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

Mei , Richard

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

The optical transmitter is permitted to produce transmit waveforms with dispersion penalties (TWDPs) that are 0.5 dB worse than that to which the receiver is tested. It implies that transmitters are permitted to produce outputs from the end of the fiber channel that exceed the level of stress that the receivers are required to handle. In addition, the "comprehensive stressed receiver sensitivity" test is not comprehensive because it does not include jitter impairments and baseline wander. It is very likely to cause the power budget shortfall to widen further. Therefore, the combined specifications for the transmitter, fiber and receiver do not ensure a closed power budget. For both 1000BASE and 10GBASE optical PMDs such impairments were accounted for in the link budget analysis and representative jitter impairments were included in the receiver test. This draft does not address these issues.

SuggestedRemedy

Account for jitter impairment in the receiver comprehensive SRS test in a way similar to clause 52. Provide power budget closure by adjusting the test specifications to ensure closure with the added jitter impairment.

Proposed Response *Response Status* **O**

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

Adriaenssens, Luc

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

It has become clear, based on information presented at the October 2005 interim, that the November 2004 task force motion requiring sufficient demonstration of interoperability was not fulfilled. This motion reads:

Move that IEEE 802.3aq demonstrate a 10-12 BER over the rated distance on a specified channel (TBD) and show interoperability between PMD's of at least three vendors for 10GBASE-LRM to support technical feasibility prior to sponsor ballot.
Approved by vote of 35/1/0.

A presentation made on this subject in an attempt to fulfill this motion at the October 2005 interim meeting of 802.3aq failed to get sufficient support for reasons that include failure to meet the requirements of the motion in the following ways:
- The channel was selected by the demonstrators rather than specified by the task force as required by the motion;
- Only two EDC chip vendors products were included within the modules;
- The demonstration failed to provide sufficient evidence of technical feasibility as defined by the five criteria as required by the motion.

Additionally, the center launch condition used in the demonstration did not represent the native center launch into a multimode cord, as it was filtered by the use of a singlemode patch cord, an unsupported patch cord for this application.
The technology is not proven, as only one vendor has shown sufficient data to demonstrate that the specifications can be met and this is the first application of EDC technology for MMF.

Confidence in reliability cannot be assured due, in part, to lack of sufficient numbers of channels reported in the demonstration. The presentation reported results on the equivalent of one duplex 62.5 um channel, one half duplex channel of 50 um (OM2), and one half channel of OM3 fiber.

SuggestedRemedy

Based on the results presented at the October Interim, it is clear that the task force has not yet achieved assurance of interoperability. The task force should not proceed to sponsor ballot until interoperability is demonstrated by at least three vendors over a specified duplex channel of each fiber type using only the specified launch conditions.

Proposed Response *Response Status* **O**

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

Kolesar, Paul

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

The November 2004 task force motion requiring sufficient demonstration of interoperability remains unfulfilled. This motion reads:

Move that IEEE 802.3aq demonstrate a 10-12 BER over the rated distance on a specified channel (TBD) and show interoperability between PMD's of at least three vendors for 10GBASE-LRM to support technical feasibility prior to sponsor ballot.
Approved by vote of 35/1/0.

A presentation made on this subject in an attempt to fulfill this motion at the October interim meeting of 802.3aq failed to get sufficient support. Some reasons for lack of support include failure to meet the requirements of the motion in the following ways:
- The channel was not specified as required by the motion, but chosen by the demonstrators;
- Only two EDC chip vendors products were included within the modules;
- The demonstration failed to provide sufficient evidence supporting technical feasibility as required by the motion. Technical feasibility is defined in these terms within the 5 Criteria: Demonstrated system feasibility, proven technology, reasonable testing, and confidence in reliability. System feasibility was not demonstrated as only the results of a selected set of "operational" fibers were reported without specifics on the launch conditions that were tried and that worked. In addition, the center launch condition used in the demonstration was not representative of actual center launches as it was filtered by the use of a singlemode patch cord, an unrecognized and unsupported patch cord for this application. The technology is not proven, as this is the first application of EDC technology for MMF, and only one vendor has shown sufficient data to demonstrate that the specifications can be met. Confidence in reliability cannot be assured due, in part, to lack of sufficient numbers of channels reported in the demonstration. The presentation reported results on the equivalent of one duplex 62.5 um channel, one half duplex channel of 50 um (OM2), and one half channel of OM3 fiber.

SuggestedRemedy

By the motion passed in November 2004, the task force may not proceed to sponsor ballot until fulfilling this motion's requirements to the satisfaction of the task force. Fulfill the requirements of the motion by addressing the shortcomings provided in the comment. Specifically provide interoperability results with the following conditions. The task force should define test channels for each media in sufficient numbers: three duplex channels, a minimum of six fibers of each media. At least three EDC chip vendors devices should be included. All results should be reported, including the launch conditions attempted for each combination of transmitter and fiber. No singlemode patch cords should be used for center launch. Two more EDC chip vendors should report their parametric distributions of compliance metrics.

Proposed Response *Response Status* **O**

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

Kolesar, Paul

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

Referenced fiber standard is in error because the document publication date is wrong. There is no edition of this document that was published in 2003.

SuggestedRemedy

SuggestedRemedy: In the objectives document replace all six occurrences of "60793-2-10:2003" with "60793-2-10:2004".

Proposed Response *Response Status* **O**

Cl **0** *SC* *P* *L* # 5

Kolesar, Paul

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

Draft fails broad market potential criteria. In July 2004 and November 2004, representatives of systems vendors stated via the 10GBASE-LRM email reflector that providing 300 m capability on legacy fiber was a strong and clear requirement, and that providing anything less was a "non-starter". The task force has studied the technology and concluded that providing a robust 300 m solution is not feasible. The draft therefore misses customer expectations, placing it in jeopardy of failing the broad market potential criteria.

SuggestedRemedy

Halt development of the document unless and until representatives of those same system vendors state that 220 m, the present maximum, is now an acceptable supportable distance.

Proposed Response *Response Status* **O**

Cl **00** *SC* *P* *L* # 6

Kolesar, Paul

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

Document fails to fulfill stated objective to support 300 m on multimode fiber.

SuggestedRemedy

SuggestedRemedy: Do not progress to Sponsor Ballot until the document provides a solution the meets all its stated objectives.

Proposed Response *Response Status* **O**

Cl **44** *SC* **44.5** *P* **16** *L* **28** # 7

Abbott, John

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

Table 44-4. Max channel length for 50um was reduced from 300m to 220m. Modeling for OM3 fiber suggests that 220m is not rigorously supported, and because new OM2 fiber will be largely OM3 fall-out it is expected that there will be a problem with OM2 as well. The OM1 length needs to be re-checked as well. The length needs to be reduced. An alternative remedy is to increase PIE-D.

SuggestedRemedy

SuggestedRemedy: Change 220m to 200m for 50um fibre.

Proposed Response *Response Status* **O**

Cl **45** *SC* **45.2.1.10** *P* **18** *L* **15** # 8

Dawe, Piers Agilent

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

The 2 that substitutes for the stricken 1 should be underlined. This point is not worth another recirculation to fix.

SuggestedRemedy

When opening sponsor ballot, underline the 2 (in black).

Proposed Response *Response Status* **O**

Cl **45** *SC* **45.2.1.7.4** *P* **17** *L* **31** # 9

Dawe, Piers Agilent

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

In three places, '52.4.n.' is crossed out and replaced by 'xxx 68.n.n xxx 52.4.n.'. Really, the proposed change is less than shown. This point is not worth another recirculation to fix.

SuggestedRemedy

When opening sponsor ballot, leave the '52.4.n.' in plain text at the end of each sentence: neither stricken nor underlined. Remove any duplicate '52.4.n.'. Also change 'subcluase' to 'subclause' and 'disable. as' to 'disable, as'.

Proposed Response *Response Status* **O**

Cl **68** *SC* *P* *L* # 10

Kolesar, Paul

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

The power budget does not close. The combined specifications for the transmitter, fiber and receiver do not ensure an operational link. Transmitters are permitted to produce outputs from the end of the fiber channel that exceed the level of stress that the receivers are required to handle. Specifically, the transmitter is permitted to produce transmit waveforms with dispersion penalties (TWDPs) that are 0.5 dB worse than that to which the receiver is tested. In addition, the "comprehensive stressed receiver sensitivity" test is not comprehensive, causing the power budget shortfall to widen further because it does not include jitter impairments and baseline wander. For both 1000BASE and 10GBASE optical PMDs these impairments were accounted for in the link budget analysis and representative jitter impairments were included in the receiver test. Such rigor is lacking in this draft.

SuggestedRemedy

Add jitter impairment to the receiver comprehensive SRS test in a manor similar to that of clause 52. Provide power budget closure by adjusting the test specifications to ensure closure with the added jitter impairment. Examples of adjustments include lowering the transmitter maximum TWDP, raising the receiver stressor waveform dispersion impairment, increasing the minimum available optical modulation amplitude.

Proposed Response *Response Status* **O**

Cl **68** *SC* **5.3** *P* **32** *L* **35** # 11

Ghiasi, Ali Broadcom

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

Dawve comment #18 from draft 2.3 and Ghiasi comment 67 from Draft 2.2

SuggestedRemedy

Current draft of 802.3aq has a very signifincat interoperablity hole as listed by Dawes comment 18 and Ghiasi comment 67 from darft 2.2. In faover of time to market we are compropmising every jitter toelerance fundamnetals as applied to 802.3ae, 802.3z, FC, IB, OIF CEI, SRIO, SAS, etc. Worse we are taking credit for low frequny < 4MHz jitter by using a CRU, but we don't test the receiver for the same jitter.

Further since when power supply jitter, DC-DC conver noise, PLL jitter peaking were only present for B2B! LRM standard to be sucessful need to define comprehensive jitter tolerance with SJ applied on top of the channel stressor per IEEE 802.3ae.

Proposed Response *Response Status* **O**

Cl **68** *SC* **5.3.1** *P* **28** *L* **13** # 12

Ghiasi, Ali Broadcom

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

Stress sensitivity for symmetrical pulse is reduced to -6 dBm instead of -6.5 dBm. Split pulse is already easer by about 0.5 dB compare to pre and post cursor. Weakening the split symmetric cursor creates serious hole for an installation which wants to achieve high degree of availability and reliability.

SuggestedRemedy

Current IEEE symmetric pulse is more like a post cursor and we have observed split symmetric pulses with center and offset launch. The standard should not be relaxed for split symmetric because they often occur with center launch. We must have comprehensive standard based on worse case instead of trying to tailor the standard to some specific need.

Make stress sensitivity for stressor to be -7 dBm per Dudek Comment 14 from D2.3.

Proposed Response *Response Status* **O**

Cl **68** *SC* **5.3.1** *P* **28** *L* **13** # 13

Ghiasi, Ali Broadcom

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

Stressed sensitivity in OMA for symmetrical test is added to the table without any references what it means.

SuggestedRemedy

This is another instance which the document is not following IEEE style requirement as stated James Comment 1 draft 2.3. Currently this paragraph is not connected to the rest of the test. Requires adding foot note OMA sensitivity when tested with symmetric pulse stressor and provide reference to the appendix.

Proposed Response *Response Status* **O**

Cl **68** *SC* **6.5** *P* **31** *L* **40** # 14

Swenson, Norman ClariPhy Communicati

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

""eye crossing means"" is not well-defined.

SuggestedRemedy

Change ""determined by the eye crossing means"" to ""determined by the mean times at which the waveform crosses the mean value of the waveform in the eye diagram.

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.10** *P* **47** *L* **1** # 15

Dawe, Piers Agilent

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

Capitals (new format to follow). 'protocol implementation conformance statement' to go in lower case (except e.g. initial P in the title). This new point is not worth another recirculation.

SuggestedRemedy

When opening sponsor ballot, revise per comment (two instances).

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.10.3.4** *P* **50** *L* **28** # 16

Dawe, Piers Agilent

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

Bad cross-reference. This point is not worth another recirculation to fix.

SuggestedRemedy

When opening sponsor ballot, remove '.4' after '68.6.11'.

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.10.3.4** *P* **50** *L* **48** # 17

Dawe, Piers Agilent

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

A stray capital. This point is not worth another recirculation to fix (and is out of scope).

SuggestedRemedy

When opening sponsor ballot, change 'Labeling' to 'labeling'.

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.10.3.6** *P* **51** *L* **6** # 18

Dawe, Piers Agilent

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

Feature does not match clause. This point is not worth another recirculation to fix (and is out of scope).

SuggestedRemedy

When opening sponsor ballot, change 'optics' to 'optic'.

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.5** *P* **24** *L* **50** # 19

Abbott, John

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

Table 68-2: OM3 length was changed from 300m to 220m at Oct LRM meeting. At that meeting in abbott_1_1005.pdf it was shown that for a 220m length and a PIE-D of 4-4.2dB, the EMB needs to be roughly 700MHz.km or there will start to be a significant number of fibers with higher PIE-D. Fibers can meet the OM3 spec without meeting a 700MHz.km center launch at 1300nm, and a review of the OM3 modeling confirms this. The length for OM3 needs to reduced. The lengths for OM2 (which is closely related to OM3) and OM1 need to checked rigorously before moving to sponsor ballot. As an alternate remedy, we can increase the PIE-D level of the stressors.

SuggestedRemedy

Reduce OM3 length to 200m.

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **26** *L* **31** # 20

Swenson, Norman ClariPhy Communicati

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

This is a pile-on comment to Tom Lindsay's comment # 54 against D2.3. The TWDP limit is too low to pass production quality LR transceivers.

SuggestedRemedy

Increase the TWDP limit from 4.7 dB to 5.0 dB.

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **26** *L* **31** # 21

Abbott, John

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

I am still unclear on why the value of TWDP is not the same as the largest value of PIE-D or P(14,5) for the three stressors - why is it 4.7 rather than 4.2? It seems as if the TWDP test can pass transmitters which the receiver is not set up to handle.

SuggestedRemedy

SuggestedRemedy: Document how transmitter and receiver tests are linked.

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.5.1** *P* **26** *L* **35** # 22

Abbott, John

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

Table 68-3, encircled flux values. footnote f p.27 line 8-9 is ambiguous about how the encircled flux measurement is to be made. The TIA FOTP 203 and IEC procedures use a 10m test jumper of MM fiber, while section 68.4.1 p.22 line 15 notes the patchcord is between two and five meters in length. The encircled flux measurement needs to be done on a 10m piece of fiber, not a 2-5m patch cord. Alternatively, the task force can determine the encircled flux after 10m when the measurement is done on a 2 meter piece and modify the supporting analysis.

SuggestedRemedy

augment footnote to say "This encircled flux specification, measured per IEC 61280-1-4 on a test jumper at least 10m in length, defines.."

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.6.10** *P* **43** *L* **26** # 23

Dawe, Piers Agilent

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

Bad cross-reference. This point is not worth another recirculation to fix.

SuggestedRemedy

When opening sponsor ballot, change to a working link to Table 68-4.

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.6.10** *P* **44** *L* **14** # 24

Dawe, Piers — Agilent

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

Tidy up and save space. This point is not worth another recirculation.

SuggestedRemedy

When opening sponsor ballot, move the label 'Mode-conditioning patch cord' to above the optical attenuator, like the other figures.

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.6.6.2** *P* **35** *L* **14** # 25

Dawe, Piers — Agilent

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

It would be nice to indent the line in the 'for' loop. Other beautifications to the algorithm's listing (e.g. spaces between command and '%', and between '%' and comment) would be nice. These are not worth another recirculation to fix (and are out of scope).

SuggestedRemedy

When opening sponsor ballot, insert spaces wehre appropriate.

Proposed Response *Response Status* **O**

Cl **68** *SC* **68.6.9.3** *P* **40** *L* **53** # 26

Dawe, Piers — Agilent

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

To help calibrate stressed eye generators, we could provide the Qsq values for the three stressed cases as well as the unstressed case. We can add them in sponsor ballot, but I thought I would point this out now so that those who can say what the numbers are can have them ready for sponsor ballot.

SuggestedRemedy

No action at this time.

Proposed Response *Response Status* **O**

Cl **68** *SC* **Table 68-5** *P* **28** *L* **27** # 27

Weiner, Nick — Phyworks

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

At the October 802.3aq meeting Piers Dawe presented analysis [dawe_1_1005] on the topic of the ""symmetrical"" part of the comprehensive stressed receiver test. He showed, using the MC model, that this stressor significantly differs from channel responses anticipated in practice.

Piers also predicted that this case would prove to be the most severe of the three parts of the comprehensive stressed receiver sensitivity test.

Jonathan King presented measurement results [king_1_1005] that agreed with this prediction.

During the discussion a comment was made that the ""symmetrical"" stressor represents channel responses that may occur transiently. Detailed analysis leading to this conclusion was not presented though.

So it seems that the ""symmetrical"" case is likely to be the most difficult and therefore in the cost ""critical path"".
At the same time, there appears to be a question as to whether it is actually needed.

SuggestedRemedy

Commenter suggests that committee remains open to presentations that address this issue, with a view to making a change to the comprehensive stressed receiver test if sufficient evidence is provided to the effect that the test, as specified in Draft 2.4, is not appropriate.

Proposed Response *Response Status* **O**