Cl **00** *SC* **0** *P* *L* # 1

METHLEY, STEVEN G Individual

Comment Type **G** *Comment Status* **R**

I have voted to approve, but wish to add the general comment that during my reading I did wonder a) whether implementation was close to being prescribed in places, plus b) whether the margin of such a system will prove to deliver robustness in the final application.

SuggestedRemedy

Response *Response Status* **C**

REJECT.

The comment resolution committee is obliged to reject this comment as it contains no suggested remedy. However, to address the concerns raised …

Regarding a: The consensus within the Task Force is that the specification leaves considerable implementation flexibility. It is also the consensus that the specification does not limit implemenation choices.

Regarding b: The consensus within the Task Force, based upon the work undertaken in developing the details of the specification, is that 10GBASE-LRM products will prove to be robust in final applications.
Please refer to the presentations in the LRM project area (IEEE802.org/3/aq/public).

Cl **00** *SC* **0** *P* **0** *L* # 2

COORDINATION, EDITORIAL

Comment Type **GR** *Comment Status* **A**

If applicable, please incorporate the changes made to 802.3-2005 into this amendment.

Thank you, Michelle

SuggestedRemedy

Response *Response Status* **W**

ACCEPT.

The editor will consult David Law and Bob Grow on how best to approach this.

Cl **00** *SC* **0** *P* **0** *L* **0** # 3

BARRASS, HUGH Individual

Comment Type **GR** *Comment Status* **R**

The use of "MyBallot" as a comment entry tool is unacceptable for any serious standard.

SuggestedRemedy

Resubmit the standard for approval using an acceptable comment handling tool or select a professional standards development organization for this subject

Response *Response Status* **W**

REJECT.

As this comment does not address the content of the 802.3aq document it is ruled is out of scope by the Chair of 802.3, who will forward the commenter's feedback to the SA.

Cl **TOC** *SC* **TOC** *P* **10** *L* **24** # 4

JAMES, DAVID V Individual

Comment Type **GR** *Comment Status* **A**

This document does not conform to the IEEE Style Manual. Specific instances include:
Page 10, line 24 and 28: Excessive title length.
Page 12, line 44, 47: Excessive capitalization
Page 18, line 18: Intermixed call caps and lower case in figure
Page 20, line 39: Excessive figure title length.
Page 31, line 29: Inconsistent font (use 8-point Arial in figures)
Also, excessive capitalization.
Page 7, line 8: Inconsistent font (use 8-point Arial in figures)
(Applies to all figures).

SuggestedRemedy

The editor (or selected IEEE editor) should fix the deviations before resending the draft for review.

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Advice sought, by editor, from IEEE Program Manager. Her resoponse to an email, including a copy of this comment, is given below.
Following this feedback, the Task Force will leave it to the IEEE Editorial Staff to handle the style details of the type refered to by the commenter.

Response from IEEE Program Manager:

Hello Nick,

I looked over the comments and upon review of the document all of the comments listed below will be handled by IEEE Editorial Staff during the publication process. Thank you.

****
Michelle Turner
Program Manager, Document Development
IEEE Standards Activities

Cl **68** *SC* **68.1.3** *P* **12** *L* **11** # 5

SWANSON, STEVEN E Individual

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

Incorrect reference.

SuggestedRemedy

Change "IEC 60794-2-11 (2004), Optical fibre cables - Part 2-11: Indoor optical fibre cables - Detailed specification for simplex and duplex cables for use in premises cabling." to "IEC 60794-2-11 (2005), Optical fibre cables - Part 2-11: Indoor cables - Detailed specification for simplex and duplex cables for use in premises cabling."

Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.1.3** *P* **12** *L* **11** # 6

SWANSON, STEVEN E Individual

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

Incorrect reference.

SuggestedRemedy

Change "IEC 60794-3-12 (2004), Optical fibre cables - Part 3-12: Outdoor fibre cables - Detailed specification for duct and directly buried optical telecommunication cables for use in premises cabling." to "IEC 60794-3-12 (2005), Optical fibre cables - Part 3-12: Outdoor fibre cables - Detailed specification for duct and directly buried optical telecommunication cables for use in premises cabling."

Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.4.1** *P* **21** *L* **15** # 7

SWANSON, STEVEN E Individual

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

The success of 10GBASE-LRM as a standard is based on the ability of customers to purchase system components that meet the specifications in the standard, plug them together and have them work in a predictable, reliable and useful manner over the installed base of optical fiber. Since the installed base of fiber is not designed nor tested to support the alternative launch specified in the standard, I must recommend that the alternative launch be removed. This recommendation is consistent with the launch conditions specified in both 1000BASE-LX and 10GBASE-LX-4 and is the only known method to ensure predictable, reliable and useful operation of the link.The specification of two optical launch conditions that must be selected by the user in order to mitigate the risk of a link failing does not meet the level of quality and reliability associated with previous standards developed by 802.3.

SuggestedRemedy

Replace "...The optical launch condition at TP2 is either the preferred launch or the alternative launch (at the user's choice), as specified in 68.5.1. A compliant PMD shall support both options. The launch is selected by using either a single-mode fiber offset-launch mode-conditioning patch
cord or a regular multimode fiber patch cord inserted between the MDI and TP2, consistent with the media type." with "...The optical launch condition at TP2 is specified in 68.5.1. The launch is selected by using a single-mode fiber offset-launch mode-conditioning patch cord inserted between the MDI and TP2, consistent with the media type."

Response *Response Status* **U**

REJECT.

The Task Force has received input from delegates having experience with system vendors that a dual lauch will be acceptable to customers and is consistent with current practice.

Two launches are used to a) Cover the range of fiber types supported; and b) increase coverage statistics. The judgement of the committee is that the specification of Draft 3.0, including the launch details, will support the distances given in Table 68-2.

For: 12
Against: 2
Abstain: 2

Cl **68** *SC* **68.5** *P* **23** *L* **37** # 8

SWANSON, STEVEN E Individual

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

Specify launch condition here consistent with 1000BASE-LX.

SuggestedRemedy

Add the following text above Table 68-2: "To ensure that the specifications of Table 68-2 are met, the 10GBASE-LRM transmitter outputs shall be coupled through a single-mode offset-launch mode-conditioning patchcord, as defined in 38.1.4 for all fibers except OM-3, which uses a regular patchcord."

Response *Response Status* **U**

REJECT.

See response to comment 7.

Cl **68** *SC* **68.5** *P* **23** *L* **44** # 9

SWANSON, STEVEN E Individual

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

Adjust the supportable operating range consistent with the modeling of a offset launch.

SuggestedRemedy

Reduce the operating range to a value that can be supported by the offset launch for the first four fiber types.

Response *Response Status* **U**

REJECT.

See response to comment 7.

Cl **68** *SC* **68.5** *P* **23** *L* **44** # 10

SWANSON, STEVEN E Individual

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

Adjust the maximum channel insertion loss consistent with the actual supportable distance using 1.5 dB/km times the cable attenuation plus the 1.5 dB allocation for connectors. The values that support the 220m length are 1.83, 1.83, 1.83, 1.65, and 1.83 respectively but may need adjusted based on the recalculation of supportable operating ranges.

SuggestedRemedy

Replace the current values with those based on the supportable operating ranges. The values that support the 220m length are 1.83, 1.83, 1.83, 1.65, and 1.83 respectively but may need adjusted based on the recalculation of supportable operating ranges.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The measured insertion losses are not of first order significant in meeting the operating distances given in the table, however they might help for verification of the fiber type. For this reason, adjustment to within hundreths of a dB does not seem justified.

Change one value: For 50um 400/400 fiber to 1.7 dB

Cl **68** *SC* **68.5** *P* **23** *L* **50** # 11

SWANSON, STEVEN E Individual

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

Incorect placement of footnote marker "d"

SuggestedRemedy

Move footnote marker "d" to the first column so it ties to the OFL specifications.

Response *Response Status* **C**

ACCEPT.

Make change as sugested, putting d after the existing text in column 1.
Add "also" to footnote d, and include changes suggested in comments 55 and 56, as follows:
The OM3 fiber specification also includes 850 nm laser launch bandwidth in addition to OFL bandwidths.

Cl **68** *SC* **Table 68-3** *P* **25** *L* **31** # 12

SWANSON, STEVEN E Individual

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

The specification of TWDP allows penalties 0.5 dB or more worse than that which the reciever is tested based on the current stressors specified in Table 68-5. This implies that the transmitter can produce channel outputs that exceed the level of stress that the receivers are specified to accomodate.

SuggestedRemedy

Replace "4.7" with "4.2"

Response *Response Status* **U**

REJECT.

See response to comment 113.

Yes:16
No: 4
Abstain: 0

Cl **68** *SC* **Table 68-3** *P* **25** *L* **35** # 13

SWANSON, STEVEN E Individual

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

The success of 10GBASE-LRM as a standard is based on the ability of customers to purchase system components that meet the specifications in the standard, plug them together and have them work in a predictable, reliable and useful manner over the installed base of optical fiber. Since the installed base of fiber is not designed nor tested to support the alternative launch specified in the standard, I must recommend that the alternative launch be removed. This recommendation is consistent with the launch conditions specified in both 1000BASE-LX and 10GBASE-LX-4 and is the only known method to ensure predictable, reliable and useful operation of the link.The specification of two optical launch conditions that must be selected by the user in order to mitigate the risk of a link failing does not meet the level of quality and reliability associated with previous standards developed by 802.3.

SuggestedRemedy

Delete "Preferred" and associated footnote "d."

Response *Response Status* **U**

REJECT.

See response to comment 7.

Cl **68** *SC* **Table 68-3** *P* **25** *L* **38** # 14

SWANSON, STEVEN E Individual

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

The success of 10GBASE-LRM as a standard is based on the ability of customers to purchase system components that meet the specifications in the standard, plug them together and have them work in a predictable, reliable and useful manner over the installed base of optical fiber. Since the installed base of fiber is not designed nor tested to support the alternative launch specified in the standard, I must recommend that the alternative launch be removed. This recommendation is consistent with the launch conditions specified in both 1000BASE-LX and 10GBASE-LX-4 and is the only known method to ensure predictable, reliable and useful operation of the link.The specification of two optical launch conditions that must be selected by the user in order to mitigate the risk of a link failing does not meet the level of quality and reliability associated with previous standards developed by 802.3.

SuggestedRemedy

Delete "Encircled flux for alternative launch" and associated values.

Response *Response Status* **U**

REJECT.

See response to comment 7.

Cl **68** *SC* **Table 68-3** *P* **25** *L* **41** # 15

SWANSON, STEVEN E Individual

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

The success of 10GBASE-LRM as a standard is based on the ability of customers to purchase system components that meet the specifications in the standard, plug them together and have them work in a predictable, reliable and useful manner over the installed base of optical fiber. Since the installed base of fiber is not designed nor tested to support the alternative launch specified in the standard, I must recommend that the alternative launch be removed. This recommendation is consistent with the launch conditions specified in both 1000BASE-LX and 10GBASE-LX-4 and is the only known method to ensure predictable, reliable and useful operation of the link.The specification of two optical launch conditions that must be selected by the user in order to mitigate the risk of a link failing does not meet the level of quality and reliability associated with previous standards developed by 802.3.

SuggestedRemedy

Delete "Preferred" and associated footnote "d."

Response *Response Status* **U**

REJECT.

See response to comment 7.

Cl **68** *SC* **Table 68-3** *P* **25** *L* **44** # 16

SWANSON, STEVEN E Individual

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

The success of 10GBASE-LRM as a standard is based on the ability of customers to purchase system components that meet the specifications in the standard, plug them together and have them work in a predictable, reliable and useful manner over the installed base of optical fiber. Since the installed base of fiber is not designed nor tested to support the alternative launch specified in the standard, I must recommend that the alternative launch be removed. This recommendation is consistent with the launch conditions specified in both 1000BASE-LX and 10GBASE-LX-4 and is the only known method to ensure predictable, reliable and useful operation of the link.The specification of two optical launch conditions that must be selected by the user in order to mitigate the risk of a link failing does not meet the level of quality and reliability associated with previous standards developed by 802.3.

SuggestedRemedy

Delete "Encircled flux for alternative launch" and associated values.

Response *Response Status* **U**

REJECT.

See response to comment 7.

Cl **68** *SC* **Table 68-3** *P* **26** *L* **5** # 17

SWANSON, STEVEN E Individual

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

Footnote is not needed.

SuggestedRemedy

Delete footnote "d."

Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **68** *SC* **68.6** *P* **28** *L* **1** # 18

SWANSON, STEVEN E Individual

Comment Type **GR** *Comment Status* **R**

Despite the passing of a motion at the November 2005 TF meeting that accepted that interoperation has been demonstrated, it is not clear to the commenter that the TF has proven the test methods and specifications can be satisfied by multiple vendors.

SuggestedRemedy

Commenter recommends a further demonstration of plug and play capability between multiple (at least 3) EDC chip vendors using multiple (at least 3) transceiver implementations.

Response *Response Status* **U**

REJECT.

As this comment does not address the 802.3aq document, nor any IEEE SA process requirements, it is out of scope. This is the view of the 802.3 Chair.

The Task Force and the Working Group have both passed motions accepting the presented interop results.

The Task Force encourages developers to perform further tests and to publish results through appropriate industry channels, but the IEEE SA has no authority to require such tests, nor the publication of the results.

For: 16
Against: 2
Abstain: 6

Cl **68** *SC* **Table 68-8** *P* **44** *L* **18** # 19

SWANSON, STEVEN E Individual

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

Include wavelength consistent with other entries

SuggestedRemedy

Add "at 1300 nm" after "Fiber insertion loss"

Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **Table 68-9** *P* **44** *L* **35** # 20

SWANSON, STEVEN E Individual

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

Include wavelength consistent with other entries

SuggestedRemedy

Add "at 1300 nm" after "Cable attenuation"

Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.2** *P* **20** *L* **53** # 21

HO, KEANG P Individual

Comment Type **T** *Comment Status* **R**

The round-trip delay of 9216 BT is far larger than any feasible implementation. It will take a very bad engineer and very difficult effort to have a delay approaching this long in all reasonable implementation. In the optimal implementation, a round-trip delay of 512 BT may even be possible.

SuggestedRemedy

Shorten the maximum round-trip delay to 4608 BT or even smaller.

Response *Response Status* **C**

REJECT.

Straw poll 1:
Support specification change: 9
Do not support spec. change: 9

Straw poll 2:
Retain 9216 BT - 12
Change to 6656 BT - 11
Change to 4608 BT - 7
Change to 2560 BT - 4
Change to 1024 BT - 1
Change to 512 BT - 2

The justification for the 9216 BT may be found in the p802.3aqD2.1com8Aug05.pdf, comment number 1023. This allows for a range of digital implementations.

After much discussion on the merits of lower latency vs the merits of allowing the flexibility in implementation, the committee considered that, on balance, the existing spec is acceptable.

For: 14
Against: 4
Abstain: 2

Cl **00** *SC* **0** *P* *L* # 22

BHUSHAN, RAHUL B Individual

Comment Type **G** *Comment Status* **X**

No comment.

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.5.3** *P* **27** *L* **27** # 23

WEINER, NICHOLAS Individual

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

The Symmetrical tap weight values would benefit from further work.

Jonathan King presented an example fiber, in king_1_1105, having a response that may vary in time between precursor and post-cursor. The time separation between the two peaks is about 70ps. The two peaks present in the current symmetrical test response are separated by 150ps.

Statistics of two peak cases have not been presented.

SuggestedRemedy

At this time, the commenter does not have a specific proposed remedy.

Response *Response Status* **U**

REJECT.

The commenter has not provided evidence that the values in Draft 3.0 are inadequate.

The comp stressed rx test ISI values in Draft 3.0 results from considerable study by the TP3 sub-committee.

Cl **68** *SC* **68.5.1** *P* **25** *L* **27** # 24

WEINER, NICHOLAS Individual

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

The current transmitter RIN specification is the same as those in the transmitter specifications of Clause 52. However transmitted noise is more detrimental to channels limited by ISI than to channels limited by attenuation. For this reason, if transmitter noise performance can be improved without significant cost implication, it should be.

SuggestedRemedy

At this time, the commenter does not have a specific proposed remedy.

Response *Response Status* **U**

REJECT.

The existing RIN spec allows desirable flexibility in the choice of laser type. The existing spec can not be changed, as suggested, without significant cost implication.

Cl **68** *SC* **68.6.8** *P* **36** *L* **42** # 25

WEINER, NICHOLAS Individual

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

A signal from a compliant transmitter may include jitter, for which a compliant receiver has not been tested (as Ali Ghiasi has previously commented).

In particular, only components of jitter in the transmitted signal with frequencies above 4MHz are measured. This follows from the high frequency cut-off frequency specified for the CRU. On the other hand, a receivers ability to deliver error-free results in the presence of signal jitter is tested only at 40kHz (5UI) and 200kHz (1UI). From these two tests, one may expect a compliant receiver to also perform error-free in the presence of 1MHz (0.2UI) jitter.

A test to ensure that transmitted signals do not contain significant jitter above 1MHz would appear to ensure the necessary interoperability.

SuggestedRemedy

Modify the description of the CRU for the transmitter uncorrelated jitter test as follows:

Change:
.. high frequency corner bandwidth of 4 MHz and a slope of -20 dB/decade.

To:
.. high frequency corner bandwidth of 1 MHz and a slope of -20 dB/decade.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See comment 45.

Cl **68** *SC* **68.6.2** *P* **29** *L* **11** # 26

WEINER, NICHOLAS Individual

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

Error in cross reference.

SuggestedRemedy

Change:
.. the variable MeasuredOMA in 68.6.6.1.
To:
.. the variable MeasuredOMA in 68.6.6.2.

Proposed Response *Response Status* **W**

NOTE TO EDITOR: REMEMBER TO WORK ON FORMATTING ON NAMES OF CONSTANTS/VARIABLES.

Cl **30** *SC* **30.5.1** *P* **13** *L* **1** # 27

DUDEK, MICHAEL T Individual

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

For consistency with the rest of the clause the American spelling of "fiber" should be used

SuggestedRemedy

Change "Fibre" to "Fiber"

Proposed Response *Response Status* **O**

Cl **30B** *SC* **30B.2** *P* **19** *L* **31** # 28

DUDEK, MICHAEL T Individual

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

For consistency with the rest of the clause the American spelling of "fiber" should be used

SuggestedRemedy

Change "Fibre" to "Fiber"

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **25** *L* **16** # 29

DUDEK, MICHAEL T Individual

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

The presentation by Lindsay et al (Lindsay_1_1105) at the November 05 meeting shows that the connector loss experienced in a link with laser launch is significantly less than expected from the overfill connector loss spec, resulting in a 0.9dB unallocated margin. In addition if the TWDP of the Tx is not at the maximum value this margin is even larger. Relaxation in the minimum OMA/Average power of the Tx (and potentially linking it to the TWDP of the Tx) would result in easier to manufacture (lower cost) Tx's.

SuggestedRemedy

Option 1. In table 68-3 change Launch Power in OMA min to "-5dBm" and Average luanch power min to "-7dBm" Option 2 In table 68-3 change Luanch power in OMA min to "-6dBm" and Average launch power min to "-7dBm". Add an additional link "Launch power in OMA min -9.7dBm + TWDP". In table 68-4 change Lowest power in OMA to "-7.4dBm" For both options. Change Figure 68-5 to reflect the new numbers (figures are available for presentation). Add an informative foot-note to table 68-4 referenced from Lowest power in OMA and Lowest average power. "Note that the connector loss experienced in a link with laser launch is less that the specified connector loss which is measured with overfill launch. This results in the minimum receiver input power being greater than the minimum transmitter output power minus the overfill connector loss.

Response *Response Status* **U**

REJECT.

Straw poll 1:
There is margin within the link budget.
Agree: 14
Disagree: 1
Abstain: 2

Straw poll 2:
There is margin within the link budget AND that we will use it to reduce the tx OMA (min) and tx ave power (min) by 0.5dB, or less.
Agree: 6
Disagree: 12
Abstain: 0

Straw poll 3:
We will allow a trade off between lower TWDP value and tx OMA (min).
Yes: 4
No: 10
Abstain: 2

Reject with explanation:

The consensus within the committee is that margin within the link budget should not be used to reduce the tx power in OMA. This consideration includes the margin resulting from TWDP that is better than the max.

For: 11
No: 2
Abstain: 2

Cl **68** *SC* **68.5.3** *P* **27** *L* **37** # 30

DUDEK, MICHAEL T Individual

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

The jitter tolerance test values in Table 68-5 are not adequate to test for the equivalent of the maximum uncorrelated jitter allowed in the Tx.

SuggestedRemedy

In table 68-5 change jitter frequency and peak to peak amplitude from (40,5) to (80,5) and (200,1) to (400,1)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment 45.

Cl **68** *SC* **68.6** *P* **27** *L* **20** # 31

GWINN, JOSEPH M Individual

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

For test transmitter signal-to-noise ratio Qsq[sup]b, no type or units are given, a possible source of confusion, as SNRs can be specified in either logarithmic form (decibels) or in linear form (a dimensionless ratio).

SuggestedRemedy

Suggest adding the phrase "linear ratio" or the like to the Unit block.

Proposed Response *Response Status* **O**

Cl **68** *SC* **68-5** *P* **27** *L* **40** # 32

HARGIS, MARIAN C Individual

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

The maximum average received power for damage does not correlate with that in Clause 52. They should match

SuggestedRemedy

Received average power for damage - 1.5 dBm

Response *Response Status* **W**

ACCEPT.

Cl **68** *SC* **68.6.7, Fig 68-4** *P* **35** *L* **47** # 33

HARGIS, MARIAN C Individual

Comment Type **GR** *Comment Status* **R**

Specify window width for noise measurement in Fig 68-4 AND/OR Clause 68.6.7

SuggestedRemedy

Using the same square wave, measure the rms noise over flat regions (xx% of wave) of the logic ONE and logic
ZERO portions of the square wave, as indicated in Figure 684, compensating for noise in the measurement
system.

Response *Response Status* **W**

REJECT.

The flat region of the waveform will differ from case to case, both in position and width. For this reason selection of the position needs to be left to the discretion of the person making the measurement.

Note also that the procedure forms an alternative, approximate, measurement.

Cl **68** *SC* **68.6.9.2** *P* **38** *L* **35** # 34

HARGIS, MARIAN C Individual

Comment Type **GR** *Comment Status* **R**

This test is far too complicated to be readily done by most development labs, requiring expensive dedicated equipment and an inordinate amount of time. Six separate measurements per device!!

Further, the simple method has no real relationship to the full test described. If the waveform of the pulse is so critical to determining the compliance of the receiver, then even the suggestion of using only filter stress is ludicrous and should then be stricken from the standard

SuggestedRemedy

Response *Response Status* **W**

REJECT.

The consensus within the committee is that the comprehensive stressed receiver test, whilst somewhat complicated, is the minimum necessary. Presentations have been made indicating that implementation is possible using widely available components.

Although a different filtering method is used, the Simple Test does produce a waveform for equalization, with ISI penalties similar to those for the Comprehensive test .

The simple test is informative only, and is anticipated to be of value if, as expected, the results from the simple and comprehensive tests correlate for a large manufacturing lot of identical receivers.

Cl **68** *SC* **68.5.3.1** *P* **25** *L* **31** # 35

MCVEY, JAMES D Individual

Comment Type **T** *Comment Status* **R**

The TWDP specification is too tight given that the measurement captures various degradations some of which are represented elsewhere in the link budget.

SuggestedRemedy

Change TP2 TWDP specification from 4.7 dB to 5.0 dB

Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **45** *SC* **45.2.1.6.1** *P* **16** *L* **11** # 36

MCVEY, JAMES D Individual

Comment Type **T** *Comment Status* **R**

Existing XAUI hardware (for example SerDes ASICs) may not be able to implement the PMA/PMD type selection register values as proposed in the draft. This is complicated by the fact that the XENPAK MSA group has not defined bits for LRM (or many other formats). An alternative arrangement of register bit assignments will allow existing products to be used.

SuggestedRemedy

Change the heading of subclause 45.2.1.6.1 as follows:
45.2.1.6.1 PMA/PMD type selection (1.7.2:0) and (1.12.4:0)
Change subclause text as follows:
The PMA/PMD type of the 10G PMA/PMD shall be selected using bits 2 through 0 and if required bits 4 through 0 of the extended PMA/PMD type selection register. The PMA/PMD type abilities of the 10G PMA/PMD are advertised in bits 9 and 7 through 0 of the 10G PMA/PMD status 2 reg-ister and bits 0 and 1 of the 10G PMA/PMD extended ability register. A 10G PMA/PMD shall ignore writes to the PMA/PMD type selection bits that select PMA/PMD types it has not advertised in the status register.
Change table 45-7 to:
Bit(s) Name Description R/W a
1.7.15:3 Reserved Value always 0, writes ignored R/W
1.7.2:0 PMA/PMD type selection 2 1 0
1 1 1 =10GBASE-SR PMA/PMD type R/W
1 1 0 =10GBASE-LR PMA/PMD type
1 0 1 =10GBASE-ER PMA/PMD type
1 0 0 =10GBASE-LX4 PMA/PMD type
0 1 1 =10GBASE-SW PMA/PMD type
0 1 0 =10GBASE-LW PMA/PMD type
0 0 1 =10GBASE-EW PMA/PMD type
0 0 0 =PMA/PMD type determined by register 1.12.4:0
Add clause and table
45.2.1.XX 10G PMA/PMD type selection extended ability control register (Register 1.12)
Table 45-XX 10G PMA/PMD Extended Ability control register bit definitions
Bit(s) Name Description R/Wa
1.12.15:3 Reserved Value always 0, writes ignored R/W
1.12.2:0 PMA/PMD type selection 2 1 0
1 X X = Reserved R/W
1 0 0 = 10GBASE-KR PMA/PMD type
0 1 1 = 10GBASE-KX4 PMA/PMD type
0 1 0 = 10GBASE-T PMA/PMD type
0 0 1 = 10GBASE-LRM PMA/PMD type
0 0 0 = 10GBASE-CX4 PMA/PMD type
a R/W = Read/Write

Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **45** *SC* **45.2.1.10** *P* **17** *L* **1** # 37

MCVEY, JAMES D Individual

Comment Type **T** *Comment Status* **R**

Existing XAUI hardware (for example SerDes ASICs) may not be able to implement the PMA/PMD extended ability register as proposed in the draft. This is complicated by the fact that the XENPAK MSA group has not defined bits for LRM (or many other formats). An alternative arrangement of register assignments will allow existing products to be used.

SuggestedRemedy

Change clause heading to:
45.2.1.10 10G PMA/PMD extended ability register (Register 1.13)
Change bit assignment entries in table 45-11 from register 1.11 to register 1.13

Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **68** *SC* **68.1** *P* **20** *L* **13** # 38

DALLESSASSE, JOHN Individual

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

"See Clause 44 &" is not a well-formed sentence - .

SuggestedRemedy

Change to "Clause 44 contains an introduction &"

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* *L* # 39

DALLESSASSE, JOHN Individual

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

At the time that the IEEE 803.3aq study group was formed, the situation in the market for transceivers to serve the installed multi-mode fiber infrastructure was substantially different that it is today. Due to the collapse of the "telecom bubble," the supply base for 10GBASE-LX4 modules had become unstable by the time of the November 2003 LRM CFI. Per the CFI material presented by Tolly, there was a "lack of broad market availability from multiple vendors of 10GBASE-LX4&". The situation today is dramatically different than it was when the 802.3aq study group was formed. Tens of thousands of 10GBASE-LX4 modules have shipped from multiple vendors. A larger base of vendors has formed behind these to provide components. Broad market potential is being achieved. Introducing another PMD with substantially similar capabilities to 10GBASE-LX4 may not further promote the 10 Gigabit Ethernet Market, it could rather create market confusion that will further delay the broad deployment of 10 GbE systems and hurt the companies that have invested tens of millions of dollars to bring 10GBASE-LX4 technology to the market. Furthermore, the "distinct identity" of LRM is on weak footing. A key premise behind the "distinct identity" claim for 10GBASE-LRM is that only LRM modules can be made with a serial electrical interface. This is not the case. With the availability of XAUI to XFI ICs having power dissipation comparable to the EDC ICs required in 10GBASE-LRM transceivers, 10GBASE-LX4 modules can also be made with a "serial" XFI electrical interface. Smaller optical multiplexing and demultiplexing components are also now commercially available, allowing compact Tx and Rx optical subassemblies that can fit into very small form-factors.

SuggestedRemedy

No change is proposed. The sponsor ballot pool should be made aware of these issues through the normal comment resolution process so that they can make the most informed vote.

Response *Response Status* **U**

REJECT.

Draft 3.0 of the specification has received 87% approval by the Sponsor Ballot pool.

The consensus within the Task Force and Working Group is that 10GBASE-LRM retains both distinct identity and broad market potential.

Further, to address the commenters remark about the investment in LX4, considerable resources have now also been invested in development of 10GBASE-LRM technology, reinforcing belief in this standard within the industry.

The comment, together with this response, will be recirculated - meeting the wishes of the commenter.

For: 13
Against: 4
Abstain: 3

Cl **68** *SC* **68.5.3.1** *P* **24** *L* **42** # 40

DALLESSASSE, JOHN Individual

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

It is well known that the stability of the transfer function of multi-mode optical fiber is very poor for a center launch. Polarization effects have also been shown to have a significant impact on the channel characteristics when an offset launch is used (see Fiedler_1_0904). While the IEEE 802.3aq task force has done an outstanding job in modeling the static impulse response of fibers thought to be representative of the installed base, the study of the dynamic response of the channel has been more limited. While the work presented in King_1_1104 and Cunningham_1_1104 has been a good starting point, an exhaustive study of the dynamic characteristics of the multi-mode fiber transfer function in a broad set of fibers has not been conducted. It has not been conclusively proven that changes in the fiber impulse response will be limited to the 10's of Hertz rate. There is a strong risk that performance problems will be observed in the field on links at or near the maximum operating distances specified in the standard. Even if dynamic effects were fully understood and modeled, the document does not define an adaptation rate required for the EDC IC to track changes in the fiber impulse response or a standard test for the speed of adaptation.

SuggestedRemedy

Specify a minimum rate of adaptation, and define a test for verification of compliance.

Response *Response Status* **W**

REJECT.

One outcome of the detailed work within the 802.3aq channel ad hoc Task 2 sub-committee was that all significant variations in fiber responses are expected to occur at frequencies less than 10Hz. This result may be found in king_1_1104. The consensus within the Task Force is that such slow rates of change will not challenge the adaptation speed capabilities of any practical adaptive equalizer. As the comprehensive stressed receiver test will pass only adaptive equalizers, a separate dynamic test would be redundant (as well as being complicated and expensive to implement).

Further, the committee has had some feedback from the Ballot Pool that the existing receiver compliance test in too complicated. - See comment 34.

Cl **68 6 2** *SC* **68 6 2** *P* **29** *L* # 41

BABANEZHAD, JOSEPH N Individual

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

The measurment procedure is barrowed from 52 9 5 but a new figure (68 4) is provided. This figure has two problems: 1st the near perfect rise and fall times make it incompatible with the TX eye diagram of 68 6. 2nd the centre 20% is not clearly shown

SuggestedRemedy

Go back to figure 52 6

Proposed Response *Response Status* **O**

Cl **68 6 3** *SC* **68 6 3** *P* **29** *L* # 42

BABANEZHAD, JOSEPH N Individual

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

To define the extinction ratio reference is made to 52 9 4. The latter itself however refers to ANSI/TIA/EIA 526 4A 1997 [B13].

SuggestedRemedy

Define the extinction ratio in 68 6 3

Response *Response Status* **C**

REJECT.

The existing wording retains consistency with Clause 52.

Straw poll 1
Leave doc as is:12
Remove ER from Clause 68 spec: 2
Include definition of ER in Clause 68: 0

Straw poll 2
Change the value of the ER spec: 3
Do not change value of ER spec: 7
Need more info to form opinion: 2

Cl **68** *SC* **68.5.2** *P* **27** *L* **21** # 43

WEINER, NICHOLAS Individual

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

The transmitter signal to noise ratio values, for the comprehensive stressed receiver tests, would benefit from some further work. In particular, the value for the sensitivity tests. Analysis and/or measurement results involving both total noise power and noise distribution would be helpful.

SuggestedRemedy

At this time, the commenter does not have a specific proposed remedy.

Response *Response Status* **U**

REJECT.

The commenter has not provided evidence that the values in Draft 3.0 are inadequate.

The committee has now decided to add the filtered Qsq values to the document. See response to comment 61.

Cl **68** *SC* **68.6.9.3** *P* **39** *L* **39** # 44

PULEO, MARIO Individual

Comment Type **T** *Comment Status* **R**

In a practical stressed signal generator TWDP of the stressed signal can be higher than the specified value even if the actual pulse response nicely matches the ideal one. The standard says : for small differences, the ISI generator should be adjusted to obtain the expected values. I wonder if compensating non idealities leading to higher TWDP with lower ISI is meaningful and how this could be done.

SuggestedRemedy

Give guidance about how much is "small difference" and how the ISI generator could be adjusted. Allow implementation margins.

Response *Response Status* **C**

REJECT.

After considerable discussion within the committee, the consensus is that the issues raised are test set-up implementation specific, and the committee does not feel is appropriate to include guidance on these points within the document.

Cl **68** *SC* **68.5.1** *P* **25** *L* **33** # 45

DAWE, PIERS J G Individual

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

The transmitter jitter generation and receiver jitter tolerance specification values need review. Assume a module with XFI interface, Tx and Rx CDRs similar to OC-192 but somewhat relaxed, some apparent transmitter jitter caused by transmitter noise, and a 'slow nominal' 47 ps transmitter. Note that our transmitter jitter spec has no upper frequency limit of measurement, unlike SONET.

SuggestedRemedy

In table 68-5, may need to increase the two frequencies for jitter tolerance. In table 68-3, may need to tighten the transmitter uncorrelated jitter.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Straw poll 1:

Change to jitter spec needed?
Yes: 10
No: 3

Straw poll 2:

Change needed to:
a) tx spec only - 2
b) rx spec only - 12
c) tx spec and rx spec - 1

Straw poll 3:

Implement modified rx jitter test:
a) Whilst retaining separate rx jitter test - 10
b) Incorporating jitter into Comp Rx Stressed Test - 7

Straw poll 4:

Use of continuous jitter template - 5
Use of a set of discrete points - 13

Committee response to comment

The consensus of the committee is that:

1) The jitter specifications in Draft 3.0 are not sufficiently consistent between the tx and rx tests. With the values given below, the test signals in the rx jitter test have the same RMS value of uncorrelated jitter as a worst case compliant transmitter.

2) The appropriate balance between tx and rx specification is achieved by retaining the tx spec of Draft 3.0 and modifying the rx test.

3) Adding sinusoidal jitter to the comp. rx stressed test multiplies the number of test conditions excessively, and is not believed to be necessary.

4) The use of a pair of discrete test points is adequate.

5) Replacement test conditions for Table 68-5:
75kHz, 5UI (in line 36)
375kHz, 1UI (in line 38)

(These replace the present 40KHz, 5UI and 200KHz, 1UI)

For: 16
Against: 0:
Abstain: 9

Cl **68** *SC* **68.5.1** *P* **26** *L* **9** # 46

DAWE, PIERS J G Individual

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

We say 'transmitter reflectance is defined looking into the transmitter' but do we need to be more specific? In particular, does one measure this with SMF, MMF or a MCPC? Similarly to 68.6.7 Transmitter signal to noise ratio, SMF may give more consistent and relevant results.

SuggestedRemedy

Extend footnote: 'Transmitter reflectance is defined looking into the transmitter with a single-mode fiber.'

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The consensus within the committee is that a transmitter reflectance spec is pertinent to single mode systems, but not (upon reflection) to multi-mode systems. For this reason, the consensus is that the transmitter reflectance specification be removed altogether.

Remove line 52, page 25, Table 68-3 and footnote f.

Cl **68** *SC* **68.6.6.2** *P* **33** *L* **38** # 47

DAWE, PIERS J G Individual

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

The anti-aliasing filter function should be re-written using 'plain vanilla' functions to make it more accessible, readable and portable.

SuggestedRemedy

Rewrite...

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Revised code will be provided by Piers 13th Jan 06, and reviewed by Tom, Norm, Petar, John Abbott and Reza who will respond to the editor by 16th Jan, with their OK or not, and Piers will provide the code (if agreed to by the reviewers) for inclusion in the document.

Regarding comments:
Straw poll:
1) Retain current code, as comment - 5
2) Include new comments that do not include MATLAB functions - 10
3) Do not have enough info - 1

Comments for the new code will not include MATLAB functions.

Cl **99** *SC* **99** *P* **1** *L* **39** # 48

DAWE, PIERS J G Individual

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

Unit should go with number

SuggestedRemedy

Use non-breaking space between 10 and Gb/s

Proposed Response *Response Status* **O**

Cl **99** *SC* **99** *P* **3** *L* **1** # 49

DAWE, PIERS J G Individual

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

New .fm for this page is available

SuggestedRemedy

Use latest file

Proposed Response *Response Status* **O**

Cl **99** *SC* **99** *P* **4** *L* **45** # 50

DAWE, PIERS J G Individual

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

Because section 5 contains more physical layers and sublayers at rates addressed by sections 1-3, and .3an, .3aq contain more physical layers and sublayers at 10 Gb/s, we should not say 'Section one includes THE specifications for 10 Mb/s...' and so on.

SuggestedRemedy

Please delete 'the' before 'specifications', four times.

Proposed Response *Response Status* **O**

Cl **99** *SC* **99** *P* **5** *L* **36** # 51

DAWE, PIERS J G Individual

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

Stray 'T' at end of line

SuggestedRemedy

Remove

Proposed Response *Response Status* **O**

Cl **01** *SC* **1.5** *P* **12** *L* **44** # 52

DAWE, PIERS J G Individual

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

In the list of abbreviations, unlike most places, the first letter should be lower case if the phrase would start in lower case if in the middle of a sentence.

SuggestedRemedy

clock, transmitter

Proposed Response *Response Status* **O**

Cl **30** *SC* **30** *P* **12** *L* **50** # 53
DAWE, PIERS J G Individual

Comment Type **E** *Comment Status* **X**
These two headings and the rubric are widows, the line on the next page is an orphan.

SuggestedRemedy
Keep together.

Proposed Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **14** *L* **7** # 54
DAWE, PIERS J G Individual

Comment Type **E** *Comment Status* **X**
Rogue capitals

SuggestedRemedy
Lower case 'serial' (4 times), and 'lane'.

Proposed Response *Response Status* **O**

Cl **45** *SC* **45.2.1.6** *P* **16** *L* **10** # 55
DAWE, PIERS J G Individual

Comment Type **T** *Comment Status* **A**
10GBASE-T has no PMD.

SuggestedRemedy
Delete '/PMD' for the 10GBASE-T entry.

Response *Response Status* **C**
ACCEPT.

Cl **49** *SC* **49.1.4** *P* **18** *L* **3** # 56
DAWE, PIERS J G Individual

Comment Type **E** *Comment Status* **X**
Rubric does not match figure key.

SuggestedRemedy
Change 'M = MULTIMODE FIBER' to 'M = PMD WITH DISPERSION COMPENSATION FOR MULTIMODE FIBER'. (Note no hard hyphen in multimode fiber.)

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.5.2** *P* **24** *L* **33** # 57
DAWE, PIERS J G Individual

Comment Type **E** *Comment Status* **X**
Tables 68-4 and 68-5 are further away from their clauses than they need be, making the document hard to use, while there is empty space on page 26.

SuggestedRemedy
Try stopping table 68-4 from floating. With luck this will move 68.5.2 to p26, and the document will continue as is on p27.

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.6.1** *P* **28** *L* **41** # 58
DAWE, PIERS J G Individual

Comment Type **E** *Comment Status* **X**
Use indents to show what is not a primary row entry, in the style of table 68-3.

SuggestedRemedy
Indent 'Pattern 1 subsequence' and 'Pattern 1 subsequence key'

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.6.2** *P* **29** *L* **12** # 59
DAWE, PIERS J G Individual

Comment Type **E** *Comment Status* **X**
The variable MeasuredOMA isn't mentioned until 68.6.6.2.

SuggestedRemedy
Change the reference from 68.6.6.1 to 68.6.6 (or 68.6.6.2 if preferred).

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **25** *L* **31** # 60

DAWE, PIERS J G Individual

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

As we learn how to do TWDP measurements better, I wonder if we still need a limit of 4.7 dB, considering the customer input that better performance is good. I'll make this a TR so that we can keep the situation under review in the coming months.

SuggestedRemedy

Change 4.7 to 4.6.

Response *Response Status* **U**

REJECT.

See response to comment 113.

For: 17
Against: 3
Abstain: 1

Cl **68** *SC* **68.6.9.3** *P* **38** *L* **51** # 61

DAWE, PIERS J G Individual

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

To help calibrate stressed eye generators accurately, we should provide the observable Qsq values for the three stressed cases used as well as the (un-observable, un-used) unstressed case. (This is a TR because we may need time to agree the numbers.)

SuggestedRemedy

Insert 'NOTE - Qsq of the three test signals, with ISI impairment, is X, Y, Z for the pre-cursor, symmetrical and post-cursor signals, respectively. These figures are ratios of linear units of optical power.'

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
New para below existing note, to take the form given here. The precise values are to be confirmed by Jim McVey by 17th January.

With the ISI generator present, the Qsq values are: pre-cursor sensitivity - 39.0; symmetrical sensitivity - 31.8; post-cursor sensitivity - 40.2; pre-cursor overload - 49.1; symmetrical overload - 40.0; post-cursor overload - 50.6. Significant differences from these values indicate problems with the test equipment (possibly noise sources within the ISI generator), and the test will not provide valid results. For small differences the amplitude of the added Gaussian white noise should be adjusted to obtain the expected values.

Cl **45** *SC* **45.2.1.7.4** *P* **16** *L* **32** # 62

DAWE, PIERS J G Individual

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

One of the two 'in's should be underlined

SuggestedRemedy

Underline second 'in'.

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.6.9.2** *P* **38** *L* **52** # 63

DAWE, PIERS J G Individual

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

Do we need to be more prescriptive about low frequency performance? I presume we need the test transmitter to have adequate low frequency performance such that the difference between its effect on measured TWDP and its effect on equalizing receiver sensitivity is small enough so as not to invalidate the test. 'Good enough' will depend on implementer's margining strategy so it is difficult to give specific advice.

SuggestedRemedy

Add sentence (in its own paragraph?): 'The test transmitter is expected to have adequate low frequency response so that this is not a significant factor in any measurement.'

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add to note at 68.6.9.3, line 42:

Also, one should ensure that the test transmitter has adequate low frequency response to avoid baseline wander problems with the longer test patterns used for TP3 testing.

Cl **68** *SC* **68.6.5.1** *P* **31** *L* **40** # 64

GHIASI, ALI Individual

Comment Type **T** *Comment Status* **R**

Transmitter eye mask allows 6.75 hits in the eye. A pathological transmitter may not meet minimum BER of 1E-12 when you have hit inside the eye mask.

SuggestedRemedy

Propose to create a inner eye mask at 50% the size of mask on Figure 68-6 which no hits are allowed with enough confidence to guarantee BER <1E-12.

Response *Response Status* **C**

REJECT.

See response to comment 67.

Cl **68** *SC* **68.5.3.1** *P* **27** *L* **38** # 65

GHIASI, ALI Individual

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

Current IEEE 802.3aq has significant interoperability gap with long history of comments about this issue.
- Draft 2.0 comment 247 (Thor) and comment 414 (Ghiasi)
- Draft 2.1 comment 1171 (Ghiasi)
- Draft 2.3 comment 18 (Dawe)
- Draft 2.4 comment 1 (Mei) and comment 11 (Ghiasi)

Every other standard has performed comprehensive jitter tolerance test with stressor present, where this standard only performs jitter tolerance at single point without any stressor.

Furthermore in presence of power supply related jitter, DC-DC converter noise, PLL jitter, jitter peaking currently defined 802.3aq link can even fail in back to bac

SuggestedRemedy

Propose to add comprehensive stress sensitivity test based on the IEEE 802.3ae stress receiver sensitivity mask of clause 52 to guarantee 802.3aq will be as robust as other IEEE standards and eliminate pathological link failures. This mask will be significantly simpler than IEEE 802.3ae as it will not require complex calibration with jitter amplitude in range of 0.05-0.15 UI at 4 MHz, in case of 802.3aq I propose to keep jitter amplitude at 4 MHz to 0.05 UI fixed as there is no need for eye mask calibration. To simplify testing time manufactures may choose to only test a subset of 802.3ae clause 52 frequency to guarantee overall link BER. An example subset of test frequency is given below:
5UI at 40KHz
0.5 UI at 400 KHz
0.05 UI at 4 MHz
0.05 UI at 40 MHz.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Duplicate of comment 92.

Cl **68** *SC* **68.5.3.1** *P* **27** *L* **38** # 66

GHIASI, ALI Individual

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

Current IEEE 802.3aq has significant interoperability gap with long history of comments about this issue.
- Draft 2.0 comment 247 (Thor) and comment 414 (Ghiasi)
- Draft 2.1 comment 1171 (Ghiasi)
- Draft 2.3 comment 18 (Dawe)
- Draft 2.4 comment 1 (Mei) and comment 11 (Ghiasi)

Every other standard has performed comprehensive jitter tolerance test with stressor present, where this standard only performs jitter tolerance at single point without any stressor.

Furthermore in presence of power supply related jitter, DC-DC converter noise, PLL jitter, jitter peaking currently defined 802.3aq link can even fail in back to back.

SuggestedRemedy

Propose to add comprehensive stress sensitivity test based on the IEEE 802.3ae stress receiver sensitivity mask of clause 52 to guarantee 802.3aq will be as robust as other IEEE standards and eliminate pathological link failures. This mask will be significantly simpler than IEEE 802.3ae as it will not require complex calibration with jitter amplitude in range of 0.05-0.15 UI at 4 MHz, in case of 802.3aq I propose to keep jitter amplitude at 4 MHz to 0.05 UI fixed as there is no need for eye mask calibration. To simplify testing time manufactures may choose to only test a subset of 802.3ae clause 52 frequency to guarantee overall link BER. An example subset of test frequency is given below:
5UI at 40KHz
0.5 UI at 400 KHz
0.05 UI at 4 MHz
0.05 UI at 40 MHz.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment 45.

For: 14
Against: 7
Abstain: 7

Straw poll:
Add a single sinusoidal stressor to the comp stressed rx test.
Yes: 11
No: 10

Accept in Principle

See response to comment 45. Also, the committee does not believe that convincing evidence has been presented that jitter stress needs to be included in the comp. stressed rx test to ensure link performance.

For: 16
Against: 2
Abstain: 6

Cl **68** *SC* **68.6.5.1** *P* **31** *L* **38** # 67

GHIASI, ALI Individual

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

Transmitter eye mask allows 6.75 hits in the eye. A pathological transmitter may not meet minimum BER of 1E-12 when you have hit inside the eye mask.

SuggestedRemedy

Propose to create a inner eye mask at 50% the size of mask on Figure 68-6 which no hits are allowed with enough confidence to guarantee BER <1E-12.

Response *Response Status* **W**

REJECT.

The judgement of the committee is that the eye mask of Draft 3.0 is sufficient.

The committee has not been convinced that a pathological transmitter, as mentioned in the comment, exists and creates a difficulty in practice.

The additional inner eye mask suggested would lead to a very long test run time.

Cl **68** *SC* **68.5.3.1** *P* **24** *L* **43** # 68

ABBOTT, JOHN S Individual

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

"Transient" Dynamic Response: One type of dynamic response issue identified by the 802.3aq LRM task force is the transient effect emphasized in this paragraph. There is a consensus in the task force that transient dynamic response (i.e. 10Hz) is important because of the signal processing implicit in EDC. There needs to be some minimum normative criteria to verify a receiver "tolerates such time varying responses", or a more detailed informative annex with examples or references.

SuggestedRemedy

Refer to previous comments and presentations. Modify receiver tests to include time varying channel responses. As an analogy, encircled flux is measured with a fiber shaker.

Response *Response Status* **U**

REJECT.

See reponse to comment 58.

Cl **68** *SC* **68.5.3** *P* **27** *L* **25** # 69

ABBOTT, JOHN S Individual

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

"Quasi-Static" Dynamic Response: A second type of dynamic response identified by the 802.3aq LRM task force and documented in presentations and previous comments is the quasistatic variation caused by touching or twisting or adjusting the fiber and/or connector. The modeling used to estimate the modal power distribution for near-center launches does not include this effect, nor does it agree with actual measurements presented by Corning, OFS, and Big Bear Networks. The resulting analysis gives an optimistic estimate of possible problems with OM1 and OM2 fiber.

SuggestedRemedy

The estimated failure rate in simulations with near-center launch needs to include an more realistic MPD consistent with worst case MPDs seen as the connector is twisted. In order to keep the supported length at 220m, this will require changing the 'stressor' or tap weights in Table 68-5 for the receiver and in the TWDP code for the transmitter. This work should be done rigorously to the satisfaction of the task force. The proposed change is to shift the three indicated stressors each one "place" further down the table previously calculated by J. Ewen.

Response *Response Status* **U**

REJECT.

In a simulation of the consequences of optical behavour mentioned in the comment, approximately 0.06dB difference ISI stress (PIE_D) levels is predicted. This is not considered, by the committee, to be significant enough to justify changing the document at this time.

Cl **68** *SC* **68.5.3** *P* **27** *L* **25** # 70

ABBOTT, JOHN S Individual

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

The index perturbations for OM1 and OM2 fibers are signficantly different. OM1 fiber is optimized for 1300nm, while OM2 fiber can be either 850- or 1300-optimized. The result is that the supported length, the stressors, and the failure probability cannot all be the same. What is likely is that OM2 fiber meeting the minimum OFL criteria and optimized for 850nm will have a signficantly higher failure rate. The stressors need to be adjusted to take this into account, or the supported lengths for OM1 and OM2 need to be different.

SuggestedRemedy

Supported length and/or stressors for OM2 fiber need to ensure that the link will work regardless of the 'type' of OM2 fiber installed (i.e. 1300nm-optimized, 850-optimized, or generic dual window). Divide the OM2 'distribution' approximately into thirds (1300-, 1075-, and 850- optimized) , and determine the stressors necessary for each third to meet the supported length. Use the most conservative.

Response *Response Status* **U**

REJECT.

The consensus view within the committee is that convincing evidence has not been provided that the Draft 3.0 ISI generator parameter values are not adequate to support the distance given in Table 68-2 for OM2.

The ISI stressors are chosen to stress the receiver performance for families of different stress types, and are designed to cover the different fiber types.

Regarding the subset of fiber manufactured as OM3 that does not meet the OM3 spec and is re-classified and sold as OM2: This is likely to have less stressful ISI response for offset launch than OM3, and is expected to have good performance with center launch.

An agreed calibration of the OM2 model stats with the link performance of the intsalled base has not be presented. This model predicts very pessimistic results when compared with existing link standards.

See ewen_1_0905 and abbott_1_1105, in particular slide 13 in the Abbott presentation.

For: 13
Against: 3
Abstain: 3

Cl **68** *SC* **68.6.6.2** *P* **33** *L* **13** # 71

ABBOTT, JOHN S Individual

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

The committee recommendation to the resolution of comment 166 to Draft 2.0 (John Abbott) was to make the TP2 stressors 0.07dB greater than TP3 stressors, to account for the effect of the laser being at 1355nm rather than 1310nm.

SuggestedRemedy

Modify the stressors for TWDP (i.e. TP2) per the committee recommendation. This may require recalculation of the Ewen "table" to a finer PIE-D spacing to enable a more exact shift of the stressors.

Response *Response Status* **C**

REJECT.

The note, referd to by the commenter, included in the response to comment 166 on Draft 2.0 was an aknowledgement, by the committee, that a recommendation has been made. It was not an acceptance of that recommendation.

That recommendation was calculated based upon a link length of 300m, and the then current comp. stressed rx test definition. Values consistent with the present test definition would be smaller and the effect is not considered significant enough to warrant a change to the document.

Cl **68** *SC* **68** *P* **3** *L* **51** # 72

ABBOTT, JOHN S Individual

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

square root symbol is Symbol font, like summation symbol? See http://www.tal.bris.ac.uk/SpecialChars.htm

SuggestedRemedy

change font from Times to Symbol

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.5** *P* **23** *L* **48** # 73

ABBOTT, JOHN S Individual

Comment Type **T** *Comment Status* **R**

operating range for 400/400 fiber was just a guess. Simulations with different lengths suggest that a PIE-D of 4 corresponds to 320MHz.km at 100m, and 400MHz.km at 120m. Hence either 100m can be considered conservative or we should be able to increase length to 120m.

SuggestedRemedy

add informative footnote (e) to table 68-2 that 120m is achieved if laser BW of 400MHz.km is achieved with the launch condition.

Response *Response Status* **C**

REJECT.

The committee agrees with the commenter that the current operating distance for 400/400 fiber is conservative. However, no change will be made to the document at this time as laser BW is not a widely used metric by users.

Cl **68** *SC* **68.5** *P* **24** *L* **1** # 74

ABBOTT, JOHN S Individual

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

OM3 specification for laser launch bandwidth is at 850nm; also, make "OFL bandwidth" plural.

SuggestedRemedy

change wording to "includes 850nm laser launch bandwidth in addition to OFL bandwidths".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.
See response to comment 11.

Cl **68** *SC* **68.5.1** *P* **25** *L* **11** # 75

ABBOTT, JOHN S Individual

Comment Type **T** *Comment Status* **R**

We are planning this standard to apply to FP lasers, DFB lasers, and 1300nm VCSELs. The "RMS spectral width" does not adequately characterize the laser. See Derickson p. 27 or Senior 2nd edition p. 403. We should use FWHP and ideally do some modeling/experimentation showing the effect of spectral width. Figure 68-3 assumes a Gaussian spectral distribution(?)

SuggestedRemedy

Following Derickson, use FWHP instead of RMS spectral width. Add informative note that spectrum is typically non-Gaussian.

Response *Response Status* **C**

REJECT.

Commonly used test equipment report RMS values, and do not require a spectrum to be Gaussian.

The committee does not agree with the commenter that the use of an RMS value implies a Gaussian spectral distribution.

Also, link performance is not significanly affected by the spectral width and so the precise method of specifying it is not of significance.

Cl **68** *SC* **Table 68-5** *P* **27** *L* **9** # 76

ABBOTT, JOHN S Individual

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

Receiver characteristics include center wavelength but not spectral width. Receiver needs to be able to receive data at the center wavelength of the transmitter AND a little beyond, corresponding to spectral width of transmitter

SuggestedRemedy

broaden range of receiver to go 3 * RMSwidth higher and lower than the spectral width, to correspond to transmitters in table 68-3 with center wavelengths at 1260 & 1355

Response *Response Status* **C**

REJECT.

Receivers that pass the sensitivity test over the specified range of centre wavelengths can, pragmatically, be expected to be insensitive to the precise received spectral width.

Cl **68** *SC* **68.6.6.1** *P* **32** *L* **27** # 77

ABBOTT, JOHN S Individual

Comment Type **T** *Comment Status* **R**

interpolation for TWDP: should linear interpolation be prohibited (i.e. it is likely to pass a bad transmitter) or should the informative comment make it clear that good transmitters will fail unless the correction interpolation is used

SuggestedRemedy

modify the text to make it clear whether using inappropriate interpolation causes good transmitters to fail, or bad transmitters to pass. If it causes bad transmitters to pass then additional normative text should be added.

Response *Response Status* **C**

REJECT.

Straw poll:
No change: Linear interpolation is not recommended - 12
Linear interpolation may give inacurate results - 8
Linear interpolation is highly not recommended - 0
A band limiting interpolation technique is recommended, such as the sin(x)/x method - 9
Change code - 0

The committee has conducted a straw poll and the concensus is that a change to the note on interpolation methods was not considered necessary, and that the existing wording is strong enough.

Cl **68** *SC* **Table 68-5** *P* **27** *L* **13** # 78

ABBOTT, JOHN S Individual

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

See p. 38 line 53. Two different signal powers are used depending on whether the stressor is the split-symmetric or the pre-cursor/post-cursor. In 2004 it was shown by multiple fiber manufacturers that split pulses are found with offset launches on fibers with specific profile perturbations. Hence we should not use a lower power for split symmetric but should use the same power for all 3 stressors.

SuggestedRemedy

change split-symmetric test stressed sensitivity to -6.5dB on line 13, so that it agrees with line 11.

Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **40** *SC* **40** *P* **25** *L* **19** # 79

ABBOTT, JOHN S Individual

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

Everywhere it says "symmetric" change the wording to "split-symmetric", to distinguish a two-peak symmetric pulse from a 1-peak(unimodal/Gaussian) symmetric pulse. The term "symmetric" applies to both a Gaussian pulse and a dual Gaussian pulse. Future additions to the 802.3 standard may want to reference both single and double pulses.

SuggestedRemedy

change "symmetric pulse" to "split-symmetric pulse". Note that "double pulse" is also an alternate wording although the pre- and post-cursors might also be considered "double" pulses.

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.5** *P* **24** *L* **1** # 80

EWEN, JOHN F Individual

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

Footnote d specifies "OM-3 fiber". The hyphen is not consistent with the notation used in the table.

SuggestedRemedy

Remove the hyphen. Change to "OM3 fiber".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **68** *SC* **68.5.3** *P* **27** *L* **21** # 81

EWEN, JOHN F Individual

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

The value of 22.5 for Qsq was derived assuming a PIE-D of 4.6dB and a 300m link length. The current draft specifies 220m and with a PIE-D of about 4.1dB. The value of Qsq needs to be updated to be consistent with these specifications following the method of lindsay_2_0505.pdf

SuggestedRemedy

Change the value of Qsq for sensitivity tests from 22.5 to 20.7

Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **68** *SC* **68.5.1** *P* **25** *L* **27** # 82

KOLESAR, PAUL F Individual

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

RIN20OMA is inconsistent with the -12 dB reflectance level permitted the receiver. RIN must be specified under the conditions consistent with the worst case reflections in the link. Given the -20dB reflectance specification of the multimode connectors, this corresponds to the more severe reflectance of -12 dB from the receiver. This inconsistency creates a condition that cannot ensure link operation.

SuggestedRemedy

Change the RIN specification to match the highest reflectance in the link. If the receiver reflectance remains at -12 dB, then change RIN20OMA to RIN12OMA.

Response *Response Status* **C**

REJECT.

The question of measurement using multimode fiber, with the -12dB spec, or measurement using single mode fiber, with the -20dB spec was discussed, in some detail, in March 2005. The decision to use the latter was adopted for reasons of repeatability, and it was agreed that this would emulate the former sufficiently closely.

See:
http://ieee802.org/3/aq/public/comments/d1.1/P802.3aqD1.1comments16Mar05.pdf, comment 45 and
http://ieee802.org/3/aq/public/comments/d2.0/P802.3aqD2.0comFinal.pdf, comment 315

The consensus view within the comment resolution committee is that this rational remains valid.

Cl **68** *SC* **68.5.3** *P* **27** *L* **42** # 83

KOLESAR, PAUL F Individual

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

Transmitter's RIN specification is based on -20 dB reflectance, but receiver is permitted a higher reflectance of -12 dB creating a worse operating condition than can be assured to work with present tests.

SuggestedRemedy

Change the receiver reflectance to a value that does not exceed the RIN specification. If RIN remains specified with -20dB reflectance, then reduce maximum receiver reflectance to -20 dB.

Response *Response Status* **C**

REJECT.

See response to comment 82.

Cl **68** *SC* **68.5.1** *P* **25** *L* **31** # 84

KOLESAR, PAUL F Individual

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

The maximum transmitter waveform dispersion penalty (TWDP) is permitted to be 0.5 dB higher than the highest TWDP stress applied to the receiver in the comprehensive stressed receiver test. This creates a significant lack of closure in the power budget that fails to ensure link operation.

SuggestedRemedy

Reduce maximum TWDP to a level not exceeding the highest stressor level applied to the receiver during the comprehensive stress receiver sensitivity test. If the receive stressors remain at present levels, reduce maximum TWDP to 4.2 dB.

Response *Response Status* **U**

REJECT.

See response to comment 113.

Yes: 15
No: 5
Abstain: 0

Cl **68** *SC* **68.5.3** *P* **27** *L* **25** # 85

KOLESAR, PAUL F Individual

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

The maximum transmitter waveform dispersion penalty (TWDP) is permitted to be 0.5 dB higher than the highest TWDP stress applied to the receiver in the comprehensive stressed receiver test. This creates a significant lack of closure in the power budget that fails to ensure link operation.

SuggestedRemedy

Increase the stressor level of all three stressor waveforms so that at least one meets or exceeds the maximum transmitter TWDP by choosing new stressors using previous methodology. If the transmitter TWDP remains at the present 4.7 dB, then increase the stressor level of all three by at least 0.5 dB.

Response *Response Status* **U**

REJECT.

The judgement of the committee is that, with the Draft 3.0 tx and rx specs, the link performance is ensured. The suggested remedy would place a significant, and unnecessary, additional burden upon a receiver. This is the case even if the OMA value for the tests is increased by 0.5dB.

See also the response to comment 65.

For: 14
Against: 3
Abstain: 3

Cl **68** *SC* **68.5.2** *P* **26** *L* **24** # 86

KOLESAR, PAUL F Individual

Comment Type **T** *Comment Status* **R**

The maximum peak power value appears to be inconsistent with the conditions that correspond to those that would create the highest peak power, namely the maximum average launch power of 0.5 dBm and maximum OMA of 1.5 dBm.

SuggestedRemedy

Change the maximum peak power to 2.6 dBm.

Response *Response Status* **C**

REJECT.

Considering Ave power + 1/2 OMA gives 2.6dBm, as indicated by commenter.

But overshoot is allowed by the eye mask, with peak power limited by the tx peak power spec to 3dBm.

Cl **68** *SC* **68.5.3** *P* **27** *L* **33** # 87

KOLESAR, PAUL F Individual

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

The nominal stress level of 4 dB for the simple stressed receive test that corresponds to the nominal rise and fall time of 115 ps is inconsistent with the allowed stress from the transmitter defined by the 4.7 dB maximum TWDP of line 31 on page 25.

SuggestedRemedy

Adjust the rise and fall time to create a receiver stress level consistent with the transmitter's permitted stress level defined by max TWDP. If max TWDP remains at 4.7 dB, increase the rise and fall time to produce the corresponding receiver stress level.

Response *Response Status* **U**

REJECT.

The committee has not made a change to the ISI values for the comp. stressed rx test (see response to comment 113). The Draft 3.0 Simple rx test is, and should remain, consistent with the comp. stressed rx test.

Cl **00** *SC* **0** *P* **4** *L* **4** # 88

GROW, ROBERT M Individual

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

Make consistent with IEEE Std 802.3-2005,

SuggestedRemedy

Delete the parenthesis at the beginning and end of this boxed paragraph.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **4** *L* **44** # 89

GROW, ROBERT M Individual

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

Make consistent with IEEE Std 802.3-2005,

SuggestedRemedy

The various sections capatilize their number (Section One), fix at the headings of each section and in the following sentences. The "--" also should be replaced with an em-dash. "Includes" is also capatilized in 2005.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **6** *L* **7** # 90
GROW, ROBERT M Individual

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

Make consistent with IEEE Std 802.3-2005,

SuggestedRemedy

Replace with the text of 2005: Section Five--Includes Clause 56 through Clause 67 and Annex 58A through Annex 67A. Section Five defines services and protocol elements that permit the exchange of IEEE Std 802.3 format frames between stations in a subscriber access network.

Response *Response Status* **C**

ACCEPT.

The editor will do his best to update all text as needed.

Cl **00** *SC* **0** *P* **5** *L* **11** # 91
GROW, ROBERT M Individual

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

The Editor's Note should be here, not in front of the section descriptions. The pre-Sponsor ballot MEC recommended following the example of P802.3as.

SuggestedRemedy

See comment

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **3** *L* **1** # 92
GROW, ROBERT M Individual

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

Make consistent with IEEE Std 802.3-2005,

SuggestedRemedy

The Special Symbols page is published after the TOC. Make sure the latest and greatest version is used.

Proposed Response *Response Status* **W**

Motion

Editor is authorised to use his descretion to resolve E comments and to accept ER comments.

Moved: Nick Weiner
Seconded: Scott Schube

Passed without opposition.

Cl **00** *SC* **0** *P* **11** *L* **13** # 93
GROW, ROBERT M Individual

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

Insert new second sentence in Note.

SuggestedRemedy

Simarily, the publication editor my choose to modify those Change instructions referencing only to a sentence of a paragraph to appropriately show an entire paragraph.

Proposed Response *Response Status* **O**

Cl **01** *SC* **1.3** *P* **12** *L* **5** # 94
GROW, ROBERT M Individual

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

Alphabetization isn't sufficient

SuggestedRemedy

Change "alphabetic" to "alphanummeric".

Proposed Response *Response Status* **O**

Cl **01** *SC* **1.3** *P* **12** *L* **8** # 95

GROW, ROBERT M Individual

Comment Type **T** *Comment Status* **R**

Can the seemingly earlier referenced in 2005 be replaced?

SuggestedRemedy

Make this reference an Change instead of an Insert if appropriate

Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **44** *SC* **44.1.1** *P* **13** *L* **6** # 96

GROW, ROBERT M Individual

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

Insert Editor's Note.

SuggestedRemedy

Editor's Note: (to be removed prior to publication) This paragraph is also being modified by P802.3an. If P802.3aq is not published prior to P802.3an, then the paragraph shown here should preserve the changes defined by P802.3an.

Proposed Response *Response Status* **O**

Cl **44** *SC* **44.1.3** *P* **13** *L* **17** # 97

GROW, ROBERT M Individual

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

Insert Editor's Note.

SuggestedRemedy

Editor's Note: (to be removed prior to publication) This paragraph is also being modified by P802.3an. If P802.3aq is not published prior to P802.3an, then the paragraph shown here should preserve the changes defined by P802.3an.

Proposed Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **13** *L* **26** # 98

GROW, ROBERT M Individual

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

Make consistent with IEEE Std 802.3-2005,

SuggestedRemedy

Preceed each clause number with "Clause". "Clause 49, Clause 51, and Clause 68)."

Proposed Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **13** *L* **31** # 99

GROW, ROBERT M Individual

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

Insert Editor's Note.

SuggestedRemedy

Editor's Note: (to be removed prior to publication) This paragraph is also being modified by P802.3an. If P802.3aq is not published prior to P802.3an, then the paragraph shown here should preserve the changes defined by P802.3an.

Proposed Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **13** *L* **33** # 100

GROW, ROBERT M Individual

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

For hot links, each number is preceeded by Clause.

SuggestedRemedy

Editor's Note: (to be removed prior to publication) This paragraph is also being modified by P802.3an. If P802.3aq is not published prior to P802.3an, then the paragraph shown here should preserve the changes defined by P802.3an.

Proposed Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **13** *L* **37** # 101
GROW, ROBERT M Individual

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

Replace Editor's Note.

SuggestedRemedy

Editor's Note: (to be removed prior to publication) This table is also being modified by P802.3an. If P802.3aq is not published prior to P802.3an, then the table shown here should preserve the changes defined by P802.3an.

Proposed Response *Response Status* **O**

Cl **44** *SC* **44.1.4.4** *P* **14** *L* **4** # 102
GROW, ROBERT M Individual

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

Service to humanity. Correct editorial error in 2005.

SuggestedRemedy

As published, the clause 54 column is headed with "54.". Strikethrough the ".".

Proposed Response *Response Status* **O**

Cl **44** *SC* **44.3** *P* **13** *L* **37** # 103
GROW, ROBERT M Individual

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

Insert Editor's Note.

SuggestedRemedy

Editor's Note: (to be removed prior to publication) This table is also being modified by P802.3an. If P802.3aq is not published prior to P802.3an, then the table shown here should preserve the changes defined by P802.3an, preserving the new row added by P802.3an as the last row.

Proposed Response *Response Status* **O**

Cl **44** *SC* **44.4** *P* **15** *L* **4** # 104
GROW, ROBERT M Individual

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

Insert Editor's Note.

SuggestedRemedy

Editor's Note: (to be removed prior to publication) This paragraph is also being modified by P802.3an. If P802.3aq is not published prior to P802.3an, then the paragraph shown here should preserve the changes defined by P802.3an.

Proposed Response *Response Status* **O**

Cl **44** *SC* **44.4** *P* **15** *L* **24** # 105
GROW, ROBERT M Individual

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

The first column (not heading) should be left aligned.

SuggestedRemedy

See comment

Proposed Response *Response Status* **O**

Cl **45** *SC* **45.2.1.6** *P* **15** *L* **44** # 106
GROW, ROBERT M Individual

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

Improve readability

SuggestedRemedy

Unfloat the table so it appears immediately after the Editor's Note.

Proposed Response *Response Status* **O**

Cl **45** *SC* **45.2.1.6.1** *P* **16** *L* **25** # 107

GROW, ROBERT M Individual

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

Second paragraph isn't changed

SuggestedRemedy

Change instruction to refer only to first paragraph of subclause and delete the second paragraph.

Proposed Response *Response Status* **O**

Cl **45** *SC* **45.2.1.15** *P* **16** *L* **41** # 108

GROW, ROBERT M Individual

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

This new subclause is misnumbered and inserted in the wrong place. 801.3ak did not define its ability bit so if we want to define this bit, a definition for the CX4 bit should also be added. This belongs with the changes to the table on page 17, line 2.

SuggestedRemedy

Change the Editor's Note on page 17, line 5 to indicate that the inserted paragraph 45.2.1.10.2 is also included as an new text in P802.3an. Delete the proposed paragraph here and insert the following in the correct subclause as described below:
Insert new subclauses after first paragraph of 45.2.1.10.
45.2.1.10.1 10GBASE-LRM ability (1.11.1)
When read as a one, bit 1.11.1 indicates that the PMA/PMD is able to operate as 10GBASE-LRM. When
read as a zero, bit 1.11.1 indicates that the PMA/PMD is not able to operate as 10GBASE-LRM.
45.2.1.10.2 10GBASE-CX4 ability (1.11.0)
When read as a one, bit 1.11.0 indicates that the PMA/PMD is able to support a 10GBASE-CX4 PMA/PMD
type. When read as a zero, bit 1.11.0 indicates that the PMA/PMD is not able to support a 10GBASE-CX4
PMA/PMD type.

Response *Response Status* **C**

ACCEPT.

Piers will advise editor, if requested to do so.

Cl **49** *SC* **49.1.1** *P* **17** *L* **31** # 109

GROW, ROBERT M Individual

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

Perform insert of comma as requested in pre-Sponsor ballot MEC.

SuggestedRemedy

"10GBASE-ER, and 10GBASE-LRM"

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **19** *L* **12** # 110

GROW, ROBERT M Individual

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

Make consistent with IEEE Std 802.3-2005, There are only 47 entries.

SuggestedRemedy

Change editing instruction to insert after B45. Consider changing identification to 45a to avoid confusion if others modify the Bibliography.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **19** *L* **15** # 111

GROW, ROBERT M Individual

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

Will the URL remain consistent?

SuggestedRemedy

Verify with Mr. Law if the URL will remain constant after the project is archived.

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.4.4** *P* **22** *L* **28** # 112

GROW, ROBERT M Individual

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

Style

SuggestedRemedy

Left align left column. Text is generally left aligned and values centered, with numeric values decimal point aligned. Also Table 68-2,

Proposed Response *Response Status* **O**

Cl **68** *SC* **68** *P* **25** *L* **31** # 113

LINDSAY, THOMAS A Individual

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

It has been shown that some LR transmitters may not meet TWDP the requirement. To improve yields of transmitters and to keep costs down for LRM systems, the TWDP limit should be increased.

SuggestedRemedy

Increase the TWDP limit to 5.0 dB.

Response *Response Status* **U**

REJECT.

Straw poll (Chicago rules)

4.2 dB - 3
4.6 dB - 3
4.7 dB (current value) - 16
5 dB - 7
5.2 dB - 3

The consensus within the committee is that the present value of 4.7dB represents the correct trade-off between transmitter yield and link performance considerations.

The consesus of the committee is also to agree with the budget presented in lindsay_1_1105 indicating that there remains unallocated link budget margin, with this tx spec.

Yes: 14
No: 4
Abstain: 2

Cl **00** *SC* **0** *P* *L* # 114

LINDSAY, THOMAS A Individual

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

Clause 68 uses PRBS9 as an optional pattern for TWDP and other testing. Future PHY chips will be able to include PRBS9 functionality. Therefore, it is desirable to provide a common MDIO interface for advertising and enabling the test pattern across present and future form factors.

SuggestedRemedy

See separate document: "PRBS9 MDIO control comment.doc".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Tom to finalize changes and provide revised document to editor by 23 Jan 06.

Cl **68** *SC* **68.6** *P* **28** *L* **1** # 115

LINGLE, ROBERT L Individual

Comment Type **GR** *Comment Status* **R**

Although the TF passed a motion at the November meeting in Vancouver which accepted that interoperation has been demonstrated, serious deficiencies were noted in the Interoperability study. 1) The most serious is that two launches are allowed by the standard, but the results were only reported as "passing one or the other launch option." This is a serious deficiency because there were only four fibers with seven possible launch conditions in a study which needs to represent three possible fiber impulse response categories (precursor, postcursor, and split-symmetric). Apparently, however, some transmitter/receiver combinations could not equalize one or the other launch on some fibers, and this information was withheld. As a result, it is not possible to judge the true meaning of mcvey_1_1105. 2) Based on discussion during the October Corning meeting, it seems that other fibers were studied at the same time as the interop, but results were not reported because they "were not part of the Interop." 3) It appears to be the case that the Interop employed EDC chips from only two vendors, which would severely limits the usefulness of the study, even though the TF had originally demanded that an Interop should include PMDs from at least three vendors. This is an issue because the complexity of the EDC circuit and its ability to adapt, to a large degree, drive other design features in a transceiver. Thus employing chips from at least three vendors is a necessary condition for have three truly independent implementations of an LRM transceiver.

SuggestedRemedy

The results of the Interop should be more fully published, including whether the center or offset launch passed in each case. Further work should be done so that at least three EDC chip vendors circuits are used in the Interop.

Response *Response Status* **U**

REJECT.

As this comment does not address the 802.3aq document, nor any IEEE SA process requirements, it is out of scope. This is the view of the 802.3 Chair.

The Task Force and the Working Group have both passed motions accepting the presented interop results.

The Task Force encourages developers to publish results, through appropriate industry channels, but the IEEE SA has no authority to require such tests, nor the publication of the results.

For: 17
Against: 2
Abstain: 7

Cl **68** *SC* **68.4.1** *P* **21** *L* **17** # 116

LINGLE, ROBERT L Individual

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

Although the TF passed a motion at the November meeting in Vancouver which accepted that interoperation has been demonstrated, serious deficiencies were noted in the Interoperability study. Instead of launching directly into a MM patchcord, as called out in 68.4.1, the center launch was implemented in the Interop with an intervening single mode fiber patch cord between MDI and TP2. This had the likely effect of serving as a mode filter for higher order modes launched into the single mode stub in a low tolerance laser package, possibly improving the results artificially.

SuggestedRemedy

Change the draft to mandate the use of a single mode patch cord between the transmitter and center launch, or else repeat the Interop study without the single mode fiber patch cord in the center launch implementation.

Response *Response Status* **U**

REJECT.

The Task Force and the Working Group have both passed motions accepting the presented interop results.

The use of a single mode patch cord is undesirable for CL as this would require the use of another patch cord type - having one SMF and one MMF.

The interop test was not intended to test all worst case conditions.

The SMF was used during the interop testing to connect a single mode attenuator. The attenuator was used to accommodate receivers that did not have the necessary overload performance to operate without one.

It should be noted that the document is not prescriptive about how a transmitter that meets the encircled flux spec is to be implemented. Within an implementation, use of a single mode connection is one possiblity.

It should also be noted that a number of presentations have been made showing that system performance is not strongly affected, in the case of CL, by the exact launch conditions, provided that the EF spec is met. Eg: cunningham_1_1005.

For: 9
Against: 4
Abstain: 3

The Task Force and the Working Group have both passed motions accepting the presented interop results.

The use of a single mode patch cord is undesirable for CL as this would require the use of another patch cord type - having one SMF and one MMF.

The interop test was not intended to test all worst case conditions.

The SMF was used during the interop testing to connect a single mode attenuator. The attenuator was used to accommodate receivers that did not have the necessary overload performance to operate without one.

It should be noted that the document is not prescriptive about how a transmitter that meets the encircled flux spec is to be implemented. Within an implementation, use of a single mode connection is one possiblity.

It should also be noted that a number of presentations have been made showing that system performance is not strongly affected, in the case of CL, by the exact launch conditions, provided that the EF spec is met. Eg: cunningham_1_1005.

It was noted in discussions regarding the interop test report that: When the single mode patch cords were replaced with multimode patch cords no significant degradation of link performance was observed. This experiment was performed by two of the particpating module vendors.

For: 14
Against: 3
Abstain: 2

Cl **68** *SC* **68.5** *P* **23** *L* **47** # 117

LINGLE, ROBERT L Individual

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

It is physically unreasonable that OM2 fiber should have the same operating range as OM3 fiber, for receivers tested against a single set of stressors, unless the TF is being very conservative on OM3 (which is not the case). OM3 fiber cannot use offset launch because the alpha shift is too large. OM3 can use center launch productively because OM3 fiber is subjected to stringent DMD testing, limiting the center defects. OM2 fiber is either fiber which was not manufactured with the strict process control required for OM3 fiber, or else it can be a downgraded product which did not meet OM3 specifications. Both these facts point to poor center launch performance compared to OM3. Thus the ~33% of OM2 fiber which is optimized at 850nm will have poor offset launch performance like OM3 due to tuning, but also much worse center launch than OM3. Therefore it is highly unlikely that the 99%tile distance for OM2 should be 220m.

SuggestedRemedy

Either eliminate OM2 fiber from Table 68-2 or calculate an independent value for the 99%tile operating range using a Monte Carlo delay set, as was done for OM1 and OM3.

Response *Response Status* **W**

REJECT.

See response to comment 70.

Cl **68** *SC* **68.5.3** *P* **27** *L* **25** # 118

LINGLE, ROBERT L Individual

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

Although the TF passed a motion at the November meeting in Vancouver which accepted that interoperation has been demonstrated, serious deficiencies were noted in the Interoperability study. 1) The most serious is that two launches are allowed by the standard, but the results were only reported as "passing one or the other launch option." This is a serious deficiency because there were only four fibers with seven possible launch conditions in a study which needs to represent three possible fiber impulse response categories (precursor, postcursor, and split-symmetric). Only one fiber-launch condition (4Orange CL) of the seven should have challenged receivers which passed the stressed sensitivity test. Apparently, however, some transmitter/receiver combinations could not equalize one or the other launch on some fibers. This is disturbing, because our methodology for both quantifying the difficulty of equalizing fibers and for implementing a stressed receiver sensitivity test relies on the use of the PIE-D metric. The apparent failure of compliant parts to equalize all of the combinations presented in the Interop study raises serious questions about whether or not the stressed receiver sensitivty test is appropriately rigorous.

SuggestedRemedy

In the absence of more quantitative analysis, it is recommended to adopt the "~4.5dB PIE-D Ewen stressors" that were previously advocated in London and San Francisco in comments by Bhoja, Swenson, and Telang. These were Ewen 23, 22, and 20 for pre-, quasi-symmetric, and post-cursor cases.

Response *Response Status* **U**

REJECT.

The Task Force and the Working Group have both passed motions accepting the presented interop results.

The reported PIE_D values were means, as measured separately in the lab, and not peak values that may occur when the shaker is used.

The committee does not agree that any results presented in the interop report suggest that the receiver compliance test requires modification.

For: 14
Against: 5
Abstain: 1

The Task Force and the Working Group have both passed motions accepting the presented interop results.

The reported PIE_D values were means, as measured separately in the lab, and not peak values that may occur when the shaker is used.

The PIE_D values given may also include measurement errors.

The committee does not agree that any results presented in the interop report suggest that the receiver compliance test requires modification.

For: 18
Against: 6
Abstain: 0

Cl **68** *SC* **68.5** *P* **27** *L* **35** # 119

LINGLE, ROBERT L Individual

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

Starting with D2.0, some TF members have raised an issue about jitter tolerance and interoperability. In the November Vancouver TF meeting, during discussion of Ali Ghiasi's comment 11, I heard three independent observers agree with Ali that it is possible for a compliant part not to interoperate based on jitter issues that are not fully addressed by the standard. However, this issue continues to get rolled forward to the next meeting.

SuggestedRemedy

Address the jitter and interoperability issue as recommended in ghiasi_1_1105 and D2.4 comment 11 (referencing 802.3ae) or equivalent approach

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment 45.

Cl **68** *SC* **68.6** *P* **30** *L* **39** # 120

SWENSON, NORMAN L Individual

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

"eye crossing means" is not well-defined.

SuggestedRemedy

Use the language of Clause 52.9.7. Replace "0 and 1 on the unit interval scale are determined by the eye crossing means." with "Normalized times of 0 and 1 on the unit interval scale are to be determined by the eye crossing means measured at the average value of the optical eye pattern."

Response *Response Status* **C**

ACCEPT.

Options discussed, with straw poll results ...

Normalized times of 0 and 1 on the unit interval scale are to be determined by the eye crossing means measured at the average value of the optical eye pattern.
11

Normalized times of 0 and 1 on the unit interval scale are to be determined by the eye crossing means measured at the average value of the transmitted optical signal.
0

Normalized times of 0 and 1 on the unit interval scale are defined by the means of the crossing times at the average value of the signal.
7

Cl **68** *SC* **68.5** *P* **25** *L* **31** # 121

SWENSON, NORMAN L Individual

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

The TWDP limit of 4.7 dB is about .5 dB too low to allow low-cost transmitters to be used. Room exists in the link budget to increase this limit.

SuggestedRemedy

Change the TWDP limit from 4.7 dB to 5.2 dB.

Response *Response Status* **U**

REJECT.

See response to comment 113.

For: 13
Against: 5
Abstain: 1

The consensus within the committee is that the present value of 4.7dB represents the correct trade-off between transmitter yield and link performance considerations.

The committee has not been convinced that the link performance can be assured with this change.

For: 20
Against: 0
Abstain: 1

Cl **68** *SC* **68.5** *P* **25** *L* **29** # 122

SWENSON, NORMAN L Individual

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

The eye mask does not provide any additional screening over the TWDP test.

SuggestedRemedy

Remove the eye mask limits. Also, remove the eye mask measurement technique from subclause 6.

Response *Response Status* **U**

REJECT.

The judgement of the committee is that the eye mask provides additional information on the quality of the transmitted signal that is not provided by TWPD alone.

Yes: 10
No: 0
Abstain: 4

Cl **68** *SC* **68.6.11** *P* **42** *L* **47** # 123

LINDSAY, THOMAS A Individual

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

After further study, I agree with Ali Ghiasi.

SuggestedRemedy

Sine jitter should be combined with the Comprehensive stress test.
A full frequency template should be used.
The amplitude should be increased to 0.082 UI pk-pk when combined with the random noise in the Comp test.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See response to comment 45.