Cl **1** *SC* **1.5** *P* **20** *L* **24** # 136
Lusted, Kent Intel

Comment Type **ER** *Comment Status* **A** *Abbrev*

The abbreviation "FEC" already exists in the base standard 802.3-2015

SuggestedRemedy

remove entry

Response *Response Status* **U**

ACCEPT.

Cl **1** *SC* **1.5** *P* **20** *L* **24** # 111
Anslow, Pete Ciena

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

"FEC" is already in the abbreviations list

SuggestedRemedy

Remove "FEC" from 1.5

Response *Response Status* **C**

ACCEPT.

Cl **1** *SC* **1.5** *P* **20** *L* **24** # 231
Ran, Adee INTEL

Comment Type **ER** *Comment Status* **A** *Abbrev*

The abbreviation FEC is already defined in the base document.

SuggestedRemedy

Delete the inserted abbreviation.

Response *Response Status* **U**

ACCEPT.

Cl **1** *SC* **1.5** *P* **20** *L* **25** # 8
Hajduczenia, Marek Bright House Networks

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

FEC is already part of abbreviations in 802.3

SuggestedRemedy

Remove

Response *Response Status* **C**

ACCEPT.

Cl **1** *SC* **1.5** *P* **20** *L* **30** # 112
Anslow, Pete Ciena

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

POF is expanded twice with different spellings of fiber.
IEEE only uses the spelling "fibre" when quoting the title of a document.

SuggestedRemedy

Remove the second expansion

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

IEEE Std 802.3 actually uses the spelling in other contexts (e.g., standard related uses like Fibre Channel style connector). This was expected to be the case for POF, but the draft does not use plastic optical fibre anywhere, so the second expansion will be deleted.

Cl **114** *SC* **114.2.2.2** *P* **40** *L* **53** # 61
Hajduczenia, Marek Bright House Networks

Comment Type **TR** *Comment Status* **A** *Big Ticket 64B/65B*

More unnecessary units of data: chunks: "1 664 symbols are divided into 13 chunks each of 128 symbols" - it is becoming at this point to follow all units of data that are being used in this draft

SuggestedRemedy

There are several instances of "chunk" in the draft - do we really need to introduce another data unit into the already complex mixture of data units? Consider removing them altogether in three locations - they do not seem to add anything into the description anyway.
It also seems that a "chunk" does not have any specific definition in terms of number of bits. It is used as "GMII chunk", "block chunk" etc. ... very confusing

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Change "chunk" to "piece" in:
- pg 40, line 53
- pg 41, line 1
- pg 41, line 50 (also check here the text font of the para, it seems not to be times-roman)
- pg 41, line 51

The removal of "chunk" in S2 and PHS descriptions is not a particularly difficult problem, but removing GMII chunk would be a larger problem as it recurs frequently and the term GMII chunk is much better than "8 consequtive GMII transfers". The TF would appreciate any suggestion of better term than GMII chunk.

Change "chunk" to "piece" in pg 60, line 11.

Cl **114** *SC* **114.2.2.2** *P* **40** *L* **53** # 264

Carlson, Steve HSD/Marvell

Comment Type **T** *Comment Status* **A** *Big Ticket 64B/65B*

The term "chunk" is used in several places in the draft, but is not defined. Is it really necessary to define yet another term, and a rather informal one at that, for some amount of data?

SuggestedRemedy

If "chunk" has a specific definition, please provide it. Otherwise, please use "word", "octet" or "bits" per 802.3 practice.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See repsonse to comments #61 and #73.

Cl **114** *SC* **114.2.4.1** *P* **44** *L* **37** # 70

Hajduczenia, Marek Bright House Networks

Comment Type **TR** *Comment Status* **A** *Big Ticket 64B/65B*

What is the purpose of statement: "This encoding supports end-to-end transmission of Ethernet frames contained in the GMII data stream by preserving delimitation of those frames as well as other GMII control information." - no other existign PHY speaks to that, and it is not clear what the purpose is to begin with - we build a L2/L1 PHY that has an Ethernet MAC, ergo MACs talk Ethernet frames to each other. Nothing less, nothing more

SuggestedRemedy

Strike this statement - it btrings more questions than answers

Response *Response Status* **U**

ACCEPT.

Cl **114** *SC* **114.2.4.1** *P* **44** *L* **38** # 68

Hajduczenia, Marek Bright House Networks

Comment Type **TR** *Comment Status* **A** *Big Ticket 64B/65B*

"Only full duplex operation is supported by the 64B/65B encoding." - what does it really mean? An encoder sees data in and sends data out. It is not associated with decoder in anyway - these are independent function

SuggestedRemedy

Strike or explain why this is needed at all

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

The GMII data stream also includes control information. The 64B/65B encoding as specified is incapable for example of encoding the carrier extend that exists in half-duplex GMII data streams. The statement that it only supports full-duplex is an indication that the specification of 1000BASE-H 64B/65B do not support the encodings required for half duplex operation.

Text can be improved though to avoid confusion.

"Only the subset of control characters defined at the GMII needed for full duplex operation are supported by the 64B/65B encoding."

Cl **114** *SC* **114.2.4.1.1** *P* **44** *L* **43** # 71

Hajduczenia, Marek Bright House Networks

Comment Type **TR** *Comment Status* **R** *Big Ticket 64B/65B*

Unnecessary description of GMII - Clause 35 is very complete as is, and does not require summary here.

SuggestedRemedy

Strike text in lines 43-47 on page 44.
On the first following use of the word "GMII" add the following statement "(see Clause 35)" with proper markup - that is all we really need as far as GMII description is concerned
Remove "TXD <7:0>, TX_EN and TX_ER, compose each GMII transmit path sample." as well ...

Response *Response Status* **U**

REJECT.

There are no normative descriptions in the text requested to be deleted. It is not uncommon to include minimal description of functions spread over many pages of another clause. This paragraph provides appropriate and minimal context to understand the signal names used in this clause that by reference are normatively described in Clause 35.

Cl **114** *SC* **114.2.4.1.1** *P* **44** *L* **49** # 73

Hajduczenia, Marek — Bright House Networks

Comment Type **T** *Comment Status* **A** *Big Ticket 64B/65B*

Unnecessary new terminology: GMII chunk

SuggestedRemedy

Replace with "aggregated GMII transfers", which is what you're referring to anyway

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

While the suggested remedy would be possible for this use, the string "aggregated GMII transfers" is imprecise (aggregated over how many samples), it does not prohibit overlapping or discontinuous aggregations of 10 GMII samples/transfers, etc. Efficient description of the encoding of the GMII data stream requires a simple noun that can be defined as having many properties. The TF rejected terms including modifiers to block. We did not consider GMII aggregation as a term, but it is not different in usage from GMII chunk. Whatever the term, it probably should be a proper noun.

Therefore, change "GMII chunk" to "GMII Chunk", all the occurrences in the draft.

Cl **114** *SC* **114.2.4.1.1** *P* **44** *L* **49** # 72

Hajduczenia, Marek — Bright House Networks

Comment Type **T** *Comment Status* **A** *Big Ticket 64B/65B*

A rather peculiar wording: "eight consecutive 10-bit samples of GMII signals"

SuggestedRemedy

Change "eight consecutive 10-bit samples of GMII signals (a GMII chunk) are compressed to eight octets, which are" to a more common wording we use: "eight consecutive GMII transfers (a GMII chunk) are combined and then"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Clause 35 uses the term transfer and also the term sample. Since bp is ahead of bv and uses term transfer, we accomodate the text to be consistent with bp.

Pg 44, line 49, change:
"eight consecutive 10-bit samples of GMII signals (a GMII chunk) are compressed to eight octets, which are"
to
"eight successive GMII transfers (a GMII chunk) are combined and then"

Pg 44, line 51, change:
"GMII transmit path sample"
to
"GMII transfer"

Change "sample" to "transfer", all the occurences:
Pg 45, line 4
Pg 45, line 34
Pg 45, line 40
Pg 45, line 45
Pg 45, line 48
Pg 46, line 33
Pg 46, line 39
Pg 46, line 44 - 54
Pg 47, line 1
Figure 114-16

Change "8-sample GMII chunk" to "8 GMII transfers" in Pg 47, line 30.

Cl **114** *SC* **114.2.4.1.1** *P* **45** *L* **1** # 74

Hajduczenia, Marek — Bright House Networks

Comment Type **T** *Comment Status* **A** *Big Ticket 64B/65B*

Unnecessary wordiness for text in lines 1 - 10. Tables are much simpler to interpret and provide a solid reference point for an implementer

SuggestedRemedy

Please convert this text into Table 114-XXX, showing TX_EN, TX_ER, TXD value combinations and resulting PDB formats. Change the text at the bottom of page 44: "Two different types of PDBs,
PDB.DATA and PDB.CTRL, are generated by the 64B/65B encoding block." to "Two different types of PDBs, PDB.DATA and PDB.CTRL, shall be generated from GMII data per Table 114-XXX."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace last sentence on page 44 to read: "Two different types of PDBs, PDB.DATA and PDB.CTRL, are encoded from the set of GMII transfers defined in Table 114-1a. The transfers shown in Table 114-1a are the subset of permissible GMII encoding of Table 35-1 used for full-duplex operation."

Table 114-1a is the number only used for comment resolution, it will become Table 114-2 with all subsequent tables renumbered in the next draft. Table 114-1a includes the first four columns of Table 35-1 with the rows for Normal data transmission plus the three contol transfers of the dashed list at p.45, l.6 to l.9.

Change paragraph beginning on page 45 to read:
"If the GMII chunk only contains 8 normal data transmission transfers, a PDB.DATA is generated. If the GMII chunk contains at least 1 of the other three GMII control transfers (GCTRL) shown in Table 114-1a, a PDB.CTRL is generated. Both PDB.DATA and PDB.CTRL are composed of a Type bit followed by 8 octets."

Delete the dashed list.

Cl **114** *SC* **114.2.4.1.1** *P* **45** *L* **12** # 76

Hajduczenia, Marek — Bright House Networks

Comment Type **TR** *Comment Status* **A** *Big Ticket 64B/65B*

At this level, speaking of Ethernet frames is confusing - data comes across GMII and all information on what is Ethernet frame and what is not it kind of lost. It is data, and more precisely - GMII transfers

SuggestedRemedy

Change "It consists of 65 bits, namely, 8 data octets from an Ethernet packet (D0 through D7) encoded in TXD<7:0> preceded by the Type bit that is set to 0." to "The PDB.DATA consists of 65 bits, comprising the Type bit (with the value of 0) followed by 8 consecutive GMII data transfers (TXD<7:0>).
Strike: "first, followed by the 8 data octets in the same order as they were received from the GMII (D0 to D7)" - this is repetetive

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Text speaks about Ethernet packets, but not Ethernet frames, which is equivalent to normal data transmission in the GMII. By definition of PDB.DATA, that is technically correct. However, it is true that is more precise using the term GMII transfers.

The recommended deletion of line 13 text is not acceptable. PDB.CTRL octets are not always transmitted in the order received from the GMII, for example, a control octet may be moved before received data octets. So, it is appropriate to state the octet order of a PDB.DATA is not changed. Also see comment #74 for addition of Table 114-1a.

Change the paragraph to read:
"The format of a PDB.DATA is shown in Figure 114-14. It consists of 65 bits, the first bit being the Type bit (with a value of 0) followed by 8 consecutive GMII data transfers (normal data transmission as shown in Table 114-1a). The 8 data octets are transmitted in the same order as they were received from the GMII. Bits in an octet are transmitted from least to most significant bit."

Cl **114** *SC* **114.2.4.1.1** *P* **45** *L* **30** # 75

Hajduczenia, Marek — Bright House Networks

Comment Type **TR** *Comment Status* **A** *Big Ticket 64B/65B*

Figure 114-14 is very confusing - a Type bit is shown to have the same size (length???) as 1 octet field shown below.

SuggestedRemedy

Change the size of Type bit field to a single bit in position b0 (this is the first bit beign transmitted). Also, consider showing the PDB.DATA in a horizontal format, fimilar to Figure 97–5 in P802.3bp, where consecutive transfers from GMII and addition of control bits is clearly demonstrated in a sequential fashion (top of the figure). Such Figure is currently missing in the draft and it is very illustrative, collecting a lot of information in a single location, creating a reference point for any reader.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Because the missalignment of PDB with the data sub-blocks, a figure like the suggested 97-5 can produce a false impression of the alignment.

Only modify existing Figure 114-14 to reduce the Type bit to the recommended size. Same modification for Figure 114-15.

Cl **114** *SC* **114.2.4.1.1** *P* **45** *L* **39** # 77

Hajduczenia, Marek — Bright House Networks

Comment Type **TR** *Comment Status* **A** *Big Ticket 64B/65B*

Description of generating PDB.CTRL is very hard to follow as described right now.

SuggestedRemedy

Change text on page 45, starting from line 39, as follows: "A PDB.CTRL shall be generated as follows:
- a GMII transfer with TX_EN = 1 and TX_ER = 0 is added to PDB.CTRL without any changes;
- a GMII transfer with (>>insert condition here<<) is modified as follows and then added to PDB.CTRL:
  * two control bits (CTRL<7:6>) encoding control data from GMII transfer per Table 114-2 are inserted
  * three offet bits (CTRL<5:3>) encoding ... (>> current text is not clear what this is and what is encodes<<)
  * three length bits (CTR<2:0>) encoding ... (>> current text is not clear what this is and what is encodes<<)
"

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Change the referenced paragraph at line 39:

"The processing of a GMII Chunk is as follows. Data octets (normal data transmission in Table 114-1a) retain the value of TXD<7:0> in the GMII transfer; but every GCTRL GMII transfer is encoded in a control 8-bit byte (CB) with the following contents:
 -- CTRL<1:0> (CB<7:6>): This field encodes the content of the GCTRL as specified in Table 114-2.
 -- OFS<2:0> (CB<5:3>): This field indicates the offset (in GMII transfers) from the beginning of the GMII Chunk to the location of the first GTCRL in the GMII Chunk. This field has the same value for all CBs created from the GTCRLs in the GMII Chunk. The OFS value range is 0 through 7.
 -- LEN<2:0> (CB<2:0>): This field is the count of GTCRLs in the GMII Chunk minus 1. This field takes the same value for all CBs created from the GTCRLs in the GMII Chunk. The LEN value range is 0 through 7."

Cl **114** *SC* **114.2.4.1.1** *P* **45** *L* **44** # 192

Zimmerman, George — CME Consulting

Comment Type **TR** *Comment Status* **R** *Big Ticket 64B/65B*

Numerous problems with this subclause. It seems to describe a 10B to 65B transcoder using tutorial text, in an unclear fashion (is 'chunk' a technical definition now?), and with no requirements (shall statements). Follow model for defining a transcoder common in IEEE Std 802.3 (see e.g., 802.3bj-2014 for good examples of transcoder definition) The encoding is simply 65B, not 64B/65B. 802.3 uses other encodings defined as 64B/65B, and, if this is the same, just reference it, but if it is different, call it something else. The only requirement is in the next section, and even that is unclear, covered in another comment.

SuggestedRemedy

Fix name to describe whether this is 64B/65B encoding as in other clauses, or something new. Rewrite tutorial text as a requirement ("The 10-bit GMII words shall be transcoded to 65B blocks constructed as follows:"), then clarify the transcoder as an enumerated process, similar to other 802.3 clauses.

Response *Response Status* **U**

REJECT.

64B/65B encodes 8 data octets or control characters from GMII in a 65B(bits) block, in the same sense of Clause 97 80B/81B encoder, that encodes 10 data octets of control characters into an 81B block.
Similar examples are C/49 64B/66B encoder, C/36 8B/10B, etc.

See comment #131 for 64B/65B definition.

The requirement with "shall" is in 114.2.4.1.2, that provides formal definition of 64B/65B encoding. See response to comment #82.

Cl **114** *SC* **114.2.4.1.1** *P* **45** *L* **52** # 78

Hajduczenia, Marek — Bright House Networks

Comment Type **TR** *Comment Status* **A** *Big Ticket 64B/65B*

Text in lines 52-53 (some fields may not exist if their size is zero) does not match text in lines 42-50 (all fields are fixes length)

SuggestedRemedy

Rationalize the text in lines 52-53 with text in lines 42-50 - either fields are variable size (and then text in lines 42-50 is wrong) or fields are of fixed size (and then text in lines 52-53) is wrong

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Strike sentence of pg 45, line 52.

Label the first Data box in Figure 114-15, Data0, and the second box Data1.

Add following text after page 46, line 37:
"Each dotted box in Figure 114-15 represents a sequence of octets. The number of octets in a dotted box may be zero. Data0 contains OFS octets. If OFS is zero, Data0 is null. The number of CBs shown below Data0 is specified by LEN. If LEN is zero, no CB is located between Data0 and Data1. Data1 similarly may or may not be null depending on the portion of the GMII chunk captured. Data1 completes the 8 octets included in a PDB.CTRL. It will be null if 8 total octets preceded it."

After that, include a NOTE:
"NOTE -- Some common example sequences of GMII transfers that illustrate the PDB.CTRL encoding include:
1. A GMII Chunk that only captures IPG will only include CBs, and not Data0 or Data1.
2. A GMII Chunk that captures the end of a packet and beginning of IPG will result in the first IPG GMII transfer converted to a CB being moved ahead of the end of the packet data that is transmitted in Data0. If any more IPG transfers were captured in the GMII Chunk, they are located in the dotted boxes with control fields CTRL_x through CTRL_LEN.
3. A GMII Chunk that captures the end of IPG and beginning of a packet does not move any CB during encoding. If only one GMII transfer of IPG is captured in the GMII Chunk, the first PDB.CTRL octet is the CB encoding the end of IPG and absent errors, the beginning of the packet is in Data0. If more than one IPG transfer is captured in the GMII Chunk, the IPG is encoded in the first CB, Data0 is null and the CBs with control fields labeled CTRL_x through CTRL_LEN hold the remaining CBs encoding the IPG. The beginning of packet then appears in Data1."

Cl **114** *SC* **114.2.4.1.1** *P* **46** *L* **32** # 79

Hajduczenia, Marek — Bright House Networks

Comment Type **TR** *Comment Status* **A** *Big Ticket 64B/65B*

"Finally, the octets within the PDB.CTRL are reordered as follows:" - the following instructions are very hard to follow without an accompanying figure to demonstrate what octets are moved around and where.
Also, references to chunks and samples are also confusing - this is a digital signal, there are no samples in here !!!

SuggestedRemedy

Please add a figure showing reordering of octets at this stage of the process.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Change pg 46, line 31-37 to:
"As final step, the octets within the PDB.CTRL are reordered as follows:
1) The CB built from the first GCRTL is transmitted as the first octet of PDB.CTRL. (This CB may encode the first GMII transfer of the GMII Chunk, or the CB may correspond to another GMII transfer of the GMII Chunk.)
2) The other seven octets of PDB.CTRL are transmited in order (not including the first CB if it was moved per step 1)."

The two figures, and improved text in response to other comments is felt sufficient.

See also response to comments #77, #78.

Cl **114** *SC* **114.2.4.1.1** *P* **46** *L* **40** # 80

Hajduczenia, Marek — Bright House Networks

Comment Type **TR** *Comment Status* **R** *Big Ticket 64B/65B*

Ambiguous statement with no clear purpose: "Because the minimum length of an Ethernet packet is longer than 7 octets, all the GMII control samples
(GCTRLs) in a chunk of a correct packet must be contiguous. Consequently, all the CBs beyond the first
will also be contiguous within the PDB.CTRL." - not sure what the intention in here really is.

SuggestedRemedy

Text is informative right now. Strike text in lines 39-46 - it does not seem to have any formal requirements right now and it is just confusing in discussing "non-contiguous GMII control samples" without explaining what these are …

Response *Response Status* **U**

REJECT.

The sentence is a simple reminder of pages of Clause 35 specification, and possible sequences of GMII transfers. None of the defined sequences in a GMII data stream allow GCTRL, data, GCTRL except for transmit error propagation (e.g., IPG, some preamble, transmit error propagation, more preamble) can occur within 8 GMII transfers.

The next paragraph describes what is done in the encoding for this case of an incorrect/errored packet. The same applies if an implementer uses transmit error propagation for a transmit abort (IPG, some preamble, transmit error propagation, IPG). Though transmit abort is not defined in Clause 35 it would be the natural GMII sequence for what is counted in management as a runt packet.

Neither is a "correct" frame.

Cl **114** *SC* **114.2.4.1.1** *P* **47** *L* **25** # 81

Hajduczenia, Marek — Bright House Networks

Comment Type **TR** *Comment Status* **R** *Big Ticket 64B/65B*

Figure 114-16 has an example of time travel, where GCTRL0 field is transmitted before it arrives in CTRL0 block. To be technically correct, the bottom part of the figure should be moved to the right side, in such a way that at best data arriving from GMII is transmitted immediately, and never before it arrives on GMII.

SuggestedRemedy

Per comment

Response *Response Status* **U**

REJECT.

This point is already clarified in Pg 47, lines 29-34. Figure not to be modified at all. It is also stated that any implementation has to buffer at least 8 GMII transfers to do the mapping.

Cl **45** *SC* **45.2.1.6** *P* **23** *L* **19** # 165

Pérez-Aranda, Rubén KDPOF

Comment Type **T** *Comment Status* **A** *Big Ticket MDIO*

Code defintions for PMA/PMD type selection are provided, but not any kind of ability advertisement.
The type of SI-POF for which the PHY layer of Clause 114 is defined is able to operate at entire visible spectrum, with much smaller insertion loss for green/blue than for red light. This, together with the fast advance of GaN based LEDs (same of lighting LEDs with increasing market today), allows to foresee that different light sources might be used with the same PCS and PMA defined in Clause 114 in the near future, being necessary a new PMD similar to RHx but with different parameter values according to those new light sources (e.g. 1000BASE-GHx for green?).
Some way of scalability in the advertisement and configuration should be provided at the MDIO registers level.
Same approach of BASE-T1 seems to be necessary for scalabilty and to be consistent.

SuggestedRemedy

- Replace 1000BASE-RHA, RHB and RHC type codes with only one: 110100 = BASE-H PMA/PMD. Add foot note as: "If BASE-H PMA/PMD is selected, register 1.2400 is used to differentiate which BASE-H PMA/PMD is selected".
- New entry in regiter 1.11 is necessary to advertise the ability. I propose using the bit 1.11.12 (need coordination with other projects), with name "BASE-H exteded abilities", and description "1 = PMA/PMD has BASE-H exteded abilities listed in register 1.19. 0 = PMA/PMD does not have BASE-H extended abilities", "RO".
- New PMA/PMD register 1.19 (need coordination with other projects), with name "BASE-H PMA/PMD extended ability", the content of this register being:
    1.19.0: name "1000BASE-RHA ability", description "1 = PMA/PMD is able to perform 1000BASE-RHA. 0 = PMA/PMD is not able to perform 1000BASE-RHA", "RO",
    1.19.1: name "1000BASE-RHB ability", description "1 = PMA/PMD is able to perform 1000BASE-RHB. 0 = PMA/PMD is not able to perform 1000BASE-RHB", "RO",
    1.19.2: name "1000BASE-RHC ability", description "1 = PMA/PMD is able to perform 1000BASE-RHC. 0 = PMA/PMD is not able to perform 1000BASE-RHC", "RO",
    1.19.15:3: name "Reserved", description, "Value always 0", "RO".
- New PMA/PMD register 1.2400 (suggested address that needs coordination with other projects), name "BASE-H PMA/PMD control register", content being
    1.2400.3:0, name "Type selection", description "0 0 0 0 = 1000BASE-RHA, 0 0 0 1 = 1000BASE-RHB, 0 0 1 0 = 1000BASE-RHC, 0 0 1 1 = Reserved, 0 1 x x = Reserved, 1 x x x = Reserved", "R/W",
    1.2400.15:4, name "Reserved", description "Value always 0", "RO"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Suggested remedy is accepted, but changing registers assignation because some of the suggested ones have been already allocated by other projects running in parallel.

Change 1.11.12 to 1.11.15.
Change 1.19 to 1.22.
Change 1.2400 to 1.900

Cl **45** *SC* **45.2.1.6** *P* **23** *L* **19** # 113

Anslow, Pete Ciena

Comment Type **ER** *Comment Status* **A** *Big Ticket MDIO*

The order of sub-rows in 1.7.5:0 is from 0 0 0 0 0 0 at the bottom to 1 1 1 1 1 1 at the top. This is opposite to the order shown in the .3bv draft

SuggestedRemedy

Change the order to:
1 1 0 1 1 0 = 1000BASE-RHC PMA/PMD
1 1 0 1 0 1 = 1000BASE-RHB PMA/PMD
1 1 0 1 0 0 = 1000BASE-RHA PMA/PMD

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Because #165 is accepted, it reduces the three code points to one eliminating order problem.

Cl **45** *SC* **45.2.3.51.3** *P* **29** *L* **2** # 166

Pérez-Aranda, Rubén KDPOF

Comment Type **T** *Comment Status* **A** *Big Ticket MDIO*

Some STA implementations may expect to read the link status of the PHY in 1.1.2 or 3.1.2. The bit 3.519.13 should be a copy of 1.1.2 and 3.1.2. Beause the bit 3.519.13 is latching-low behaviour, reading any of the copies reset the latch.

SuggestedRemedy

Add text per comment.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Bit 1.1.2, bit 3.1.2, and bit 3.519.13 are identical for 1000BASE-H, a read to any of these three bits will release the latch for all the bits.

Cl **45** *SC* **45.2.3.51.8** *P* **29** *L* **26** # 167

Pérez-Aranda, Rubén KDPOF

Comment Type **T** *Comment Status* **A** *Big Ticket MDIO*

Some STA implementations may expect to read LPI status from register 3.1.
The bits Tx Assert LPI received (3.519.8), RX Assert LPI generated (3.519.7), Tx LPI indication (3.519.6) and Rx PLI indication (3.519.5) should be a copy of the bits 3.1.11:8, respectively.

SuggestedRemedy

Add text in the description for each bit per comment

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.53.2.1.8** *P* **29** *L* **26** # 236

Trowbridge, Steve Alcatel-Lucent

Comment Type **T** *Comment Status* **A** *Big Ticket MDIO*

Not clear why a whole lot of new EEE control and status need to be defined and why the existing bits used for other PHY types (e.g., PCS status register 1) couldn't have been reused for the corresponding functions

SuggestedRemedy

Use the same PCS status and control register bits as are used for other PHY types rather than allocating new bits. In particular, PCS status 1 register, EEE control and capability register, EEE advertisement register

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

As in other projects (see P802.3bp D3.1), some of these bits are re-defined for the PHY, because, although most of them are similar, there are some specific differences. Further, it is more convenient for the STA having all the register bits in a common space instead of jumping MMD to MMD.

Comments #166 and #167 suggest for some of bits defined for 1000BASE-RHx PHY make a copy in PMA/PMD status 1 and PCS status 1.

EEE advertisement register is in Auto-Negotiation (AN) MMD, that does not apply to 1000BASE-RHx. EEE control and capability register does not match the control and status of bits 3.518.0 and 3.519.0.

Cl **114** *SC* **114.10** *P* **113** *L* **14** # 168

Pérez-Aranda, Rubén KDPOF

Comment Type **T** *Comment Status* **A** *Big Ticket MDIO*

In Table 114-14, add a mapping of signal_detect variable to bit 1.10.0. signal_detect = OK is mapped to 1.10.0 = 1, and signal_detect = FAIL to 1.10.0 = 0.

SuggestedRemedy

Per comment

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.10** *P* **113** *L* **26** # 212

Zimmerman, George CME Consulting

Comment Type **TR** *Comment Status* **A** *Big Ticket MDIO*

This sentence reads like the registers are always present, whereas earlier it stated MDIO was optional. If MDIO is not present, what capability needs to be provided by some other means.

SuggestedRemedy

See comment - clarify

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Replace the second and third paragraphs with:
"The optional MDIO capability of Clause 45 describes several variables that provide control and status for and about the PHY. If the MDIO is not implemented, an implementation shall include the functionality provided by the specified MDIO registers.

1000BASE-H based PHYs use some generic control bits common with other IEEE 802.3 PHY types. PHY variables shall be mapped as shown in Table 114-14. 1000BASE-H based PHYs also use specific registers (1.11, 1.22, 1.900 and 3.500 through 3.522).

In addition to the normal operation capabilities specified elsewhere in this clause, test modes and loopback modes use these registers and bits to facilitate testing."

Cl **114** *SC* **114.2** *P* **38** *L* **7** # 95

Szczepanek, Andre — Inphi

Comment Type **TR** *Comment Status* **A** *Big Ticket PCS RX*

One paragraph is insufficient to define the PCS receive datapath.
20 pages are spent describing every stage of the transmit datapath.

What is the required response of the receive datapath to invalid receive data, at various stages of the datapath ?.
How are invalid 64b65 coded blocks recognized and signalled to the GMII ?.

SuggestedRemedy

Provide a definition of the PCS receive datapath and it's response to invalid receive datastreams.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Analysis about some of the topics was already presented in the TF, but no text added to the draft.

See:
http://www.ieee802.org/3/bv/public/Jan_2015/perezaranda_3bv_4a_0115.pdf
http://www.ieee802.org/3/bv/public/Jan_2015/perezaranda_3bv_5_0115.pdf
for the MTTFPA analysis and decoding failure information from FEC decoder to 64B/65B decoder.

Editor actions:

Add a new heading 114.2.1 PCS Transmit functions, with renumbering of 114.2.1, 114.2.2, 114.2.3 and 114.2.4 to 114.2.1.1, 114.2.1.2, ...

Add a new heading 114.2.2 PCS Receive functions.

Use perezaranda_3bv_1_0316.pdf text as basis for specification of the PCS receive functions, with editorial license.

Cl **114** *SC* **114** *P* **35** *L* **9** # 201

Zimmerman, George — CME Consulting

Comment Type **ER** *Comment Status* **A** *Big Ticket PCS TX*

General - most of the requirements in Clause 114 are written poorly - see previous comments. They are 'the xyz shall be constructed as follows." followed by paragraphs of descriptive or tutorial text describing a method rather than an output.

SuggestedRemedy

Editor to go through all of Clause 114,specifying all requirements as input/output or measurable relations. Tutorial text to be deleted or incorporated to the specification as appropriate.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Editor will attempt to accommodate removing descriptions of method rather than specification of output.

See responses to comments #191, #196, for example.

Cl **114** *SC* **114.2.2.1** *P* **39** *L* **45** # 191

Zimmerman, George — CME Consulting

Comment Type **TR** *Comment Status* **A** *Big Ticket PCS TX*

Mixed requirement and informative text makes it nearly impossible to tell what is the requirement and what is descriptive informative language. "shall be generated as follows:" really only works when there is a clearly enumerated list of step by step requirements. Generation of a sequence would ordinarily be a small set of equations. The requirement can't be HOW the thing is generated, but WHAT the sequence must be.

SuggestedRemedy

Rewrite the requirement to clearly state the requirement. Sorry, its such a mess I can't do it for you in a comment, but suggest that you start with something like "the S1 sequence shall be a sequence of 128 pseudo-random binary numbers, resulting from a linear feedback shift register with generator polynomial 1+x22+x25." You don't need to write a tutorial on how to make LFSRs, and nomenclature should be consistent with the many existing LFSRs in 802.3. See clauses 40, 55, or many others for examples on how to do this compactly. Further, delete the MATLAB, or show why it is necessary. It leaves the reader searching for something nonobvious.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

PICS item delimits the bounds of the requirement. See also the comment #194.

Change pg 39, lines 45 - 50 to:
"A pilot S1 sub-block is transmitted at the beginning of each Transmit Block as shown in Figure 114–4. The S1 generator shall produce an S1 sub-block using a maximum length sequence (MLS) generator from which the first 128-bit binary sequence bits are then mapped into PAM2 symbols so that bits with value 0 are mapped to {-1} and bits with value 1 mapped to {+1}. The resulting 128-symbol long sequence is prefixed and postfixed by a sequence of 16 zero {0} symbols, thus obtaining the 160 symbol length for S1 sub-block."

Delete pg 40, lines 45, 46.

Detailed description of LFSR and MATLAB code are going to remain in the text. It is important to note that initialization value and how the LFSR start generating the sequence have to be clearly defined. Other clauses uses self-synchronized scramblers, where these topics are not relevant for interoperability.
The same applies to S2 sub-blocks generation and the binary and symbol scramblers. Please, note that these circuits initialize the LFSR register to specific values several times per Transmit Block (S2), or once (S1, scramblers).

See comment #196 for additional changes to 114.2.2.

Pg 40, line 50/51, change:
"The pilot S2 sub-blocks of a Transmit Block shall be generated as follows."
to:
"The S2 generator shall produce S2 sub-blocks using a sequence of 1664 PAM8 symbols."

Cl **114** *SC* **114.2.2.1** *P* **39** *L* **45** # 56

Hajduczenia, Marek — Bright House Networks

Comment Type **ER** *Comment Status* **A** *Big Ticket PCS TX*

"The S1 signal within the sub-block shall be generated as follows." - is the intent to make the whole paragraph normative, or just some part of it?

SuggestedRemedy

Clarify what the scope of "shall" statement is - it is not clear where the requirement ends The same observation for page 40, line 51 and multiple subclauses afterwards, where the scope of the "shall" statement is really not clear

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Clarity of the bound is provided in the PICS item. It is the subclause.

See response to comment #191.

Cl **114** *SC* **114.2.2.1** *P* **39** *L* **46** # 120

Dudek, Mike — QLogic

Comment Type **T** *Comment Status* **A** *Big Ticket PCS TX*

There isn't a pseudo-random sequence with 128 bits (they are all odd numbers), and the one generated by this 25 bit shift register is much longer (2^25-1).

SuggestedRemedy

Change "a pseudo-random sequence of length" to "part of a pseudo-random sequence with length". On line 48 change "pseudo-random sequence" to "sequence which is part of a pseudo-random sequence"

Make similar changes on page 40 line 52 for pilot S2.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Eliminate "pseudo-random" from:
pg 39, lines 46 and 48
pg 40, line 52
pg 41, line 4

because it does not add relevant information for implementation.

See also response to comment #191

Cl **114** *SC* **114.2.2.1** *P* **39** *L* **49** # 57

Hajduczenia, Marek — Bright House Networks

Comment Type **ER** *Comment Status* **A** *Big Ticket PCS TX*

Since B2D block is used here for the very first time: "See 114.2.4.3.6 for the definition of the B2D block.", the definition should be located here, not elsewhere

SuggestedRemedy

Move definition of B2D block to 114.2.2.1

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

B2D has been eliminated by response to comment #196.

Cl **114** *SC* **114.2.2.1** *P* **39** *L* **52** # 58

Hajduczenia, Marek — Bright House Networks

Comment Type **TR** *Comment Status* **A** *Big Ticket PCS TX*

Substantial over-specification and implementation-specific details that are not needed for the standard

SuggestedRemedy

Change "The MLS generator is made from a linear feedback shift register (LFSR) of 25-bits (see Figure 114–7)." to "The MLS generator shall produce the same result as the shift register implementation shown in Figure 114–7. The shift register shall be initialzied with the value of 0x0172 DB9D for each Transmit Block, where the leftmost digit corresponds to the initial value of register element r[0]."
Update Figure 114-7 to show the output from the MLS generator
Remove text on page 40, lines 23 - 43, including unnecessary Matlab code.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Change "The MLS generator is made from a linear feedback shift register (LFSR) of 25-bits (see Figure 114–7)." to "The MLS generator produces the same result as the shift register implementation shown in Figure 114–7.". (with no addition shall, that it is not necessary).

Figure 114-7 shows the output, rename MLS Generator output.

Rest of text remains as is, because many parts of it, including MATLAB code, were demanded by others during TF review. In addition, it is consistent and fill some gaps that could leave ambiguities with just only the figure. See also response to comment #191.

There is no implementation-specific details, only the needed details to specify the funcionality. Typically, this kind of circuits are implemented with parallel architectures that compute N output bits per N input bits, so the needed clock frequency is reduced (this specially applies to the payload data binary scrambler that has to cope with greater than 1Gbps data-rate). Therefore, the desciption is far to be considered implementation-oriented.

Cl **114** *SC* **114.2.2.1** *P* **40** *L* **28** # 228

Ran, Adee — INTEL

Comment Type **TR** *Comment Status* **A** *Big Ticket PCS TX*

"first symbol" - and then "rest of the S1 pilot bits" ... should that be "first bit"?

Also "(128 symbols)" in line 31. And later "16-symbol long sequences of zeros". This is all really confusing on first read.

I realize that there is a 1:1 correspondence but PAM2 and bits are not the same. It would be clearer to define the LFSR output as a bit sequence and then convert it to PAM2 as a whole.

SuggestedRemedy

Change "symbol" to "bit" and "symbols" to "bits". Add a clear conversion equation from bits to PAM2 symbols (or better, to PAM16 symbols)..

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comments #191 and #196.

Cl **114** *SC* **114.2.2.1** *P* **40** *L* **44** # 59

Hajduczenia, Marek — Bright House Networks

Comment Type **T** *Comment Status* **A** *Big Ticket PCS TX*

Unclear purpose of this statement and relationships between individual data units: "As shown at the bottom of Figure 114–4, the pilot S1 has a prefix and postfix. These are 16-symbol long
sequences of zeros. With the S1 being 128 symbols, the total S1 pilot sub-block length is 160 symbols."

SuggestedRemedy

Consider striking this text - no matter how many times I read it and look at Figure 114-4, the relationship between individual data units is not clear to me.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #191 and #196.

Cl **114** *SC* **114.2.3.1** *P* **42** *L* **13** # 65

Hajduczenia, Marek — Bright House Networks

Comment Type **TR** *Comment Status* **A** *Big Ticket PCS TX*

Unnecessary details for CRC16 definition

SuggestedRemedy

Insert new text under 114.2.3.1 as follows: "The Physical Header CRC16 generator shall produce the same result as the shift register implementation shown in Figure 114–10. The shift register shall be initialized with the value of 0x00 for each PHD."
Strike text page 42, lines 15-21

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

During TF review, the consensus was that the distillation here of the more verbose description in Clause 55 was the proper amount of reduction of description. Further reduction as the commenter recommends is believed likely to reduce concensus.

Change the second sentence as suggested.

Change the reset value of 0 to 0x0000 as suggested.

Cl **114** *SC* **114.2.3.2** *P* **42** *L* **36** # 66

Hajduczenia, Marek — Bright House Networks

Comment Type **TR** *Comment Status* **A** *Big Ticket PCS TX*

Unnecessary details for PH implementtion

SuggestedRemedy

Change text in 114.2.3.2 to read: "The 720 bits from the CRC16 encoder shall be scrambled prior to transmission using the Physical Header binary scrambler. The Physical Header binary scrambler shall produce the same result as the shift register implementation shown in Figure 114–11. The shift register shall be initialized with the value of 0x068D332 for each Transmit Block, where the leftmost digit corresponds to the initial value of register element r[0]."
Update PICS as needed.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

"The 720 bits from the CRC16 encoder shall be scrambled prior to transmission using using a Physical Header binary scrambler that produces the same result as the shift register implementation shown in Figure 114-11. The shift register is initialized with the value of 0x068D332 for each Transmit Block, where the leftmost digit corresponds to the initial value of register element r[0]. The initial value of r[0] is xor-ed with the first bit from the CRC16 encoder to generate the first input bit to the BCH encoder. See 114.2.2.1 for the formal definition of the LFSR."

No PICS update required.

Cl **114** *SC* **114.2.4.1.1** *P* **48** *L* **10** # 230

Ran, Adee INTEL

Comment Type **T** *Comment Status* **R** *Big Ticket PCS TX*

The modulo function is used previously in the standard (e.g. clause 55), it is well-known and does not seem to need a definition.

SuggestedRemedy

Delete equation 114-3.

Response *Response Status* **C**

REJECT.

In 55.3.2.2.19, it is provided the definition of mod16 as:
"where ‘n mod16’ for an integer n, is defined as the integer value p in the range 0 to 15 (both inclusive) such that ‘p = n + 16m’, for some integer m."
that define the modulo 16 for integer input.

In 55.4.3.1, the used mod32 is not defined, but only the equation that uses it.

Because modulo mod(x,y) operation in Clause 114 is used for x real, and y can take different values, it was considered to closely define it.

Cl **114** *SC* **114.2.4.3.1** *P* **51** *L* **7** # 194

Zimmerman, George CME Consulting

Comment Type **TR** *Comment Status* **A** *Big Ticket PCS TX*

There are several problems with this subclause. First and foremost, the only requirement is that the bits are split into 2 levels. Actually it should say two groups. The rest is descriptive, but not a requirement. Other 802.3 clauses do similar mappings, but none are written some confusing and obscure. The resulting MLCC encoding and constellation is similar to that used in Clause 55 (with a different FEC). It should be possible to describe the encoding requirements, one by one in direct equation form.

SuggestedRemedy

Identify and clarify the requirements for the bit ordering and encoding.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

The PICS item clarifies the bounds of the requirement.

In general, it was decided by the TF to use a single "shall" per block, so that PICS generation and verification are simplified, because testing more detailed shalls is impractical.

Editor will attempt to accommodate removing descriptions of method rather than specification of output. The shall statement will cover a list of items clearly specifying the operations needed to generate the demultiplexion ouput from the input bits.

In this context "group" and "level" can be considered synonymous. "level" is commonly used in multi-level coding literature, so it can be considered valid.

Cl **114** *SC* **114.2.4.3.2** *P* **52** *L* **12** # 195

Zimmerman, George CME Consulting

Comment Type **TR** *Comment Status* **A** *Big Ticket PCS TX*

Multiple problems. First, the requirement: the BCH encoder shall generate information bits? This is the only requirement, but it is not clear where it starts and ends. There is the language 'can be formed' These clearly can't be the same usage of information bits in the previous subclause, because those were INPUT to the BCH encoder. I suspect you are referring to parity bits, or maybe the whole codeword. Describing block FEC generation is done throughout 802.3, please look at and learn from the existing models.

SuggestedRemedy

Identify and clarify the requirements. Follow 802.3 style for binary block FEC encodings, in terms of equations, or a list of steps, with named variables along the way for clarity if needed. No need for a tutorial.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Change pg 52, line 12:
"The BCH encoder in Figure 114–21 shall generate information bits as follows."
to:
"The BCH encoder shall encode the information bits consistent with Figure 114-21."

Change pg 52, line 16:
"The transmitted codeword C(x) can then be formed by combining M(x) and S(x) as follows"
to:
"The transmitted codeword C(x) is formed by combining M(x) and S(x) as follows:"

See also comment #194.

Cl **114** *SC* **114.2.4.3.3** *P* **53** *L* **45** # 196

Zimmerman, George CME Consulting

Comment Type **TR** *Comment Status* **A** *Big Ticket PCS TX*

This comment speaks to multiple problems with the gray mapper. The overall description of the Gray mapping is unnecessarily complex, containing extra levels of hierarchy and indirection. Where a simple table would do, combinatorial logic is used. There appear to be unnecessary elements in the diagram (multiplication and addition are well defined - why do you need a 'binary-to-decimal converter'. Like other clauses, the only requirement is "as follows". With the requirement written this way, it doesn't specify the output, but rather the method.

SuggestedRemedy

Rewrite as requirements which specify the input-output relation rather than following a method. Collapse the description to one level of hierarchy, defining the mapping as an input output relation or compact series of equations. Delete the binary-to-decimal converter or explain why it is necessary. Fully specify the gray mapping used (there can be more than one). Define the grouping of bits rather than an arbitrary rate, abstract k-bit serial-to-parallel converter.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Rewrite 114.2.4.3.3 specifying input - output relation in form of tables for the QAM16 mapper and QAM8 mapper, adding 2 "shall" statements. Modify PICS items accordingly. Eliminate descriptive text and figures.

Elminate (sub-clauses heading and text) 114.2.4.3.4 Serial to parallel (S/P) conversion, 114.2.4.3.5 Gray to binary (G2B) conversion, and 114.2.4.3.6 Binary to decimal (B2D) conversion, together any reference to them.

Consequently:
In 114.2.2.1, modify Figure 114-6, to replace blocks doing the mapping by a single block "PAM2 mapper", specify the mapping in text, and eliminate reference to B2D.

In 114.2.2.2, modify Figure 114-8 for a single block representing mapping process "PAM8 mapper", specify PAM8 mapping in a table, eliminate references to S/P and B2D.

In 114.2.3.4, eliminate figure 114-12 and description, and only leave specificaiton of mapping in text as it is.

Cl **114** *SC* **114.2.4.3.7** *P* **55** *L* **39** # 197

Zimmerman, George — CME Consulting

Comment Type **TR** *Comment Status* **A** *Big Ticket PCS TX*

The only requirement is that the bits be processed by a lattice transformation. They could be thrown away after that. Also, requirements should specify the I/O relation, not the method.

SuggestedRemedy

Rewrite to specify I/O relation desired.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Eliminate all descriptive text and explanations not needed to implement. Specify I/O of first lattice transformation in one set of equations per each level and 2 "shall" statements. Modify PICS accordingly. Eliminate figures 114-25 and 114-26.

For consistency:
In 114.2.4.3.8, specify I/O with a set of 2 equations and the "shall" referring to it. Elimiante figure 114-27.

Cl **114** *SC* **114.2.4.3.7** *P* **56** *L* **6** # 233

Ran, Adee — INTEL

Comment Type **T** *Comment Status* **A** *Big Ticket PCS TX*

"rem" seems identical to "mod" which was used in equation 114-2.

SuggestedRemedy

Consider using "mod" consistently.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Neither mod nor rem are needed because specification is going to simplified per comment #197.

Cl **114** *SC* **114.2.4.3.9** *P* **57** *L* **30** # 198

Zimmerman, George — CME Consulting

Comment Type **TR** *Comment Status* **A** *Big Ticket PCS TX*

The requirement is again an "as follows", not clear where it begins and ends. Here, though, there actually appears to almost be a reasonable substitute for how to specify - see remedy.

SuggestedRemedy

Change "shall be further transformed … as follows" to "shall be further transformed… according to equation 114-15." on line 45 (after the equation), spell out what all the variables in equation 114-15 are, rather than leaving it to descriptive text below.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Changes to be consistent with #197.
I/O with a simple set of 2 equations, "shall" referring to equations, eliminate figures 114-28 and 114-29.

Cl **45** *SC* **45** *P* **32** *L* **1** # 254

Carlson, Steve — HSD/Marvell

Comment Type **ER** *Comment Status* **A** *Big Ticket PICS 45*

Clause is missing PICS

SuggestedRemedy

Insert PICS

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Same response as #36.

Cl **45** *SC* **45** *P* **32** *L* **1** # 36

Hajduczenia, Marek — Bright House Networks

Comment Type **ER** *Comment Status* **A** *Big Ticket PICS 45*

No PICS

SuggestedRemedy

Insert PICS

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Editor to generate PICS items per comment. Addition of “shall” as the basis for the PICS item is included and applies to other responses where necessary.

Cl **114** *SC* **114.6.5** *P* *L* # 159

Stassar, Peter — Huawei Technologies

Comment Type **TR** *Comment Status* **A** *Big Ticket PMD*

The justification for the rejection of comment #37 to draft D1.4, where it was stated "there are providers in the market that produce very low cost and very poor quality POF that in spite of being A4a.2 compliant it does not fit the 802.3bv freq response and attenuation specs. In order to filling this gap, 802.3bv specifies bounds on the response and attenuation." implies that additional requirements beyond a certain length of a specific type of POF seem necessary. Clause 114.6.5 contains requirements for transfer characteristics which seem to indicate more specific requirements than compliance to A4a.2. It needs to be made clear roughly how many of the "standard" POF fibers do not comply to these additional requirements in order to investigate in how far "broad market potential" is satisfied.

SuggestedRemedy

Make clear how in applications in the home users can use standard POF

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

It is not appropriate to include in the standard anything about how many fibers meet the specs if that was what the commenter meant in the Suggested Remedy. If only a response about broad market potential is requested, the following is provided.

Please, see:
http://www.ieee802.org/3/bv/public/Jan_2016/takahashi_3bv_03a_0116.pdf

In this presentation, transfer functions measurements are reported for part numbers selected from the most commonly used IEC 60793-2-40 sub-category A4a.2 POF for communications. Members of the TF indicated that actual market percentage is larger than 98%. Therefore, we can say that more than 98% of the A4a.2 POF market is fiber that meets the tightened additional specifications of P802.3bv.

As it was done in 1000BASE-T (40.7.1) for Class D cables, 802.3bv is specifying additional requirements compatible with A4a.2 fibers (transfer functions, insertion loss).

Cl **114** *SC* **114.6** *P* *L* # 157

Stassar, Peter — Huawei Technologies

Comment Type **TR** *Comment Status* **A** *Big Ticket PMD*

Responding to rejection of comment #37 to draft D1.4, repeating "I haven't seen any presentation from the Task Force meetings, with some form of evidence, that a set of devices, when meeting these requirements, a will operate satisfactorily in the field on a standard version of POF, and that, when they fail these requirements, they do not operate in the field."
I remain therefore unconvinced that this Optical specification is sufficiently complete and therefore have the opinion that the Task Force has not completed its work. It should be emphasized that home applications, really will need plug-and-play devices.

SuggestedRemedy

Provide evidence that the specification is adequate for usage in home applications

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

It is important to note that in the CSD documents we reference existing implementation of the VDE specifications. Though we have made a number of different choices from that VDE draft, both, VDE and 3bv, are based on PAM16 plus THP and the same type of photonics. During SG, the technical feasibility was demonstrated by theoretical analysis that supported the baseline specification, and by real experiments using VDE based existing implementations. Following presentations show VDE based devices operating satisfactorily in the field on a standard version of POF (A4a.2).
http://www.ieee802.org/3/GEPOFSG/public/July_2014/Luecke_GEPOF_02_0714.pdf
http://www.ieee802.org/3/GEPOFSG/public/July_2014/Faller_GEPOF_02a_0714.pdf
http://www.ieee802.org/3/GEPOFSG/public/Sep_2014/Lichtenegger_GEPOF_0914.pdf
http://www.ieee802.org/3/GEPOFSG/public/Sep_2014/perezaranda_GEPOF_01_0914.pdf
http://www.ieee802.org/3/GEPOFSG/public/Sep_2014/perezaranda_GEPOF_03_0914.m4v
http://www.ieee802.org/3/GEPOFSG/public/Sep_2014/perezaranda_GEPOF_02_0914.m4v

It is also important to note that many of the bounds specified for the parameters of the transmitter and the receiver are based on very worst-case simulations (1000BASE-RHx implementations are not available yet):
- worst case channel response compliant with transfer function lower bound limits
- worst TP2 launching condition compliant with EAF lower bound limits
- min. ER, min rise/fall time, largest harmonic distortion HD2 and HD3, max RIN, max jitter, etc.
- the receiver is modeled based on circuit level simulations with worst case technology process corner (slow) and highest temperature.

The simulation models correlate very well with VDE implementation.

Being said that, the main objective of the TF has been to generate an specification able to guarantee the satisfactory operation of any two compliant devices in the field. However, there can be scenarios in the field where a device that is non-compliant in some set of parameters is able to operate with a compliant device satisfactory with very good

performance. This situation can be possible because the compliant device integrates typical components that have not moved to worst-case, for example, or because temperature is below the maximum.

Cl **114** *SC* **114.6.4.8** *P* *L* # 158

Stassar, Peter Huawei Technologies

Comment Type **TR** *Comment Status* **A** *Big Ticket PMD*

It's totally unclear whether the script contained in this clause is appropriate to distinguish good from bad transmitters in a way that transmitters, when meeting these requirements, will operate satisfactorily in the field, and that, when they fail these requirements, they do not meet performance requirements in the field.

SuggestedRemedy

Provide evidence that the transmitter specification/script is adequate

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Please, see response to comment #118.

Cl **114** *SC* **114.6.2.4.2** *P* **91** *L* **27** # 121

Dudek, Mike QLogic

Comment Type **T** *Comment Status* **A** *Big Ticket PMD*

The hysterisis here defined implies that the optical power has to be measured perfectly. This is unlikely.

SuggestedRemedy

Provide an adequate guard band between the values in Table 114-5 and the values in the text such that there is enough "uncertain range" to allow for reasonablely expected measurement accuracy. eg. replace "When signal detect is not inhibited (sd_inh = FALSE) receive optical power at the MDI needs to be higher than a threshold of -29 dBm to indicate signal_detect = OK (PMDDET_OK state). Once in this state, receive optical power at the MDI has to decrease below -35 dBm to cause transition to the PMDDET_FAIL state." with When signal detect is not inhibited (sd_inh = FALSE) receive optical power at the MDI needs to be higher than a threshold of -31 dBm to indicate signal_detect = OK (PMDDET_OK state). Once in this state, receive optical power at the MDI has to decrease below -33 dBm to cause transition to thePMDDET_FAIL state." This allows the receive power monitor to have +/-1dB accuracy and still leaves 2dB of hysterisis.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Because the use of sd_inh variable, we decided to use a state diagram for specification of signal detect function. But, it is true that this way of specification is not providing the uncertainty range to allow for reasonably measurement accuracy in a real implementation.

The state diagram is not needed for signal detect specification, because everything can be included in table 114-5, providing the uncertainty range without specific thesholds; we think is better to leave up to the implementer how to manage the uncertainty range.

Editor actions:
- Table 114-5: add one column in the left of table, to include the value of sd_inh variable.
Table content:

sd_inh // Receive conditions	// Signal detect value
FALSE // AOP at TP3 < -35 dBm	// FAIL
FALSE // AOP at TP3 > -29 dBm	// OK
FALSE // -35 dBm < AOP at TP3 < -29 dBm	// Unspecified (uncertainty range)
TRUE // Any vaue of AOP at TP3	// OK

- Delete 114.6.2.4.1 and 114.6.2.4.2.

- Delete pmd_reset from table 114-14.

- Replace text of pg 90, lines 43 to 51 with:
"The value of the signal_detect parameter shall be generated in response to the average optical power present at the MDI and the sd_inh parameter according to the conditions defined in Table 114–5. The PMD receiver is not required to verify whether a compliant 1000BASE-H signal is being received. This standard imposes no response time

requirements on the generation of the signal_detect parameter."

Cl **114** *SC* **114.6.3.1** *P* **92** *L* **40** # 96

Ghiasi, Ali — Ghiasi Quantum LLC

Comment Type **T** *Comment Status* **A** *Big Ticket PMD*

In 802.3bm and bs extensively investigated PAM16 and PAM12 the conclusion was that due to finite return loss not technically feasible

SuggestedRemedy

Either need to show with 14 dB RL PAM16 modulation is technically feasible, improve RL, or change modulation to lower order PAM

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

It is important to note that in the CSD documents we referenced existing implementation of the VDE specifications. Though we have made a number of different choices from that VDE draft, both, VDE and 3bv, are based on PAM16 plus THP. During SG, the technical feasibility was demonstrated by theoretical analysis that supported the baseline specification, and by real experiments using VDE based existing implementations.

See link in response to comment #157 for evidence of technical feasibility of PAM16 THP based GEPOF.

Although it is not specifically specified, the 1000BASE-RHx are expected to use red LED as light source. See also comment #272.

Cl **114** *SC* **114.6.3.1** *P* **92** *L* **40** # 272

Goetzfried, Volker — Broadcom Limited

Comment Type **E** *Comment Status* **A** *Big Ticket PMD*

Optical return loss tolerance is not defined appropriately.

SuggestedRemedy

Add a note below table 114-6
"This value is derived from Fresnel reflections appearing at the interface from air to the fiber core (PMMA). Additional reflections may occur due to the usage of a pictail in a mated plug."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

It is not relevant for the specification how this parameter was derived, experimentally, by simulation, etc. Therefore, the note below table is not needed to be added.

Experiments carried out by TF members demonstrated that reflections has no effect in the performance of GEPOF at all. However, it is important to note that all of these experiments were carried out using LED as light source (target of the project), which is not affected because its nature of emitting light expontaneosly (versus coeherent emission of lasers).

802.3 optics experts demanded during TF review that the type of light source cannot be mandatory and specifications related to reflections have to be included for 1000BASE-RHx PMD, because of potential use of lasers in the future. Because of that, it was decided to specify the value of ORLT as the one for the worst-case observed in the lab, being sure that a system based on LED is able to operate w/o performance degradation. In such case, a laser based system should implement countermeasurements to cope with reflections in some way.

From the suggested remedy it is inferred that ORLT specification in D2p0 does not reflect the worst case of return loss, so the value should be reduced.
The TF is going to make further investigations to validate the value of this parameter.

The value of 14 is in column of min, however it should be in the column of max value, to be consistent with the rest of fiber optics PHYs of 802.3. Editor to change the column.

Cl **114** *SC* **114.6.3.1** *P* **92** *L* **42** # 86

Kolesar, Paul
CommScope

Comment Type **T** *Comment Status* **R** *Big Ticket PMD*

The extinction ratio is bounded both at minimum and maximum levels that are within a 2 dB range. This seems rather challenging to meet in manufacturing and over service life. It also is unusual to limit maximum ER.

SuggestedRemedy

Consider eliminating the maximum ER specification.

Response *Response Status* **C**

REJECT.

See response to comment #122.

Cl **114** *SC* **114.6.3.1** *P* **92** *L* **42** # 122

Dudek, Mike
QLogic

Comment Type **T** *Comment Status* **A** *Big Ticket PMD*

Extinction ratio measurements are difficult to make accurately at high values. A range between 11 and 13dB is likely to be difficult to achieve, and overshoot and droop may affect this measurement.

SuggestedRemedy

Consider whether such a tight range is required.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Because 1000BASE-RHx uses PAM16 and THP, it requires an specification of a transmitter able to guarantee some minimum levels of linearity for interoperability. Related with linearity, TF decided to define a set of parameters able to control that transmit optical power signal does not reach value 0 and also that the baseline wander produced by the transmitter is under certain limits.

Transmit optical power clipping is not well captured by the HD2 and HD3 parameters based on Volterra's series. This is because Wiener's MMSE criterion is used for calculation of them in the script defined for this purpose. Clipping can be eventually produced during signal capture without reflecting any effect in HD2 and HD3. Clipping needs to become so important to be captured in HD2 and HD3 parameters. On the other hand, although RPD is able to capture clipping, it is calculated based on the Volterra series, which could be also affected by the clipping.

Overshoot parameter was defined to capture the signal clipping (among other reasons, like limitation of the channel impulse response spread time seen by the receiver), and maximum value was calculated considering the max permitted ER. By definition of overshoot in the falling-edge (the one that can be related with clipping), clipping of the optical communications signal is produced when Pmin = 0. Therefore, OS_fall = P0/(P1-P0). By definition, ER = P1/P0, therefore OS_fall = 1/(ER-1). If max value of ER is limitted, OS_fall max value is also limitted.

Positive and negative output droops (and the signal test used for that, test mode 4) were defined to limit the baseline wander caused in the transmit signal by some AC coupling (or some control loop producing similar effect) in the transmitter implementation. These two parameters are well defined in terms of ER. Limiting the max value of ER is necessary for TX droop specification. Furthermore, if max value is not defined for ER and transmitter implementation produces some baseline wander in transmit signal, it may happen that signal clipping is produced when transmitter is configured in test mode 4.

Being said that, ER range of LED can be increased to make easier measurement and implementation, however, the sepecification of parameters that depend on ER have to be also modified accordingly.

Editor to change in table 114-6:

- max ER to 15 dB
- max DO+ to 0.8 dB
- min DO- to -0.7 dB
- max OS to 2.5 %

Cl **114** *SC* **114.6.3.1** *P* **92** *L* **42** # 276

Goetzfried, Volker — Broadcom Limited

Comment Type **T** *Comment Status* **R** *Big Ticket PMD*

Transmitter is over-defined with ER having a maximum value. To guarantee enough linearity of the Tx it is sufficient to define HD2 and HD3 derived from Volterra series (shown in 114.6.4.8). Even "clipping" can be captured with those parameters.

SuggestedRemedy

Remove maximum value of ER

Response *Response Status* **C**

REJECT.

See response to comment #122.

Cl **114** *SC* **114.6.3.1** *P* **93** *L* **12** # 97

Ghiasi, Ali — Ghiasi Quantum LLC

Comment Type **T** *Comment Status* **A** *Big Ticket PMD*

In 802.3bm and bs extensively investigated PAM16 and PAM12 the conclusion was that due to RIN not technically feasible

SuggestedRemedy

Either need to show with -137 dB RIN PAM16 modulation is technically feasible, improve RIN, or change modulation to lower order PAM

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #96.

Cl **114** *SC* **114.6.3.1** *P* **93** *L* **13** # 277

Goetzfried, Volker — Broadcom Limited

Comment Type **T** *Comment Status* **A** *Big Ticket PMD*

A relative intensity noise (RIN) maximum of -137 dB/Hz cannot be fulfilled. This value should be increased with a tradeoff to sensitivity.

SuggestedRemedy

Increase maximum value of RIN to -134 dB/Hz

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

RIN < -137 dB/Hz is achieable. However, the implementation is more feasible if this parameter is relaxed.
Simulations demonstrate that the inpact of changing this parameter to -134 dB/Hz affects in less than 0.1 dB of the receiver sensitivity (AOP min at TP3), which has been specified with margin.

Cl **114** *SC* **114.6.3.3** *P* **93** *L* **51** # 102

McDermott, Thomas Fujitsu

Comment Type **TR** *Comment Status* **R** *Big Ticket PMD*

The text specifies that the receiver shall meet the error rate using the methodology specified in 114.6.4. That paragraph specifies terminology and characterization of transmit parameters. 114.6.4 does not specify a test methodology.

The link parameters provide 0.0 dB of link margin in some cases. There is no description that assures that a worst case link is used to test the receiver.

SuggestedRemedy

New text is needed describing the test steps that are to be used to verify that the receiver meets the BER requirements over the worst case set of link parameters. This should include description of the test setup to create a worst case link (attenuation, transfer response, etc.). If such a link setup cannot be validated as worst case, the test procedure should indicate the receive margin available at nominal test limits.

Response *Response Status* **U**

REJECT.

Pg. 93, line 47, exactly state:
"A 1000BASE-RHx receiver shall meet the specifications at TP3 defined in Table 114–8 per measurement techniques defined in 114.6.4."

Table 114-8 specifies: AOP (max and min) and wavelength range.
Measurement methods for AOP and center wavelength measurement are defined for TP2 and TP3.

Pg 95, line 7, states:
"114.6.4 Optical measurement requirements
All the optical measurements of the transmitter shall be made at TP2 (at the end of a 1m length of POF cable consistent with the link type). The optical measurements for the receiver shall be done at TP3."

Pg 95, line 28, states AOP measurement for both:
"114.6.4.3 Average Optical Power (AOP) measurement
The AOP shall meet the specifications at TP2 and TP3 measured with a large area photo-detector able to couple all the output optical power from the optical fiber."

New text asked by the suggested remedy, is already in the draft.

Pg 93, line 51, really says:
"A 1000BASE-RHx PHY shall be able to establish a reliable link per specification of 114.3.7.1 throughout the average optical power (AOP) range between the minimum and maximum limit defined in Table 114–8, for signals received at the MDI that were transmitted from a remote transmitter within the specifications of 114.6.3.1 and have passed through a fiber optic channel specified in 114.6.5. Under these conditions, a 1000BASE-RHx PHY shall provide a BER less than 10^-12 operating in test mode 1 (see 114.5.1) and a frame error ratio less than 1.1·10^-10 for continuous transmission of 64-octet Ethernet frames transmitted with minimum IPG at GMII interface operating in normal (non-test) mode. These specifications apply to a complete 1000BASE-RHx full duplex link composed by two interconnected partners with their respective PCS, PMA and PMD sublayers."

Said that, transmitter is specified, channel is defined, minimum AOP at receiver is specified for link establishement, and criteria for that defined. So, the implementer can setup the test. Link budget and link margin are mathematical derivations and informative.

As said in Pg 104, line 50:
"The worst-case link power budget and unallocated link margin for a 1000BASE-RHx PHY defined in Table 114–12 are derived from the transmitter and the receiver optical specifications as well as fiber optic channel specifications of 114.6.3.1, 114.6.3.3 and 114.6.5, respectively."

Cl **114** *SC* **114.6.3.3** *P* **93** *L* **53** # 126

Dudek, Mike QLogic

Comment Type **T** *Comment Status* **R** *Big Ticket PMD*

The requirements for the Rx might be mis-understood to not require the receiver to meet the requirements with a worst case transmitter with all parameters simultaneously at the worst condition with a fiber with the the worst dispersion. Also the sentence says that all the different receivers (RHA, RHB and RHC) have to operate with the 3 different type cables which may not be what is intended. Also it says that an RHC receiver has to give the required error rate with -18.5dBm AOP when faced with the dispersion given by a Type III cable.

SuggestedRemedy

Clarify what is intend.

Response *Response Status* **C**

REJECT.

As stated in pg 92, line 15:
"1000BASE-RHA and 1000BASE-RHB PHYs have to be able to operate in a fiber optic channel type I. A 1000BASE-RHC PHY has to be able to operate in the fiber optic channel types II and III."
As stated in pg 93, line 48:
"Each 1000BASE-RHx PHY is specified for one or two of three specified fiber optic channels (type I, type II or type III)."
Also, in Table 114-8, RHA and RHB are specified for fiber optics channel type I and RHC for types II and III.
Being said that, we think that the sentence referrenced by the comenter together with previously cited ones do not say that all the different receivers (RHA, RHB and RHC) have to operate with the 3 different type channels.

Regarding to min AOP at TP3 for RHC when faces channel type III, it is correct and make sense, because fiber optic channel type III includes up to at least 15 m length. It makes sense to get better sensitivity (lower number of min AOP) for a shorter / less dispersive channel than for type II (40 m) or type III (50 m). Specification is therefore consistent.

Regarding to worst conditions for TX and channel dispersion, we think that specification is clear.
114.6.3.1 says:
"A 1000BASE-RHx transmitter shall meet the specifications at TP2 defined in Table 114–6 and the mode power distribution (MPD) shall be higher than the lower bound limits defined in Table 114–7 per measurement techniques defined in 114.6.4"
114.6.5 says, for example for Type III:
"Fiber optic channel type III includes up to at least 15 m length. The fiber optic channel type III meets […] the transfer function specification of 114.6.5.3 under launching mode power distribution at TP2 specified per EAF lower bound limits in 114.6.3.1." and 114.6.5.3 specified the lower bound limit.

Pg 93, line 53 reads:
"… for signals received at the MDI that were transmitted from a remote transmitter within the specifications of 114.6.3.1 and have passed through a fiber optic channel specified in 114.6.5".
Therefore, we think that the intent is clear: the specification includes a transmitter with all the parameters simultaneosly moved to what would be considered worst-case condition for the receiver and worst case dispersion, because in that case, both transmitter and channel also meet the specifications.

Cl **114** *SC* **114.6.3.3** *P* **94** *L* **49** # 125

Dudek, Mike QLogic

Comment Type **T** *Comment Status* **A** *Big Ticket PMD*

The Tx is only required to be tolerant of a 14dB optical return loss but there is no specification for the receiver optical return loss.

SuggestedRemedy

Add a receiver return loss specification to table 114-8. Suggested value 14dB.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See also response to comment #272.

Add return loss specification to table 114-8 in form of receiver reflectance (max) = minus the value for ORLT of table 114-6.

Cl **114** *SC* **114.6.4.4** *P* **95** *L* **53** # 123

Dudek, Mike QLogic

Comment Type **T** *Comment Status* **A** *Big Ticket PMD*

Requiring the meaurement of P0 and P1 to be a single time with +/-1ns inaccuracy in time could lead to inconsistent results if there is any droop, overshoot, or ringing.

SuggestedRemedy

Consider changing to "P1 is measured as the average power measured over a 2ns window centered 15ns after the rising-edge."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change para from pg 95 line 54 to pg 96 line 3, as:
"P1 is the steady state value that the optical signal reaches after a rising-edge transition and before the next falling-edge is produced. P1 (in mW) is obtained as the average power measured over a 2 ns window centered 15 ns after the rising-edge crossing of the optical signal with the average optical power (AOP) level. Similarly, P0 is the steady state value that the optical signal reaches after a falling-edge transition and before the next rising-edge is produced. P0 (in mW) is obtained as the average power measured over a 2 ns window centered 15 ns after the falling-edge AOP crossing."

Cl **114** *SC* **114.6.4.7** *P* **96** *L* **46** # 124

Dudek, Mike QLogic

Comment Type **T** *Comment Status* **A** *Big Ticket PMD*

"along the transmit signal" is not precise enough. It needs to be over some time interval relative to the crossing.

SuggestedRemedy

Maybe say "are measured along the transmit signal from 15ns after the rising or falling edges to 15ns before the next rising or falling edge.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

This sentence by itself is not precise at all. However, the measurement procedure is well specified later in the same paragraph.

Rewrite paragraph (lines 45-49) as follow to avoid misunderstanding:
"Then, the PHY is configured in test mode 4 (see 114.5.4) to carry out the output droop measurement. The maximum of the extinction ratio (ERmax) and the minimum of the extinction ratio (ERmin) are measured during a period of time of at least 47 us (which assures sampling over more than a complete test mode 4 pattern). ERmax is calculated from the measured P1 and P0 values where the ratio between them is maximum. Similarly, ERmin is calculated from the measured P1 and P0 values where the ratio between them is minimum. P0 and P1 are defined and measured as specified in 114.6.4.4."

Cl **114** *SC* **114.6.4.8** *P* **97** *L* **3** # 118

Anslow, Pete Ciena

Comment Type **TR** *Comment Status* **A** *Big Ticket PMD*

The multi-vendor interoperability of this PHY is critically dependent on the ability of the specification to define a suitable quality for the worst case transmitter. It is very difficult without a physical implementation to assess whether the transmitter distortion measurement defined here does this adequately.
I can't find any presentations on the P802.3bv web pages that show any correlation between the performance of transmitters in actual links and the transmitter distortion measurement defined here.
While there is no rule that requires this to be done, it has been seen as a requirement in other projects before new specification methods have been accepted. See for instance, http://www.ieee802.org/3/bm/public/nov14/petrilla_01b_1114_optx.pdf#page=8 which has plots of receiver sensitivity vs the newly proposed TDEC transmitter quality metric.

SuggestedRemedy

Please provide some measurement results showing the correlation between link performance and the transmitter distortion measurements that show that HD2 of -21 dB, HD3 of -27 dB and RPD of -40 dB are attainable using transmitters that work in conformant links and that transmitters with HD2 of worse than -21 dB or HD3 of worse than -27 dB or RPD of worse than -40 dB do not work in conformant links.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See perezaranda_3bv_3_0316.

As stated in this presentation (slides 14 - 16), TX non-linear distortion will affect to receiver sensitivity. However, it will be possible to find an implementation in the field that meets TP3 AOP specs connected to a transmitter with worse TP2 HD (I mean, no compliant TX). There are some margins agreed among the implementers, specially because 1000BASE-RH has to operate in a car during >10 years between -40 and 105ºC.

Editor to modify Table 114-6 and subclause 114.6.4.8 according to the refinement of the transmitter distortion measurement of slides 7 through 9 of perezaranda_3bv_3_0316.

Cl **1** *SC* **1.4** *P* **19** *L* **28** # 241

Thomson, Geoff — GraCaSI S.A.

Comment Type **TR** *Comment Status* **R** *BMP*

Having 3 PMD types is addressing 3 instances of Broad Market Potential. This divides the market and is beyond what the group justified and was chartered to do.

SuggestedRemedy

Reduce to a single PMD type.

Response *Response Status* **U**

REJECT.

The attempt to define one port type with multiple link/channel types was rejected by 802.3 optics experts. They demanded multiple port types. The three major markets described in P802.3 project documents do not have the same requirements, and those project documents make it clear that different reaches were required for the requirements of the different markets.

The three port types (RHA, RHB, and RHC) use 1000BASE-H PCS and PMA sublayers and only differ on an small set of specifications of the PMD sublayer. Significant reuse of components between the three port types is expected and enhances Broad Market Potential.

Cl **114** *SC* **114.6.5** *P* **101** *L* **34** # 237

Thomson, Geoff — GraCaSI S.A.

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

Having 3 “channel” types is addressing 3 instances of Broad Market Potential. This is beyond what the group justified and was chartered to do.

SuggestedRemedy

Reduce to a single “channel” type.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Three channels are in http://www.ieee802.org/3/bv/Objectives_GEPOF_2_0714.pdf.

From the technical point of view, the same piece of fiber that meets the specification of transfer function for type I, will probably do for type III. However, type III is defined for RHC which address auatomotive environment where higher temperature range is required. Because of that, larger wavelength width deviation of LED is expected, producing larger insertion loss that needs to be limited, hence different channel specification.

Add to items b and c of list in pg 101, line 33:
"The parameters of this channel type include additional considerations of enviromental conditions of the intended application."

Cl **00** *SC* **0** *P* *L* # 152

Schicketanz, Dieter — Reutlingen University

Comment Type **E** *Comment Status* **R** *Channel*

While the PHY part looks OK, the Channel part needs reworking because it contains missunderstandings and probably errors

SuggestedRemedy

First rename channel to link like in other IEEE standards. If channel is kept to compare to cabling standards define it like done there.

Response *Response Status* **C**

REJECT.

Link is typically used in 802.3 to refer to the physical connection between two devices. Channel is used when discussing the optical or electrical characteristics. Use here is consistent with that approach.

See clauses 87, 88, 89, for example.

Cl **00** *SC* **0** *P* *L* # 153

Schicketanz, Dieter — Reutlingen University

Comment Type **E** *Comment Status* **R** *Channel*

Have you thought to reduce the 50m to allow for a second connector? Eg: 30m + 2 inline connections?

SuggestedRemedy

50 m with one inline connector is nearly useless for the home market. Either you have no conector to connect eqiupmment afterwards or you precable a home (bigger market) but then you need to inline connections. No one likes unused cables hanging out of the wall.

Response *Response Status* **C**

REJECT.

As stated in Pg 101, line 34: "Fiber optic channel type I includes up to at least 50 m length". Therefore, 30 m length is included.

According to Table 114-12, you have a minimum link power budget of 11 dB, max channel insertion loss w/o inline connections of 9.5 dB and unallocated link margin of 1.5 dB.

Considering that you have 30m of a fiber compliant with type I, you get more than 4 dB of extra link margin, which can be used for addition inline connections.

See also response to comment #157.

Cl **114** *SC* **114.6.5** *P* **101** *L* **26** # 156

Schicketanz, Dieter — Reutlingen University

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

Measurement references missing for the channel

SuggestedRemedy

Are there external references like in clause 114.6.4.11? Please add.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Methodologies to measure the insertion loss and transfer function of the fiber optics channel were not included in the draft because we assumed that they are common know-how.

For insertion loss, well known cut-back method is typically used because it provides lower standard deviation than other methods.

For transfer function, the setup described in http://www.ieee802.org/3/bv/public/Jan_2016/takahashi_3bv_03a_0116.pdf is used, that consists on two steps:
1.- TX + 1m POF + RX is connected to VNA and is used to do S21 throw calibration and then,
2.- TX + xm POF + RX is conencted to VNA and S21 is measured obtaining the transfer function.

Editor to add "114.x.x fiber optic channel insertion loss measurement" including a reference to ISO/IEC 14763-3 (add also to normative references if needed).
and "114.x.x fiber optic channel transfer function measurement" including a reference to IEC 60793-1-41 (add also to normative references if needed).
in the new section 114.x devoted to Characteristics of the fiber optic cabling (channel) (see also comment #207)

Cl **114** *SC* **114.6.5** *P* **101** *L* **26** # 155

Schicketanz, Dieter — Reutlingen University

Comment Type **TR** *Comment Status* **R** *Channel*

The channels are specifically defined without connector, but in line 50 it says it meets with connections and in line 53 it says number of connections is not normative.

SuggestedRemedy

How will a user built a working system with this statements? This clause needs considerable rework to become useful . Remedy: In the channel definition include the connections (in dB) and delete lines 50 to 54.

Response *Response Status* **U**

REJECT.

See responses to comments #87, #88 and #102.

Cl **114** *SC* **114.6.5** *P* **101** *L* **29** # 240

Thomson, Geoff — GraCaSI S.A.

Comment Type **TR** *Comment Status* **R** *Channel*

The use of the term “channel” is not consistent with cabling standards. The cabling standards “channel” is NOT an equipment to equipment connection as it does not include equipment connectors.

SuggestedRemedy

Use the 802.3 term that was invented for this use, i.e. “link segment”.

Response *Response Status* **U**

REJECT.

IEEE 802.3 optics experts demanded during TF review same terminology used in other optical PMDs.
See response to comment #238.

Cl **114** *SC* **114.6.5** *P* **101** *L* **29** # 238

Thomson, Geoff — GraCaSI S.A.

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

The text “The fiber optic cabling model (channel) defined here is the same as a simplex fiber optic link segment” is incorrect. It is a duplex link segment.

SuggestedRemedy

Fix

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The same terminology is used in other clauses.
Please, see P8023_D3p2, clauses: 87.10, 88.10, 89.9, 68.8, 75.9.1, 58.9.1, 59.9.1, etc etc.

Though text can be improved. Change line 29:
"The fiber optic cabling model (channel) defined here is the same as a simplex fiber optic link segment."
to
"The fiber optic cabling model (channel) defined here is a simplex fiber optic link segment, which is sufficient for testing purposes."

Cl **114** *SC* **114.6.5** *P* **101** *L* **30** # 208

Zimmerman, George — CME Consulting

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

Is 'type I, type II, type III' a receiver designation or is it a link segment designation

SuggestedRemedy

Clarify. Use a different designation for receiver classes than for link segment classes

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Type I, type II and type III are only fiber optics channel designation. It is clearly stated in the text, though readability of tables 114-8 and 114-12 can be improved labeling the use of types with "channel".

Add label "channel" to types in indicated tables.

Cl **114** *SC* **114.6.5** *P* **101** *L* **30** # 209

Zimmerman, George — CME Consulting

Comment Type **ER** *Comment Status* **R** *Channel*

Everywhere else in 802.3 where there are generic cabling standards we don't use the term channel. No need to do it here - it is a link segment.

SuggestedRemedy

Use standard terminology, or explain the difference you mean by channel.

Response *Response Status* **U**

REJECT.

See responses to comments #238, #240.
The same terminology is used in other 802.3 optical PHYs clauses.

Cl **114** *SC* **114.6.5** *P* **101** *L* **30** # 207

Zimmerman, George — CME Consulting

Comment Type **ER** *Comment Status* **A** *Channel*

Several problems in this section - first, the link segment specification shouldn't be part of the PMD section - break it out as its own 114.x level.

SuggestedRemedy

See comment

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Move to new 114.x just after PMD.

Cl **114** *SC* **114.6.5** *P* **101** *L* **43** # 154

Schicketanz, Dieter — Reutlingen University

Comment Type **TR** *Comment Status* **R** *Channel*

Channel Type III is for automotive

SuggestedRemedy

I doubt that the fiber type specified in line 28 can be used in that envinronment. Be specific in the reference.

Response *Response Status* **U**

REJECT.

No additional reference is required.
According to IEC 60793-2-40, Table 1, applications of sub-category A4a are:
"Digital audio interface, automobile, industrial and sensor & data transmission".

A4a.2 fibers are used in automobile from > 10 years in infotainment systems (MOST) up to ambient temperature of 85ºC, with demonstrated reliability and quality. See presentations in 802.3bv project site about developed A4a.2 fibers to operate up to +105 ºC. Ageing is reported.

Cl **114** *SC* **114.6.5** *P* **101** *L* **50** # 87

Kolesar, Paul — CommScope

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

The current text states:
"Any fiber optic channel including inline connections meets the transfer function specification of each type."
This cannot be a generally true statement, because not every channel that can be deployed may be compliant to the transfer functions. Even if the channel reach is within the definitions of this clause, and the media is compliant to IEC 60793-2-40 sub-category A4a.2, inline connections will change the mode power distribution and therefore can affect the transfer function.

SuggestedRemedy

Change the sentence in question to state a reqirement as follows:
"Any fiber optic channel including inline connections shall meet the transfer function specification of each type."
Also define or provide a reference as to how to test the transfer fnction in the field.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

The experience of TF members (>10 years of MOST deployment in automotive industry) is that inline connections for specified POF cabling produce higher insertion loss for higher modes than for lower modes. Therefore, the transfer function is slightly improved per inline connection although the AOP at TP3 is reduced. Because of that, it was natural to think as a general statement.

However, it may not be necessary true in general terms.

Change text as suggested and update PICS items accordingly.

See comment #88 for measurement methodology of transfer function in the field.

Cl **114** *SC* **114.6.6** *P* **105** *L* **9** # 88

Kolesar, Paul
CommScope

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

The channel attenuation is sensitive to the test wavelength and to the test launch condition. Yet there is no specification as to how to make this measurement in the field.

SuggestedRemedy

Define or provide a reference for the measurement of channel loss in the field.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

The channel attenuation is sensitive to the test wavelength and to the test launch condition. That is true.

Improve text of Pg 101, line 34, as: "Fiber optic channel type I includes up to at least 50 m length. The fiber optic channel type I meets a maximum insertion loss of 9.5 dB without inline connections and the transfer function specification of 114.6.5.1 under spectral distribution and launching mode power distribution at TP2 specified per EAF lower bound limits in 114.6.3.1."

Modify items b and c of the same list accordingly for consistency.

The insertion loss, the transfer function specifications, TP EAF and pointer to IEC 60793-2-40 sub-category A4a.2, all together define the minimum set of specifications to produce SI-POF cabling for GEPOF link operation.

Measurement methodology of SI-POF channel in the field is out of the scope of this standard. Characteristics of cable have to be guaranteed by the specification of the cable.

Cl **114** *SC* **114.7** *P* **105** *L* **16** # 239

Thomson, Geoff
GraCaSI S.A.

Comment Type **TR** *Comment Status* **R** *Channel*

There is no MDI connector specified.

SuggestedRemedy

A default MDI connector should be specified for those cases where a connector is used. It should be polarized to enforce the cross-over requirement in the cabling.

Response *Response Status* **U**

REJECT.

Connector is not specified because it is not needed for interoperability. Specifications are independent of connector.
The optical transmit signal is defined at the output end of 1 meter of plastic optical fiber consistent with the link type connected to the MDI (TP2). The optical receive signals are specified and measured at the output of the fiber optic cabling (TP3) which in a link is connected to the receiver.
Connectors are likely to be standardized in other standardization bodies (ISO, IEC) as in many other cases.

The TF is willing to consider specific proposals regarding to the topic raised by the comment.

Cl **114** *SC* **114.6.3.2** *P* **93** *L* **43** # 275

Goetzfried, Volker — Broadcom Limited

Comment Type **E** *Comment Status* **R** *Clock Tolerance*

The clock frequency tolerance of +/- 0.025% (250 ppm) is higher than the usually specified 100 ppm. This might create a conflict in terms of interoperability with other PHY's.

SuggestedRemedy

Give an additional explanation for the higher tolerance

Response *Response Status* **C**

REJECT.

Any ECU to be installed in a passenger car has to support:
- Service life of 15 years.
- Active operation of 8000 hours, 300.000 km, 365 days of operation per year,…
- ECU inner air temperature between -40 ºC and 105ºC, with a load of 6% (480 h) below 10ºC and 7.3% (584 h) over 100ºC.

These environmental conditions typically speed up the aging of the clock references used for PHY circuits and because of the long serive life required, the car makers typically specifies supporting clock frequency deviations with over 200 ppm to not increase the cost. These requirements were strictly considered for PCS, PMA and PMD specification.

+/- 250 ppm tolerance is compatible with supporting transmission of Ethernet frames of maxEnvelopeFrameSize (2000 octets) of Table 4A-2, with interpacket gap shrinkage below the 8 BT, that is smaller than that indicated in NOTE2 of same table.

Being said that, the capability of the system to operate with larger clock tolerance is an advantage for the use of the 1000BASE-RHC PHY that does not produce any interoperability issue.

Providing explanation for the tolerance specification is not common practice. 100BASE-T requires 50 ppm and it is quite obscure because the specification is in the referenced FDDI specifications. It also is consequently not realized to be the clock frequency specification. Clause 55 though has a 50 ppm specification for its symbol clock without explanation.

Cl **1** *SC* **1.4** *P* **19** *L* **21** # 5

Hajduczenia, Marek — Bright House Networks

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

Unnumbered definitions - all new definitions under 1.4 are numbered as 1.4.x - all other amendments provide specific location where the new term is expected to be added

SuggestedRemedy

please add missing numbers to individual new definitions

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Insert the following new definition after 1.4.22 "1000BASE-CX":
1.4.22a 1000BASE-H

Insert the following new definition after 1.4.26 "1000BASE-PX":
1.4.26a 1000BASE-RHA
1.4.26b 1000BASE-RHB
1.4.26c 1000BASE-RHC

Insert the following new definition after 1.4.277b “MultiGBASE-T” (inserted by IEEE Std 802.3bq-20xx):
Editor’s note: 1.4.277b is what appears in P802.3bq/D3.0 but will probably be renumbered to be 1.4.277a
1.4.277b multi-level coset code

Insert the following new definitions after 1.4.326 "physical coding sublayer":
1.4.326a physical data block
1.4.326b physical header data
1.4.326c physical header subframe

Cl **1** *SC* **1.4** *P* **19** *L* **21** # 245

Carlson, Steve — HSD/Marvell

Comment Type **ER** *Comment Status* **A** *Definitions*

Unnumbered definitions - all new definitions under 1.4 are numbered as 1.4.x. Please provide specific locations where the new term is expected to be added, as is done in other amendments.

SuggestedRemedy

Please add the missing numbers to individual new definitions

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #5.

Cl **1** *SC* **1.4** *P* **19** *L* **23** # 187

Zimmerman, George CME Consulting

Comment Type **ER** *Comment Status* **A** *Definitions*

Amendment needs to specify where these references go and new reference numbers. 'Alphanumerical' isn't sufficient direction, especially since definitions are in various places

SuggestedRemedy

Change editing instruction to insert the following new definition after 1000BASE-CX, and number 1000BASE-H as 1.4.22a. Similarly, editor to look up appropriate places and numbering for other insertions, write individual (or if consecutive, group) editing instructions and number accordingly

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #5

Cl **1** *SC* **1.4** *P* **19** *L* **23** # 109

Anslow, Pete Ciena

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

The editing instructions for new definitions in 1.4 should state where to place them (as per the 802.3 template).

SuggestedRemedy

For each definition, add an editing instruction (definitions proposed to be removed omitted) as:
Insert 1.4.22a after 1.4.22 "1000BASE-CX" as follows:
Text of 1.4.22a 1000BASE-H
Insert 1.4.26a to 1.4.26c after 1.4.26 "1000BASE-PX" as follows:
Text of 1.4.22a 1000BASE-RHA
Text of 1.4.22a 1000BASE-RHB
Text of 1.4.22a 1000BASE-RHC
Insert 1.4.277b after 1.4.277a "MultiGBASE-T" (as inserted by IEEE Std 802.3bq-201x) as follows:
Text of 1.4.277b multi-level coset code (MLCC)
Insert 1.4.326a to 1.4.326c after 1.4.326 "Physical Coding Sublayer (PCS)" as follows:
Text of 1.4.22a physical data block (PDB)
Text of 1.4.22a physical header data (PHD)
Text of 1.4.22a physical header subframe (PHS)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #5

Cl **1** *SC* **1.4** *P* **19** *L* **40** # 188

Zimmerman, George CME Consulting

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

It is not necessary to define general and well known technical terms, which have been used elsewhere in IEEE standards, unless a special distinction is being made: BCH, (codes - if included, the definition should be BCH codes, the "codes" is left out - you aren't defining their names), CRC, FEC, MLCC, and PAM

SuggestedRemedy

Delete definitions for BCH, CRC, FEC, MLCC, and PAM

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Delete BCH, CRC, FEC, an PAM.

Keep MLCC, since this term is used in Clause 114, but not in others.

Cl **1** *SC* **1.4** *P* **19** *L* **40** # 107

Anslow, Pete Ciena

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

The definition for "Bose, Ray-Chaudhuri, Hocquenghem (BCH)" is not an adequate definition for this class of FEC codes. To be an adequate definition, it would need to be much more detailed and this is not needed here.
Adding BCH to the abbreviations list is enough.

SuggestedRemedy

Remove the definition for "Bose, Ray-Chaudhuri, Hocquenghem (BCH)"

Response *Response Status* **C**

ACCEPT.

Cl **1** *SC* **1.4** *P* **19** *L* **43** # 213

Ran, Adee INTEL

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

CRC, FEC, and PAM are already defined as abbreviations in 802.3 subclause 1.5. Adding them again as definitions does not provide more clarity and might collide with the existing entries in the standards dictionary.

SuggestedRemedy

Delete the definitions of CRC, FEC, and PAM.

Response *Response Status* **C**

ACCEPT.

Cl **1** *SC* **1.4** *P* **19** *L* **43** # 7

Hajduczenia, Marek — Bright House Networks

Comment Type **ER** *Comment Status* **A** *Definitions*

CRC is already defined in 802.3:
http://ieeexplore.ieee.org/xpls/dictionary.jsp?stdDict=browse_keyword&pageNumber=1&def_term=CRC&def_id=&stdDictionary_tarid=&stdDictionary_tarn=null&stdDictionary_scn=Aerospace+Electronics&nav=

SuggestedRemedy

Remove definition - there are individual locations where CRC is defined locally, as needed. It is dangerous to create now new definitons, affecting older clauses, without causing hertburn

Response *Response Status* **U**

ACCEPT.

Cl **1** *SC* **1.4** *P* **19** *L* **43** # 108

Anslow, Pete — Ciena

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

The terms CRC, FEC, and PAM are already very heavily used in 802.3-2015.
"CRC" occurs 163 times, "FEC" 2162 times, and "PAM" 341 times.
All three are already in the abbreviations list.
Creating new definitions such as this may well have unintended consequences.

SuggestedRemedy

Remove the definitions for "CRC", "FEC", and "PAM"

Response *Response Status* **C**

ACCEPT.

Cl **1** *SC* **1.4** *P* **19** *L* **43** # 259

Carlson, Steve — HSD/Marvell

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

The terms CRC, FEC, and PAM are used in many places in 802.3-2015.All three are already in the abbreviations list and creating unnecessary definitions is confusing and potentially harmful.

SuggestedRemedy

Remove the definitions for "CRC", "FEC", and "PAM"

Response *Response Status* **C**

ACCEPT.

Cl **1** *SC* **1.4** *P* **19** *L* **45** # 6

Hajduczenia, Marek — Bright House Networks

Comment Type **ER** *Comment Status* **A** *Definitions*

FEC is already included in IEEE Dictionary

SuggestedRemedy

http://ieeexplore.ieee.org/xpls/dictionary.jsp?stdDict=browse_keyword&pageNumber=1&def_term=FEC&def_id=&stdDictionary_tarid=&stdDictionary_tarn=null&stdDictionary_scn=Aerospace+Electronics&nav=
remove definition in line 45/46
there are individual locations where FEC is defined locally, as needed. It is dangerous to create now new definitons, affecting older clauses, without causing hertburn

Response *Response Status* **U**

ACCEPT.

Cl **1** *SC* **1.4** *P* **19** *L* **48** # 214

Ran, Adee — INTEL

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

Definition of MLCC is specific to clause 114, but does not refer to it.

SuggestedRemedy

Add (IEEE Std 802.3, Clause 114).

Response *Response Status* **C**

ACCEPT.

Cl **1** *SC* **1.4.x** *P* **20** *L* **11** # 235

Trowbridge, Steve — Alcatel-Lucent

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

Lots of precediing projects have used PAM modulation, and none have felt compelled to define "pulse amplitude modulation" as a term. PAM is defined as an acronym.

SuggestedRemedy

Delete the definition of pulse amplitude modulation

Response *Response Status* **C**

ACCEPT.

Cl **1** *SC* **1.4.91** *P* **20** *L* **15** # 131

Grow, Robert — RMG Consulting

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

The definition needs to be changed to include our 64B/65B.

SuggestedRemedy

With change marking: A set of block oriented encodings where 64-bit blocks are prepended with a single bit to indicate whether the block contains only data or a mix of data (possibly none) and control information. (See IEEE Std 802.3, Clause 55, Clause 114.)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add before the references: "The details of each 64B/65B encoding are specific to the PCS using one of the 64B/65B encodings."

Cl **1** *SC* **1.3** *P* **19** *L* **15** # 186

Zimmerman, George — CME Consulting

Comment Type **ER** *Comment Status* **A** *Ed Inst*

Editing instruction improperly references IEEE Std 802.3bw, leaves status of 802.3bp conditional, 802.3bp already has reference in d3p1.

SuggestedRemedy

Delete editing instruction and additional reference

Response *Response Status* **U**

ACCEPT.

Cl **1** *SC* **1.4** *P* **20** *L* **14** # 9

Hajduczenia, Marek — Bright House Networks

Comment Type **E** *Comment Status* **A** *Ed Inst*

Imprecise editorial instruction

SuggestedRemedy

Change "Change the following definitions:" to "Change definition 1.4.401 as shown below:"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

"Change the definition of 1.4.401 as follows:"
(In the draft in numerical subclause order for each changed definition. WG guidance on instructions is of our style.)

Cl **1** *SC* **1.5** *P* **20** *L* **21** # 132

Grow, Robert — RMG Consulting

Comment Type **E** *Comment Status* **A** *Ed Inst*

Abbreviations is an alphanumeric list.

SuggestedRemedy

Change alphabetical to alphanumeric

Response *Response Status* **C**

ACCEPT.

Cl **30** *SC* **30** *P* **21** *L* **1** # 246

Carlson, Steve — HSD/Marvell

Comment Type **ER** *Comment Status* **R** *Ed Inst*

All objects being modified in Clause 30 are also modified by other projects. Please align editorial instructions to the ones used in P802.3bp D3.1, including the list of projects changing these specific objects

SuggestedRemedy

This helps the reader, as well as the staff editors in combining individual amendments in the base standard.
See also comment i-162 in
http://www.ieee802.org/3/bp/comments/8023bp_D30_approved.pdf

Response *Response Status* **U**

REJECT.

See response to comment #10

Cl **30** *SC* **30** *P* **21** *L* **1** # 10

Hajduczenia, Marek — Bright House Networks

Comment Type **ER** *Comment Status* **R** *Ed Inst*

All objects being modified in Clause 30 are already modified by other projects. Please align editorial instructions to the ones used in P802.3bp D3.1, including list of projects changing these specific objects

SuggestedRemedy

This helps both the reader, as well satff editor folding in individual amendments into a single document.
See also comment i-162 in
http://www.ieee802.org/3/bp/comments/8023bp_D30_approved.pdf

Response *Response Status* **U**

REJECT.

Recent refinements of 802.3 style for writing editing instructions only cite the amendments necessary to unambiguously define the Insert point. Change instructions only cite amendments that are the basis for the text below the instruction.

The editing instructions are consistent with the new guidelines.

Cl **30** *SC* **30.5.1.1.2** *P* **21** *L* **23** # 134

Grow, Robert — RMG Consulting

Comment Type **T** *Comment Status* **R** *Ed Inst*

Wrong insert point. List organization seems to be grouped by PCS type but not consistently alphabetical PCS order (T following X), so could be either before 1000BASE-T or as first 1000BASE enumeration.

SuggestedRemedy

Insert the following enumerations after 100BASE-T1 (as modified by P802.3bw) in APPROPRIATE SYNTAX:

Response *Response Status* **C**

REJECT.

There is no logical order. We do not need the change.

Cl **30** *SC* **30.5.1.1.4** *P* **21** *L* **32** # 11

Hajduczenia, Marek — Bright House Networks

Comment Type **TR** *Comment Status* **A** *Ed Inst*

aMediaAvailable is beign modified by 802.3bp, but there is no reference to this fact in this text

SuggestedRemedy

Update editorial instruction to recognize changed done by 802.3bp and update sentence number - seems you're adding now sentence number 4

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Change to read: "Insert into the third paragraph in BEHAVIOUR DEFINED AS section of 30.5.1.1.4 after the second sentence (and before the sentences inserted by IEEE Std 802.3bw-2015 and IEEE Std 802.3bp-20xx) the following:"

Cl **45** *SC* **45.2.1.6** *P* **23** *L* **8** # 14

Hajduczenia, Marek — Bright House Networks

Comment Type **TR** *Comment Status* **A** *Ed Inst*

Register 1.7 is being modified by multiple projects, including P802.3bp. Bits "1 1 1 1 0 1" were allocated to BASE-T1. You should at least show which bits you're removing from reserved pool and what the reserved pool will look like after the change.
Editorial instruction is not precise, listing "change “reserved” line(s) as appropriate for values defined by this and other approved amendments" - staff editor has to be able to put these together and not figure out what needs to be changed and how, when folding multiple amendments together

SuggestedRemedy

Update editorial instruction to recognize changed done by 802.3bp and other projects. Show changes to reserved space. Update editorial instruction to recognize changes by .3bw and .3bp, which are running ahead

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Conditionally add Editor’s note that reserved rows will be addressed when the order of amendment approval is known as an editorial action.

If another amendment makes rows individually defined as Reserved as has been commented on their draft, this will become a simple change instruction.

Cl **45** *SC* **45.2.1.6** *P* **23** *L* **10** # 133

Grow, Robert — RMG Consulting

Comment Type **E** *Comment Status* **A** *Ed Inst*

Comments on earlier drafts have recommended that all reserved code points in this bit range be individuallly labeled as reserved rather than our practice of specifying blocks with x in bit positions to reduce the number of lines used for reserved code points.

SuggestedRemedy

Update the editorial instruction as events dictate.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Coordinate with comment #14.

Cl **45** *SC* **45.2.1.6** *P* **23** *L* **11** # 172

Remein, Duane — Huawei Technologies

Comment Type **ER** *Comment Status* **A** *Ed Inst*

Should list known/expected amandments rather than stating "other approved amendments"

SuggestedRemedy

Enumber list of known project changing this table.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Assumptions on which amendments have been considered when editing the draft have been put into an editors note in the front matter.

An editors note will be added to clarify that changes to show reserved row changes and edits to the instruction will be made when approval order becomes clear.

Cl **45** *SC* **45.2.3** *P* **23** *L* **28** # 248

Carlson, Steve — HSD/Marvell

Comment Type **ER** *Comment Status* **A** *Ed Inst*

"Replace 3.420 through 3.1799 row with the following rows" is not clear. Where are the strike-through and underline changes to the reserved space being modified?

SuggestedRemedy

Please show all changes to Table 45-119 reserved bit space in the standard underline / cross-through format. Update the editorial note to use the word "Change" instead of "Replace."

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #15.

Cl **45** *SC* **45.2.3** *P* **23** *L* **28** # 15

Hajduczenia, Marek — Bright House Networks

Comment Type **ER** *Comment Status* **A** *Ed Inst*

"Replace 3.420 through 3.1799 row with the following rows" - this is inclear - where are the strike-through and underline changes to reserved space you're modifying?

SuggestedRemedy

Please show changes to Table 45-119 reserved bit space in standard underline / cross-through format. Update editorial note to use the word "Change" instead of replace

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Modify editor's instruction as:
"Change the identified reserved row in Table 45-2 and insert new rows for 1000BASE-H immediately below the changed row as follows (unchanged rows and footnotes not shown):"

Add strike through 3.1799, and underscore the 3.499 in first row, underscore all new row text.

Cl **78** *SC* **78.1.4** *P* **33** *L* **5** # 37

Hajduczenia, Marek — Bright House Networks

Comment Type **ER** *Comment Status* **A** *Ed Inst*

"Insert new rows below into Table 78-1 after 1000BASE-KX:" does not account for other amendments (802.3bw, 802.3bp, etc.) that are changing the same table

SuggestedRemedy

Update the editorial instructions accounting for other amendments in tow (802.3bw, 802.3bp, etc.)
The same applies to the editorial note in 78.2 and 78-5

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Recently revised 802.3 guidance on editoral instructions indicate that for an Insert instruction, only amendments that affect the insert point are cited.

The TF believes insertion after 1000BASE-T1 would be better. Change editing instruction to point to 1000BASE-T1 (inserted by IEEE Std 802.3bp - 20xx).

Cl **78** *SC* **78.1.4** *P* **33** *L* **5** # 255

Carlson, Steve — HSD/Marvell

Comment Type **ER** *Comment Status* **A** *Ed Inst*

"Insert new rows below into Table 78-1 after 1000BASE-KX:" does not account for other amendments (802.3bw, 802.3bp, etc.) that are changing the same table

SuggestedRemedy

Update the editorial instructions accounting for other amendments in (802.3bw, 802.3bp, etc.)
Also applies to the editorial note in 78.2 and 78-5

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #37.

Cl **00** *SC* **0** *P* *L* # 260

Carlson, Steve — HSD/Marvell

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

Recent amendments have been trying to clean up inconsistent hyphenation to match the current revision. See Maytum comments to P802.3bp D3.0. Suggest searching the draft for these---here's what I found.

SuggestedRemedy

inline change to in-line
set-up change to setup
Energy Efficient Ethernet change to Energy-Efficient Ethernet
multi-mode change to multimode
steady state change to steady-state
low pass change to low-pass

Response *Response Status* **C**

ACCEPT.

Cl **00** *SC* **0** *P* *L* # 135

Grow, Robert — RMG Consulting

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

A review of 802.3 words and compound words and other corrections of inconsistent spelling/hypenation implemented in the latest revision indicate we can improve consistent usage.

SuggestedRemedy

inline should be in-line
set-up should be setup
Energy Efficient Ethernet should be Energy-Efficient Ethernet
multi-mode should be multimode
steady state should be steady-state
low pass should be low-pass

Response *Response Status* **C**

ACCEPT.

Cl **114** SC **114.11.4** P L **30** # 119
YUKI, HAYATO AutoNetworks Technol

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

IEC number should be added, because CISPR 25 does not describe the RF immunity. (Ex.) . . . according to IEC 11452/CISPR 25 test method for radio frequency (RF) immunity and RF emissions.

SuggestedRemedy

Per comment.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

A 1000BASE-RHx PHY shall meet EMC requirements according to ISO 11452 and IEC CISPR 25 test methods for radio frequency (RF) immunity and RF emissions.

Cl **114** SC P **16** L **32** # 85
Hayashi, Takehiro HAT Lab., Inc.

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

Page: 16 92 101 122 123
Line: 32 23 15, 17, 36, 41, 45 10 36

wrong term "mode power distribution"

SuggestedRemedy

modal power distribution

Response *Response Status* **C**

ACCEPT.

Cl **TOC** SC P **16** L **50** # 89
Pimpinella, Rick Panduit Corp.

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

114.11.1 through 114.11.5 are missing spaces between the section number and text.

SuggestedRemedy

Add spaces

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

This is a publication issue. (It will return if the publication editors use the default TOC template.) The level 3 TOC tab stops do not allow enough room for the length of the subclause numbers. Modify template tab stops.

Cl **TOC** SC P **17** L **6** # 90
Pimpinella, Rick Panduit Corp.

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

114.13.1 through 114.13.15 are missing spaces between the section number and text.

SuggestedRemedy

Add spaces

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #89.

Cl **1** SC **1.4** P **20** L **17** # 110
Anslow, Pete Ciena

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

"Clause 55" is a cross-reference in the base standard, so should be in Forest green

SuggestedRemedy

Apply the character tag "External" to "Clause 55"

Response *Response Status* **C**

ACCEPT.

Cl **30** SC **30.5.1.1.4** P **21** L **40** # 13
Hajduczenia, Marek Bright House Networks

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

When referencing subclauses, we do not use "Clause" and "subclause"

SuggestedRemedy

Strike two instances of "Clause" in line 40. Scrub the rest of the draft and remove other superfluous instances of the word "Clause"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Correct the FrameMaker “Format” for the cross references to “Section”. Correct external reference at P.100, L.48. Delete “clauses” P.105, L.40

Cl **30** *SC* **30.5.1.1.4** *P* **21** *L* **40** # 247
Carlson, Steve HSD/Marvell

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

When referencing subclauses, we do not use "Clause" and "subclause"

SuggestedRemedy

Strike two instances of "Clause" in line 40. Scrub the rest of the draft and remove other superfluous instances of the word "Clause"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Same response as comment #13.

Cl **45** *SC* **45.2.3.48** *P* **23** *L* **36** # 114
Anslow, Pete Ciena

Comment Type **ER** *Comment Status* **A** *EZ*

45.2.3.48 is already present in the base standard (TimeSync PCS capability (Register 3.1800))

SuggestedRemedy

Re-number 45.2.3.48 to 45.2.3.54 to be 45.2.3.47a to 45.2.3.47g

Response *Response Status* **U**

ACCEPT.

Cl **45** *SC* **45.2.3.48** *P* **23** *L* **36** # 258
Carlson, Steve HSD/Marvell

Comment Type **ER** *Comment Status* **A** *EZ*

45.2.3.48 exists in the base standard (Clause 90 TimeSync PCS capability (Register 3.1800))

SuggestedRemedy

Re-number 45.2.3.48 to 45.2.3.54 to be 45.2.3.47a to 45.2.3.47g

Response *Response Status* **U**

ACCEPT.

Cl **45** *SC* **45.2.3.48** *P* **23** *L* **53** # 127
Marris, Arthur Cadence Design Syste

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

I thought in Clause 45 the policy is not to renumber suclauses but use letter suffeces

SuggestedRemedy

Change 45.2.3.48 to 45.2.3.47a, 45.2.3.49 to 45.2.3.47b, etc

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.3.48** *P* **24** *L* **3** # 249
Carlson, Steve HSD/Marvell

Comment Type **ER** *Comment Status* **R** *EZ*

P802.3bp has added 45.2.3.51 through 45.2.3.57.

SuggestedRemedy

Update the subclause numbers and table numbers accordingly, using 802.3bp numbers as the end of the range. Add P802.3bv registers after this range.

Response *Response Status* **U**

REJECT.

P802.3bv's defined registers 3.500 through 3.522 sequentially belong between 45.2.3.47 and 45.3.48. If current new numbering conventions hold, the register descriptions will be 45.2.3.47a through 45.2.3.47g.

See #114 for acceptance of the new lettering convention for inserts.

This comment conflicts with commenter's #258.

Cl **45** *SC* **45.2.3.48** *P* **24** *L* **3** # 16

Hajduczenia, Marek — Bright House Networks

Comment Type **ER** *Comment Status* **R** *EZ*

P802.3bp is already adding 45.2.3.51 through 45.2.3.57, so I assume you intended to start adding at 45.2.3.58?

SuggestedRemedy

Update subclause numbers and table numbers, accordingly, using 802.3bp numbers as the end of the range you should be adding after

Response *Response Status* **U**

REJECT.

P802.3bv's defined registers 3.500 through 3.522 sequentially belong between 45.2.3.47 and 45.3.48. If current new numbering conventions hold, the register descriptions will be 45.2.3.47a through 45.2.3.47g.

See #114 for acceptance of the new lettering convention for inserts.

Cl **45** *SC* **45.2.3.48.1** *P* **24** *L* **47** # 250

Carlson, Steve — HSD/Marvell

Comment Type **ER** *Comment Status* **A** *EZ*

As part of a general style clean-up, please implement comment #70 from http://www.ieee802.org/3/bp/comments/8023bp_D20_approved.pdf.

SuggestedRemedy

Change all instances of "This bit" to "Bit xxxx" with a precise and unambiguous cite of the register number to avoid any possible confusion as to which bit is meant.
Also, where the word "it" is used at the beginning of the sentence in Clause 45, please also mention the bit reference explicitly - again, this avoids concerns with interpretation as to what bit is meant

Response *Response Status* **U**

ACCEPT.

Cl **45** *SC* **45.2.3.48.1** *P* **24** *L* **47** # 17

Hajduczenia, Marek — Bright House Networks

Comment Type **ER** *Comment Status* **A** *EZ*

Please implement comment #70 from http://www.ieee802.org/3/bp/comments/8023bp_D20_approved.pdf.

SuggestedRemedy

Change all instances of "This bit" to "Bit xxxx" citign specific explicit register number. This avoids concerns about what bit is used.
Also, where the word "it" is used at the beginning of the sentence in Clause 45, please also mention the bit reference explicitly - again, this avoids concerns with interpretation as to what bit is meant

Response *Response Status* **U**

ACCEPT.

Cl **45** *SC* **45.2.3.48.5** *P* **25** *L* **16** # 215

Ran, Adee INTEL

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

Comment is about standards language. The style manual says
"...the use of the word must is deprecated and shall not be used when stating mandatory requirements; must is used only to describe unavoidable situations"
and
"The word may is used to indicate a course of action permissible within the limits of the standard (may
equals is permitted to)"
And also deprecates usage of the word "will" and says "will is only used in statements of fact".

The word "must" appears in clause 114 five times, and does not refer to unavoidable situations - these seem to be normative requirements.

The word "will" appears in many places in this draft not as a statement of fact.

The word "may" is used in several places in a way that does not seem to be an option - sometimes they indicate a possible situation or a recommendation. Examples are 114.1.3, 114.3.2, 114.3.7.3, 114.6.1.5.1, 144.6.4.8.

In addition, in 114.6.4.10 there's a "may not" that does not meet the style manual's directions, and is ambiguous in English (could be interpreted as either optional or prohibitive).

A significant effort was done in 802.3bx to clean the standard with respect to these words. It would be helpful for the next revision if this amendment adheres with the manual.

SuggestedRemedy

Across the draft, change "must" and "will" to "shall" or rephrase as necessary.

Also, check usage of the word "may" (in the listed locations and elsewhere) and rephrase (e.g. using "can", "should", "might not") if necessary.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Editor to review uses for consistency with IEEE style.

Cl **45** *SC* **45.2.3.48.5** *P* **25** *L* **16** # 251

Carlson, Steve HSD/Marvell

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

The use of the word "will" is deprecated and shall not be used when stating mandatory requirements; will is only used in statements of fact.

SuggestedRemedy

Convert all instances of "will" in the draft (excluding FM) to Simple Present Tense

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #21.

Cl **45** *SC* **45.2.3.48.5** *P* **25** *L* **16** # 21

Hajduczenia, Marek Bright House Networks

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

The use of "will" in draft standard is limited to very few specific use cases. This is not one of them

SuggestedRemedy

Convert all instances of "will" in draft (excluding FM) to Simple Present Tense

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Editor to review the 18 uses of will in the body of the standard and replace and appropriately adjust grammar except where will is used as a statement of fact.

Cl **45** *SC* **45.2.3.50.3** *P* **27** *L* **31** # 30

Hajduczenia, Marek — Bright House Networks

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

Meaningless statement: "Default value of OAM enable can be 0 or 1 and it is up to implementer." - since it is either of the two values, it does not really matter, the other side cannot expect a specific value

SuggestedRemedy

Strike the statement - there is no default value
The same change in 45.2.3.50.4, line 39

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Editor to replace line 31:
"Default value of OAM enable can be 0 or 1
and it is up to implementer."
with:
"3.518.1 has no specified default value."

Replace in line 39:
"Default value of EEE enable can be 0 or 1 and it is up to the implementer."
with:
"3.518.0 has no specified default value."

Cl **45** *SC* **45.2.3.51.1** *P* **28** *L* **44** # 31

Hajduczenia, Marek — Bright House Networks

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

"This bit indicates the value of … " - we typically state that "This bit reflects the value of …" meaning that the value of specific variable is recorded in the register

SuggestedRemedy

Apply the change in 45.2.3.51.1 and 45.2.3.51.2, 45.2.3.51.4, and 45.2.3.51.5, 45.2.3.51.6, and 45.2.3.51.7 - 45.2.3.51.3 is OK as is

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.3.51.1** *P* **28** *L* **44** # 252

Carlson, Steve — HSD/Marvell

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

"This bit indicates the value of … " -in 802.3 the word "reflects" is used e.g. "This bit reflects the value of …" meaning that the value of the specified variable is recorded in the register

SuggestedRemedy

Change in 45.2.3.51.1 and 45.2.3.51.2, 45.2.3.51.4, and 45.2.3.51.5, 45.2.3.51.6, and 45.2.3.51.7

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.3.51.10** *P* **29** *L* **44** # 32

Hajduczenia, Marek — Bright House Networks

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

Unnecessary information in Clause 45: "in normal mode, and if link is established it is transmitting complete
Transmit Blocks"

SuggestedRemedy

Remove this text in 45.2.3.51.10 and 45.2.3.51.11

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.3.51.12** *P* **30** *L* **4** # 33

Hajduczenia, Marek — Bright House Networks

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

We do not need to refer "implementation" in "this bit indicates the remote PHY implementation"

SuggestedRemedy

Strike the word "implementation" when referring to PHY in Clause 45- it does not really add any detail

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.3.51.12** *P* **30** *L* **5** # 34

Hajduczenia, Marek — Bright House Networks

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

Amgibuous "it" - "When read as one, this bit indicates the remote PHY implementation is able to run the OAM protocol and it is enabled." - is it OAM protocol or remote PHY?????

SuggestedRemedy

Apply to 45.2.3.51.12 and 45.2.3.51.13

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Change sentence in 45.2.3.51.12 to read:
"When read as one, this bit indicates the remote PHY has both 1000BASE-H OAM ability and the 1000BASE-H OAM has been enabled. When read as zero, this bit indicates that the remote PHY either does not have 1000BASE-H OAM ability or the 1000BASE-H OAM is disabled."

Change sentence in 45.2.3.51.13 to read:
"When read as one, this bit indicates the remote PHY has both EEE ability and EEE has been enabled. When read as zero, this bit indicates that the remote PHY either does not have EEE ability or EEE is disabled."

Cl **114** *SC* **114** *P* **35** *L* **6** # 256

Carlson, Steve — HSD/Marvell

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

Missing serial comma in "1000BASE-RHA, 1000BASE-RHB and 1000BASE-RHC"

SuggestedRemedy

Change to "1000BASE-RHA, 1000BASE-RHB, and 1000BASE-RHC" Search the draft for missing serial commas and fix.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Editor will attempt to find and fix the other missing serial commas.

Cl **114** *SC* **114** *P* **35** *L* **6** # 39

Hajduczenia, Marek — Bright House Networks

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

Missing serial comma in "1000BASE-RHA, 1000BASE-RHB and 1000BASE-RHC"

SuggestedRemedy

Change to "1000BASE-RHA, 1000BASE-RHB, and 1000BASE-RHC"
Scrub the remainder of the draft for missing serial commas. A quick search shows at least 25 instances where changes are needed

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Editor will attempt to find and fix the other missing serial commas.

Cl **114** *SC* **114.1.2** *P* **35** *L* **38** # 41

Hajduczenia, Marek — Bright House Networks

Comment Type **ER** *Comment Status* **A** *EZ*

"Mathematical expressions in this clause include symbols and delimiters as specified in ISO 80000-2." - that is the first. All other clauses manage to get along with standard 802.3 coventions. Which specific expressions or symbols require reference to ISO???

SuggestedRemedy

Consider removing this reference, unless it is explicitly clear which expressions, symbols, and delimiters require this reference. If really needed, this ISO standard will also need to be included in references, where it is currently missing.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

This is an editorial error. All the expressions or symbols, and delimiters per ISO 80000-2 were eliminated from D1p3 to D1p4. However, editors forgot to strike this sentence although the reference to 80000-2 was already eliminated.

Cl **114** *SC* **114.1.2** *P* **35** *L* **38** # 257

Carlson, Steve HSD/Marvell

Comment Type **ER** *Comment Status* **A** *EZ*

"Mathematical expressions in this clause include symbols and delimiters as specified in ISO 80000-2." Which specific expressions or symbols require reference to ISO? The base standard does not require references to ISO.

SuggestedRemedy

Consider removing this reference, unless it is explicitly clear which expressions, symbols, and delimiters require this reference. If this ISO standard is actually needed, it will need to be included in references.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #41.

Cl **114** *SC* **114.1.5** *P* **36** *L* **28** # 43

Hajduczenia, Marek Bright House Networks

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

"1000BASE-RHx PHY types support full-duplex operation only" - there are only 7 instances of "full-duplex" in base standard, and hundreds of "full duplex"

SuggestedRemedy

Change all "full-duplex" instances to "full duplex"

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.1.5** *P* **36** *L* **51** # 44

Hajduczenia, Marek Bright House Networks

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

"the GMII data stream contained in the block" - I assume this "block" is the "Transmit Block"?

SuggestedRemedy

Change "block" to "Transmit Block" when referring to it. Also, given the number of times "Transmit Block" is used, consider adding an acronym for it

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Used in the same sentence there should not be any ambiguity. In this case clarity improved if changed to read . . .GMII data stream also included in the Transmit Block. Delete "in the block" at line 53.

Do not define acronym.

Cl **114** *SC* **114.1.6** *P* **37** *L* **36** # 163

Pérez-Aranda, Rubén KDPOF

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

Figure 114-3.
PMD service primitive PMD_RXDETECT.indication has not been included in the list of primitives (right of figure).

SuggestedRemedy

Add line between PMD and PMA (arrow with direction from PMD to PMA) with PMD_RXDETECT.indication text

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.2** *P* **38** *L* **4** # 223

Ran, Adee INTEL

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

Unit for symbol rate is Baud, not Hertz.

Also, later the units Msymbols/s appear.

SuggestedRemedy

Change "325 MHz" to "325 MBd" everywhere. Change "Msymbols/s" similarly.

Response *Response Status* **U**

ACCEPT.

Cl **114** *SC* **114.2** *P* **38** *L* **5** # 98
McDermott, Thomas Fujitsu

Comment Type **ER** *Comment Status* **A** *EZ*

Symbol transmission rate should be in symbols/sec, not Hertz.

SuggestedRemedy

Change 325 MHz to 325 megasymbols per second.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #223.

Cl **114** *SC* **114.2** *P* **38** *L* **5** # 278
Ewen, John GlobalFoundries

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

Incorrect units?

SuggestedRemedy

The symbols are transmitted at a nominal rate of 325 Mbaud.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #223.

Cl **114** *SC* **114.2.1** *P* **38** *L* **6** # 261
Carlson, Steve HSD/Marvell

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

Please use the standard symbol for "microsecond."

SuggestedRemedy

Replace the word "microsecond" with the symbol.

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.2.1** *P* **38** *L* **22** # 53
Hajduczenia, Marek Bright House Networks

Comment Type **E** *Comment Status* **R** *EZ*

Unnecessary brackets: "(The top part of the figure provides detail on the beginning of a Transmit Block and the bottom part of the figure the end of a Transmit Block.)"

SuggestedRemedy

Remove () around the sentence

Response *Response Status* **C**

REJECT.

This is a matter of style. The text as written is appropriate because the paragraph subject is Transmit Blocks, not the figure, so a sentence clarifying the referenced figure is parenthetical.

Cl **114** *SC* **114.2.1** *P* **39** *L* **2** # 226
Ran, Adee INTEL

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

Definition of CW_i appears after the figure in which it appears.

A previous sentence includes "(CW)" but CW never appears without an index.

SuggestedRemedy

Move the figure so that it appears after this paragraph so all necessary terms will have been defined.

Delete "(CW)" in P38 L53.

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.2.1** *P* **39** *L* **6** # 55
Hajduczenia, Marek Bright House Networks

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

We do have proper symbol for "microsecond"

SuggestedRemedy

Replace the word with proper symbol

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.2.1** *P* **39** *L* **6** # 99

McDermott, Thomas — Fujitsu

Comment Type **ER** *Comment Status* **A** *EZ*

Symbol transmission rate should be in symbols/sec, not Hertz.

SuggestedRemedy

Change 325 MHz to 325 MSymbol/s

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #223.

Cl **114** *SC* **114.2.1** *P* **39** *L* **11** # 190

Zimmerman, George — CME Consulting

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

Figure 114-5 mixes sublayers, doesn't show separate PCS, includes PMA within what appears to be PCS.

SuggestedRemedy

Adjust figure to show clear definition of sublayers. Possible outcomes - put a dashed box around encoding/scrambler/PAM16/Symbol Scrambler blocks, and somehow deal with the fact that there is first the PMA and then the multiplexer (is this part of the PMA - if so, extend the block) Alternatively, remove the "PMA" block and market the entire data path "PCS/PMA".

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Dashed box in the 3 data-paths around the corresponding blocks belonging to PCS. Extend PMA box to multiplexer or indicate it separately.

Cl **114** *SC* **114.2.1** *P* **39** *L* **12** # 92

Pimpinella, Rick — Panduit Corp.

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

The Payload data path has a typo in the abbreviation for the Gigbit Media Independent Interface. The abbreviation has one too many I?s(i.e., shown as GMIII).

SuggestedRemedy

Change GMIII to GMII

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.2.2.2** *P* **40** *L* **50** # 60

Hajduczenia, Marek — Bright House Networks

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

Acronym exists: "alternating with Physical Header Subframe sub-blocks"

SuggestedRemedy

Change "alternating with Physical Header Subframe sub-blocks" to "alternating with PHS sub-blocks"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accept suggested remedy

Change in pg 38, line 21: "14 header data sub-blocks" to "14 Physical Header Sub-frame (PHS) sub-blocks" for consistency and because this is the first time PHS is introduced.

In all the draft replace "header sub-block" and "physical header sub-block" with "PHS_x sub-block" to avoid unconsistency.

Cl **114** *SC* **114.2.2.2** *P* **41** *L* **24** # 62

Hajduczenia, Marek — Bright House Networks

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

Unnecessary spacing in hex definitions in Table 114-1

SuggestedRemedy

For example: "0x0 94 52 86" is hard to read, given the number of spaces in the number representation. Consider either adding "-" instead of spaces, or grouping all hex characters together
Global comment

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The approved 802.3-2015 draft consistently uses uninterrupted strings for strings of similar or smaller length. 802.3-2015 is inconsistent for strings longer than 12 hex digits. Use of hyphens could be confusing with the representation of MAC addresses.

Remove octet spaces for our strings less than 13 digits. Maintain the every 4 hex digits space separated groupings for longer strings.

Cl **114** *SC* **114.2.3** *P* **41** *L* **45** # 63

Hajduczenia, Marek — Bright House Networks

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

Unnecessarily wordy description: "by a CRC code of 16 bits (CRC16)"

SuggestedRemedy

Change to "by a 16-bit CRC code (CRC16)"

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.2.3** *P* **41** *L* **51** # 64

Hajduczenia, Marek — Bright House Networks

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

Simpler description

SuggestedRemedy

Change "the PHS0 through PHS13 sub-blocks" to "PHS0 through PHS13" - definitions of PHS are already clear

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.2.4** *P* **44** *L* **20** # 175

Laubach, Mark — Broadcom

Comment Type **ER** *Comment Status* **A** *EZ*

Figure 114–13. Make the retangular boxes larger to prevent character overlap with the box lines. Similar overlaps in figures 114-19, 114-21

SuggestedRemedy

As per comment.

Response *Response Status* **U**

ACCEPT.

Cl **114** *SC* **114.2.4.1** *P* **44** *L* **35** # 67

Hajduczenia, Marek — Bright House Networks

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

Incorrect multiplication symbol.

SuggestedRemedy

Is dot and should be x (see symbols in Frame template) - multiple instances

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Search for the dot multiplier and change to an x multiplier symbol. Search will not find use in equations, so visually inspect and edit all equations as required.

Also search for equations where the multiplication symbol is omitted, because although this is common practice in algebraic notation, is not valid for IEEE 802.3.

Changes to mult symbol do not apply to Matlab codes in the text.

Cl **114** *SC* **114.2.4.1** *P* **44** *L* **35** # 262

Carlson, Steve — HSD/Marvell

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

The multiplication symbol used here is incorrect.

SuggestedRemedy

There are multiple instances of the use of a "dot" which should be "x" (see symbols in Frame template). Please fix.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #67.

Cl **114** *SC* **114.2.4.1** *P* **44** *L* **35** # 263

Carlson, Steve — HSD/Marvell

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

The draft uses Mbps, Mb/s, Mbit/s, apparently interchangeably. 802.3 practice is to use Mb/s.

SuggestedRemedy

Please scrub the draft and use only Mb/s

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #69.

Cl **114** SC **114.2.4.1** P **44** L **35** # 69
Hajduczenia, Marek Bright House Networks

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

Mbps, Mb/s, Mbit/s --- we typically use Mb/s, this draft uses three different designations for the very same thing

SuggestedRemedy

Unitify the units of transmission in the whole document.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Unify bps, b/s bit/s to be b/s in locations where it is clear the meaning of bits/second.

Other locations where different units, as bits/dim or bits/symbol, it is more appropiate leave as is to avoid confusion.

Cl **114** SC **114.2.4.1.1** P **45** L **17** # 176
Laubach, Mark Broadcom

Comment Type **ER** *Comment Status* **A** *EZ*

Numerous places in this figure where the horizontal or vertical lines overlap with the corresponding vertical or horizontal lines respectively. Need to resize/reposition to make the edge of the lines not overlap. Similar overlaps in Figure 114-20.

SuggestedRemedy

As per comment.

Response *Response Status* **U**

ACCEPT.

Cl **114** SC **114.2.4.1.1** P **47** L **23** # 177
Laubach, Mark Broadcom

Comment Type **ER** *Comment Status* **A** *EZ*

Top of text too near or overlapping with horiztonal line in Figure 114–16. Need to increase separation between the of the objects to prevent text/line overlap.

SuggestedRemedy

As per comment.

Response *Response Status* **U**

ACCEPT.

Cl **114** SC **114.2.4.1.1** P **48** L **4** # 229
Ran, Adee INTEL

Comment Type **ER** *Comment Status* **A** *EZ*

In equations, variables should be in italic font and functions should be in Roman. Variables (like j) should also be italicized in the body text. (see Style Manual, 15.3 Presentation of equations).

SuggestedRemedy

In all equations change functions mod, floor to Roman. Change j to italic in the text.

Review other equations and expressions in this draft for possible similar changes.

Response *Response Status* **U**

ACCEPT.

Cl **114** SC **114.2.4.3** P **50** L **21** # 140
Booth, Bradley Microsoft

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

Figure 114-19 is a bit difficult to read.

SuggestedRemedy

Make the figure a bit larger by shifting the level 2 path down to create greater separation between level 1 and level 2.

Response *Response Status* **C**

ACCEPT.

Cl **114** SC **114.2.4.3.2** P **52** L **17** # 141
Booth, Bradley Microsoft

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

Missing a colon at the end of the sentence.

SuggestedRemedy

Change to read "... as follows:"

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.3.2.2** *P* **53** *L* **26** # 179
Laubach, Mark Broadcom

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

Arrow runs to inside of box, rather than up to the edge of the box. Same with Figure 114–23.

SuggestedRemedy

Fix alignment

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Because #196 is accepted, figure 114-23 and 114-22 are eliminated, therefore alignment does not need to be fixed.

Cl **114** *SC* **114.2.4.3.3** *P* **53** *L* **31** # 142
Booth, Bradley Microsoft

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

Missing a colon at the end of the sentence.

SuggestedRemedy

Change to read "... to each component is as follows:"

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.3.2.2** *P* **53** *L* **36** # 180
Laubach, Mark Broadcom

Comment Type **ER** *Comment Status* **A** *EZ*

The "a" in ceil(a) is a variable and should be italicized. Note there appear to be numerous use of variables that are not italicized. These need to be all fixed.

SuggestedRemedy

As per comment.

Response *Response Status* **U**

ACCEPT.

Cl **114** *SC* **114.2.4.3.7** *P* **55** *L* **49** # 143
Booth, Bradley Microsoft

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

Missing colons on page 55 line 49, page 56 line 2 and page 56 line 15.

SuggestedRemedy

Change to read "... as:"

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.2.4.3.9** *P* **57** *L* **40** # 144
Booth, Bradley Microsoft

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

Missing colon at end of sentence.

SuggestedRemedy

Change to read "... is given by:"

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.3.3** *P* **61** *L* **46** # 94
Szczepanek, Andre Inphi

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

"PMD is signals"

SuggestedRemedy

"PMD are signals"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "is" to "uses".

Cl **114** *SC* **114.3.3.1** *P* **61** *L* **52** # 145
Booth, Bradley Microsoft

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

Period at end of sentence should be a colon.

SuggestedRemedy

Fix.

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.3.5.1** *P* **66** *L* **5** # 181

Laubach, Mark — Broadcom

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

link_control has the same global characteristic as pma_reset, but is missing the statement "All state diagrams respond to the open-ended…"

SuggestedRemedy

Add a similar "All state diagrams… " statement.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

"All state diagrams respond to the open-ended link_control = DISABLE."

Cl **114** *SC* **114.3.7.1** *P* **76** *L* **34** # 115

Anslow, Pete — Ciena

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

In "BCH Frame Error Rate (BFER) is less than 8.8·10-11":
"Frame Error Rate" should not be capitalised (IEEE does not capitalise the expanded versions of abbreviations)
"Error Rate" should be "error ratio" as this is not errors per unit time
The symbol used for multiply between 8 and 1 should not be a dot (see IEEE style manual 15.3)

SuggestedRemedy

Change to "BCH frame error ratio (BFER) is less than 8.8x10-11"
where "x" is Ctrl-q 0 in Framemaker
Also fix the "." on:
Page 44, line 35
Page 53, line 11
Page 54, line 4
Page 62, line 9, line 14
Page 95, line 2, line 48 (2 instances), line 49 (2 instances), line 50 (4 instances)
Page 122, line 31
and any others I missed.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Editor to replace any "." multiplier that is able to find.

Cl **114** *SC* **114.3.8** *P* **77** *L* **53** # 234

Ran, Adee — INTEL

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

"(m-n) bits are used to represent the decimal part"?

This seems to be the fractional part.

SuggestedRemedy

change "decimal" to "fractional".

Response *Response Status* **U**

ACCEPT.

Cl **114** *SC* **114.6.3** *P* **92** *L* **2** # 270

Goetzfried, Volker — Broadcom Limited

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

Abbreviation SI-POF undefined

SuggestedRemedy

Define SI-POF in clause 1.5 (Abbreviations):
SI-POF Step Index Plastic Optical Fiber

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Do not capitalize the expansion.

Cl **114** *SC* **114.6.3** *P* **92** *L* **12** # 271

Goetzfried, Volker — Broadcom Limited

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

The Kojiri criteria is not explained or defined.

SuggestedRemedy

Add to clause 1.4:
1.4.x Kojiri Criteria: A rule for the mechanical design of receptacles and mated plugs with the usage of fibers to be scoop-proof.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Editor to add definition,
"1.4.x Kojiri-safe: A property of the mechanical design for receptacles and mated plugs to protect sensitive functional elements, especially fiber optic ferrules and receptacles. Also called scoop-proof."

Scrub all the draft for replacing "kojiri criteria" with "Kojiri-safe" (capital K).

Cl **114** SC **114.6.3.1** P **93** L **23** # 183
Laubach, Mark Broadcom

Comment Type **E** *Comment Status* **R** *EZ*

Table 114–7, there is a double vertical line between columns 1st "EAF" and 2nd "Angle()". Make it as single vertical line. There is a thick vertical line between columns 2nd "EAF" and 3rd "Angle()". Make both a double line for consistency.

SuggestedRemedy

As per comment.

Response *Response Status* **C**

REJECT.

Please, note that heading of columns 1 and 3 are identical, and heading of columns 2 and 4 are identical. The headings combined with double vertical line indicate continuation of the columns, like in Table 40-10, changing a long narrow table and using parallel presentation of the columns.

Cl **114** SC **114.6.3.2** P **93** L **41** # 274
Goetzfried, Volker Broadcom Limited

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

To be consistent with the existing IEEE 802.3 standard the term 'Transmitter Clock Frequency' should be replaced by 'Transmit Clock Frequency'

SuggestedRemedy

Replace Transmitter by Transmit

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Both terms are common; C/40 and C/55 uses "transmit" and C/97 (802.33bp) uses "transmitter".
Accepted because majority with lower case "transmit".

Cl **114** SC **114.6.3.2** P **93** L **43** # 100
McDermott, Thomas Fujitsu

Comment Type **ER** *Comment Status* **A** *EZ*

Symbol transmission rate should be in symbols/sec, not Hertz.

SuggestedRemedy

Change MHz to MSymbol/s

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See repsonse to comment #223.

Cl **114** SC **114.6.4.5** P **96** L **12** # 184
Laubach, Mark Broadcom

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

In the matlab code, there is a multiplication sign. Here and one other place, there is no mult sign. Suggest adding the 'x' mult symbol for consistency

SuggestedRemedy

As per comment.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Any Matlab code has to use mult symbol following the syntax rules of the language (that is '*').

For equations (pg 96 line 12) and other parts of the text, see also response to comment #67.

Cl **114** SC **114.6.4.8** P **97** L **9** # 273
Goetzfried, Volker Broadcom Limited

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

Residual peak distortion (RPD) is not defined or explained. An explanation or short definition would help to clarify the purpose of this parameter in the PMD section.

SuggestedRemedy

Add a definition or explanation of RPD

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

It is not longer applicable because response to comment #118.

Cl **114** SC **114.6.4.8** P **97** L **19** # 117
Anslow, Pete Ciena

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

Numbers followed by units should be separated by a non-breaking space (Ctrl space) so that it does not split across two lines.

SuggestedRemedy

Put a non-breaking space between 3.25 and Gs/s
Check for any other occurrences in the draft.

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.6.4.8** *P* **97** *L* **19** # 116

Anslow, Pete — Ciena

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

This says "with the minimum sampling rate of 3.25 Gs/s (10 times the transmit symbol rate of 325 Ms/s)."
However, if the captured block is not with this sampling rate, the script does not work correctly.
Changing the row in the script: "[HD2 HD3 RPD] = txdist(xcap, 10);" to:
"% set the over sampling ratio (min 10)
osr = 10;
[HD2 HD3 RPD] = txdist(xcap,osr);"

would make it easier for users to understand how to change this value.

SuggestedRemedy

Change the row in the script:
"[HD2 HD3 RPD] = txdist(xcap, 10);"
to:
" % set the over sampling ratio (min 10)
osr = 10;
[HD2 HD3 RPD] = txdist(xcap,osr);"

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.13.15** *P* **126** *L* **11** # 139

Lusted, Kent — Intel

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

typo in E8 for "hazzard"

SuggestedRemedy

change to "hazard"

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.1.1** *P* **35** *L* **18** # 138

Lusted, Kent — Intel

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

Some of the listed features are subjective and un-quantifiable. specifically, items d-h.

SuggestedRemedy

remove items d-h from the list.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #40.

Cl **114** *SC* **114.1.1** *P* **35** *L* **19** # 266

Carlson, Steve — HSD/Marvell

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

There is no other PHY clause that has a "features" list. This seems more like marketing material, some of it directed at the system-level.

SuggestedRemedy

Strike 114.1.1

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

There are lots of clauses that have objectives lists. The objectives are not repeated word for word here, but are contained in the list. Arguably 97.2.1 is a verbose list of features. In 96.1.1 does a similar thing with paragraphs of many project objectives, and even includes a two item list of "features".

See comment #40 for changes to the subclause that might satisfy the commenter by reducing the marketing feel of the subclause.

Cl **114** *SC* **114.1.1** *P* **35** *L* **19** # 40

Hajduczenia, Marek — Bright House Networks

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

Some of the "features" are really just marketing, given that there is no other POF PHY to compare to

SuggestedRemedy

Strike items d), e), f), and g) - these have nothing to do with the PHY itself, but more with system level features, which we really do not describe in the standard.
Revise b) to read: "full duplex operation"
Review c) to read: "support for BER of 10-12 or better" - I believe you do not need BER of 10-12 at PHY layer to operate correctly, which is what you're implying right now
Review h) to read: "operation in automotive, industrial, and home network environments" - current text is just unneccesssarily vagie and open ended

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Strike d), e), f).

Change g) to read:
"communication side channel for PHY management and operations, administration, and maintenance between link partners;"

Accept suggested remedies for b), c) and h).

Cl **114** *SC* **114.1.1** *P* **35** *L* **30** # 93

Szczepanek, Andre — Inphi

Comment Type **E** *Comment Status* **R** *Features*

starting a final list item with "and" is poor english.
Perhaps this is a typo and the "and" should have been "an" ?

SuggestedRemedy

Either remove "and" or replace it with "an".

Response *Response Status* **C**

REJECT.

The intro to the list and the list are a single sentence with items separated by a semicolon, and last item terminated with a full stop. The "and" is correct for this organization. The "and" would not be appropriate if instead each list item were a capitalized sentence. (Some choose to place the and at the end of the next to last list item, others at the beginning of the last item as is done here.) Our publication editor will have the option to rewrite if he or she feels it is not proper English.

Cl **114** *SC* **114.1.4** *P* *L* # 137

Lusted, Kent — Intel

Comment Type **TR** *Comment Status* **A** *Fig 114-1*

Figure 114-1 has an empty box between the GMII reference and the PMA box of the PHY.

SuggestedRemedy

remove box or put something in it

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #42

Cl **114** *SC* **114.1.4** *P* **36** *L* **1** # 91

Pimpinella, Rick — Panduit Corp.

Comment Type **E** *Comment Status* **A** *Fig 114-1*

Figure 114.1
PCS is not shown in the figure or list of abbreviations below the figure

SuggestedRemedy

Add ?PCS? to figure and abbreviations.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #42

Cl **114** *SC* **114.1.4** *P* **36** *L* **2** # 162

Pérez-Aranda, Rubén — KDPOF

Comment Type **E** *Comment Status* **A** *Fig 114-1*

In Figure 114-1 PCS definition is not provided.

SuggestedRemedy

Add PCS = PHYSICAL CODING SUBLAYER on top of PMA defintion.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #42

Cl **114** *SC* **114.1.4** *P* **36** *L* **14** # 189
Zimmerman, George CME Consulting

Comment Type **E** *Comment Status* **A** *Fig 114-1*

PCS is missing from figure sublayers and definition is missing "PCS"

SuggestedRemedy

Add PCS sublayer into figure, and "PCS" next to "= PHYSICAL CODING SUBLAYER"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #42

Cl **114** *SC* **114.1.4** *P* **36** *L* **14** # 42
Hajduczenia, Marek Bright House Networks

Comment Type **TR** *Comment Status* **A** *Fig 114-1*

Missing PCS in Figure 114-1 ???

SuggestedRemedy

We have PMA, PMD, but PCS seems to be missing - if it is not defined, the box should be gone … Seems that it is needed though, given text on page 36, line 44

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Somehow the PCS in the empty box and the text "PCS" on the bottom left expansion got deleted in D1.4. Restore both.

Cl **114** *SC* **114.1.4** *P* **36** *L* **14** # 151
Hidaka, Yasuo Fujitsu Laboratories of

Comment Type **T** *Comment Status* **A** *Fig 114-1*

In Figure 114-1, there is a blank sub-layer above PMA.
A blank is not appropriate.
It seems PCS.

SuggestedRemedy

Label the blank sub-layer as "PCS".
Or, identify it as an appropriate sub-layer(s).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #42

Cl **114** *SC* **114.1.4** *P* **36** *L* **14** # 267
Carlson, Steve HSD/Marvell

Comment Type **TR** *Comment Status* **A** *Fig 114-1*

The PCS in Figure 114-1 seems to be missing. There is a box, but it's empty.

SuggestedRemedy

Assuming that this PHY has a PCS, please add it to the figure.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #42

Cl **114** *SC* **114.1.3** *P* **36** *L* **14** # 146
Booth, Bradley Microsoft

Comment Type **ER** *Comment Status* **A** *Fig 114-1*

Figure 114-1 is missing PCS in the figure and in the abbreviation list.

SuggestedRemedy

Insert PCS in the figure and the abbreviation list.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #42

Cl **114** *SC* **114.1.4** *P* **36** *L* **20** # 150
Hidaka, Yasuo Fujitsu Laboratories of

Comment Type **E** *Comment Status* **A** *Fig 114-1*

In Figure 114-1, the abbreviation is missing before "= PHYSICAL CODING SUBLAYER".

SuggestedRemedy

Prepend "PCS" in front of "= PHYSICAL CODING SUBLAYER".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #42

Cl **FM** *SC* **FM** *P* **1** *L* **1** # 185

Zimmerman, George — CME Consulting

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

Draft is for initial working group, text says for task force review

SuggestedRemedy

change "TF review" to "Working Group ballot recirculation" (assuming that this change is forward looking)

Response *Response Status* **C**

ACCEPT.

Cl **FM** *SC* **FM** *P* **1** *L* **1** # 103

Anslow, Pete — Ciena

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

In the headers, "IEEE 802.3bv Gigabit ..." should be "IEEE P802.3bv Gigabit ..."

SuggestedRemedy

Change "IEEE 802.3bv Gigabit ..." to "IEEE P802.3bv Gigabit ..." in all headers (both odd and even pages) in all files.

Response *Response Status* **C**

ACCEPT.

Cl **FM** *SC* **FM** *P* **1** *L* **26** # 2

Hajduczenia, Marek — Bright House Networks

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

"The purpose of the amendment is to add new Physical Layer specifications for 1000 Mb/s operation." This is imprecise. Typically, we list here specific type of PMD/PHY being added.For example, 802.3bp uses the following text: "This amendment adds point-to-point 1 Gb/s Physical Layer (PHY) specifications and management parameters for operation on a single twisted-pair copper cable."

SuggestedRemedy

Please make the text concise and technically correct - you're not adding 1000Mb/s PHY operating over air or copper, for example

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Replace with:
"This amendment adds point-to-point 1000 Mb/s Physical Layer (PHY) specifications and management parameters for operation on duplex plastic optical fiber."

Cl **FM** *SC* **FM** *P* **1** *L* **27** # 242

Carlson, Steve — HSD/Marvell

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

The statement "Draft D2.0 is prepared for TF review" is not correct.

SuggestedRemedy

Change to "Draft D2.1 is prepared for Working Group recirculation ballot" in D2.1.

Response *Response Status* **C**

ACCEPT.

Cl **FM** *SC* **FM** *P* **1** *L* **27** # 104

Anslow, Pete — Ciena

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

"Draft D2.0 is prepared for TF review." should be "Draft D2.0 is prepared for Working Group ballot.

SuggestedRemedy

Change to "Draft D2.1 is prepared for Working Group ballot recirculation."

Response *Response Status* **C**

ACCEPT.

Cl **FM** *SC* **FM** *P* **1** *L* **27** # 128

Grow, Robert — RMG Consulting

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

Somehow in handing drafts back and forth, the edits to this paragraph got lost

SuggestedRemedy

For D2.1, change TF review to Working Group recirculation ballot

Response *Response Status* **C**

ACCEPT.

Cl **FM** *SC* **FM** *P* **1** *L* **27** # 1

Hajduczenia, Marek — Bright House Networks

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

"Draft D2.0 is prepared for TF review." - not true

SuggestedRemedy

Change to "Draft D2.0 is prepared for Working Group recirculation ballot" in D2.1.

Response *Response Status* **C**

ACCEPT.

Cl **FM** *SC* **FM** *P* **7** *L* **15** # 129

Grow, Robert RMG Consulting

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

Now that the WG ballot group is known, we can add the list

SuggestedRemedy

Add list of WG members forming the P802.3bv ballot group.

Response *Response Status* **C**

ACCEPT.

Cl **FM** *SC* **FM** *P* **9** *L* **16** # 105

Anslow, Pete Ciena

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

Introduction text does not match the latest version in the 802.3 template.

SuggestedRemedy

At the end of the second paragraph add: "A full duplex MAC protocol was added in 1997. "
In the fourth paragraph, change "is comprised of" to "is composed of"

Response *Response Status* **C**

ACCEPT.

Cl **FM** *SC* **FM** *P* **10** *L* **1** # 243

Carlson, Steve HSD/Marvell

Comment Type **ER** *Comment Status* **A** *FM*

The description of the 802.3 standard suite is not up-to-date. Please use the template available at: http://www.ieee802.org/3/tools/framemaker/P802_3xx_D0p1_version_2p5.zip.
Update the list of amendments per comment i-55 in http://www.ieee802.org/3/bp/comments/8023bp_D30_approved.pdf

SuggestedRemedy

Per comment

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #3.

Cl **FM** *SC* **FM** *P* **10** *L* **1** # 3

Hajduczenia, Marek Bright House Networks

Comment Type **ER** *Comment Status* **A** *FM*

The description of 802.3 standard suite is not up-to-date. Please use the template available at: http://www.ieee802.org/3/tools/framemaker/P802_3xx_D0p1_version_2p5.zip.
Also, consider updating the list of amendments per comment i-55 in http://www.ieee802.org/3/bp/comments/8023bp_D30_approved.pdf

SuggestedRemedy

Per comment

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Update front matter content to current template. Update amendment list, and amendment descriptions modify note to reflect content based best guess at amendment order resulting in the assumption that P802.3bv will be Amendment 9.

Cl **FM** *SC* **FM** *P* **10** *L* **18** # 130

Grow, Robert RMG Consulting

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

Because the WG Chair has determined approval order for various amendments, we should update this list earlier than the promised Sponsor ballot.

SuggestedRemedy

Update editor's note. In text: 802.3bw is Amendment 1, 802.3by is Amendment 2, 802.3bq is Amendment 3, 802.3bp is Amendment 4. 802.3bn and 802.3br are in Sponsor ballot and may get amendment numbers assigned via SB comments from the WG Chair. 802.3bu is ahead of us (in WG R1), and 802.3bz in parallel with us. Make unassigned documents <tbd> for the amendment number. While updating order, also check document descriptions.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Same response as comment #3.

Cl **45** *SC* **45.2.3.52.1** *P* **30** *L* **41** # 164

Pérez-Aranda, Rubén KDPOF

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

Link margin in clauses 45 registers and 114 PHD fields is defined with precision that exceeds practical implementations and it is not needed for correct operation of the link. For example, PHD.RX.LINKMARGIN is defined to be fixed-point formatted (14,6), which means 5 bits + 1 of sign for the integer part and 8 bits precision for the fractional part. This means that we can report a log2(link_margin) with an error of 0.0020 between -32 and 32. This is translated to a link margin in dB with 0.0060 dB error (0.012 dB resolution) and a range from -96.3 and 96.3 dB. It may mean that the implementation has to guarantee this resolution in the measurement, which is not realistic!.

SuggestedRemedy

Modify link margin format in PHD field and MDIO registers to be 5 fractional bits + 2 bits integer part + 1 bit for the sign: format (8,3) with +/- 0.05 dB error (0.1 dB precision) for link margin and a range of approx -12 to 12 dB.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Modify Table 45-165 as:
- replace "3.520.15:14" with "3.520.15:8"
- replace "3.520.13:0" with "3.520.7:0"

Heading 45.2.3.52.1, modify to: "Local link margin (3.520.7:0)"

Pg 30, line 44, replace "(14,6)" with "(8,3)"

Similar changes for Table 45-166 and 45.2.3.53.1.

Pg. 64, line 7. replace "(14,6)" with "(8,3)" in "Valid values" column.

Replace "(14,6)" with "(8,3)" in Pg 65, line 21.

Cl **45** *SC* **45.2.3.52.1** *P* **30** *L* **44** # 218

Ran, Adee INTEL

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

114.3.8 describes the encoding and decoding of fixed point numbers, and has nothing to do with floating point (floating point is defined in IEEE Std 754). The fact that Matlab is used for the description does not make it floating point.

SuggestedRemedy

Change "The formal description for converting fixed point numbers to floating point and vice versa is in 114.3.8" to "Encoding and decoding of fixed-point is defined in 114.3.8".

Apply similar changes for other registers that use fixed-point encoding.

Change subclause headings and content in 114.3.8 to eliminate the term "floating point" and define the process as encoding and decoding of fixed-point numbers.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Regarding first proposed change, we prefer using the remedy suggested in comment #35, because it refers to format.

In Pg 78, line 1, change:
"Formal definitions for floating-point to fixed-point conversion and vice versa are provided in 114.3.8.1 and 114.3.8.2."
to:
"Encoding and decoding of fixed-point are defined in 114.3.8.1 and 114.3.8.2, respectively."

Change heading 114.3.8.1 to "Fixed-point encoding"

Pg 78, line 44, change:
"Formal definition of floating-point to fixed-point is provided by the MATLAB (see 1.3) code listed as follows:"
to:
"Formal definition of fixed-point encoding is provided by the following MATLAB (see 1.3) code:"

Change heading 114.3.8.2 to "Fixed-point decoding"

Pg 79, line 10, change:
"Formal definition of floating-point to fixed-point is provided by the MATLAB (see 1.3) code listed as follows:"
to:
"Formal definition of fixed-point decoding is provided by the following MATLAB (see 1.3) code:"

Cl **45** *SC* **45.2.3.53.1** *P* **31** *L* **14** # 35

Hajduczenia, Marek — Bright House Networks

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

Unnecessary circular reference: "This register has the same fixed-point format as register 3.520.13:0 (see 45.2.3.52.1)"

SuggestedRemedy

Change to "See 114.3.8 for fixed-point format definition"
Change "The formal description for converting fixed point numbers to floating point and vice versa is in 114.3.8." to "See 114.3.8 for fixed-point format definition" in 45.2.3.52.1

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.3.53.1** *P* **31** *L* **14** # 253

Carlson, Steve — HSD/Marvell

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

Loop infinite---see infinite loop: "This register has the same fixed-point format as register 3.520.13:0 (see 45.2.3.52.1)"

SuggestedRemedy

Change to "See 114.3.8 for fixed-point format definition"
Change "The formal description for converting fixed point numbers to floating point and vice versa is in 114.3.8." to "See 114.3.8 for fixed-point format definition" in 45.2.3.52.1

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #35.

Cl **114** *SC* **114.3.8.1** *P* **79** *L* **42** # 202

Zimmerman, George — CME Consulting

Comment Type **ER** *Comment Status* **R** *FP*

There is no need to define fixed and floating point, much less with matlab in this standard, same comment applies to 114.3.8.2

SuggestedRemedy

Define the format where the format is used, succinctly, as in other clauses.

Response *Response Status* **U**

REJECT.

Fixed-point format is used for:
- the link margin reported in the PHD field PHD.RX.LINKMARGIN
- the two registers of clause 45 reporting both the local and remote link margin
- THP coefficients sent by the local PHY to the remote PHY to be used by the remote transmitter.

We think it is more appropiate and easier to maintain to only define a location where format is defined and then add cross references where are needed.

Cl **114** *SC* **114.1.4** *P* **35** *L* **50** # 219

Ran, Adee — INTEL

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

The specifications refer to GMII so it is not optional. It may not be physically instantiated or available but it is part of the architecture (as seen in Figure 114-1).

SuggestedRemedy

Change "using the optional GMII. An implementation may use the GMII as a logical interface" to "using GMII as a logical interface. Physical instantiation of the GMII is optional".

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Change sub-clause to:
"1000BASE-RHx PHY types are specified with the PCS interfacing to a GMII. Physical implementation of the GMII is optional. System operation from the perspective of signals at the MDI and management objects are identical whether the GMII is implemented or not. The MII Management Interface used with the initial set of Gigabit Ethernet PHYs is not used for 1000BASE-RHx PHY types."

Cl **114** *SC* **114.3.5.1** *P* **66** *L* **33** # 280

Pérez-Aranda, Rubén KDPOF

Comment Type **E** *Comment Status* **A** *Link Monitor*

Definition of new_rxphd_event is not precise.
"Variable set by the PHY receiver to indicate the arrival of a new PHD block from the link partner."
It is not indicated if event is produced when reception starts, or when it finishes.

SuggestedRemedy

Change to read:
"Variable set by the PHY receiver to indicate the complete reception (including data decoding and CRC16 checking) of a new PHD block from the link partner."

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.3.5.4** *P* **70** *L* **17** # 279

Pérez-Aranda, Rubén KDPOF

Comment Type **T** *Comment Status* **A** *Link Monitor*

Link monitor state diagram will produce a glitch in the state variable rem_rcvr_status when, being in LINK_UP state, the state variable loc_rcvr_status changes to NOT_OK by PMA check quality state diagram and the remote PHY receiver stays OK. The variable link_status is correctly assigned to FAIL. However, the variable rem_rcvr_status transtions to NOT_OK and later to OK again when PHD.RX.LINKSTATUS = OK is received again. This glitch does not have impact on operation of the receiver. However the rem_rcvr_status value reflected in MDIO registers is wrong because it does not reflect the real status of the remote PHY receiver.

SuggestedRemedy

In transition from LINK_UP to LINK_DOWN, eliminate qualifier + loc_rcvr_status = NOT_OK. Add new transition from LINK_UP to LINK_REMOK qualified by loc_rcvr_status = NOT_OK. Add assignation link_status <= FAIL to LINK_REMOK state.
See perezaranda_3bv_2_0316.pdf

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.3.50.2** *P* **27** *L* **21** # 27

Hajduczenia, Marek Bright House Networks

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

"The loopback modes support a MAC transmitting to itself while exercising the selected portion of the
bidirectional link with a neighbor." - this is a functional description of the loopback test, which is supposed to be located where loopback tests are defined, and not in register definition.

SuggestedRemedy

Remove this text

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #217.

Cl **45** *SC* **45.2.3.50.2** *P* **27** *L* **21** # 217

Ran, Adee INTEL

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

The first sentence of this subclause is confusing. What is the "selected portion of the bidirectional link"? it seems like an attempt to bundle together things that are very different from each other.

GMII and PMD loopback modes do not need a link with a "neighbor" (undefined term; should be "partner"), in fact there may be no fiber or partner at all. In line loopback the phrase "a MAC transmitting to itself" is irrelevant since the local MAC does not transmit to itself, and the link partner may be just a pattern generator without a MAC.

SuggestedRemedy

Change the first sentence to something less confusing. Suggested text: "These bits are used to select one of the loopback modes defined in 114.9".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change all the subclause to:
"Bits 3.518.12:10 are used to select one of the loopback modes defined in 114.9. Bits 3.518.12:10 have a default value of binary 000, selecting no loopback operation. Loopback modes are only available when a 1000BASE-H based PHY is in the normal operation mode (no test mode is selected in 3.518.15:13)."

Cl **45** *SC* **45.2.3.50.2** *P* **27** *L* **23** # 28

Hajduczenia, Marek — Bright House Networks

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

"Loopback modes are only operative in normal operation" - likely, "Loopback modes are only available when 1000BASE-H PHY is in the normal operation mode" - the word "operative" does not exist in this meaning …

SuggestedRemedy

Per comment

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #217.

Cl **45** *SC* **45.2.3.50.2** *P* **27** *L* **24** # 29

Hajduczenia, Marek — Bright House Networks

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

"The various 1000BASE-H loopback modes" - no need for "the"

SuggestedRemedy

Change to "Various 1000BASE-H loopback modes"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #217.

Cl **114** *SC* **114.9** *P* **112** *L* **27** # 211

Zimmerman, George — CME Consulting

Comment Type **E** *Comment Status* **R** *Loopback*

Usually loopback modes are included in the discussion of the part of the PHY that is being looped back. Break this up and put it in the appropriate part, and show on the block diagrams where the loopbacks occur.

SuggestedRemedy

See comment

Response *Response Status* **C**

REJECT.

Figure 114-3 already shows where the different loopbacks occur.

Breaking the content up and spreading it along the draft can reduce clarity. TF considered that is better to have just only a point where reader can find all the information about loopbacks.

Cl **78** *SC* **78.5** *P* **33** *L* **47** # 161

Pérez-Aranda, Rubén — KDPOF

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

Refinement of Tw_sys_tx, Tw_phy and Tphy_shrink_tx parameters is necesary. The minimum wake time is computed as: the time needed to transmit a payload data sub-block, plus a pilot or physical header sub-block, plus the maximum PDB offset, plus at least one idle byte insertion before the first Ethernet packet data byte (this is because GMII specification), plus GMII TX jitter (+/- GMII clock cycles equivalent to worst case of 32 bit times) = 24.91631 us.
The previous result has to be compensated with maximum transmit symbol clock deviation: x (1 + 250e-6). This gives a result of 24.9226 us.
Accuracy of 10's of ns is not needed for these LPI timing parameters, so accuracy can be relaxed.

SuggestedRemedy

Replace 24.88 with 25.

Response *Response Status* **C**

ACCEPT.

Cl **114** *SC* **114.2.2.1** *P* **40** *L* **30** # 171

Remein, Duane — Huawei Technologies

Comment Type **ER** *Comment Status* **R** *Matlab*

MATLAB is a registered trademark and should be so noted

SuggestedRemedy

Add trandmark symbol and footnote indicating it is a trademark per Mathworks requirements

Response *Response Status* **U**

REJECT.

This is not the first time MATLAB has been used in IEEE Std 802.3 for specification of normative requirements. There is a normative reference for MATLAB in IEEE Std 802.3 (see P8023_D3p2_SECTION1, pg 68, line 43 and footnote 17). See 40.6.1.2.4, as an example.

Cross reference to 1.3 is provided in pg 40, line 30. Section 1.3 includes all required trademarking and references to MathWorks.

Cl **114** *SC* **114.2.2.1** *P* **40** *L* **31** # 173

Laubach, Mark Broadcom

Comment Type **ER** *Comment Status* **R** *Matlab*

First use of MATLAB must properly indicated it is a trademark. Insert "T" or appropriate symbol and a footnote if needed.

SuggestedRemedy

As per comment.

Response *Response Status* **U**

REJECT.

See response to comment #171.

Cl **114** *SC* **114.2.2.1** *P* **40** *L* **34** # 174

Laubach, Mark Broadcom

Comment Type **ER** *Comment Status* **A** *Matlab*

A pseudo-code paragraph style has been adopted by 802.3, but is not yet in the template; i.e. P802.3bn is using it. Obtain the template update and apply to all pseudo-code examples uses in this draft. Same for other places: e.g., Page 48, Line 22, etc.

SuggestedRemedy

As per comment.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

It will be updated when it is in the template.

Cl **114** *SC* **114.2.2.1** *P* **40** *L* **36** # 227

Ran, Adee INTEL

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

Curly quotes should not be used in Matlab code.

This code seems to be redundant since the functionality is clearly defined by Figure 114-7. The code is confusing since it is not clear that the seed argument should be a string. It would be easier to provide the 128-bit result as a 16-character hexadecimal value.

SuggestedRemedy

Change curly quotes to straight quotes.

Consider deleting the code and providing the resulting hexadecimal value.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Curly quotes are produced by Famemaker when code text is pasted. Editor team to find the root cause, because same problem happens in 114.6.4.8.

Change pg 40 line 31/32, "… initialization
value of the shift register (0x1 72 DB 9D)"
to
"...initialization value of the shift register (string '172DB9D')"

See repsonse to comment #58.

Cl **114** *SC* **114.2.4.1.2** *P* **48** *L* **20** # 193

Zimmerman, George CME Consulting

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

unclear requirement - "shall be consistent" - consistency is a vague and general term, I suspect you mean "shall produce the same sequence as". If the previous comment on 114.2.4.1.2 is accepted, this section becomes informative and can be deleted or moved to an informative annex.

SuggestedRemedy

If the comment on 114.2.4.1.1 is accepted, delete subclause 114.2.4.1.2. Otherwise rewrite requirement to be "shall produce the same sequence as the following MATLAB code", and demote the preceding subclause to be after the code and marked informative.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comments #82 and #83.

Cl **114** *SC* **114.2.4.1.2** *P* **48** *L* **20** # 178

Laubach, Mark — Broadcom

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

Putting the "shall" as well as "formal" here implies a requirement that implementers are required to purchase MATLAB in order to check consistency to compliant with the PICS. I don't think this purchasing is required in order to implement a compliant 64B/65B line encoder. Some other projects that use 64B/65B encoding did not require this; e.g.55.3.2.2.3, 74.7.4.3, 101.3.2.2, etc.

SuggestedRemedy

Reword or re-implement to remove the requirement to purchase MATLAB.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comments #82 and #83.

Cl **114** *SC* **114.2.4.1.2** *P* **48** *L* **20** # 268

Carlson, Steve — HSD/Marvell

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

Matlab code is used here to provide normative behavior. I do not believe this is allowed in 802.3. The code itself cannot be normative, as it forces the use of a commercial tool (Matlab) in this case. The code can be informative only. Matlab code is typically used in test procedures to allow for a uniform test setup. The process of encoding data from the GMII should be described in a state diagram instead, following our normal 802.3 methodology.

SuggestedRemedy

If the process is already described in an state diagram, please make the state diagram normative and make code informative only

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comments #82 and #83.

Cl **114** *SC* **114.2.4.1.2** *P* **48** *L* **20** # 82

Hajduczenia, Marek — Bright House Networks

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

The code itself cannot be really normative, given that it forces the use of a commercial tool (Matlab) in this case. The code can be informative only, but the process of encoding data from GMII should be described in a state diagram instead, following our normal 802.3 methodology.

SuggestedRemedy

If the process is already described in an SD, please make the SD normative and make code informative only

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

This is not the first time MATLAB has been used in IEEE Std 802.3 for specification of normative requirements. There is a normative reference for MATLAB in IEEE Std 802.3 (see P8023_D3p2_SECTION1, pg 68, line 43 and footnote 17).

Modify introductory text to the code to make it clear that MATLAB is not required, only consistent output as produced by the MATLAB code.

Change Pg 48, line 21:
"The 64B/65B encoder implementation shall be consistent with the following formal MATLAB definition."
to
"The 64B/65B encoder implementation shall produce output consistent with the following MATLAB (see 1.3) code (add footnote)."

Footnote to read: "Copyright release for MATLAB code: Users of this standard may freely copy or reproduce the MATLAB code in this subclause so it can be used for its intended purpose."

Cl **114** *SC* **114.2.4.1.2** *P* **48** *L* **21** # 83

Hajduczenia, Marek — Bright House Networks

Comment Type **ER** *Comment Status* **R** *Matlab*

Matlab is a trademarked name: http://www.mathworks.com/company/aboutus/policies_statements/trademarks.html and should be listed as follows. Furthermore, it is not clear what the actual policy is on forcing implementers of the standard to comply with Matlab code implementation - at best, we should be using a pseudocode with the same result, that can be then implemented in any formal language of choice

SuggestedRemedy

My personal preference would be to remove all Matlab code, or convert it into a pseudocode instead.
If Matlab is to stay, it needs to be trademarked, and staff editor needs to be consulted on the use of trademarked names and scripts

Response *Response Status* **U**

REJECT.

See also response to comment #82.

Matlab code is to stay. Pseudocode should be based on a well-defined language (syntax, data types, etc). To be the use of pseudocode (no trademarked) feasible, the syntax and then the complete language definition needs to be public and at least an implementation of the golden interpreter be accessible under FRAND terms to all the implementers, to ensure all of them can produce interoperable implementations.

Matlab language / syntax can be used by any implementer. Use of Matlab language does not force to use MathWorks software.

Cl **114** *SC* **114.2.4.1.2** *P* **48** *L* **31** # 232

Ran, Adee — INTEL

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

In Matlab "!" (the exclamation mark) is not a negation operator - this character is undefined and causes a syntax error. Tilde should be used instead, also in the "not equal" operator.

SuggestedRemedy

Change all "!" to tilde signs in all Matlab code in this draft - logical negation and inequality operators.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Oooops. In D1.2 the Matlab code was correct. When D1.3 was implemented to eliminate "~" symbol from OAM message status table, a general find and replace with "!", did this code wrong.

Same problem detected in Pg 79, line 22.

Editor to review code and compare with the correct one in D1.2 for 114.2.4.1.2 and 114.3.8.2.

Cl **45** *SC* **45.2.3.48.2** *P* **24** *L* **53** # 20

Hajduczenia, Marek — Bright House Networks

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

The term "OAM" is already defined as Clause 57 OAM, which you do not use in this project.

SuggestedRemedy

Change all instances of "OAM" with "1000BASE-H OAM" to match definition of "1000BASE-T1 OAM" used right now in 802.3bp to distinguish OAM used there from any other OAM defined in other projects. Global change in the draft

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Editor to search and selectively replace in text. Field names and variable names typically will not be changed as is the case in P802.3bp/D3.1.

Cl **45** *SC* **45.2.3.48.3** *P* **25** *L* **3** # 18

Hajduczenia, Marek — Bright House Networks

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

"This bit indicates the value of the TXO_MSGT bit in the last message read by the station management entity" - description in 3.500.14 states "This bit indicates the value of the TXO_MSGT bit in the last OAM message received by the remote 1000BASE-H PHY" - is there any specific difference between "Remote PHY" and "station management entity" in this case? Seems that it does not matter what reads data from the given register / bit

SuggestedRemedy

Based on the description, it is not clear what the difference between 3.500.13 and 3.500.14 really is - both point to TXO_MSGT bit in some last message (I assume - the last OAM message in both cases) but why there are two of them, is not clear.
Please clarify what the difference between these two bits is and why both are needed.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Answer to technical question:
The difference between the two bits is stated. TXO_MSGT is a toggle bit (a one bit sequence number) of a message. As described in the referenced 114.8.2 the MSGT bit is toggled to a new value, some time later, the related message is transmitted, the message is received and validated at the receiver, and at some later time, the message is read by the management entity.
When message is received and validated at the receiver, it causes the receiving link partner PHY to acknowledge message reception by the PHY via the TXO_PHYT bit to the transmitting station. As indicated in state diagram of Figure 114-53, this acknowledge indicates the OAM message has been received and copied to the OAM RX registers and it is ready to be read by the management entity. As specified in state diagram, the receiving link partner PHY cannot copy the received message and then acknowledge via PHYT flag if there is a previous message that has not been read by the management entity.
When message is read by the management entity, it causes the receiving link partner PHY to acknowledge message reception by the management entity via the TXO_MERT bit to the transmitting station.

Editor's actions:
Move sentence of Pg 25 line 11 to Pg 24 line 50 as second paragrapth of TXO_REQ description.

Cl **45** *SC* **45.2.3.48.4** *P* **25** *L* **8** # 19

Hajduczenia, Marek — Bright House Networks

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

"This bit is used for message identification" - the draft uses terms "OAM message" and "message" and it is not clear whether they are the same or not

SuggestedRemedy

if they are the same, consider using "OAM message" consistently.
If they are not the same, what is the difference between "OAM message" and "message" - please clarify. A generic "message" is very overloaded in 802.3 and is hard to decode

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

All uses of message in 45.2.3.48.1 through 45.2.3.48.4 should be 1000BASE-H OAM message. Also apply to 114.8 and 114.3.4.
(See also #20).

Cl **45** *SC* **45.2.3.48.5** *P* **25** *L* **16** # 169

Pérez-Aranda, Rubén — KDPOF

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

The register field TXO_TYPE (3.500.11:0) does not really contain any type identification of the OAM message. As stated in lines 17 and 18, these bits are not changed or interpreted by the local or remote PHY and together with the TXO_DATAx bits form the OAM message payload. There is no reason to assign the name of TYPE to this field.

SuggestedRemedy

For sake of clarity, replace TYPE with DATA0, in 1000BASE-H OAM transmit and receive registers. Modify consistently the name of the of PHD field in 114.3.4 and descriptions in 114.8.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Also merge TXO_TYPE and TXO_DATAx sub-clauses. Similarly for RXO_TYPE and RXO_DATAx.

Cl **45** *SC* **45.2.3.48.5** *P* **25** *L* **17** # 22

Hajduczenia, Marek — Bright House Networks

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

Meaningless information: "These bits are not changed or interpreted by the local or remote PHY"

SuggestedRemedy

Change "These bits are not changed or interpreted by the local or remote PHY and together with the TXO_DATAx" to "Bits 3.500.11:0 together with registers 3.501 through 3.508 … "

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

"Bits 3.500.11:0 together with registers 3.501 through 3.508 form the 1000BASE-H OAM message payload. The 1000BASE-H OAM message payload is not changed or interpreted by the local or remote PHY."

Cl **45** *SC* **45.2.3.49.2** *P* **25** *L* **21** # 26

Hajduczenia, Marek — Bright House Networks

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

What is a "toggle identifier"????

SuggestedRemedy

A quick search of Clause 45 in 802.3 does not come up with any references to this term. Please define what it is, or describe in other terms.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Change to read:
"Bit 3.509.12 is used for message identification. It changes with every new received message, acting as a one bit sequence number."

Also make parallel modifications to 45.2.3.48.4:
"Bit 3.500.12 is used for message identification. It is changed by the 1000BASE-H PHY when it accepts a new message for transmission (simultaneously with clearing bit 3.500.15 to zero), acting as a one bit sequence number."

Cl **45** *SC* **45.2.3.49.2** *P* **25** *L* **21** # 265

Carlson, Steve — HSD/Marvell

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

"This bit contains the toggle identifier of the received message. It toggles with every new received message." What is a "toggle identifier?"

SuggestedRemedy

A search of Clause 45 in 802.3-2015 has no reference to this term. Please define what it is, or describe in other terms.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #26.

Cl **45** *SC* **45.2.3.48.6** *P* **25** *L* **21** # 170

Pérez-Aranda, Rubén KDPOF

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

OAM channel is specified in 114.8 as a pipe for message exchange between two STAs attached to the partners of a GEPOF link.
OAM channel is a requirement from the automotive OEMs. Therefore, it is likely that other standardization bodies want to specify some format of the OAM messages in the definition of e.g. protocols of management between ECUs in a car.
Said that, I think leaving the OAM message totally unspecified is wrong and 802.3bv should specify a format that might be used as a framework to define different message formats / protocols in an interoperable maner. OUI/CID can be used to create a context dependent identier (CDI), in a similar way the vendor specific MMDs are identified in Clause 45.

SuggestedRemedy

In page 25, line 23, add description as:
The bit TXO_DATA0[11] shall be used to indicate if OAM message is used in an engineered network or not.
TXO_DATA0[11] = 1 indicates engineered network. In that case, the content TXO_DATA0[10:0] and TXO_DATA1 to 8 is vendor specific.
TXO_DATA0[11] = 0 indicates that TXO_DATA0[10:0] and TXO_DATA1[15:0] is a 27-bit value, which may constitute a unique identifier for a particular type of vendor-specific protocol. The identifier shall be composed of the Organizationally Unique Identifier (OUI) or Company ID (CID) assigned to the protocol manufacturer by the IEEE, plus a 3-bit protocol number. The format of the unique protocol identifier shall be TXO_DATA0[10:0] = OUI[23:13], DATA1[15:3] = OUI[12:0], DATA1[2:0] = protocol number. The content of TXO_DATA2 to TXO_DATA8 is vendor specific.

This change does not affect to state diagrams specified in 114.8, because PHY does not care about the content of the message payload.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Edit suggested remedy for incorrect use of may and other grammar.
Replace: "which may constitute a unique identifier for a particular type of vendor-specific protocol. The identifier shall be composed"
with:
"which shall constitute a unique identifier for a particular type of vendor-specific protocol. The identifier is composed"

Also, eliminate specifcation for TXO_DATA0[11] engineered network. Modify mapping for TXO_DATA0 and TXO_DATA1 as:
TXO_DATA0[11:0] = OUI[23:12], DATA1[15:4] = OUI[11:0], DATA1[3:0] = protocol number.

Cl **45** *SC* **45.2.3.49** *P* **25** *L* **25** # 23

Hajduczenia, Marek Bright House Networks

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

"These registers are used as part of an OAM channel between 1000BASE-H link partners .. ." - no they are not. They just store information send over OAM channel.

SuggestedRemedy

Change to read: "Registers 3.509 through 3.517 store information exchanged over the OAM channel between 1000BASE-H link partners … "

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Same wording for Pg 24, line 5.

Cl **45** *SC* **45.2.3.49** *P* **25** *L* **42** # 216

Ran, Adee INTEL

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

"No new message" is confusing - since when? As explained in 45.2.3.49.1, RXO_VAL is set to zero after a message is fully read. This should be clarified in this table.

SuggestedRemedy

Change "No new message" to "No new message arrived since last message was read".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

"No new message arrived since either last message was read or PMA reset"

Cl **45** *SC* **45.2.3.49.1** *P* **26** *L* **14** # 24

Hajduczenia, Marek — Bright House Networks

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

"The bit is set to zero when the last register (3.517) containing the message is read after a read access to the first register (3.5.10) (see Figure 114–53)." - what does it really mean: "after a read access to the first register" - are you trying to account for the actual duration of the transmission of OAM message on OAM channel?

SuggestedRemedy

It seems that "The bit is set to zero when the last register (3.517) containing the OAM message is read." would be more than sufficient

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accept suggested remedy and modify state diagram of Figure 114-53 accordingly:
- Eliminate state OAMRX_RXR_LOCK
- The transition from state OAMRX_RXR_UPDT to state OAMRX_MERT_UPDT is qualified by read_RXOAM_DATA8_event
- Eliminate state variable from read_RXOAM_CTRL_event from 114.8.4.1
- Change pg 112 lines 15 through 23 to read:

"OAMRX_RXR_UPDT state is exited when register 3.517 is read (read_OAMDATA8_event = TRUE). This event is the acknowledgment by
the local STA that the OAM message has been successfully received. State OAMRX_MERT_UPDT sets the RXO_VAL bit of register 3.509 to zero indicating that no valid message is stored in the OAM receive registers. Also, the local PHY notifies the link partner of reception of the message by the local STA by setting field LOCPHD.OAM.MERT of the transmit PHD to the value of the RXO_MSGT bit of register 3.509 (txphd_mert <= rxr_msgt)."

Cl **45** *SC* **45.2.3.49.1** *P* **26** *L* **17** # 25

Hajduczenia, Marek — Bright House Networks

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

"The 1000BASE-H PHY does not update the receive message registers with a new message until this bit is equal to zero." - seems like a race condition to me - first sentence in this para describes the condition when the bit is set to zero (all data is read from register) and here we state that data is not updated until bit is set to zero. If data is read at a slower rate than it is coming across OAM channel, it seems that data might be lost in the process.

SuggestedRemedy

Resolve the race condition per comment

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

There is not race condition according state diagrams 114-53 (referrenced in the text) and 114-52.

However, description of 45.2.3.49.1 may be improved to avoid the feeling of race condition.

Replace:
"(see Figure 114–53). The 1000BASE-H PHY does not update the receive message registers with a new message until this bit is equal to zero."

with:
". The 1000BASE-H PHY does not update the receive message registers until the previous received message has been read, which results in bit 3.509.15 to being set to zero (see Figure 114–53)."

Cl **114** *SC* **114.2** *P* **37** *L* **52** # 45

Hajduczenia, Marek — Bright House Networks

Comment Type **E** *Comment Status* **A** *PCS TX Intro*

"The PCS transmit functions include several steps." - I see just one PCS Transmit Function in Figure 114-3

SuggestedRemedy

Change to "The PCS transmit function includes several steps."
Similarly, on page 38, line 7: "The PCS receive functions comprise" to "The PCS receive function comprises"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

From Pg. 37, line 52 to Pg. 38 line 5, replace with:
"The PCS transmit function includes several steps. The GMII transmit data stream is encapsulated and encoded into 65-bit blocks called physical data blocks (PDB), which are then scrambled. After that, the scrambled data is encoded and mapped using a Multi-Level Coset Code (MLCC) block-oriented encoder, which generates fixed-length codewords of PAM16 symbols. The resultant PAM16 codewords are symbol-by-symbol scrambled and then time division multiplexed with control information fields using various sub-blocks to create Transmit Blocks. The control information fields in Transmit Blocks are encoded differently, but symbol time is equal for both, the PAM16 symbols carrying information from GMII and the control information fields. The symbols are transmitted at a nominal rate of 325 MBd."

Accept suggested remedy for page 38, line 7.

Cl **114** *SC* **114.2** *P* **37** *L* **53** # 47

Hajduczenia, Marek — Bright House Networks

Comment Type **T** *Comment Status* **A** *PCS TX Intro*

"and then scrambled" - it is not clear what is scrambled. From the context, it seems that it is GMII data, which I do not think is the intent.

SuggestedRemedy

Change "encoded into 65-bit length blocks called physical data blocks (PDB) and then scrambled" to "encoded into 65-bit length blocks (physical data blocks, PDB), which are then scrambled"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #45.

Cl **114** *SC* **114.2** *P* **37** *L* **53** # 46

Hajduczenia, Marek — Bright House Networks

Comment Type **E** *Comment Status* **A** *PCS TX Intro*

Unnecessary qualification in "encoded into 65-bit length blocks called physical data blocks"

SuggestedRemedy

Change to "encoded into 65-bit blocks called physical data blocks" - there is just one instance anyway

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #45.

Cl **114** *SC* **114.2** *P* **38** *L* **1** # 49

Hajduczenia, Marek — Bright House Networks

Comment Type **T** *Comment Status* **A** *PCS TX Intro*

Avoid the use of vague terms: "After that, the information is encoded" - what information do you mean in this statement?

SuggestedRemedy

Change to "After that, the scrambled data is encoded" - the description should be sufficiently clear to allow a reader draw a functional block matching what is included in the draft

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #45.

Cl **114** *SC* **114.2** *P* **38** *L* **1** # 48

Hajduczenia, Marek — Bright House Networks

Comment Type **T** *Comment Status* **A** *PCS TX Intro*

"make the transmit signal independent of GMII data content." - that is not the purpose of encoding and scrambling

SuggestedRemedy

Strike the statement - it is technically incorrect and unnecessary

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #45.

Cl **114** *SC* **114.2** *P* **38** *L* **2** # 222

Ran, Adee INTEL

Comment Type **TR** *Comment Status* **A** *PCS TX Intro*

The text refers to PAM16 symbols, then MLCC codewords, then PAM16 codewords. That seems incorrect or is confusing.

SuggestedRemedy

Correct or clarify as necessary

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #45.

Cl **114** *SC* **114.2** *P* **38** *L* **2** # 50

Hajduczenia, Marek Bright House Networks

Comment Type **E** *Comment Status* **A** *PCS TX Intro*

Compound adjectives are hyphenated

SuggestedRemedy

Change "block oriented encoder" to "block-oriented encoder" - the second instance in the draft is spelled correctly

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment #45.

Cl **114** *SC* **114.2** *P* **38** *L* **3** # 51

Hajduczenia, Marek Bright House Networks

Comment Type **TR** *Comment Status* **A** *PCS TX Intro*

Again, unclear order of events: PAM16 symbols are created using MLCC encoder. Then they are scrambled. And then we have some MLCC codewords introduced out of the blue, resulting in Transmit Blocks, and then some symbols introduced without clarity of what they are again. Very confusing

SuggestedRemedy

Change
"The resultant PAM16 symbols are further scrambled. The MLCC codewords are time division multiplexed with control information using various sub-blocks that compose Transmit Blocks. The symbols are transmitted at a nominal rate of 325 MHz."
to
"The resultant PAM16 symbols are scrambled and then time division multiplexed with control information using various sub-blocks to create Transmit Blocks. The Transmit Blocks are transmitted at a nominal rate of 325 MHz."

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #45.

Cl **114** *SC* **114.2.1** *P* **38** *L* **19** # 224

Ran, Adee INTEL

Comment Type **TR** *Comment Status* **A** *PCS TX Intro*

Are all these symbols PAM16?

SuggestedRemedy

Assuming they are, either use "PAM16 symbols" consistently or make it clear earlier that "symbols" always means PAM16.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comments #45 and #54.

Cl **114** *SC* **114.2.1** *P* **38** *L* **21** # 225

Ran, Adee INTEL

Comment Type **T** *Comment Status* **A** *PCS TX Intro*

"header data sub-blocks"
Doesn't PHS stand for "physical header subframe"? Or is it "pilot and header subblock" which appears below figure 114-4?

SuggestedRemedy

Clarify (prior to figure 114-4) what PHS stands for in the context of this figure. If there are multiple terms with this acronym then consider renaming them to avoid confusion.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comments #54 and #60.

Cl **114** *SC* **114.2.1** *P* **38** *L* **51** # 54

Hajduczenia, Marek Bright House Networks

Comment Type **TR** *Comment Status* **A** *PCS TX Intro*

Unclear relationship between sub-blocks and symbols: "Each pilot and header sub-block is composed of 160 symbols." - what are these "symbols" ?

SuggestedRemedy

Define or provide reference where they are defined
Note that on page 39, line 3, they are called "data symbols" ??? - "This gives a total of 221 312 payload data symbols."

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

The rewrite of 114.2 is expected to better introduce the use of "symbol" as a generic term.

Some confusion may be caused by the erronous use of symbols at p.38, l.19, change first sentence to read:

"Each Transmit Block shall include pilot sub-blocks, physical header subframe sub-blocks, and payload data sub-blocks, which are transmitted in defined time slots. All sub-blocks are composed of a sequence of symbols transmitted at nominal rate."

Cl **114** *SC* **114.3.6** *P* **72** *L* **43** # 101

McDermott, Thomas Fujitsu

Comment Type **T** *Comment Status* **R** *PMA Interoperability*

The methods to determine the channel response variation and estimate THP coefficients needed is implementation dependent.

Does this introduce vendor interoperablity issues, or does it impact only the receiver? The setup should be plug and play between different vendors.

SuggestedRemedy

Response *Response Status* **C**

REJECT.

Comment editor does not recommend any change to the draft. Following is the response to the comment.

This does not produce any interoperability issue. As in other 802.3 PHYs, it is up to the implementor how the channel response is estimated and how the received signal is equalized to solved the ISI. This is very clear to understand when the equalizer block is only implemented in the receiver side (e.g. Decision Feedback Equalizer (DFE), the receiver estimates/adapts the coefficients of the feedback and feedforward filters and also implements them).

Clause 114 specifies the use of adaptive Tomlinson-Harashima Precoding (THP) that compensates the causal part (post-cursor) of the channel response. THP technique was included in the core proposal mainly because:
- the use of high spectral efficiency transmission scheme
- the use of high coding gain multi-level coset coding
- highly dispersive channel response
- easy combination of THP and FEC without error propagation problems
(see SG presentations for technical feasibility)

In case of THP (very similar structure to a DFE) the feedback filter is implemented in the transmitter, however the calculation is carried out by the receiver. The state diagrams specified in the draft allow for dynamic adaptation of the THP coefficients before and after the link is established. The receiver dynamically request to the partner the adaptation of THP coefficients being used in transmission. Once the partner receives the request, it announces one Transmit Block ahead that the adaptation is going to take effect, so that the receiver can adapt its circuitry if needed. The number of coefficients, dynamic range and accuracy of them have been specified based on real channels measured in the laboratory and they are specified with margin.

As can be seen, as is typical in other PHYs, the receiver estimates the channel and adapts the equalizer coefficients, although in this case, some part of the equalizer is implemented in the transmitter of the parter, which obeys orders of receiver.

Cl **1** *SC* **1.4** *P* **19** *L* **28** # 221

Ran, Adee INTEL

Comment Type **T** *Comment Status* **A** *Port Types*

What does 1000BASE-H stand for? PCS and PMA without PMDs? It seems that this is a term for a family of Physical Layer Devices (compare to 1.4.51 100GBASE-R).
Why do the PMD types include "R" (such as 1000BASE-RHA) when the family term is 1000BASE-H? This is somewhat confusing.

SuggestedRemedy

Change 1000BASE-H to be defined as a family of Physical Layer devices.

Consider removing the "R" in the PMD types.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The number of port types was discussed during TF Review. This approach resolved comments from multiple 802.3 members. 1000BASE-H is defined in what is being added to 1.4. Naming uses the same format as other port types for example 1000BASE-X is the 8B/10B PCS, 1000BASE-LX and 1000BASE-SX differentiating the PMD wavelength.

RHA, RHB and RHC are PHY types, and for consistency change:
"1.4.x 1000BASE-RHA: IEEE 802.3 PMD specifications for 1000 Mb/s Ethernet using duplex plastic optical fiber cabling and red light with optical budget tailored for home and other consumer application requirements. (See IEEE Std 802.3, Clause 114.)"

to read:

"1.4.x 1000BASE-RHA: IEEE 802.3 Physical Layer specification for 1000 Mb/s Ethernet using 1000BASE-H encoding and red wavelength with duplex plastic optical fiber, and PMD tailored for home and other consumer application requirements. (See IEEE Std 802.3, Clause 114.)"

Do similar change to definitions of 1000BASE-RHB and 1000BASE-RHC.

Change:
"1.4.x 1000BASE-H: IEEE 802.3 PCS and PMA sublayers for 1000 Mb/s Ethernet using duplex plastic optical fiber cabling. (See IEEE Std 802.3, Clause 114.)"
to:
"1.4.x 1000BASE-H: IEEE 802.3 PCS and PMA sublayers for 1000 Mb/s Ethernet that support PMDs for operation using duplex plastic optical fiber cabling. (See IEEE Std 802.3, Clause 114.)"

Cl **30** *SC* **30.5.1.1.4** *P* **21** *L* **40** # 12

Hajduczenia, Marek Bright House Networks

Comment Type **TR** *Comment Status* **A** *Port Types*

"For 1000BASE-RHx," - term 1000BASE-RHx is not defined anywhere in the draft and used here for the very first time

SuggestedRemedy

Change all instances of "1000BASE-Hx" to "1000BASE-H" - I believe "H" type is a aggregate name to designate all PHYs you specify

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

The Study Group discussed the possibility of defining 1000BASE-GH in the future for longer reach. The difference between the 1000BASE-RH envisioned at that time, and 1000BASE-GH are the same as the difference between 1000BASE-SX and 1000BASE-LX, different optical wavelengths. GEPOF is unique in recognizing the different component types and impact on link budget that our target markets demand.

IEEE 802.3 optics experts demanded during TF review that the one port type (RH) and six topology and temperature range types (Type 1 through Type 6) be rewritten as three port types (current RHA, RHB, RHC) and three topology/temperature types. This creates the first time time in 802.3 of having three port types with the same encoding, same wavelength, but different port type names for the different optical budgets resulting from the market connector requirements (e.g., lens and connector versus direct clamp of the POF cable).

Add to definitions:
"1.4.26d 1000BASE-RHx: IEEE 802.3 specifications for a family of 1000 Mb/s Ethernet using duplex plastic optical fiber cabling and red light with optical budget specified by the PMD."

Cl **78** *SC* **78.1.4** *P* **33** *L* **10** # 160

Pérez-Aranda, Rubén KDPOF

Comment Type **T** *Comment Status* **R** *Port Types*

Tables 78-1, 78-2 and 78-4 distinguish among 1000BASE-RHA, RHB and RHC PHY types, specifying same EEE parameters for the three types. According to 114, the three types share the same specifications of PCS, PMA and PMD and differences among them are related to AOP at TP2 and TP3 and fiber optic channel type for which are addressed. LPI timing does not depend on that.

SuggestedRemedy

Use only one row for specification in three tables. PHY type should be 1000BASE-RHx

Response *Response Status* **C**

REJECT.

Commenter should note that the two 40GBASE- and four 100GBASE- PHYs have the same values. Listing all three of our PHY types is consistent with this current content of the table.

Cl **78** *SC* **78.2** *P* **33** *L* **25** # 38

Hajduczenia, Marek Bright House Networks

Comment Type **T** *Comment Status* **R** *Port Types*

Is there any reason why 1000BASE-RHA/B/C are listed explicitly when the values are the same?

SuggestedRemedy

Consider merging three rows into a single one with "1000BASE-H" designator
The same applies to 78.5, Table 78-4

Response *Response Status* **C**

REJECT.

1000BASE-H is not a PHY type. Commenter should note that the two 40GBASE- and four 100GBASE- PHYs have the same values. Listing all three of our PHY types is consistent with this current content of the table.

Cl **114** *SC* **114.1** *P* **35** *L* **16** # 220

Ran, Adee INTEL

Comment Type **E** *Comment Status* **R** *Port Types*

It is customary in recent clauses to include a reference table for associated clauses. See Table 72-1 as an example. This could be a good place to state optionality of EEE and GMII.

SuggestedRemedy

Add a table "Physical Layer clauses associated with 1000BASE-H" with content based on Table 72-1.

Response *Response Status* **C**

REJECT.

We undertand that this kind of table can be very useful for a PHY for which the PCS, PMA and PMD and other sublayers are specified in different clauses and some of them can be optional, providing to the reader an scheme about which clauses need to read to get a full specification of the PHY.

Clause 114 specifies PCS, PMA and PMD sublayers all together, and the only dependent clauses are 35, 45, 30, 78 and Annex 4A (the typically expected ones). The referenced Clause 72 does not include clause 45 in the table, it is only mentioned in text. There is no mention in the Table nor text of Annex 4A (it is defined for full duplex), Clause 30, nor the clauses for state diagram rules, etc.

Using the same deducted criteria, the table would have 2 lines (35-GMII and 78-EEE) for clause 114, and GMII is already mentioned in Figure 114-1 and Figure 114-3. Therefore, we think it is not worth adding this kind of table because the small information that provide for a clause like 114.

Cl **114** *SC* **114.2.1** *P* **38** *L* **15** # 52

Hajduczenia, Marek Bright House Networks

Comment Type **E** *Comment Status* **R** *Port Types*

"information for 1000BASE-H" - I assume it is 1000BASE-H PHY?

SuggestedRemedy

Change to "information for the 1000BASE-H PHY."

Response *Response Status* **C**

REJECT.

Either is correct with appropriate surrounding language. 1000BASE-H is a defined term for the PCS and PMA (used in a 1000BASE-RHx PHY). The Transmit Block is a structure relevant to PCS and PMA functions, so as written, the sentence is correct.

Cl **114** *SC* **114.6.3** *P* **91** *L* **51** # 203

Zimmerman, George — CME Consulting

Comment Type **TR** *Comment Status* **A** *Port Types*

The specifications aren't referred to as RHA, RHB and RHC - those are the PHY types you have specified. Are you saying now that actually it is a single PCS, single PMA and a choice of 3 PMDs? If so, then write it that way.

SuggestedRemedy

Clarify. If it is the PMDs, include a table showing the uses of each of the 3 PMDs and making the relationship of the 3 PHY types clear.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

IEEE 802.3 optics experts damanded during TF review that the one port type (RH) and six topology and temperature range types (Type 1 through Type 6) be rewritten as three port types (current RHA, RHB, RHC), three topology types and three temperature classes.

This creates the first time in 802.3 of having three port types with the same PCS and PMA, same wavelength, but different port type names for the different optical budgets resulting from the market connector requirements (e.g., lens and connector versus direct clamp of the POF cable).

Table as the one recommended by the commenter does not apply.

Change:
"Three different sets of specifications are specified for 1000BASE-RHx. These different sets of specifications are identified as 1000BASE-RHA, 1000BASE-RHB, and 1000BASE-RHC."
to:
"Different PMD to MDI optical specifications are provided for port types 1000BASE-RHA, 1000BASE-RHB, and 1000BASE-RHC."

Cl **114** *SC* **114.6.3** *P* **92** *L* **1** # 204

Zimmerman, George — CME Consulting

Comment Type **ER** *Comment Status* **A** *Port Types*

The description of the applications for the PHY types is buried this deep into the document. It would make much more sense up front.

SuggestedRemedy

Move the description of the applications for the 3 PHY types to the overview section.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Move pg 92, lines 1 to 13, to 114.1 line 15.

Cl **114** *SC* **114.6.3.1** *P* **92** *L* **36** # 205

Zimmerman, George — CME Consulting

Comment Type **TR** *Comment Status* **R** *Port Types*

According to Table 114-6, the 3 PHY types only differ by their minimum AOP level. If true, simplify Table 114-6 to just the MDI characteristic, and add a table showing just the how RHA, RHB, and RHC differ in AOP.

SuggestedRemedy

See comment

Response *Response Status* **U**

REJECT.

1000BASE-RHA, RHB, and RHC are port types, and not only different AOP specification at the MDI, because the targeted application is different for each port type.

See response to comment #203.

Cl **114** *SC* **114.6.3.3** *P* **93** *L* **39** # 206

Zimmerman, George — CME Consulting

Comment Type **TR** *Comment Status* **R** *Port Types*

According to Table 114-8 there are only 2 discernable Receivers - Type I/2 and Type 3, which differ by 1.5dB sensitivity.

SuggestedRemedy

Either - justify how the 3 receivers differ, OR, collapse the table to 2 types.

Response *Response Status* **U**

REJECT.

See also response to comment #203.

RHA, RHB, and RHC are three PHY types, therefore clause 114 has to provide specifications of transmitter and receiver for each one of the PHY types.

In table 114-8 it is specified the same sensitivity for RHA and RHB with channel type I and for RHC with channel type II, however it is important to note that type I is at least up to 50 m channel, and type II refers to at least up to 40 m channel. Different dispersion is expected from the two channels. The same sensitivity is because the different enviromental conditions of RHC.

See table 114-12, where the different PHY types have different link power budget and unallocated link margin.

Cl **114** *SC* **114.6.5** *P* **101** *L* **30** # 210

Zimmerman, George — CME Consulting

Comment Type **TR** *Comment Status* **R** *Port Types*

After reading through this, I can't find anything mapping the transmit PMDs and receiver specs to the link segment types. I thought this would be where it would be.

SuggestedRemedy

Include a table showing how the various transmitter types, receiver types and link segment types relate, including, which are permissible combinations and which are not.

Response *Response Status* **U**

REJECT.

There are neither transmitter types nor receiver types.
See responses to comments #203, #206 and #208.

Just 3 PHY types, 1000BASE-RHA, 1000BASE-RHB, and 1000BASE-RHC and 3 fiber optics channel types.

As stated in Pg 92 line 15, the specified combinations are:
"1000BASE-RHA and 1000BASE-RHB PHYs have to be able to operate in a fiber optic channel type I. A 1000BASE-RHC PHY has to be able to operate in the fiber optic channel types II and III."
"Combinations" are also reflected in Table 114-6, Table 114-8 and Table 114-12.

Cl **1** *SC* **1.3** *P* **19** *L* **15** # 4

Hajduczenia, Marek — Bright House Networks

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

Reference to CISPR is added in P802.3bp D3.1 and since you're trailing P802.3bp - you do not need to include it any more

SuggestedRemedy

Strike lines 15-19

Response *Response Status* **C**

ACCEPT.

Cl **1** *SC* **1.3** *P* **19** *L* **15** # 244

Carlson, Steve — HSD/Marvell

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

The reference to CISPR was added in P802.3bp D3.1 and is not necessary to include in P802.3bv.

SuggestedRemedy

Strike lines 15-19

Response *Response Status* **C**

ACCEPT.

Cl **1** *SC* **1.3** *P* **19** *L* **16** # 106

Anslow, Pete — Ciena

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

P802.3bp D3.1 (ahead of P802.3bv in the queue) has removed the edition and date from the CISPR 25 reference (and the text inserted by P802.3bw is "IEC CISPR 25 Edition 3.0 2008-03:"

SuggestedRemedy

Remove this reference from the draft

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Remove reference and editor's note.

Cl **114** *SC* **114.3.5.2** *P* **67** *L* **1** # 269

Carlson, Steve — HSD/Marvell

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

The state machine has an entry on the side (pma_reset = ON +link_control ≠ ENABLE). It should be on the top per editorial convention. This problem is also present in a number of other state machines.

SuggestedRemedy

Please follow the editorial guidelines for state machines and scrub the draft for these problems.

Response *Response Status* **U**

ACCEPT.

Cl **114** *SC* **114.3.5.2** *P* **68** *L* **1** # 199

Zimmerman, George — CME Consulting

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

Figure 114-34 - style is for entry and exit to states to be at the top and bottom, respectively, not the side

SuggestedRemedy

Redraw with pma_reset entry to PMATX_DISABLE_TX on the top

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

There is no rule for this and many state diagrams have entries and exits from sides.
When the change will improve readibility we will move entries and exits as sguggested.
Certainly pma_reset will be on top entry.

Cl **114** *SC* **114.3.5.2** *P* **68** *L* **3** # 147

Booth, Bradley — Microsoft

Comment Type **ER** *Comment Status* **A** *SD*

The state machine in Figure 114-34 doesn't follow typical 802.3 conventions.

SuggestedRemedy

Move the "pma_reset = ON..." arrow from the side of the box to the top.

Response *Response Status* **U**

ACCEPT.

Cl **114** *SC* **114.3.5.2** *P* **68** *L* **3** # 182

Laubach, Mark — Broadcom

Comment Type **TR** *Comment Status* **R** *SD*

Figure 114-34, state entry for PMATX_DISABLE_TX is "pma_reset = ON + link_control ≠ ENABLE", but state exit is only "link_control = ENABLE". This is not sufficiently specific and ambiguous as pma_reset = ON retains this state regardless of value of link_control. The exit criteria for SDs in this draft must include an exit condition that is the AND of any variables listed in the OR entry transition. In this case change to "pma_reset = OFF * link_control = ENABLE". The necessary value of your "global" variables must also be listed as part of the exit criteria if they are listed as OR'd entry criteria.

SuggestedRemedy

As per comment, and do for all state diagrams (numerous) that have this exit ambiguity.

Response *Response Status* **U**

REJECT.

According to 21.5, there is no ambiguity:
"Any open arrow (an arrow with no source block) represents a global transition. Global transitions are evaluated continuously whenever any state is evaluating its exit conditions. When a global transition becomes true, it supersedes all other transitions, including UCT, returning control to the block pointed to by the open arrow."

The commenter has fully understood the SD: "… as pma_reset = ON retains this state regardless of value of link_control", which is agree with 21.5.

Being said that and because 802.3 and other projects running ahead to 802.3bv, as 802.3bp, extensively do not implement the rule asked by the commenter, the comment is rejected.

Cl **114** *SC* **114.3.5.3** *P* **69** *L* **1** # 148

Booth, Bradley — Microsoft

Comment Type **ER** *Comment Status* **A** *SD*

State machine diagram doesn't follow typical 802.3 conventions.

SuggestedRemedy

Move PMARX_DISABLE to be at the top of the state diagram followed by PMARX_TIMING_COARSE and PMARX_TIMING_FINE. Have the open arrow into PMARX_DISABLE at the top.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #199.

Cl **114** *SC* **114.3.5.3** *P* **69** *L* **1** # 200

Zimmerman, George — CME Consulting

Comment Type **ER** *Comment Status* **A** *SD*

Figure 114-35 - style is for entry and exit to states to be at the top and bottom, respectively, not the side. This comment applies to ALL state diagrams except for 114-38 and 114-39

SuggestedRemedy

Redraw state diagram with entries on top and exits on the bottom of states

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #199.

Cl **114** *SC* **114.3.5.3** *P* **69** *L* **27** # 84

Hajduczenia, Marek — Bright House Networks

Comment Type **ER** *Comment Status* **A** *SD*

Per editorial conventions, state can be only entered from the top, not from the side (PMARX_TIMING_COARSE > PMARX_TIMING_FINE) or the bottom (>

SuggestedRemedy

Update all SDs in the draft - there are multiple instances of these issues

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment #199.

Cl **114** *SC* **114.3.7.4** *P* **78** *L* **30** # 149

Booth, Bradley — Microsoft

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

State diagram shouldn't have a loop back to itself. The state should only be exited if the exit conditions have been met.

SuggestedRemedy

Remove the loop back arrows on PMAMON_SYNCH and PMAMON_UPDATE.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

All the events used in the state diagrams will be rewritten to eliminate boolean values, so they behave more like a service interface indication (trigger). Also replace the references as a boolean.

For example:
"new_txblock_event
Signal sent by the PHY transmitter to indicate the start of a new Transmit Block. This event persists only long enough to cause a state diagram transition."