Cl **158** *SC* **158.8.1.1** *P* **86** *L* **23** # R1-1

Ran, Adee
Intel Corporation

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

Footnote a says "This is the test pattern checker defined in 49.2.12. Pattern 3 is optional".

1. The table does not define a test pattern checker; it defines a test pattern.

2. 49.2.12 does indeed define a test pattern checker, which works with either PRBS31 or with the "pseudo-random" (A/B) pattern and has some requirements about its operations. It is irrelevant for this subclause which just defines the test pattern (equivalent to 49.2.8).

3. The test pattern is not optional; its implementation may be optional, but in this PMD clause there is no requirement to implement any of the test patterns anyway (a PMD may not implement any test pattern generator or checker, including test patterns 1/2 or square wave). Therefore, there is no need to state "optional" only for PRBS31.

SuggestedRemedy

Replace the footprint with the following
"The PRBS31 test pattern is identical to the one defined in 49.2.8".

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.8.1.1** *P* **85** *L* **44** # R1-2

Ran, Adee
Intel Corporation

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

This subclause is titled "Test pattern definition". But there is no requirement to implement a generator and/or a checker for these test pattern, or indication these are required.

The PMD tests require generating/checking these test patterns (e.g. for measuring Transmit eye in 158.8.7, or BER in SRS test in 158.8.9.1.1).

It seems reasonable not to require implementation of test pattern logic in a PMD, but it must be implemented somewhere (e.g. in test equipment or in other sublayers). This is not clear from the current text.

Note that testing a PMD in isolation (e.g. optical module) is typically done using test equipment, but when testing a full PHY, test pattern generation by test equipment may not be applicable (the clause 51 PMA does not require remote loopback capability), and test pattern checking in the PCS requires bypassing the RS-FEC sublayer; going into these details seems unnecessary, but the test definition should allow multiple implementations.

SuggestedRemedy

Add the following paragraph in 158.8.1, before the NOTE:

"Test pattern generation and checking functions, such as the ones defined in 49.2.8 and in 49.2.12, are required for testing a PMD. Tests may utilize test pattern generator and checker in other sublayers (e.g. the PCS of clause 49) or in the test equipment, as appropriate".

In 158.8.9.1.1, change the sentence "As defined in section 49.2.12 and 50.3.8, the PCS is capable of detecting the data pattern and reporting any errors received" to "error counting may be performed in a higher sublayer (e.g. the PCS of clause 49) or in the test equipment, as appropriate".

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.8.5** *P* **87** *L* **36** # R1-3

Ran, Adee Intel Corporation

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

"OMA shall be as defined in 52.9.5 for measurement with a square wave (8 ones, 8 zeros) test pattern or 68.6.2 (from the variable MeasuredOMA in 68.6.6.2) for measurement with a PRBS9 test pattern"

1. 52.9.5 defines the test procedure, not a value. There should be no "shall" for a definition of a test procedure (it is defined by the standard, not by an implementation). The "shall" should refer to the test result and the requirements in Table 158–7.

2. The test procedure in 68.6.2 uses PRBS9 test pattern, which is not defined in this clause, and a different calculation. The results might be different and create ambiguity. There should be one test definition.

Also applies to 159.7.4 (cross-clause).

SuggestedRemedy

Change the quoted sentence to "OMA shall meet the requirements in Table 158–7 when measured using the method defined in 52.9.5".

Apply similar change to 159.7.4 (with reference to Table 159–6 instead).

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.6.1** *P* **83** *L* **24** # R1-4

Ran, Adee Intel Corporation

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

In Table 158–7, the "Optical Modulation Amplitude" is not followed by the abbreviation "OMA" (unlike "TDP" one row below, and unlike Table 159–6).

Also, the row "Launch power (min) in OMA minus TDP" should be placed after the rows that define OMA and TDP.

SuggestedRemedy

Change the description from "Optical Modulation Amplitude (min)" to "Optical Modulation Amplitude (OMA) (min)".

Reorder rows such that "Launch power (min) in OMA minus TDP" is after OMA and TDP.

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.7** *P* **85** *L* **22** # R1-5

Ran, Adee Intel Corporation

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

"The jitter specifications for 10GBASE-BRx ... are defined in 158.8.9"

But they are not; 158.8.9 specifies jitter tolerance, which is complementary to jitter specification. There seem to be no jitter specifications in this clause, similar to other optical PMD clauses (other than an eye mask, but that is actually defined in 158.8.7).

The remainder of this sentence refers to "the sinusoidal jitter used to test receiver jitter tolerance". This does not match the subclause heading "jitter specifications".

SuggestedRemedy

Replace the text of this subclause to

"The jitter specifications for 10GBASE-BRx are defined by the transmitter eye mask requirements in Table 158–7, using the definitions in 158.8.7 and the reference receiver defined in 158.8.10.3."

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.8.7** *P* **87** *L* **46** # R1-6

Ran, Adee — Intel Corporation

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

Measurement of a transmitter eye depends on the CRU bandwidth. The bandwidth can affect meeting the eye mask requirements, so it has to be defined.

The referenced procedure in 86.8.4.6.1 does not specify the CRU bandwidth (it is specified in another place, 86.8.3.2).

In this clause, the CRU bandwidth is defined for the reference receiver in 158.8.10.3 (although it is placed under the TDP subclause). The current text says "The clock recovery unit (CRU) used in the TDP measurement has a corner frequency of 4 MHz and a slope of 20 dB/decade", which is identical to 86.8.3.2). This definition can be used to avoid pointing to another document (but it should be made less specific to apply to transmitter eye as well).

Alternatively, a reference to 86.8.3.2 can be added instead.

SuggestedRemedy

Add the following sentence after the existing paragraph in 158.8.7:
"The reference receiver for the transmitter optical waveform measurement is defined in 158.8.10.3".

In the last paragraph of 158.8.10.3, delete the words "used in the TDP measurement".

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.8.6** *P* **87** *L* **42** # R1-7

Ran, Adee — Intel Corporation

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

"RIN shall be as defined by the measurement methodology of 52.9.6 with the exception that the optical return loss shall be..."

The measurement methodology of 52.9.6 does not define a requirement for RINxOMA - the requirement is in Table 158–7. So the "shall" should refer to the table.

The measurement methodology does have the return loss as a parameter, so the exception is not needed.

Also, using the term RIN where Table 158–7 uses RINxOMA is unnecessarily confusing.

SuggestedRemedy

Changer the text of this subclause to

"RINxOMA shall meet the requirement in Table 158–7 when measured using the method of 52.9.6, with x being the Optical return loss tolerance (max) specified in Table 158–7 for the PMD under test."

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.8.9.1.1** *P* **90** *L* **1** # R1-8

Ran, Adee — Intel Corporation

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

Figure 158–4 has a "system under test" the with sublayer stack of clause 52, which is irrelevant for this clause; the PHYs in this clause do not support WIS. The system under test may also not have a PCS (for example, when a module is tested unconnected to a host).

Also, there is a BiDi arrow labeled "test pattern" which goes to both the test equipment and the PCS. It is unclear what it means. Is this a selector of test patterns?

To minimize confusion, it is suggested to remove unnecessary details which may cause the figure to be incorrect.

SuggestedRemedy

Delete the "test pattern" label and the associated bi-directional arrow.
Change the label "PCS or WIS" to "Higher sublayers".

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.8.9.1.4** *P* **93** *L* **53** # R1-9

Ran, Adee — Intel Corporation

Comment Type **GR** *Comment Status* **X**

"It does, however, guarantee that a receiver meeting the requirements of this test operates with the worst-case optical input."

The word "guarantee" should not be used in a standard. The test method does not necessarily guarantee what is claimed here.

I am suggesting deletion of the whole sentence, since the spirit of this claim goes without saying, as it does in many other places throughout 802.3. If there is a way to rephrase it with a looser claim it would also be acceptable.

SuggestedRemedy

Delete this sentence.

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.8.9.2** *P* **95** *L* **50** # R1-10

Ran, Adee — Intel Corporation

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

This test procedure is based on 95.8.8, which has 4 lanes and RS-FEC encoding. For a single-lane PMD, an additional exception is required. See 112.7.8 for reference.

SuggestedRemedy

Add to the list of exceptions:
- Since 10GBASE-BR20 has a single lane in each direction, The interface BER is identical to the BER on the single receiver, and the conditions for receiver aggressor lanes in Table 95–7 do not apply.

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.8.10.2** *P* **96** *L* **10** # R1-11

Ran, Adee — Intel Corporation

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

"The channel for 10GBASE-BRx is a 2 m to 5 m patch cord meeting the requirements in Table 158–15."

I assume this requirement is only for the specific test. The PHYs are intended to operate over somewhat larger lengths.

SuggestedRemedy

Change "The channel for 10GBASE-BRx" to "The channel for testing the 10GBASE-BRx TDP" or "The channel used in this test".

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.9.7** *P* **97** *L* **38** # R1-12

Ran, Adee — Intel Corporation

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

The subclause title is "PMD labeling requirements" but the text says "It is recommended that" - this is not a requirement.

Also in 159.8.7 and in 160.8.7.

SuggestedRemedy

Change the subclause title to "PMD labeling" in all 3 cases.

Proposed Response *Response Status* **O**

Cl **159** *SC* **159.6.1** *P* **112** *L* **15** # R1-13

Ran, Adee — Intel Corporation

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

Table 159–6 has row for "RINxOMA", but 159.7.7 defines the parameter RIN20OMA (there is only one value of optical return loss tolerance).

Also, footnote c has "RINxOAM" (typo), but this footnote would not be required if the term was simply RIN20OMA.

SuggestedRemedy

Change RINxOMA to RIN20OMA, and delete footnote c.

Proposed Response *Response Status* **O**

Cl **159** *SC* **159.7.10** *P* **117** *L* **17** # R1-14

Ran, Adee — Intel Corporation

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

In addition to "the conditions for receiver aggressor lanes do not apply"

The interface BER is not an average of four BER measurements; the BER should be defined as the BER of the single receiver.

SuggestedRemedy

Add another exception to the list:
"The interface BER is identical to the BER on the single receiver".

Proposed Response *Response Status* **O**

Cl **160** *SC* **160.6.1** *P* **136** *L* **42** # R1-15

Ran, Adee — Intel Corporation

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

Footnote d has "RINxOAM" (typo).

SuggestedRemedy

Change to "RINxOMA"

Proposed Response *Response Status* **O**

Cl **160** *SC* **160.7.9** *P* **143** *L* **38** # R1-16

Ran, Adee — Intel Corporation

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

"RIN shall be as defined by the measurement methodology of 52.9.6"

52.9.6 defines the test procedure, not a value. There should be no "shall" for a definition of a test procedure (it is defined by the standard, not by an implementation). The "shall" should refer to the test result and the requirements in Table 160-7.

Also, using the term RIN where Table 160–7 uses RINxOMA is unnecessarily confusing.

SuggestedRemedy

Change the quoted sentence to "RINxOMA shall meet the requirements in Table 160–7 when measured using the method defined in 52.9.6".

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.5.10** *P* **81** *L* **44** # R1-17

Ran, Adee — Intel Corporation

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

"157.5" is not an active cross reference.

Also in 159.5.10 and in 160.5.10

SuggestedRemedy

Create active xref in all 3 places.

Proposed Response *Response Status* **O**

Cl **FM** *SC* **FM** *P* **1** *L* **27** # R1-18

Dawe, Piers J G — NVIDIA

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

50
Gb/s

SuggestedRemedy

Use non-breaking space. Also at 20
km in abstract

Proposed Response *Response Status* **O**

Cl **FM** *SC* **FM** *P* **6** *L* **50** # R1-19

Dawe, Piers J G — NVIDIA

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

Two people's names in one entry

SuggestedRemedy

Split them

Proposed Response *Response Status* **O**

Cl **56** *SC* **56.1.3** *P* **41** *L* **12** # R1-20

Dawe, Piers J G NVIDIA

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

Clause 108's title has changed and it is clear now that it can be used at 10G

SuggestedRemedy

Change "25GBASE-R RS-FEC" to "Reed-Solomon FEC" (which is how it is referred to in Clause 45), and delete note a, it's no longer needed

Proposed Response *Response Status* **O**

Cl **56** *SC* **56.1.3** *P* **41** *L* **12** # R1-21

Dawe, Piers J G NVIDIA

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

108 appears twice in Table 56-2

SuggestedRemedy

Combine the entries

Proposed Response *Response Status* **O**

Cl **108** *SC* **108.2.1.3.3** *P* **50** *L* **36** # R1-22

Dawe, Piers J G NVIDIA

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

"See 107.1.4.2"

SuggestedRemedy

As this is for one of the 10GBASE-R service primitives, maybe it should be "See 49.2", as for FEC_UNITDATA.indication above.

Proposed Response *Response Status* **O**

Cl **49** *SC* **49.2.13.2.2** *P* **542** *L* # R1-23

Dawe, Piers J G NVIDIA

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

In the base document:
signal_ok
Boolean variable that is set based on the most recently received value of PMA_SIGNAL.indication(SIGNAL_OK) or WIS_SIGNAL.indication(SIGNAL_OK). It is true if the value was OK and false if the value was FAIL.

SuggestedRemedy

This could say:
PMA_SIGNAL.indication(SIGNAL_OK) or WIS_SIGNAL.indication(SIGNAL_OK) or FEC_SIGNAL.indication(SIGNAL_OK)
or more neatly,
PMA_SIGNAL.indication(SIGNAL_OK), WIS_SIGNAL.indication(SIGNAL_OK) or FEC_SIGNAL.indication(SIGNAL_OK)

Proposed Response *Response Status* **O**

Cl **159** *SC* **159.6.3** *P* **106** *L* **12** # R1-24

Dawe, Piers J G NVIDIA

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

Blank line in table, layout

SuggestedRemedy

Remove any unnecessary C/R at line 12. Preferably, make column 2 wider in tables 159-7 and -8 so "1320 to 1340" fits on one line.

Proposed Response *Response Status* **O**

Cl **159** *SC* **159.7.10** *P* **110** *L* **25** # R1-25

Dawe, Piers J G NVIDIA

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

Table layout

SuggestedRemedy

Remove any C/R causing the empty line 31. Make the right column (or both) a little wider

Proposed Response *Response Status* **O**

Cl **160** *SC* **160.9** *P* **138** *L* **35** # R1-26

Dawe, Piers J G NVIDIA

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

The header row of the table...

SuggestedRemedy

Should be bold

Proposed Response *Response Status* **O**

Cl **160** *SC* **160.6.1** *P* **127** *L* **14** # R1-27

Dawe, Piers J G NVIDIA

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

Blank line in table

SuggestedRemedy

Remove any unnecessary C/R

Proposed Response *Response Status* **O**