 == bit 64 in the payload blocks, the bit 65 shall be inverted.

*SuggestedRemedy*

add text after line 36. "The FEC decoder is also responsible for correcting bit 65 of the 66-bit code word. If bit 65 == bit 64 in the payload blocks, the bit 65 shall be inverted."

Proposed Response Response Status O

CI 92 SC 92.2.4.2 P 317 L 40 # 822  
 Mandin, Jeff PMC Sierra

Comment Type T Comment Status X

The FEC decoder should replace received sync headers with invalid values when it needs to trigger reception of an error code (rather than replacing the data directly).

*SuggestedRemedy*

Change:

"The data blocks of the frame must then be replaced by /E/ blocks before being passed to the PCS."

to:

"The sync headers of the data blocks carried in the frame are then be replaced with the invalid '00' value before being passed to the PCS."

Proposed Response Response Status O

CI 92 SC 92.2.4.3 P 317 L 42 # 777  
 Remein, Duane Alcatel-Lucent

Comment Type E Comment Status X

More cross references.

*SuggestedRemedy*

Add the following cross references

92.2.4.3 Descrambler

"See 49.2.10 Descrambler."

92.2.4.4 66B/64B Decode

"See 49.2.11 Receive process."

Proposed Response Response Status O

CI 92 SC 92.2.4.3 P 317 L 43 # 744  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X

The Subclause 92.2.4.3 body is missing

*SuggestedRemedy*

Since the 10GEPONs will use the 10GBASE-R PCS (with modifications), the descrambler remains the same as defined in subclause 49.2.10.

Insert a text in the body of subclause 92.2.4.3 as follows:

"Clause 92 PCS sublayer will use the Descrambler function as defined in Subclause 49.2.10".

Proposed Response Response Status O

CI 92 SC 92.2.4.4 P 317 L 47 # 745  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type T Comment Status X

The Subclause 92.2.4.4 body is missing

*SuggestedRemedy*

Since 64B/66B decoding is not changed from 10GBASE-R, we can reference clause 49.2.4.

Insert text as follows: "The 64B/66B decoding process is carried out as specified in Subclause 49.2.4."

Proposed Response Response Status O

Cl 92 SC 92.2.4.5 P 317 L 51 # 992  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

There is currently no mechanism defined for the receiving PCS to insert the IDLE codes that need to take the place of the removed FEC parity bytes. A state diagram and supporting text for variables is provided. Some text describing the state diagram may also be wanted.

Two state machines are provided. The first state machine writes 72-bit vectors into a FIFO, and the second reads them out. On the write side, the rate is slower than the normal XGMII rate. This is due to the fact that the FEC parity blocks are being removed and not put through the decoder and descrambler. On the read side, the rate is the normal XGMII rate. The read side must sometimes insert extra idles that replace the parity octets (although not necessarily in the same location as the parity bytes).

#### SuggestedRemedy

Add figure in 3av\_lynskey\_0803\_4.pdf.

Add to 92.2.3.4.7 Messages

DECODER\_UNITDATA.indicate(rx\_raw\_in<71:0>)

A signal sent by the PCS Receive process conveying the next code-group received and decoded.

DUDI

Alias for DECODER\_UNITDATA.indicate(rx\_raw\_in<71:0>).

Add to 92.2.3.7.2 Variables

NextVector

TYPE: 72-bit binary

Holds contents of current rx\_raw\_in<71:0> vector.

PrevVector

TYPE: 72-bit binary

Holds contents of previous rx\_raw\_in<71:0> vector.

rx\_raw\_in<71:0>

Vector received from the output of the 64B/66B decoder containing two successive XGMII transfers. RXC<0> through RXC<3> for the first transfer are placed in rx\_raw<0> through rx\_raw<3>, respectively. RXC<0> through RXC<3> for the second transfer are placed in rx\_raw<4> through rx\_raw<7>, respectively. RXD<0> through RXD<31> for the first transfer are placed in rx\_raw<8> through rx\_raw<39>, respectively. RXD<0> through RXD<31> for the second transfer are placed in rx\_raw<40> through rx\_raw<71>, respectively.

rx\_raw\_out<71:0>

Vector received from the output of the IDLE insertion function containing two successive

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general  
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn  
SORT ORDER: Clause, Subclause, page, line

XGMII transfers. RXC<0> through RXC<3> for the first transfer are placed in rx\_raw<0> through rx\_raw<3>, respectively. RXC<0> through RXC<3> for the second transfer are placed in rx\_raw<4> through rx\_raw<7>, respectively. RXD<0> through RXD<31> for the first transfer are placed in rx\_raw<8> through rx\_raw<39>, respectively. RXD<0> through RXD<31> for the second transfer are placed in rx\_raw<40> through rx\_raw<71>, respectively.

Add to 93.2.3.7.5 Counters

ExcessIdleCount

TYPE: 16-bit signed

Counts the number of 72-bit idle vectors that need to be inserted by the receiving PCS to take the place of removed FEC parity vectors.

FrameReadyCount

TYPE: 16-bit unsigned

Counts the number of frames that are waiting in the receive FIFO.

RxVectorCount

TYPE: 16-bit unsigned

Counts the number of of 72-bit vectors removed from the receive FIFO.

Proposed Response Response Status O

Cl 92 SC 92.2.4.5 P 318 L 1 # 952  
Lynskey, Eric Teknovus

Comment Type E Comment Status X

Editorial fixes for Figure 92-9.

#### SuggestedRemedy

In INIT state, replace "UpprotectedBlockCount" with "UnprotectedBlockCount".

Rename second TRANSMIT\_BURST\_PREAMBLE state to FEC\_IS\_ON on line 15 (as shown in 3av\_0703\_kramer\_1.pdf). Also in this state, on line 32, replace "SuncHeader" with "SyncHeader". On line 31, replace "IDLMS" with "IDLES".

In first TRANSMIT\_BURST\_PREAMBLE state, change comment on line 45 from "IDLMS" to "IDLES". Also in this state, on line 46, change "SuncHeader" to "SyncHeader".

Also, throughout the figure, update with IEEE style.

Proposed Response Response Status O



CI 92 SC 92.2.4.5 P 318 L 1 # 953  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

Technical fixes for Figure 92-9. The figure needs to be updated to use the 27 data plus 4 parity blocks for the FEC.

*SuggestedRemedy*

Change the value of 28 to 27 in the following states: LASER\_IS\_OFF, TRANSMIT\_BURST\_PREAMBLE(1), and TRANSMIT\_BURST\_PREAMBLE(2).

In the LASER\_IS\_OFF state, add an occurrence of TransmitBlock(0x555...) so that there are 4 calls to this function every time the UnprotectedBlockCount is greater than or equal to 27.

In the first TRANSMIT\_BURST\_PREAMBLE state, add an occurrence of TransmitBlock(0x555...) so that there are 4 calls to this function every time the UnprotectedBlockCount is greater than or equal to 27.

In the second TRANSMIT\_BURST\_PREAMBLE state, remove the TransmitBlock(0x555...) call and add two more TransmitBlock calls to transmit the other two parity blocks: TransmitBlock(PARITY[2]) and TransmitBlock(PARITY[3]). On the exit condition from this state, replace N with LsrOffBound.

Proposed Response Response Status O

CI 92 SC 92.2.4.5 P 318 L 27 # 986  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

PMD\_SIGNAL.request can take on values of ON and OFF.

*SuggestedRemedy*

In TURN\_LASER\_ON state on line 27 change to ON. In TURN\_LASER\_OFF state on line 41 change to OFF.

Proposed Response Response Status O

CI 92 SC 92.2.4.6.1 P 319 L 12 # 692  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X

Language revision + alignment of the definition of variables, contants etc. to the common format.

Subclauses 92.2.4.6.1, 92.2.4.6.2 and 92.2.4.6.3 are affected.

*SuggestedRemedy*

See 3av\_0803\_hajduczenia\_8.pdf for the proposed modifications to subclauses 92.2.4.6.1, 92.2.4.6.2 and 92.2.4.6.3. 3av\_0803\_hajduczenia\_8.fm contains the source files.

Proposed Response Response Status O

CI 92 SC 92.2.4.6.3 P 320 L 1 # 948  
Lynskey, Eric Teknovus

Comment Type E Comment Status X

The closing parenthesis should be kept with the function. The function also appears to be written in a different font. Also, use consistent array indexing brackets. In 92.2.4.6.1 it uses array[xx]. Here, it uses array<xx>.

*SuggestedRemedy*

Rewrite the function with the normal font and keep the definition on one page.

Proposed Response Response Status O

CI 92 SC 92.2.4.6.6 P 320 L 13 # 954  
Lynskey, Eric Teknovus

Comment Type E Comment Status X

Figure reference is incorrect.

*SuggestedRemedy*

Update to Figure 92-10 (or correct Figure number).

Proposed Response Response Status O

CI 92 SC 92.2.4.6.6 P 320 L 13 # 693  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X  
 Reference missing in the text

SuggestedRemedy  
 Change "Figure 92-##" to "Figure 92-10" (most likely). Use uniform designators of the missing value e.g. "?TBD?" or alike.

Proposed Response Response Status O

CI 92 SC 92.2.4.6.6 P 321 L 1 # 946  
 Lynskey, Eric Teknovus

Comment Type E Comment Status X  
 Figure 92-10 should use the assignment operator instead of "==".

SuggestedRemedy  
 Replace "==" with the assignment operator as shown in Table 21-1.

Proposed Response Response Status O

CI 92 SC 92.2.4.6.6 P 321 L 36 # 947  
 Lynskey, Eric Teknovus

Comment Type T Comment Status X  
 The SLIP state is missing the call to the SLIP function.

SuggestedRemedy  
 Add SLIP function call to the SLIP state as shown in 3av\_0801\_effenberg\_4.pdf.

Proposed Response Response Status O

CI 92 SC 92.2.4.6.6 P 321 L 40 # 1015  
 Lin, Rujian Shanghai Luster Terab

Comment Type E Comment Status X  
 Figure 92-10

SuggestedRemedy  
 Figure 92-11

Proposed Response Response Status O

CI 92 SC 92.2.5 P 322 L 1 # 817  
 Mandin, Jeff PMC Sierra

Comment Type T Comment Status X  
 Base Text for PCS management

SuggestedRemedy  
 Incorporate 3av\_0803\_mandin\_2.pdf

Proposed Response Response Status O

CI 92 SC 92.3.5 P 313 L 24 # 826  
 Mandin, Jeff PMC Sierra

Comment Type TR Comment Status X  
 BURST\_DELIMITER is not defined.

Way back when ( [http://www.ieee802.org/3/10GEPON\\_study/email/msg00270.html](http://www.ieee802.org/3/10GEPON_study/email/msg00270.html) ) the number preferred was binary 11 followed by 0xb56d244aec44e35

SuggestedRemedy

- Append new subclause 92.3.5.1 at the end of 92.3.5

"92.3.5.1 BURST\_DELIMITER

The BURST\_DELIMITER is the 66bit sequence shown here:

```

1 1          b5 6d 24 4a ae c4 4e 35
2 leading bits octets: 0 1 2 3 4 5 6 7

```

The transmission is from left to right. The first bit out on the wire is the leading '1' bit at the far left."

- Modify 92.3.3.8.1 thus:

"BURST\_DELIMITER  
 TYPE: 66 bit unsigned  
 A 66-bit value used to find the beginning of the first FEC codeword in the upstream burst.  
 The value is depicted in 92.3.5.1.

Proposed Response Response Status O

**Cl 92**    **SC 92.4.2.1**                      **P 317**                      **L 26**                      # **988**  
 Lynskey, Eric                                      Teknovus  
**Comment Type**    **E**                      **Comment Status**    **X**  
     Extra line in middle of sentence.  
**SuggestedRemedy**  
     Remove.  
**Proposed Response**                      **Response Status**    **O**

**Cl 92**    **SC 92.4.2.1**                      **P 317**                      **L 9**                      # **989**  
 Lynskey, Eric                                      Teknovus  
**Comment Type**    **E**                      **Comment Status**    **X**  
     Probably not a good idea to be using binary and decimal notation in the same subclause like this.  
**SuggestedRemedy**  
     Quotes are used in some places for the sync bits. Possibly use quotes throughout.  
**Proposed Response**                      **Response Status**    **O**

**Cl 93**    **SC 93**                                      **P 53**                      **L 1**                      # **1045**  
 Hajduczenia, Marek                                      Nokia Siemens Networ  
**Comment Type**    **TR**                      **Comment Status**    **X**  
     Clause 93 and Clause 64 contain a lot of repetitive material and can be condensed into a single clause with 2 annexes, as described in detail in the Suggested Remedy.  
**SuggestedRemedy**  
     Remove Clause 93.  
     Replace Clause 64 with the contents of 3av\_0803\_hajduczenia\_12.pdf, 3av\_0803\_hajduczenia\_13.pdf and 3av\_0803\_hajduczenia\_14.pdf (source in 3av\_0803\_hajduczenia\_12.fm, 3av\_0803\_hajduczenia\_13.fm, 3av\_0803\_hajduczenia\_14.fm). List of general changes:  
     - clause 64 was cleaned from all data rate dependent definitions (any values in ns were converted into time\_quanta units)  
     - definitions of the MPCPDUs were extended with the optional fields (GATE, REGISTER\_REQ and REGISTER MPCPDUs) - the extended fields will be transmitted as zeros in the case of 1 G EPONs  
     - extended the Discovery Process description and figure 64-14 to reflect the necessary changes in the Discovery Process, due to the existence of optional fields  
     - extended the state machines in the Discovery Processing section, including parsing for new optional fields  
     - added a new function GetLaserTime, which is defined in Clause 64 and specified in Annex 64A for 1G and Annex 64B for 10G EPONs  
     - created Annex 64A and Annex 64B for 1 and 10G EPONs, respectively, both are normative and contain definitions for individual elements of the MPCP framework different between 1G and 10G EPONs.  
**Proposed Response**                      **Response Status**    **O**

Cl 93 SC 93.1.2 P 5 L 30 # 961  
 Lynskey, Eric Teknovus

Comment Type T Comment Status X

Since this clause is completely independent of clause 64, there is no need to talk about the 1000 Mb/s SCB MAC. This is fully defined in Clause 64, and we only need to talk about the 10 Gb/s SCB MAC here.

SuggestedRemedy

Revert back to unchanged Clause 64 text.

"In the downstream direction, the PON is a broadcast medium. In order to make use of this capability for forwarding broadcast frames from the OLT to multiple recipients without multiple duplication for each ONU, the single-copy broadcast (SCB) support is introduced.

The OLT has at least one MAC associated with every ONU. In addition one more MAC at the OLT is marked as the SCB MAC. The SCB MAC handles all downstream broadcast traffic, but is never used in the upstream direction for client traffic, except for client registration. Optional higher layers may be implemented to perform selective broadcast of frames. Such layers may require additional MACs (multicast MACs) to be instantiated in the OLT for some or all ONUs increasing the total number of MACs beyond the number of ONUs + 1.

When connecting the SCB MAC to an 802.1D bridge port it is possible that loops may be formed due to the broadcast nature. Thus it is recommended that this MAC not be connected to an 802.1D bridge port.

SCB channel configuration as well as filtering and marking of frames for support of SCB is defined in 92.1.2.3.3.2.

Proposed Response Response Status O

Cl 93 SC 93.1.3 P 7 L 7 # 924  
 Lynskey, Eric Teknovus

Comment Type E Comment Status X

Figure 93-3 contains references to Clause 64.

SuggestedRemedy

Replace the Clause 64 references with the relevant Clause 93 references. A quick look shows that you should be able to replace the 64 with 93 in all cases.

Proposed Response Response Status O

Cl 93 SC 93.1.3 P 7 L 7 # 923  
 Lynskey, Eric Teknovus

Comment Type E Comment Status X

By the time we get to working group ballot, IEEE 802.3Rev will be very near completion if not fully completed. A number of changes were made to Clause 64, and therefore Clause 93, which will need to be updated. For example, look at Figure 64-3 / Figure 93-3. It may be a good idea to get started on getting the latest changes implemented now instead of later.

SuggestedRemedy

Update Clause 93 so that it is consistent with the Clause 64 that will be approved in IEEE 802.3Rev.

Proposed Response Response Status O

Cl 93 SC 93.1.3 P 7 L 7 # 960  
 Lynskey, Eric Teknovus

Comment Type E Comment Status X

Figure 93-3 contains references to clause 64.

SuggestedRemedy

Replace all clause 64 references with clause 93 references.

Proposed Response Response Status O

Cl 93 SC 93.2.2.1 P 14 L 10 # 966  
 Lynskey, Eric Teknovus

Comment Type T Comment Status X

tqSize is incorrect for 10G operation. Of course, the ONU needs to know what speed it is running at in order to use the correct value. For a 1G upstream ONU, it needs to use a value of 2, and for a 10G upstream ONU, it needs to use a value of 20. Currently there is no good way to maintain separate variables for the symmetric and asymmetric ONU.

SuggestedRemedy

Replace value with 20.

Proposed Response Response Status O

CI 93 SC 93.2.2.4 P 16 L 3 # 963  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

The equation for 10G\_PCS\_Overhead is incorrect. Just as the EPON FEC\_Overhead function did not take 8B/10B overhead into account, this function does not need to look at 64B/66B overhead. We only need to look at the overhead that the MAC sees, and this is in terms of regular data bytes.

Each block of 216 data bytes requires 32 bytes of parity to be added. Since the MPCP layer knows about and keeps track of the timestamp, this can be equated to delaying 4 time quanta for every 27 time quanta.

*SuggestedRemedy*

Replace function with the following:

FEC\_Overhead(length)

This function calculates the size of additional overhead to be added by the FEC encoder while encoding a frame of size length. Parameter length represents the size of an entire frame including preamble, SFD, DA, SA, Length/Type, and FCS. As specified in 92.2.3.4 the FEC encoder adds 32 parity octets for each block of 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:

... see 3av\_lynkey\_0308\_5.pdf

Proposed Response Response Status O

CI 93 SC 93.3.2.3 P 24 L 20 # 984  
Lynskey, Eric Teknovus

Comment Type E Comment Status X

A common method of showing the LLID should be used throughout. This comment also applies to 93.3.3.6 page 32 line 26.

*SuggestedRemedy*

Change 7F-FF to 0x7FFF, and 7F-FE to 0x7FFE.

Proposed Response Response Status O

CI 93 SC 93.3.2.3 P 24 L 31 # 962  
Lynskey, Eric Teknovus

Comment Type E Comment Status X

Incorrect reference. Also on 93.2.2.4 page 16 line 10.

*SuggestedRemedy*

On page 24 line 31, change 92.1.3.3.2 to 92.1.2.3.3.2. On page 16 line 10, change ?92.2.3.2? to 92.2.3.4.

If possible, also try to synchronize the different files so that cross references will update automatically if they change.

Proposed Response Response Status O

CI 93 SC 93.3.3 P 25 L 8 # 982  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

The textual description of the discovery process should be expanded to include the new features.

*SuggestedRemedy*

Replace sentence starting at end of line 7 with, "Included in the REGISTER\_REQ message is the ONU's MAC address, number of maximum pending grants, laser on time, and laser off time."

Replace sentence starting at end of line 13 with, "Also, the OLT echoes the number of pending grants, laser on time, and laser off time."

Proposed Response Response Status O

CI 93 SC 93.3.3 P 26 L 1 # 983  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

Figure 93-14 does not include the new fields (discovery information, laser on and laser off) that have been added to the discovery process.

*SuggestedRemedy*

Add the new fields to the figure.

Proposed Response Response Status O

CI 93 SC 93.3.3 P75 L # 827  
Oota, Noriyuki NTT

Comment Type E Comment Status X

Fig93-14 Discovery Handshake Message Exchange has no description of Discovery Information. Laser On Time and Laser Off Time.

*SuggestedRemedy*

Change the discovery GATE description to "GATE1{DA = MAC Control, SA = OLT MAC address, content = Grant + Discovery Information + Sync Time}."

Change the REGISTER\_REQ description to "REGISTER\_REQ1{DA = MAC Control, SA = ONU MAC address, content = Pending grants + Discovery Information + Laser On Time + Laser Off Time}."

Change the REGISTER description to "REGISTER1{DA = ONU MAC address, SA = OLT MAC address, content = LLID + Sync Time + echo of pending grants + echo of Laser On Time + echo of Laser Off Time}."

Proposed Response Response Status O

CI 93 SC 93.3.3 P75 L1 # 1044  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type TR Comment Status X

Figure 93-14 does not reflect the extended information carried in the GATE, REGISTER\_REQ and REGISTER MPCPDUs.

*SuggestedRemedy*

A modified (updated figure) is included in 3av\_0803\_hajduczenia\_10.pdf (see also the 3av\_0803\_hajduczenia\_10.fm for source file).

Update the description of the Discovery Process contained in 93.3.3 as included in 3av\_0803\_hajduczenia\_11.pdf (see also the 3av\_0803\_hajduczenia\_11.fm for source file).

Proposed Response Response Status O

CI 93 SC 93.3.3 P76 L3 # 1043  
Hajduczenia, Marek Nokia Siemens Networ

Comment Type TR Comment Status X

Primitive MA\_CONTROL.request(DA,REGISTER,LLID,status) does not contain pending\_grants, yet in 93.3.3.5 the same primitive is defined as MA\_CONTROL.request(DA, REGISTER, LLID, status, pending\_grants). Lack of consistency

*SuggestedRemedy*

Change the primitive MA\_CONTROL.request(DA,REGISTER,LLID,status) on page 76 to MA\_CONTROL.request(DA,REGISTER,LLID,status, pending\_grants). Interfaces affected: Discovery Processing (Broadcast and Unicast instances for OLT).

Proposed Response Response Status O

CI 93 SC 93.3.3.2 P29 L26 # 981  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

During syncTime for 10Gb/s symmetric ONUs, more than just IDLE is transmitted. How do we go about specifying different behavior for the different ONUs?

*SuggestedRemedy*

Replace the last sentence with the following: "During the synchronization time a 1000 Mb/s ONU transmits only IDLE patterns, and 10 Gb/s ONU sends a synchronization pattern of 0x55 (binary 0101...) followed by a burst delimiter and idle blocks as defined in 92.2.3.5."

Proposed Response Response Status O

CI 93 SC 93.3.3.2 P77 L47 # 804  
Kuroda, Yasuyuki O F Networks Co., Ltd.

Comment Type E Comment Status X

The "laserOffTime" and "laserOnTime" are not a constant but a variable.

*SuggestedRemedy*

Replace the word of "constant" with "variable".  
"This constant holds the time required ---"  
=>"This variable holds the time required ---"

Proposed Response Response Status O

CI 93 SC 93.3.3.2 P 77 L 49 # 829  
Oota, Noriyuki NTT

Comment Type T Comment Status X

Defined type of laserOffTime does not match assignment in Figure 93-20 Discovery Processing OLT Register State Diagram. The variable laserOffTime is defined as 32 bit unsigned type. But Figure 93-20: "data\_tx[104:111] <= laserOffTime" indicates assignment as 8 bit width. And, laserOnTime is also.

SuggestedRemedy

Change definition of type of laserOffTime and laserOnTime to 8 bit unsigned.

Proposed Response Response Status O

CI 93 SC 93.3.3.5 P 29 L 52 # 980  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

Add discoveryInformation to the MA\_CONTROL.request message.

SuggestedRemedy

Modify to "MA\_CONTROL.request(DA, GATE, discovery, start, length, discovery\_length, sync\_time, discoveryInformation)"

Add "discoveryInformation: speed(s) the OLT is capable of receiving and speed(s) at which the discovery window will open for."

Proposed Response Response Status O

CI 93 SC 93.3.3.5 P 30 L 37 # 976  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

The MA\_CONTROL.indication needs to have the discovery information and laserOn and laserOff parameters added to it.

SuggestedRemedy

Change to MA\_CONTROL.indication(REGISTER\_REQ, status, flags, pending\_grants, RTT, discoveryInformation, laserOnTime, laserOffTime). Add parameters as follows:

discoveryInformation: This parameter holds the contents of the discovery information field in the REGISTER\_REQ message. This parameter holds a valid value only when the primitive is generated by the Discovery process in the OLT.

laserOnTime: This parameter holds the contents of the laserOn field in the REGISTER\_REQ message. This parameter holds a valid value only when the primitive is generated by the Discovery process in the OLT.

laserOffTime: This parameter holds the contents of the laserOff field in the REGISTER\_REQ message. This parameter holds a valid value only when the primitive is generated by the Discovery process in the OLT.

Proposed Response Response Status O

CI 93 SC 93.3.3.5 P 33 L 20 # 979  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

Figure 93-18 needs to have the discovery information field added to it.

SuggestedRemedy

Add data\_tx[120:135] = discoveryInformation to the SEND\_DISCOVERY\_WINDOW state. Add discoveryInformation to the MACR call leading into this state.

Proposed Response Response Status O





CI 93 SC 93.3.6 P 48 L 16 # 964  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

For 10G operation a time\_quantum is no longer 16 bit transmissions.

*SuggestedRemedy*

Replace with: Timestamp. The timestamp field conveys the content of the localTime register at the time of transmission of the MPCPDUs. This field is 32 bits long and counts time in 1 time\_quantum granularity.

Proposed Response Response Status O

CI 93 SC 93.3.6 P 48 L 16 # 985  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

16 bit transmissions is a carry over from Clause 64.

*SuggestedRemedy*

Either replace with "160 bit transmissions" or replace the two sentences with "This field is 32 bits long and increments every 16 ns. The timestamp counts time in 1 time\_quantum granularity."

Proposed Response Response Status O

CI 93 SC 93.3.6.1 P 49 L 10 # 957  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

Figure 93-31 does not show the discovery information field.

*SuggestedRemedy*

Add discovery information field.

Proposed Response Response Status O

CI 93 SC 93.3.6.1 P 50 L 22 # 965  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

Instead of idle, the ONU sends a repeating 0x5555... pattern, burst delimiter, and some idle codes during the sync time (see figure 92-7).

This comment also applies to page 56 line 14. Identical text should be used in both locations.

*SuggestedRemedy*

Replace sentence with the following: "During the synchronization time the ONU shall send a synchronization pattern of 0x55 (binary 0101...) followed by a burst delimiter and idle blocks as defined in 92.2.3.5."

Proposed Response Response Status O

CI 93 SC 93.3.6.1 P 50 L 36 # 972  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

Table 93-1 can be rearranged so that the default values of all zero imply the opening of a legacy 1G discovery window. This would make the parsing of this discovery gate the same no matter what ONU is used.

*SuggestedRemedy*

Change bits 0 and 4 in the following manner:

Bit 0 - OLT is not 1G upstream capable

Values:

0 - OLT does support 1000 Mb/s reception.

1 - OLT does not support 1000 Mb/s reception.

Bit 4 - OLT is not opening 1G discovery window

Values:

0 - OLT can receive 1000 Mb/s data in this window.

1 - OLT cannot receive 1000 Mb/s data in this window.

Proposed Response Response Status O

CI 93 SC 93.3.6.1 P50 L38 # 958  
 Lynskey, Eric Teknovus

Comment Type T Comment Status X  
 Table 93-1 should be written from the point of view of the OLT. For bits 0 and 1, talk about reception and not transmission.

SuggestedRemedy  
 0 - OLT does not support 1000 Mb/s reception.  
 1 - OLT supports 1000 Mb/s reception.

0 - OLT does not support 10 Gb/s reception.  
 1 - OLT supports 10 Gb/s reception.

Proposed Response Response Status O

CI 93 SC 93.3.6.1 P98 L # 830  
 Oota, Noriyuki NTT

Comment Type T Comment Status X  
 GATE MPCPDU in Figure 93-31 has no field of Discovery Information.

SuggestedRemedy  
 Insert Discovery Information field between Grant #4 Length field and Sync Time field.

Proposed Response Response Status O

CI 93 SC 93.3.6.1 P98 L1 # 803  
 Kuroda, Yasuyuki O F Networks Co., Ltd.

Comment Type E Comment Status X  
 The Discovery Information field is missed in Figure 93-31.

SuggestedRemedy  
 Add the Discovery Information field to Figure 93-31.  
 "---, Grant #4 Length, Sync Time, Pad/Reserved, FCS"  
 =>"---, Grant #4 Length, Sync Time, Discovery Information, Pad/Reserved, FCS"

Proposed Response Response Status O

CI 93 SC 93.3.6.1 P98 L10 # 816  
 Mandin, Jeff PMC Sierra

Comment Type T Comment Status X  
 Missing Field

SuggestedRemedy  
 Add the Discovery Information field to GATE MPCPDU illustration in figure 93-31

Proposed Response Response Status O

CI 93 SC 93.3.6.1 P99 L # 828  
 Oota, Noriyuki NTT

Comment Type E Comment Status X  
 There is no description table about the number of grants/Flags field.

SuggestedRemedy  
 Add the description table about the number of grants/Flags field.

Proposed Response Response Status O

CI 93 SC 93.3.6.1 P99 L18 # 1042  
 Hajduczenia, Marek Nokia Siemens Networ

Comment Type ER Comment Status X  
 Discovery Information field seems to be misplaced.

SuggestedRemedy  
 Move the Discovery Information field to behind the Sync Time field. Otherwise it seems that the Discovery Field precedes the Syn Time field which is not true.

Proposed Response Response Status O

CI 93 SC 93.3.6.1 P 99 L 35 # 824  
Mandin, Jeff PMC Sierra

Comment Type TR Comment Status X

We've been maintaining backward-compatibility in MPCP PDU definitions - ie. the PDU definitions must be such that a 1G format PDU is legal and correctly interpreted according to the 10G definitions.

Consequently the "OLT is 1G upstream capable" bit of Discovery Info must use the value '0' to indicate 1G capability (not 1).

Same thing for the "opening 1G discovery window" bit.

*SuggestedRemedy*

1. Modify the "Values" field of the bit 0 entry in Table 93-1 so that it appears thus:

- 0 – OLT supports 1000 Mb/s transmission in the upstream direction
- 1 – OLT does not support 1000 Mb/s transmission in the upstream direction

2. Modify the "Values" field of the bit 4 entry in Table 93-1 so that it appears thus:

- 0 – OLT can receive 1000 Mb/s data in this window
- 1 – OLT cannot receive 1000 Mb/s data in this window

Proposed Response Response Status O

CI 93 SC 93.3.6.3 P 54 L 1 # 959  
Lynskey, Eric Teknovus

Comment Type E Comment Status X

Extra period in front of REGISTER\_REQ in subclause heading.

*SuggestedRemedy*

Replace ".REGISTER\_REQ" with "REGISTER\_REQ"

Proposed Response Response Status O

CI 93 SC 93.3.6.3 P 54 L 32 # 973  
Lynskey, Eric Teknovus

Comment Type T Comment Status X

Table 93-5 can be rearranged so that the default values of all zero imply the register request of a legacy 1G ONU. This would make the parsing of this message the same no matter what ONU or OLT is used.

*SuggestedRemedy*

Change bits 0 and 4 in the following manner:

Bit 0 - ONU is not 1G upstream capable

Values:

- 0 - ONU transmitter is capable of 1000 Mb/s.
- 1 - ONU transmitter is not capable of 1000 Mb/s.

Bit 4 - 1G registration attempt

Values:

- 0 - 1G registration is attempted.
- 1 - 1G registration is not attempted.

Proposed Response Response Status O

CI 93 SC 93.3.6.4 P 56 L 4 # 967  
Lynskey, Eric Teknovus

Comment Type E Comment Status X

Make the definitions of Echoed Laser On Time and Laser Off time consistent with previous values. Also, in there is a typo of "inthe" in the next to last sentence of bullets g and h.

*SuggestedRemedy*

Replace the first sentence of bullets g and h with, "This is an unsigned 8 bit value signifying the Laser On(Off) Time for the given ONU transmitter." Replace "inthe" with "in" in the next to last sentence of these bullets.

Proposed Response Response Status O