Cl **00** *SC* *P* *L* # 1001

Dallesasse, John

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

See John George's Comment #6 in recirculation package.

SuggestedRemedy

Per suggested remedy in George Comment #6.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

This comment was resolved during the Draft 2.0 cycle.
Motion to reconsider Draft 2.0 comment 6.
Moved: Steve Swanson
Seconded: John George
Yes: 14
No: 5
Abstain: 5

Motion passes (50% threshold for proceedural)

Proposal to accept Draft 2.0 comment 6 in principle.
Refer to response to Draft 2.0 comment 158 as being an acceptable remedy.
Yes: 19
No: 0
Abstain: 6

Cl **00** *SC* *P* *L* # 1002

Dallesasse, John Emcore Corporation

Comment Type **TR** *Comment Status* **R** *D2.0 comment 2*

Per the vote in the November, 2004 meeting, the group needs to: ""...demonstrate a 10-12 BER over the rated distance on a specified channel (TBD) and show interoperability between PMDÆs of at least three vendors for 10GBASE-LRM to support technical feasibility prior to sponsor ballot."" This has not been done. The precedent established in IEEE 802.3ae can be synopsized by an excerpt from Jonathan Thatcher's comment regarding this topic that was submitted during 802.3ae balloting: ""...Feasibility means that technology must be demonstrated with reports and working models; proven technolgy; reasonable testing and with confidence in reliability..."" The presentations made to the 802.3ae Task Force in October and November of 2001 set a reasonable bar for the 802.3aq Task Force. The work of the 802.3aq task force on this subject should also contain confirmation that equalizer adaptation times ensure link stability under conditions typical for standard office environments, such as those called out in GR-63-CORE or IEC 61300-2-1, 2nd Edition, 2003-01.

SuggestedRemedy

An adaptation of Thatcher's suggested remedy applies here as well: Demonstrate the technical feasibility of the technology specified in Clause 68 while ensuring the attainment of the other 4 criteria. Or, change the requirements/specifications such that this goal can be achieved.

Proposed Response *Response Status* **U**

REJECT.
Out of scope. Comment does not point out any deficiencies in Draft 2.0.
(TF has passed a motion that interop test is necessary prior to Sponsor Ballot)

Cl **00** *SC* *P* *L* # 1003

Thaler, Pat

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

Responses to some comments in the unsatisfied category reference responses to satisfied comments, 1 and 158, that were not in the ballot package. The ballot package should be complete so either the satisfied but referenced by unsatisfied comments should have been included or the content of their responses should have been moved to an unsatisfied comment.

SuggestedRemedy

In the future, please send out a complete ballot package including any referenced comment responses. I've made this a T because I'm sure you will fix it in the future, but if the problem persists on other ballots, I'll have to start making it a TR or ER.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
In the future, links to documents containing all referenced material will be provided.

Cl **00** *SC* *P* *L* # 1004

Thaler, Pat

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

This draft and the 802.3an draft are the first time I recall a recirculation being conducted with unresolved comments. The purpose of recirculation is to determine whether a draft is ready for sponsor ballot. A draft with unresolved comments is not ready to go forward to sponsor ballot and should therefore not be recirculated.

SuggestedRemedy

Resolve all comments before doing any future recirculations. Doing otherwise is a bad practice that abuses the voter's time.

Proposed Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
The TF chair and editor were advised that the requirement is that the resolution committee consider all comments, but the TF chair will ensure that all comments are resolved in the future.

Cl **00** *SC* *P* *L* # 1005

Thaler, Pat

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

In addition to the lack of consensus on the unresolved comments, there are quite a few unsatisfied comments where the task force response is inadequate. For example, comments 6, 115, 116, 160, 173, 255 (and the family of other comments that reference the response to 255), 200, 205, 216. 251, 276, 285, 300, 303, 433, 435.

I think this also applies to comment 166 where the explanation in the response where the explanation seems to say that some change to stressors is pending but not made yet, but the relationship of the response on stressors to the comment which requests a length reduction isn't entirely clear.

SuggestedRemedy

If things are broken in a draft (e.g. incomplete, incorrect, or non-interoperable), they need to be fixed before forwarding the draft even if the commentor who points out the problem doesn't know how to fix them and therefore is unable to submit a specific change. Therefore, responses that reject a comment solely with ""specific change to document not suggested"" ""no consensus for change"" are inadequate.

We do expect technical feasibility so comments that say technical feasibility has not been shown are valid (e.g. 115, 160) and deserve a valid response. For example, an acceptable response might say that operation to the desired confidence level (e.g. 95%) has been shown, preferably with reference to simulation or test presentations that substantiate that statement.

One can add to that response that no specific change was suggested, but there also needs to be a part of the response that says ""it ain't broken"". Lack of a sufficiently detailed change is a good reason to turn down an attempt to ""improve"" the draft, but it doesn't justify failing to fix a broken one.

Provide adequate responses to all unsatisfied comments - e.g.:
The draft is correct as it stands because ... <and the comment doesn't suggest a specific remedy> or <and there is no consensus for change>
Feasibility has been adequately shown, see presentations xxxx and yyyy.
Comment (e.g. 279) does not identify a problem, only a fear that a problem may be found in the future, therefore no change is necessary.
for a comment such as 285: The standard is not meant to be a test implementation spec. The signal quality to be measured is clearly defined, it is up to the implementor of the test to design the test to give adequate accuracy for the implementor's desired confidence level and based on the specifics of the test implementation.
etc.

Proposed Response *Response Status* **W**

ACCEPT.
Resolution committee agrees with the sentiment of the commenter, and will endeavour provide fuller explanations for rejected comments, for this, and future revision cycles.

D2.0 comments 2, 115, 160 will be included with D2.1 recirc.

Cl **00** *SC* *P* *L* # 1006

George, John

Comment Type **TR** *Comment Status* **A** *D2.0 comment 6*

The parameters in clause 68 create a specification that will enable compliant transceivers to support a certain percentage of single installed multimode fibers - known as fiber coverage. In past IEEE optical PMDs where coverage was relaxed to less than 100% (99%) the coverage was calculated for bi-directional links. 10GBASE-LRM requires two fibers on which to operate a bi-directional link and the end user is concerned with link coverage. For example, if the 95% fiber coverage being proposed is adopted it will result in a dangerously low 90% link coverage which is unacceptable for a PMD that will be used primarily in backbone applications.

SuggestedRemedy

SuggestedRemedy: For all modeling and affected parameters in clause 68, adjust values to assure an agreed upon bi-directional link coverage. For example, to achieve 95% link coverage requires 97.5% fiber coverage (0.975^2=0.95), and 99% link coverage requires 99.5% fiber coverage.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Motion to accept in principle
Stating that no changes required to document.
Moved: Mike Dudek
Seconded: Paul Kolesar

Vote to call question:
For: 23
Against: 11
Abstain: 1

Vote on motion
For: 9
Against: 23
Abstain: 4

Motion to reject
No specific remedy suggested.

Moved: Nick Weiner
Seconded: Jan Peeters Weem

Motion to call question:
For: 32
Against: 2
Abstain: 0

Vote on Motion:
For: 27
Against: 7
Abstain: 2
Motion passes.

20th July.
See response to comment 1001.

Cl **01** *SC* *P* **11** *L* **1** # 1007

Grow, Robert

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

Missing title of Clause 1. Publication style is to simply included the clause title and nothing else.

SuggestedRemedy

Delete the Changes to ... title on all changed clauses.
Insert ""1. Introduction"" for clause 1

Proposed Response *Response Status* **C**

ACCEPT.

Cl **01** *SC* **1.3** *P* **11** *L* **4** # 1008

Dawe, Piers

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

Gratuitous capital

SuggestedRemedy

references

Proposed Response *Response Status* **C**

ACCEPT.

Cl **01** *SC* **1.4** *P* *L* # 1009

Thaler, Pat

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

TWDP and CRU need to be added to the Abbreviations subclause

SuggestedRemedy

Add TWDP and CRU to 1.4

Also any others that haven't been added.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Abbreviations subclause is 1.5.

Cl **01** *SC* **1.4** *P* **11** *L* **37** # 1010

Dawe, Piers

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

This definition needs improvement. For those of us who think flux is something we use when soldering: flux of what? And, how is the integral done? The definition is ambiguous. Resolution to D2.1 comment 23 at least contained the word 'energy'.

SuggestedRemedy

Replace with:
The flow of optical energy within a specified radius of a fiber center, as a percentage of that within 36 um (for 62.5 um fiber) or 29 um (for 50 um fiber).

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The optical power within a specified radius of a fiber center, as a percentage of that within 36 um (for 62.5 um fiber) or 29 um (for 50 um fiber).

Cl **01** *SC* **1.4** *P* **4** *L* **30** # 1011

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **A** *D2.0 comment 23*

What's encircled flux? I couldn't find a definition either in P802.3am or P802.3aq

SuggestedRemedy

Add a definition for encircled flux.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Encircled flux: The integral of encircled energy from zero (fiber center) to r, where r varies from zero to 36 um (for 62.5 um fiber) or 29 um (for 50 um fiber), normalized to have unity peak value (at 36 or 29 um), so the units of measure are arbitrary but have dimension optical power (as a function of radius).

Note to editor: rs initalics.

Cl **30** *SC* **30.5.1.1.2** *P* **13** *L* **29** # 1012

Dallesasse, John

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

Fiber should only be spelled ""fibre"" in text specifically referencing an international standard that uses the ""fibre"" spelling.

NOTE: ""Fiber"" is not spelled in a consistent manner in this subclause. All of the ""10BASE-.."" and ""1000BASE-.."" use ""fiber"" while all of the ""10GBASE-.."" use ""fibre."" This may need to be forwarded for a maintenance revision of the overall document.

SuggestedRemedy

Change ""fibre"" to ""fiber""

Proposed Response *Response Status* **C**

REJECT.
As commenter says, the comment refers to spelling already used within Clause 30. This is beyond the scope of changes needed to accommodate 10GBASE-LRM.

Cl **30B** *SC* **30.B.2** *P* **22** *L* **22** # 1013

Dallesasse, John

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

Fiber should only be spelled ""fibre"" in text specifically referencing an international standard that uses the ""fibre"" spelling.

NOTE: ""Fiber"" is not spelled in a consistent manner in this subclause. All of the ""10BASE-.."" and ""1000BASE-.."" use ""fiber"" while all of the ""10GBASE-.."" use ""fibre."" This may need to be forwarded for a maintenance revision of the overall document.

SuggestedRemedy

Change ""fibre"" to ""fiber""

Proposed Response *Response Status* **C**

REJECT.
As commenter says, the comment refers to spelling already used within Annex 30B. This is beyond the scope of changes needed to accommodate 10GBASE-LRM.

Cl **30B** *SC* **30B** *P* **22** *L* **10** # 1014

Dawe, Piers

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

Wrong font for titles

SuggestedRemedy

per comment

Proposed Response *Response Status* **C**

ACCEPT.

Cl **44** *SC* **44.1.4.4** *P* **14** *L* **19** # 1015

Dawe, Piers

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

Subclause number '44.1.4 4' missing a dot.

SuggestedRemedy

44.1.4.4

Proposed Response *Response Status* **C**

ACCEPT.

Cl **44** *SC* **44.1.4.4** *P* **14** *L* **24** # 1016

Dawe, Piers

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

Misplaced comma

SuggestedRemedy

Change '... 51, 52, and 68 refers' to '... 51, 52 and 68, refers'.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **44** *SC* **44.3** *P* **16** *L* **20** # 1017

Dudek, Mike

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

This Comment agrees with the ""other lack of consensus"" comment 458 on draft 2.0. Additional delay should be allowed in order to allow more complex signal processing.

SuggestedRemedy

In table 44-2 line 20 Change ""Serial PMA and PMD"" to ""Serial PMA and PMD other than 10G BASE-LRM"" and change ""See 52.2 and 68.2"" to ""See 52.2""
Add line to the table
""10GBASE-LRM serial PMA and PMD."" with Maximum bit time 6656, Pause Quanta 13 and Notes ""see 68.2""
In section 68.2 page 25 line 35 change ""not more than 512 bit times, or one pause_quanta"" to ""not more than 6656 bit times, or 13 pause quanta""

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 1023 for different delay value.

Cl **44** *SC* **44.5** *P* **16** *L* **50** # 1018

Thaler, Pat

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

Table 44-4. With the change made to 68.5, this chart doesn't tell a complete story and doesn't make it easy to choose between LX4 and LRM.

SuggestedRemedy

Add a footnote to indicate that ensured coverage to these distances depends on is provided for some types (or bandwidths) of the 50 and 62.5 u fiber and reference 68.5 for details. I believe that footnote would also apply to LX4 for 50 u fiber, so a reference to 53.6 would also be appropriate.

Proposed Response *Response Status* **W**

REJECT.
The committee believes that Table 44-4 is not intended to tell a complete story, nor to offer guidance between PMDs. It has to fit within ISO IEC11801 style.
Yes: 24
No: 4
Abstain: 9

Cl **45** *SC* **45.2.1.10** *P* **18** *L* **45** # 1019

Dawe, Piers

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

Editorials

SuggestedRemedy

Wrong font for title (also 45.2.1.6), on line 54 'my need' should be 'may need'.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.1.10** *P* **19** *L* **41** # 1020

Dawe, Piers

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

Although tables 45-1 and 45-3 contain entries in forwards numerical order, most of the tables in clause 45 'count down'.

SuggestedRemedy

In table 45-11, reverse the order of the last two rows (restoring the order in D2.0).

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* *P* *L* # 1021

Thaler, Pat

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

In the future, it would be helpful if the editor would manually insert a red X over figures and tables in the comparison document that are deleted so that the voter doesn't have to flip between the comparison and the no change documents to figure out which figures and tables are real and which are spurious.

SuggestedRemedy

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* *P* **19** *L* **2** # 1022

George, John

Comment Type **T** *Comment Status* **R** *D2.0 comment 108*

In table 68-3 footnote e must be clarified to minimize link failures by encouraging the use of the "best" launch.

SuggestedRemedy

SuggestedRemedy: In footnote e, replace the first sentence "The default launches are the preferred launches" WITH "The preferred launch must be used at each end of the link on the initial attempt to operate the link, to minimize the probability of link failure. If the link fails using the preferred launch, the alternative launch on one or both ends of the link may enable a functional link."

Proposed Response *Response Status* **C**

REJECT.

Accept in principle
The preferred launch is expected to have the highest probability of link success. However, if the link fails using the preferred launch, use of the alternative launch increases the overall probability of achieving a functional link.

Yes: 16
No: 13

The preferred launch is expected to have the highest probability of link success for worst-case channels. However, if the link fails using the preferred launch, use of the alternative launch increases the overall probability of achieving a functional link.

Yes: 10
No: 17

Reject.
User guidance is not appropriate within transmitter spec table.
The name "preferred launch" has been adopted in comment 107.

Yes: 23
No: 10

No Consensus reached.

20th July:

Accept in Principle
The preferred launch is expected to have the highest probability of link success. However, if the link fails using the preferred launch, use of the alternative launch increases the overall probability of achieving a functional link.

Yes: 13
No: 10
Abstain: 14

Reject.
User guidance is not appropriate within transmitter spec table.
The name "preferred launch" has been adopted in Draft 2.0 comment 107.
Yes: 20
No: 8
Abstain: 7

Accept in Principle
The preferred launch is expected to have the highest probability of link success. However, if the link fails using the preferred launch, use of the alternative launch increases the overall probability of achieving a functional link.
Yes: 9
No: 4
Abstain: 5

Reject
User guidance is not appropriate within tx compliance spec table.
Yes: 15
No: 2
Abstain: 2

Cl **68** *SC* **2** *P* **25** *L* **34** # 1023

Rommel, Albrecht

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

The current value for the PMA and PMD round trip delay in table 44.2 (round-trip delay constraints, informative) is 512 bit (1 pause quanta), with references to clause 52.2 (10GBASE-SR/LR/ER) and 68.2 (10GBASE-LRM). The PMA comprises the SERDES function with CDR, the PMD in case of 10GBASE-SR/LR/ER is a single optical/electrical conversion. For these standards, the definition of a max. delay of 512 bits is appropriate. For 10GBASE-LRM, the max. delay of 512 bits is insufficient to allow for the option of signal processing intensive receiver implementations in the future.

Signal processing functions for baud rates at 10 Gbps may require a parallelism of 64 (161 MHz clock) and a depth of 128 cycles to achieve a reasonable trade-off between power, signal processing capability and logic clock rate. Therefore, a reasonable and feasible delay for this function would be 64*128 = 8192 bits (16 pause quanta). The current delay value of one pause quanta (512 bits) is still reasonable for receive and transmit PMA. To allow for a limited amount of signal processing in the transmit PMD, 1 additional pause quanta is suggested, leading to a proposed total of 9216 bits or 18 pause quanta. With these values, the overall delay from MAC to PMD (10GBASE-R PCS plus PMA plus PMD) is about 1.3 micro seconds, compared to 0.4 micro seconds of 10GBASE-LR.

10GBASE-LRM: PCS + PMA + PMD = 3584 + 9216 = 12800 (~1.3 us)
10GBASE-LR: PCS + PMA + PMD = 3584 + 512 = 4096 (~0.4 us)

SuggestedRemedy

In Clause 68.2, change the informative value of 512 bits (1 pause quanta) to 9216 bits (18 pause quanta) for PMA plus PMD. In Table 44.2, add separate row for 10GBASE-LRM according to the definitions in clause 68.2

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **5** *P* **17** *L* **10** # 1024

Cobb, Terry Commscope

Comment Type **TR** *Comment Status* **R** *D2.0 comment 115*

Table 68-2. The maximum operating range for 50 um fibers with 500/500 and 400/400 MHz-km modal bandwidths has not been substantiated.

SuggestedRemedy

Use actual range limits based on necessary analysis and experiments using worst case models.

Proposed Response *Response Status* **U**

REJECT.
Specific remedy not suggested.

Cl **68** *SC* **6.6** *P* **23** *L* **46** # 1025

Lindsay, Tom ClariPhy Communicati

Comment Type **TR** *Comment Status* **R** *D2.0 comment 116*

Another comment proposes changing the signal strength measurement from OMA to RF signal power where, in general, a stronger signal will improve the SNR at a slicer input. Although that proposal analyses the signal in a manner that is relevant to an EDC system, there still may be concern that the signal is highly distorted and could cause an implementation penalty cliff. Therefore, we may still need a separate cap on distortion. The current TWDP method is based on same-OMA scaling, and can incorrectly cause changes in signal strength to appear as a change in penalty.

SuggestedRemedy

Some options (combinations are possible): 1. Impose non-idealities into the EDC emulator used with the TWDP code to represent real equalizers. Examples are finite EQ lengths or intentional timing error, which also presumes finite length. 2. Determine penalty via loss in SNR at the slicer input compared to a matched filter bound as determined by the signal at the channel input, including the transmitter. 3. Rely only on the Tx RF signal power metric until it is justified that an implementation penalty cliff exists.

Proposed Response *Response Status* **U**

REJECT.
Suggested remedy does not give specific change to document.

Cl **68** *SC* **6.8** *P* **18** *L* **17** # 1026

Dudek, Mike — Picolight

Comment Type **TR** *Comment Status* **R** *D2.0 comment 117*

Table 68-3 What matters to the Receiver is the signal to noise ratio of the equalized signal (plus a maximum amount of distortion to equalize). The measurement of TWDP becomes imprecise with different shaped Tx outputs due to the difficulty in defining OMA. It would be better to specify these quantities in the way that matters to the receiver and so that inaccuracies in the OMA definition cancel out. Also if parts have low TWDP there is no need to have as large an OMA or average output power.

SuggestedRemedy

Change ""Launch power in OMA min"" value to ""-9.5dBm + TWDP"". Reduce Average Launch Power min to -7.5dBm.

Proposed Response *Response Status* **U**

REJECT.
PROPOSED ACCEPT IN PRINCIPLE.
Also:

Change min OMA to -5.5dBm

Change Figure 68-5 complaint region to -7.5dBm ave power
New label on min OMA vertical dashed line "for case of TWDP of 5.1 dB"

No consensus reached.

See response to comment 1050.

Cl **68** *SC* **68.1** *P* **24** *L* **17** # 1027

Dawe, Piers

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

In Bn, n is a variable or placeholder. So I think it should...

SuggestedRemedy

be in italic font

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.10.2.3** *P* **61** *L* **10** # 1028

Dawe, Piers

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

Although it seems the right way to do the PICS, the 'major capability' row for LRM isn't used conditionally anywhere in the PICS, and other clauses don't seem to have an equivalent.

SuggestedRemedy

Check the 'house style' and if appropriate, remove this row and change column heading from 'Clause/subclause' to Subclause'.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Row removed. Thanks to David Law for the help.

Cl **68** *SC* **68.10.2.3** *P* **61** *L* **13** # 1029

Dawe, Piers

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

Might as well give a subclause for the INS item.

SuggestedRemedy

68.9

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.2** *P* **14** *L* **4** # 1030

Swenson, Norman

Comment Type **T** *Comment Status* **A** *D2.0 comment 458*

Unlike other optical PMDs, LRM is signal processing intensive, and should allow more latency to widen the implementation space available to vendors. The suggested remedy increases the total delay limit for the combined PCS, PMA and PMD from roughly .4 microseconds to roughly 1 microsecond (from 4096 bit times to 10240 bit times).

SuggestedRemedy

Change text of Clause 68.2 from ônot more than 512 bit times, or 1 pause_quantaö to ônot more than 6656 bit times, or 13 pause_quantaö. This will also require addition of a row for LRM in Table 44-2 as follows: Sublayer: LRM; Maximum (bit time): 6656; Maximum (pause_quanta): 13; Notes: Includes 2 meters of fiber. See 68.2.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

June meeting:
This comment remains unresolved.

21 July 2005:
See comment 1023 for different delay value.

Cl **68** *SC* **68.4.1** *P* **25** *L* **52** # 1031

Swanson, Steve

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

Since FDDI fiber is not specified to support a center launch (and current analysis suggests that greater than 60% of the links would fail the center launch), the IEEE Draft P802.3aq should require the mode-conditioning patch cord per 38.11.4 as the specified launch. This is the same launch that has been previously specified for 1000BASE-LX on multimode fiber and 10GBASE-LX-4 on multimode fiber in the current Ethernet standard. If the Working Group elects to include the center launch, it should be included only as part of an informative annex.

SuggestedRemedy

Replace: ""The optical launch condition at TP2 is either the preferred launch or the alternative launch (at the userÆs 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: ""To ensure that the requirements of 68.5.1 are met, the 10GBASE-LRM transmitter output shall be coupled through a single-mode fiber offset-launch mode-conditioning patch cord as defined in 38.11.4""

Proposed Response *Response Status* **U**

REJECT.
This topic has been debated at length during previous revision cycles and there is clear consensus within the Task Force in favour of using both Offset Launch and Center Launch for 62.5um and 50um OM2 fiber types.

Comments, and voting results, on this topic during Draft 1.0 cycle are as follows:

Comment 52 - Include both offset and centre launch encirlced flux specs for 62.5um MMF - For: 31; Against: 0; Abstain: 6

Comment 56 - Include both offset and centre launch encirlced flux specs for 50um, OM2 MMF - For: 30; Against: 0; Abstain: 10

Yes:25
No: 6
Abstain: 8

Cl **68** *SC* **68.5** *P* **17** *L* **10** # 1032

Kolesar, Paul
Systimax

Comment Type **TR** *Comment Status* **R** *D2.0 comment 160*

In Table 68-2, the maximum operating range for 50 um fibers with 500/500 and 400/400 MHz-km modal bandwidths have not been substantiated by simulation or experimental data. The properties of populations of these fibers are substantially different from 62.5 um and OM3 fibers so that they must be analyzed independently for each 50 um fiber type. For example, all specifications for operation on 62.5 and OM3 fibers were based on analysis with fibers having no less than 500 MHz-km bandwidth at 1300 nm. In addition the installed base of 50 um fibers with 500/500 bandwidth has a distinctly different bandwidth distribution than that of 62.5 um fibers.

SuggestedRemedy

Perform necessary analysis and experiments to determine actual range limits. To that end, the Task 1 Channel Modeling ad-hoc group have been developing ""worst case"" fiber models for 50 um fibers of similar sort to that of the 108-fiber model developed for 62.5 um fibers. This work must be brought to completion and the results applied to determine actual operating ranges on the 500/500 and 400/400 MHz-km grades of 50 um fiber. Monte Carlo models or, preferably, actual fiber data will also be required to analyze statistical distributions and the dual launch approach.

Proposed Response *Response Status* **U**

REJECT.
Specific change to document not suggested.

Cl **68** *SC* **68.5** *P* **17** *L* **78** # 1033

Abbott, John
Corning Incorporated

Comment Type **TR** *Comment Status* **R** *D2.0 comment 165*

The long standing philosophy in 802.3 is to employ worst case design values to ensure a robust system. The LRM specifications need to balance requirements for (a) worst case design (i.e. failure rate of less than 1%); (b) functional objectives (i.e. 300m & BER<10^-12), and (c) low cost/complexity (i.e. PIE-D = 5dB). The ISI parameters in Table 68-4 for the comprehensive stressed receiver test are not consistent with a 1% duplex link failure rate based on Monte Carlo modeling with the Gen67YY data set; nor are they consistent with a 1% single channel failure rate based on calculations using actual 98-99 fiber DMD data. Hence the link length will need to be reduced so that (a)-(b)-(c) are all met.

SuggestedRemedy

The specific suggested remedy based on simulation results and actual fiber DMD data is to reduce the length 15% to 255m in table 68-2 p.17 lines 7-9 for 62.5.um fiber. The required change in target length needs to be finalized by 802.3aq once the complexity (c) is finalized.

Proposed Response *Response Status* **U**

REJECT.
See comment 158.

Motion to accept in principle.
See comment 158; Beyond this, further change not required.
Moved: David Law
Seconded: Mike Dudek.

Motion to amend
See comment 158; Also change 62.5um and 500/500 50um 300m operating range upper limits to 220m in Table 68-2.
Moved: Paul Kolesar
Seconded: Steve Swanson
For: 7
Against: 23
Abstain: 2
Motion to amend fails

Motion to amend
Reject with same explanation.
Moved: Piers Dawe
Seconded: Jonathan King
For: 22
Against: 6
Abstain: 3

Motion becomes:

Motion to reject.

See comment 158; Beyond this, further change not required.
Moved: David Law
Seconded: Mike Dudek.

For: 30
Against: 4
Abstain: 2

Cl **68** *SC* **68.5** *P* **18** *L* **9** # 1034

Abbott, John — Corning Incorporated

Comment Type **TR** *Comment Status* **R** *D2.0 comment 166*

The center wavelength range of the laser in table 68-3 is 1260-1355nm. A calculation has been done to determine the impact on failure rate as the laser wavelength is shifted from 1300 to 1355nm. A similar calculation was done by TIA during the development of the OM3 product (see Pepeljugoski et al., JLT vol.21 No.5 May 2003 p.1273 figure 17); in that case the failure rate increased by 0.3% as the wavelength shifted 5nm off of 850nm. Calculations based on the Gen67YY Monte Carlo set indicate that shifting from 1300 to 1355nm increases the failure rate between .75%(PIE-D=5) and 1.5%(PIE-D=4) depending on PIE-D required. Hence the target length will need to be reduced slightly.

SuggestedRemedy

The specific suggested remedy based on simulation results is to reduce the LRM length by 10% to 270m in table 68-2 p.17 lines 7-9 for 62.5.um fiber. The calculation of the required change in target length needs to be verified by the 802.3aq LRM task force. The calculation will need to be repeated and the target length will change if there are adjustments in the required complexity (c) [PIE-D implicit in comprehensive stressed receiver test] and target % failure rate [coverage of installed base]. A similar effect is expected with OM3 fiber.

Proposed Response *Response Status* **U**

REJECT.

Motion to reject with the explanation:
TP2 group has recommended that we choose or create TP2 stressors that are approximately 0.07dB greater than TP3 stressors and enter into TWDP code. However no changes to Draft 2.0.
Moved: David Law
Seconded: Norm Swenson
Passed without opposition

Cl **68** *SC* **68.5** *P* **28** *L* **50** # 1035

Thaler, Pat

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

The relationship of Table 68-2 and Figure 68-5 is unclear. I think there should be some transition statement to make it clear that the FDDI fiber is a different fiber type from the fibers addressed in the Table. Also the text that references the figure uses a couple of forms of ""legacy multimode fiber"" to describe the fiber but the figure calls it FDDI-grade multimode fiber which gives a more specific understanding of the fiber type.

SuggestedRemedy

Insert after ""For information:"" ""Legacy 62.5/125 fiber that was installed to meet the requirements of FDDI does not necessarily provide the characteristics of fiber types in Table 68-2.""

Proposed Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Change title of Figure 68-5 to "Percentile coverage of randomly selected 62.5 um 160/500 and 62.5um 200/500 multimode fibers"

Cl **68** *SC* **68.5** *P* **28** *L* **50** # 1036

Diab, Wael

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

The note and figure (68-5) on coverage are not consistant with previous optical clauses. It is not clear to me that this adds any value but introduces confusion.

SuggestedRemedy

Please delete the informative note and figure 68-5

Proposed Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Reject
In order to maintain technical integrity of standard it is necessary to set customer expectations relative to past optical PMDs.
Yes: 32
No: 2
Abstain: 6

Reconsideration (approved by acclamation)
Straw poll conducted on the following 4 proposed responses. Voting results shown next to each response heading.

Diab Response 39 votes
Abhijit's stressors from comment 1063;
In Table68-2: 220m for both 62.5um fibers and for 50um OM2.
Remove coverage figure and accompanying text

Bhoja Response 18 votes
Use stressors from Abhijit's comment for normative test
(Coverage figure remains)

Shanbhag Response 15 votes
Use stressors from Abhijit's comment for normative test
(Coverage figure remains)
Add informative annex with stressors from Sudeep's comment

Ghiasi Response 15 votes
Use stressors from Abhijit 1063 for split symmetric, 4.11 dB
Pre Ewen Channel 16, and
4.2 dB Post
Remove figure

Motion on Diab Response:
Moved: Wael Diab
Seconded: Jan Peeters Weem
Accept in principle all comp rx stress test stressor comments with:
Abhijit's stressors from comment 1063;
In Table68-2: 220m for both 62.5um fibers and for 50um OM2.
Remove coverage figure and accompanying text
Editor has authority to implement resulting changes.

Yes: 45
No: 3
Abstain: 3

Cl **68** *SC* **68.5** *P* **28** *L* **50** # 1037

Swanson, Steve

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

The addition of the informative text and Figure 68-5 into D/2.1 appear to suggest that the specified ranges in Table 68-2 for all fibers (except 50um 400/400 which is already noted as conservative) cannot be supported while meeting the stated priorities of cost, heat, size and time to market as well as the long-standing and widely accepted precedents of utilizing worst case design philosophy and plug and play operation. Since it is not clear how the Working Group will resolve the comments related to the stressed receiver sensitivity, the addition of the text and Figure 68-5 seems premature. In any event, it is recommended that the standard specify normative operating ranges based on stressors that can be supported in a robust manner and include all information on statistical coverage in an informative annex to clause 68.

SuggestedRemedy

Add a footnote tied to the operating range of all fibers in Table 68-2 (except 50um 400/400) that reads: ""For other distances, see Annex 68.x for information on the tradeoffs between operating range and coverage estimates for the installed base of legacy multimode fiber.""

Replace: ""For information: In order to provide a balance between support for installed legacy multimode fiber and lower power, higher density and lower cost, 10GBASE-LRM trades off the percentile coverage as a functionof operating range. This trade-off is illustrated in Figure 68û3. From Figure 68û3 it can be seen that 10GBASE-LRM supports the vast majority of legacy 62.5/125 multimode fiber with length of 300 m and very nearly all legacy 62.5/125 multimode fiber of length less than 220 m.""

With: ""For information: In order to provide a balance between support for installed legacy multimode fiber and lower power, higher density and lower cost, users of 10GBASE-LRM may consider the tradeoff between the estimated coverage as a function of operating range. This trade-off is illustrated in Figure 68û3.""

Modify Figure 68-5 to include duplex coverage numbers for the mode-conditioning patch cord launch. If it is decided to provide informative information on an alternate launch (e.g. center launch), include those numbers as well as the statistics of a dual launch (i.e., the graph should include all launch statistics not just the dual launch). Move this text and Figure 68-5 to a new informative annex.

Proposed Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
See response to comment 1036.

Cl **68** *SC* **68.5** *P* **28** *L* **53** # 1038

Dallesasse, John

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

Improper grammar.

SuggestedRemedy

Change ""..with length of.."" to ""..with lengths to.""

Proposed Response *Response Status* **C**

REJECT.
Text in question to be removed. - See response to comment 1036.

Cl **68** *SC* **68.5** *P* **28** *L* **54** # 1039

Dudek, Mike

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

The description of the coverage issue is a good idea. However it does not mention fiber types other than 62.5/125. This needs to be clarified but I'm not sure what the appropriate coverage percentages are.

SuggestedRemedy

Add an additional sentence at the bottom of page 28

Option 1
""The percentage coverage for other fiber types at the maximimum operating range listed in table 68-2 is expected to be greater than 99%.""
Option 2
""The percentage coverage for other fiber types at various link lengths is expected to be similar to Figure 68-3 when the horizontal axis is scaled to the maximum operating range in table 68-2
Option 3
""The percentage coverage for 50um 400/400 and 50um 1500/500 fiber types at the maximimum operating range listed in table 68-2 is expected to be greater than 99%. The percentage coverage for 50u 500/500 fiber type at various link lengths is expected to be similar to Figure 68-3.

Proposed Response *Response Status* **C**

This comment was WITHDRAWN by the commenter.
See response to comment 1036.

Cl **68** *SC* **68.5** *P* **29** *L* **18** # 1040

Thaler, Pat

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

If (f) is an editor's note, will it be removed before publication? Usually that statement is included. The note content won't be appropriate for after publication since it mentions the task force.

More importantly, the content of the note appears to indicate that confidence in this number is lower than for the other numbers in the table and that this fiber type is not as important as the others.

SuggestedRemedy

My preference is to either delete the fiber type or, if the type is believed to be important, get the missing data to produce a number similar in confidence to the other figures in the table. If neither of these is done, then at a minimum provide a note that indicates this is a more conservative figure than the others.

Proposed Response *Response Status* **W**

ACCEPT IN PRINCIPLE.
Replace the footnote with: "This operating range is conservative."

Cl **68** *SC* **68.5** *P* **30** *L* **23** # 1041

Dudek, Mike

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

The title of Figure 68-3 doesn't convey the correct information. The coverage is supposed to be for duplex links, but the title implies single fibers

SuggestedRemedy

Change ""multimode fibers"" to ""multimode fiber pairs""

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change ""multimode fibers"" to ""duplex links""

Note from editor: Comment resolution committee subsequenly decided to remove the figure in question. - See response to comment 1036.

Cl **68** *SC* **68.5.1** *P* *L* # 1042

Dallesasse, John

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

See Nick Weiner's Comment #167 in recirculation package.

SuggestedRemedy

Per Weiner Comment #167.

Proposed Response *Response Status* **U**

REJECT.
This is a proposal to reconsider a resolved comment.
Motion to reconsider
Moved: John Dallesasse
Seconded: Robert Lingle Jr.
Yes: 7
No 16
Abstain: 0
Motion fails

Cl **68** *SC* **68.5.1** *P* **18** *L* # 1043

Weiner, Nick Phyworks

Comment Type **TR** *Comment Status* **R** *D2.0 comment 167*

Transmit signal rise and fall times: For all analysis leading to the development of the clause and receiver tests in particular, transmit signal rise and fall times of 47ps has been assumed. For link behaviour as predicted by the analyses, this rise and fall time needs to be achieved. New transmitter parameter suggested, togeher with test pattern and measurement method subclause.

SuggestedRemedy

New row for Table 68-3 (transmit characteristics): ""Signal rise time and fall time (20 % to 80 %)"" ""max"" ""47"" ""ps"". New row for Table 68-5 (test patterns): ""Transmit signal rise and fall times"" ""Square, ten ONEs and ten ZEROs"" ""68.6.X"" New subclause (after 68.6.5): 68.6.X Transmitted signal rise and fall time The transmitted signal rise and fall times are measured between 20 % of the OMA above the mean logic ZERO value and 20 % of the OMA below the mean logic ONE value.

Proposed Response *Response Status* **U**

REJECT.
TWDP ensure adequate tx performance. This test not needed.

Cl **68** *SC* **68.5.1** *P* **18** *L* **28** # 1044

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **R** *D2.0 comment 173*

The eye mask coordinates might need minor tweaking when we know more about the range of acceptable transmitters from the TP2 study. I do not wish to adjust them now but I am logging this comment to put the issue on the living list.

SuggestedRemedy

When the TP2 study is complete and TWDP is settled, review the eye mask coordinates for consistency (should be a little bit easier than TWDP), and make small changes if necessary.

Proposed Response *Response Status* **U**

REJECT.
Specific remedy not proposed.

Cl **68** *SC* **68.5.1** *P* **18** *L* **30** # 1045

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **R** *D2.0 comment 174*

The TWDP limit must be revised to agree with what cost-effective transmitters can do. It is not obvious that the stressors need be included in TWDP at all, and their inclusion may (dis)favour specific transmitters against equivalently useful transmitters according to the choices made in defining the three stressors. This is another comment that we may not be able to close for a while. Note that TWDP is the best thing we have; we do need a relevant test of transmitter quality, and eye mask is not relevant enough. 'Just get rid of TWDP' is not a practical option.

SuggestedRemedy

Investigate the usefulness of a 'TWP' metric without emulated fibers. If this doesn't work, consider whether the relevant criterion is the worst of the three cases, the worst difference to PIE-D or PIE(n,m) of the Gaussian reference transmitter with those cases, the mean of the three cases, the mean of the three differences, or what. Choose a new and suitable limit.

Proposed Response *Response Status* **U**

REJECT.
See motion recorded in response comment 255.

Cl **68** *SC* **68.5.1** *P* **30** *L* **27** # 1046

Thaler, Pat

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

Please move Tables 68-3 and 68-4 text which references them.

SuggestedRemedy

Move the tables to appear closer to the text that references them (before Figures 68-5 and 68-6.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Editor agrees with commenter, but was not able to pursuade FrameMaker to put the tables as close to the referencing text as would seem desirable.

Cl **68** *SC* **68.5.1** *P* **31** *L* **34** # 1047

Swanson, Steve

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

Despite the current thinking that forcing the end user to experiment with two launches to achieve a functional link is acceptable, the standard should specify what is required to guarantee an operable link. Users may elect to try alternative launches but it is unacceptable to encourage it in the normative part of the standard.10GBASE-LRM is no different than 1000BASE-LX and 10GBASE-LX-4 in that all three PMDs are intended to support the installed base of multimode fiber with a transmitter that the fiber is not designed to support. Both 1000BASE-LX and 10GBASE-LX-4 REQUIRED the mode-conditioning patch cord to ensure that the operating range could be met; there is no reason 10GBASE-LRM should be any different.

SuggestedRemedy

Change ""Optical launch for 62.5 Ám fiber:"" to read ""Optical launch for OM1 and 160/500 62.5 Ám fiber:"" to be consistent with text used for OM2 fiber.

Delete ""Preferred for both OM1 and OM2 fibers.

Delete ""Encircled flux for alternative launch"" on lines 36 and 37 for 62.5um fiber and on lines 41 and 42 for OM2, 50um fiber as well as the associated specifications in the second column for both OM1 and OM2 fibers.

Proposed Response *Response Status* **U**

REJECT.
See response to comment 1031.
Yes: 25
No: 5
Abstain: 7

Cl **68** *SC* **68.5.1** *P* **31** *L* **53** # 1048

Swanson, Steve

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

All transmit characteristics apply at TP2; therefore, this footnote is not needed.

SuggestedRemedy

Delete footnote b.

Proposed Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **68** *SC* **68.5.1** *P* **32** *L* **2** # 1049

Swanson, Steve

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

Assuming acceptance of previous comments, footnote e is no longer required.

SuggestedRemedy

Delete footnote e.

Proposed Response *Response Status* **U**

REJECT.
See response to comment 1031.
Yes: 28
No: 5
Abstain: 4

Cl **68** *SC* **68.5.1** *P* **36** *L* **16** # 1050

Dudek, Mike

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

Table 68-4. This is further clarification of the comment 117 from draft 2.0 that had a lack of consensus.

What matters to the Receiver is the signal to noise ratio of the equalized signal (plus a maximum amount of distortion). The existing specification assumes OMA of the Tx will represent this quantity well, however this has been found not to be true. A more accurate measure of this quantity is (OMA - TWDP) and this quantity also has the advantage that inaccuracies in the measurement of OMA cancel out. We should use this more accurate measurement for the minimum required output signal amplitude. Also there is no need to restrict the average optical power so tightly.

SuggestedRemedy

Table 68-4 page 36.
Change Launch power in OMA min to -9.5dBm +TWDP. (but no less than -5.5dBm)
Change Average power min to -7.5dBm

Change Fig 68-11 (page35) to the accompanying figure. (without the differentiation of colors which are included to show the change from the existing figure).

Table 68-5 page 37.
Change Lowest power in OMA to -7.5dBm
Change Lowest Average power to -9.5dBm.

Proposed Response *Response Status* **U**

REJECT.
TWDP has not been shown to provide an approximation of the power penalty experienced when using a real receiver. The committee would wish to see evidence that the TWDP does provide this approximation before agreeing to the proposed change.
Yes: 16
No: 2
Abstain: 2

Cl **68** *SC* **68.5.1** *P* **36** *L* **35** # 1051

Dawe, Piers

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

The method of indenting to indicate headings and group table entries works so well for the receiver table, let's use it here.

SuggestedRemedy

Indent 'Preferred' and 'Encircled flux ...', just twice each.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Identing applied, as suggected. Not exactly as for rx table (where separate heading rows are used) as this would have made the table too large to fit a single page.

Cl **68** *SC* **68.5.1** *P* **36** *L* **37** # 1052

Kolesar, Paul

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

Simulations of link coverage for center launch have been based on a uniform distibution of lateral offsets between the laser beam and the fiber core center that ranges from 0 to 3um. However, per Kropp and Bottacchi contribution to Task 2 of December 2004, the center launch encircled flux specification permits offsets as large as 6um. This results in incorrect coverage calculations that are to be reflected in Figure 68-5 of clause 68.5.

SuggestedRemedy

Run simulations of center launch and dual launch coverage with uniform distribution of lateral offset between laser and fiber core center ranging from 0 to 6um. Represent these results, instead of those using the current 0 to 3um range, in the coverage calculations that will be reflected elsewhere in the document.

Proposed Response *Response Status* **U**

REJECT.
The TP2 group have modelled launches and discussed them at length during the task force process. It is believed that the launch modelling is already adequate for development of this standard.
Yes: 22
No: 9
Abstain: 5

Accept in principle, changing 6um to 4.5um
Yes: 11
No: 22
Abstain: 8

Reject.
It is not clear to the committee that the document should be changed at this time. The commenter and others are encouraged to perform simulations and advise the committee if the results support changes to the document
Yes:30
No: 0
Abstain: 3

Cl **68** *SC* **68.5.1** *P* **36** *L* **38** # 1053

Kolesar, Paul

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

Simulations of link coverage for center launch have been based on a uniform distibution of lateral offsets between the laser beam and the fiber core center that ranges from 0 to 3um. However, the center launch encircled flux specification permits offsets as large as 6um per Kropp and Bottacchi contribution to Task 2 of December 2004. This results in incorrect coverage calculations that are to be reflected in Figure 68-5 of clause 68.5.

SuggestedRemedy

Modify the encircled flux specifications to be consistent with the current simulations.
Specifically change the alternate launch specifications for 62.5um fiber to read:
30% within 4.5 um radius;
86% within 10.5 um radius.
And change the alternate launch specifications for OM2, 400/400 MHz-km, and OM3 50um fiber to read:
30% within 4.0 um radius;
86% within 9.5 um radius.

Proposed Response *Response Status* **U**

REJECT.
Standard, as written, does not allow 6um offset, as suggested by commenter, due to constraints on coupling ratios between single mode launch (for use of mode conditioning patch cord) and multi-mode launch (for direct launch into MMF) implied by TP2 tx OMA limits.
Yes: 24
No: 5
Abstain: 6

Cl **68** *SC* **68.5.1** *P* **36** *L* **52** # 1054

Dawe, Piers

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

This statement 'The loss of the patchcord between MDI and TP2 can vary.' is misleading. We should not be suggesting that the loss of a patch cord can vary (through time), but that different patch cords can have different losses.

SuggestedRemedy

Change to 'Different patchcords can have different losses between MDI and TP2. This range of losses must ...'

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Patchcord losses, between MDI and TP2, differ. The range of losses must be accounted for
..

Cl **68** *SC* **68.5.1** *P* **36** *L* **53** # 1055

Dawe, Piers

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

Consistent punctuation

SuggestedRemedy

patch space cord (twice here, once in 68.9.3)

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.5.2** *P* **19** *L* **31** # 1056

Weiner, Nick Phyworks

Comment Type **TR** *Comment Status* **A** *D2.0 comment 201*

Receiver test parameter values in Draft 2.0 were suggested in before our current method for deriving the values was developed. We now have values that have been carfully derived, considering real world implementation factors, to facilitate rapid introduction of low cost, low power 10GBASE-LRM implementations. Together with the other 10GBASE-LRM compliance tests, the resulting receiver test will ensure robust performance of 10GBASE-LRM in the field.

SuggestedRemedy

Pre-cursor values: 0.168 0.188 0.527 0.117
Symmetrical values: 0.000 0.513 0.000 0.487
Post-cursor values: 0.254 0.453 0.155 0.138

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

This comment remains unresolved at 10am Thur 16th June 2005
See responses to comment 196 and 401.

19th July 2005:
Vote to Accept
Yes: 24
No: 21
Abstain: 2

Vote to reject:
Yes: 21
No:23
Abstain: 3

20th July:
See response to comment 1036

Cl **68** *SC* **68.5.2** *P* **19** *L* **31** # 1057

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **A** *D2.0 comment 196*

These 'ISI parameters' are wrong. Parameters must be chosen with regard to the project's priorities of cost, heat, size and timescale. Also, we need to be sure that the _combination_ of pulse spreading and noise loading is acceptable for 2005-vintage equalising receivers, so at time of writing I can't sign off even my best guess.

SuggestedRemedy

My best guess parameters are:
0.168 0.188 0.527 0.117,
0.000 0.513 0.000 0.487,
0.254 0.453 0.155 0.138.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Motion

Reject.
Stressors will not adequately support robust 10GBASE-LRM to the 300m distance.
Moved: John George
Seconded: John Abbott

Motion to call question:
For: 21
Agaist: 3

For: 13
Against: 19
Abstain: 7

Motion

Reject

Lack of consensus that the stressors will adequately support 10GBASE-LRM over 300m.

Moved: John Abbott

Failed - No seconder.

Motion

Accept in priciple.

Stressor values to be as given in suggested remedy.

Moved: Steve Swanson
Seconder: Paul Kolesar

For: 19
Against: 13
Abstain: 8

This comment remains unresolved at 9.30am Thursday 16th June 2005.

19th July 2005 Afternoon

Straw poll on stressor values:

No change. Retain Draft 2.1 stressors
Pre-cursor: 0.65, 0.50, 0.91, 0.26 (5.1 dB)
Symmetrical: 0.88, 0.58, 0.89, 0.10 (4.75 dB)
Post-cursor: 0.51, 0.89, 0.29, 0.81 (5.1 dB)
16 votes

Bhoja, Lindsay, Telang comments
Pre-cursor: 0.354, 0.038, 0.412, 0.196 (4.57 dB)
Symmetrical: 0.086, 0.387, 0.096, 0.430 (4.57 dB)
Post-cursor: 0.256, 0.397, 0.110, 0.23 (4.56 dB)
22 votes

Babla, Dawe, Weiner comments
Pre-cursor: 0.168, 0.188, 0.527, 0.117 (3.82 dB)
Symmetrical: 0.000, 0.513, 0.000, 0.487 (3.83 dB)
Post-cursor: 0.254, 0.453, 0.155, 0.138 (4.2 dB)
25 votes

Shanbhag comment
Pre-cursor: 0.158, 0.176, 0.499, 0.167 (4.03 dB)
Symmetrical: 0.000, 0.513, 0.000, 0.487 (3.83 dB)
Post-cursor: 0.254, 0.453, 0.155, 0.138 (4.2 dB)
22 votes

No position: 3

61 people present.

Vote on acceptance of stressors in suggested remedy:
For: 22
Agaist: 21
Abstain: 5

Vote on rejection of stressors in suggested remedy:
For: 19
Against: 22
Abstain: 6

Further responses discussed:

A) Acceptance in principle of stressors in suggested remedy, together with revised operating range, in Table 68-2, to 220m. Also add footnote referencing new annex with informative info about how to achieve longer reach. Annex will include the Bhoja stressors (comment 1165).

B) Acceptance in principle of stressors in suggested remedy, together with revised operating range, in Table 68-2, to 220m. Add footnote: Link lengths longer than 220m are considered engineered links. Bandwidth requirements for such links need to be greater than the minimum specified for FDDI fiber. Refer to new annex for further information.

C) Acceptance in principle of stressors in suggested remedy. Also, add new column to Table 68-2, indicating 220m operating range and referring to Figure 68-5.

Straw poll:
A) 5
B) 5
C) 27

Vote on response C:
Yes: 24
No: 22
Abstrain: 3

19th July 2005 Evening

Further possible responses, and straw poll results:

1) Change distance in Table-2, for 62.5um fiber, to 220m. Adopt stressors from Abhijit's comment. 19 votes
2) Adopt the post-cursor stressor from Piers's comment. 34 votes
3) Use stressors from Piers's comment for normative test and add a new informative annex with stressors from Sudeep's comment and an explanation that they correspond to a higher (approx 99%) coverage at 300m. 27 votes
4) Use stressors from Piers's comment for normative test and add new informative annex with stressors from Sudeep's comment and explanation that they correspond to higher (99% ?) coverage. Also move coverage curve to this annex. And reference to the annex under table 68-2. 19 votes
5) Use stressors from Piers's comment for normative test and add new informative annex with stressors from Sudeep's comment and explanation that they correspond to higher (99% ?) coverage. Also, move coverage curve to this annex. Change distance in Table 68-2, for 62.5um fiber, to 220m. 11votes
6) Stressors from Abhijit's comment. Change distance to 220m if it is shown that coverage at 300m falls below 90%. Informative annex for coverage plot and Sudeep's stressors. 17 votes

7) Pre-cursor and post-cursor stressors from Abhijit's comment. No split-symmetrical stressor. Change distance to 220m if it is shown that coverage at 300m falls below 90%. Informative annex for coverage plot and Sudeep's stressors. 2 votes
8) Use stressors from Abhijit's comment for normative test and add a new informative annex with stressors from Sudeep's comment and an explanation that they correspond to a higher (approx 99%) coverage at 300m. 29 votes
9) Use stressors from Abhijit's comment for normative test and add a new informative annex with stressors from Sudeep's comment and an explanation that they correspond to a higher (approx 99%) coverage at 300m. Change operating range for 62.5um fiber to 220m in Table 68-2. 21votes
10) Use post-cursor and split-symmetric stressors from Abhijit's comment and precursor stressor 20B from John Ewen's set for normative test. Add a new informative annex with stressors from Sudeep's comment with an explanation that they correspond to a higher (approx 99%) coverage at 300m. 17 votes

Number of people in room: 51

Vote to accept suggestion 8 as direction to resolve all comp rx test stressor comments.
For: 29
Against: 16
Abstain: 5

20th July:
See response to comment 1036

Cl **68** *SC* **68.5.2** *P* **19** *L* **31** # 1058

CUNNINGHAM, DAVID AGILENT TECHNOLO

Comment Type **TR** *Comment Status* **R** *D2.0 comment 200*

The three sets of ISI parameters need to be replaced by new ones. At the end of the last two meetings it was generally agreed that they were approximate placeholders. In addition, the methodology used to select the ISI stressors is flawed because it does not take into account the purpose of project 10GBASE-LRM per the approved PAR (see text from PAR). The purpose of 10GBASE-LRM dictates a reasonable balance between the following: Support of FDDI-Grade fiber and lower-cost smaller form factor transceivers per the 10GBASE-LRM PAR parts 14. The stress test stressors should not be based on PIE_D values of worst-case link scenarios. Rather to allow lower cost, lower power implementations, the stressors should be back-off from the worst-case PIE_D values. This approach would mimic the proven methodology used by Gigabit Ethernet in the original development of SRS conformance tests for Ethernet. The objectives for the stress test should be: a) With reasonable confidence disallow poor EDC implementations (e.g.: insufficiently long FFE section, very noisy optical-equalizer combinations). b) Ensure that a compliant receiver can recover valid but highly stressed signals. In common with Gigabit Ethernet the LRM stress signals should not be worst-case stress signals.

SuggestedRemedy

I believe that new stressors are to be proposed for the comment review meeting. If they are closer to 4 dBo PIE_D equivalent than 4.5 dBo PIE_D equivalent I am likely to support them.

Proposed Response *Response Status* **U**

REJECT.
No specific remedy suggested.

Cl **68** *SC* **68.5.2** *P* **19** *L* **41** # 1059

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **R** *D2.0 comment 205*

Rise time for simple stressed receiver test needs to be appropriately related to comprehensive stressed test tap weights. We will need to consider the metric for comparison, the desired deliberate offset, implications of noise loading and of difference in signal levels. We should pick a new rise time that is easier for the receiver than the comprehensive stressed receiver sensitivity spec by an amount to cover experimental tolerances.

SuggestedRemedy

Considering all the above, choose a new rise time that is a little easier for the receiver than the comprehensive stressed receiver sensitivity spec.

Proposed Response *Response Status* **U**

REJECT.
Specific remedy has not been suggested.

Cl **68** *SC* **68.5.2** *P* **20** *L* **7** # 1060

Thompson, Geoff

Comment Type **TR** *Comment Status* **R** *D2.0 comment 213*

The receiver max input should be able to tolerate the max transmitter output likely to be encountered (plus margin) and be stated as such.

SuggestedRemedy

Change the text that reads:
"f The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having a power level equal to the average receive power (max) plus at least 1 dB."

To:
"f The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having a power level equal to the average transmit power (max) of any 802.3 optical transmitter plus at least 1 dB."

Proposed Response *Response Status* **U**

REJECT.
The present value covers existing 802.3 multimode PMDs. Not possible to anticipate future standards.

Cl **68** *SC* **68.5.2** *P* **37** *L* **23** # 1061

Dawe, Piers

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

For table 68-5: a lowest possible compliant peak power does exist. I believe it is -6 dBm. It may be worth adding to the table to save the reader trying to puzzle out why a maximum peak power is listed but a minimum is not.

SuggestedRemedy

Add row for minimum peak power, -6 dBm.

Proposed Response *Response Status* **C**

REJECT.
Yes: 16
No: 4
Abstain: 5

Cl **68** *SC* **68.5.2** *P* **40** *L* **37** # 1062

Dawe, Piers

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

Need a new risetime for the simple Rx test to go with new stressors. If the current risetime of 129 ps after Bessel-Thomson filter represents 126 ps before Bessel-Thomson filter, that's a TWDP of 4.8 dB (~0.25 dB below the hardest stressor in D2.1). For the stressors I and others propose, a risetime of 105 to 107 ps unfiltered, 108 to 110 ps filtered, TWDP of 3.7 to 3.8 dB might be suitable.

SuggestedRemedy

Change the filtered risetime in the table from 129 ps to 108 ps

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change the filtered risetime in the tx table to 115 ps.
(This corresponds to a PIE-D value of 4dB, and to a 2.3GHz Gaussian filter)

Cl **68** *SC* **68.5.3** *P* **30** *L* **25** # 1063

Shanbhag, Abhijit

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

The ISI parameters in D2.1 were suggested in another era (dark ages) within standards development. There has been comprehensive work done within the channel modeling group since. Further, multiple silicon & module vendors can now make a much better judgement, based on real silicon implementations (e.g., with CMOS technology) of fully adaptive EDC and real 10G modules, in selecting challenging stressors to facilitate low cost, low power implementations in '05 and '06, while keeping with a very robust PAR. In addition, a more practical methodology to select the stressors has been developed and agreed to within the Task Force in making the stressor selection.

SuggestedRemedy

Pre-cursor tap weights: {0.158, 0.176, 0.499, 0.167}
Symmetrical tap weights: {0.000, 0.513, 0.000, 0.487}
Post-cursor tap weights: {0.254, 0.453, 0.155, 0.138}

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Vote to accept:
Yes: 19
No: 18
Abstain: 12

Vote to reject:
Yes: 17
No: 23
Abstain: 10

20th July:
See response to comment 1036

Cl **68** *SC* **68.5.3** *P* **40** *L* **13** # 1064

Dawe, Piers

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

The method of grouping rows by indenting is helpful to this reader. Notice that some items which are 'conditions of ...' are not yet so grouped.

SuggestedRemedy

Move two rows 'Comprehensive stressed receiver sensitivity in OMA' and Comprehensive stressed received overload in OMA' under 'Conditions of comprehensive stressed receiver tests:'. Similarly with simple sensitivity and overload.

Proposed Response *Response Status* **C**

This comment was WITHDRAWN by the commenter.

Cl **68** *SC* **68.5.3** *P* **40** *L* **44** # 1065

Dawe, Piers

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

There is no 'damage test', just a spec to allow testers some margin to do their other tests without blowing up the receiver under test.

SuggestedRemedy

Delete the word 'test' after 'damage'.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.5.3.1** *P* **32** *L* **24** # 1066

Dallesasse, John

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

Clause 68.5.3.1 is still very weak. Link adaptation time and adaptation penalties have not been specified by this document, and the body of work to support the assertion that the time variation of the channel is limited to 10 Hz, while a good starting point, is very thin. This is a complex topic that cannot be dismissed based upon a fairly limited data set. If the group is not willing to specify a test for adaptation time, it needs to at least highlight that the PHY vendor should provide a specification for it. The approach suggested below is consistent with what has been done in the past, such as in Clause 52.11, where manufacturers are encouraged to provide a specification defining the range of environmental conditions over which normative requirements are met.

SuggestedRemedy

Add sentance to end of section as follows:

""It is further recommended that manufacturers indicate in the literature associated with the PHY the minimum adaptation time over which the normative specifications in this clause are met.""

Proposed Response *Response Status* **U**

REJECT.
The committee believes that stronger statements on dynamic performance, beyond that already in Clause 68, are not required and are beyond the scope of Clause 68.
Yes: 21
No: 5
Abstain: 6

Cl **68** *SC* **68.52** *P* **17** *L* **20** # 1067

George, John

Comment Type **TR** *Comment Status* **R** *D2.0 comment 215*

Statement must be normative.

SuggestedRemedy

Receivers will have to tolerate dynamically changing impulse response shapes and PIE-D with changes in polarization and fiber shaking. This has been shown is balemarthy_1_0105, king_1_1104, and meadowcroft_1_0105. Thus, the statement should clearly be identified as normative by removing the words "Also, for information".

Proposed Response *Response Status* **U**

REJECT.
See proposed response to comment 1.

Motion to accept this response:
Moved: Jonathan King
Seconded: Piers Dawe

For: 21
Against: 6
Abstain: 3

Cl **68** *SC* **68.6** *P* **18** *L* **15** # 1068

Swenson, Norman ClariPhy Communicati

Comment Type **TR** *Comment Status* **R** *D2.0 comment 216*

Table 68-3: Min OMA and Max OMA are not appropriate for specifying a transmit power when predistorion is permitted in the transmit waveform.

SuggestedRemedy

A new measure of transmitted power needs to be defined in terms of the standard deviation of the transmitted power. It is this value that is directly related to the matched filter bound, which is currently used as a figure of merit for the TWDP test.

Proposed Response *Response Status* **U**

REJECT.
Detailed change to document not suggested.

Cl **68** *SC* **68.6** *P* **19** *L* **31** # 1069

Telang, Vivek Broadcom Corp

Comment Type **TR** *Comment Status* **A** *D2.0 comment 219*

The values of the Precursor ISI parameters in the comprehensive stressed receiver tests have been shown to be not optimal (see John Ewen's presentation http://grouper.ieee.org/groups/802/3/aq/public/mar05/ewen_1_0305.pdf)

SuggestedRemedy

Replace with the values from Row 23 of the Precursor worksheet from the spreadsheet ""Candidate TP3 Response Rev00.xls"" submitted by John Ewen to the reflector on 4/7/05. http://grouper.ieee.org/groups/802/3/10GMMFSG/email/xls00003.xls The parameters are: 0.354 0.038 0.412 0.196, separated by 0.75 UI

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

This comment remains unresolved at 10am Thur 16th June 2005
See responses to comment 196 and 401.

Vote to accept comments 1069, 1070 and 1071
Yes: 17
No: 23
Abstain: 10

Vote to reject comments 1069, 1070 and 1071
Yes: 23
No: 18
Abstain: 8

20th July:
See response to comment 1036

Cl **68** *SC* **68.6** *P* **19** *L* **33** # 1070

Telang, Vivek — Broadcom Corp

Comment Type **TR** *Comment Status* **A** *D2.0 comment 220*

The values of the Symmetrical ISI parameters in the comprehensive stressed receiver tests have been shown to be not optimal (see John Ewen's presentation http://grouper.ieee.org/groups/802/3/aq/public/mar05/ewen_1_0305.pdf)

SuggestedRemedy

Use the values from Row 22 of the Split-Symmetric worksheet from the spreadsheet ""Candidate TP3 Response Rev00.xls"" submitted by John Ewen to the reflector on 4/7/05: http://grouper.ieee.org/groups/802/3/10GMMFSG/email/xls00003.xls The parameters are: 0.086 0.387 0.096 0.430, separated by 0.75 UI

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

This comment remains unresolved at 10am Thur 16th June 2005
See responses to comment 196 and 401.

20th July:
See response to comment 1036

Cl **68** *SC* **68.6** *P* **19** *L* **35** # 1071

Telang, Vivek — Broadcom Corp

Comment Type **TR** *Comment Status* **A** *D2.0 comment 221*

The values of the Postcursor ISI parameters in the comprehensive stressed receiver tests have been shown to be not optimal (see John Ewen's presentation http://grouper.ieee.org/groups/802/3/aq/public/mar05/ewen_1_0305.pdf)

SuggestedRemedy

Use the values from Row 20 of the Postcursor worksheet from the spreadsheet ""Candidate TP3 Response Rev00.xls"" submitted by John Ewen to the reflector on 4/7/05: http://grouper.ieee.org/groups/802/3/10GMMFSG/email/xls00003.xls The parameters are: 0.256 0.397 0.110 0.237, separated by 0.75 UI

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

This comment remains unresolved at 10am Thur 16th June 2005
See responses to comment 196 and 401.

20th July:
See response to comment 1036

Cl **68** *SC* **68.6** *P* **40** *L* **35** # 1072

Thaler, Pat

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

What is the purpose of the editor's note? It appears to indicate that this value is uncertain.

SuggestedRemedy

Values should be determined before balloting a draft. If any work is necessary to validate this value, please complete before doing further ballots and remove the note.

Proposed Response *Response Status* **W**

ACCEPT.

Cl **68** *SC* **68.6.1** *P* **20** *L* **45** # 1073

Dawe, Piers — Agilent

Comment Type **TR** *Comment Status* **R** *D2.0 comment 231*

Did we come to a conclusion on 511 bits vs. 512 bits? Is the following correct?

SuggestedRemedy

Change 'is also acceptable' to 'has the advantage of balance but can cause triggering and aliasing problems'.

Proposed Response *Response Status* **U**

REJECT.
Not consensus within Task Force on the advantage of 512 bit code.

Cl **68** *SC* **68.6.1** *P* **43** *L* **21** # 1074

Dawe, Piers

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

In table 68-9 (change bar), TWDP needs the option of the 512 bit pattern (which may be the best option) as much as Tx uncorrelated jitter does.

SuggestedRemedy

Add another superscript 'a' after 'PRBS9'.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.10** *P* **32** *L* **3** # 1075

Dawe, Piers — Agilent

Comment Type **TR** *Comment Status* **R** *D2.0 comment 245*

The contents of table 68-12, and the labels in figure 68-12, will need revision as we change and renormalise the stressors.

SuggestedRemedy

Follow other comments.

Proposed Response *Response Status* **U**

REJECT.
Can not be accepted at present.

Cl **68** *SC* **68.6.10** *P* **56** *L* **15** # 1076

Dawe, Piers

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

Considering the issues with calibrating stressed eye generators, and the need to check the comprehensive stressed eye generator with the TWDP program, it makes good sense to do the same with the simple stressed eye generator. The actual value 'X' below depends on the rise time - see another comment for proposed new rise time. If the current risetime of 129 ps after Bessel-Thomson filter represents 126 ps before Bessel-Thomson filter, that's a TWDP of 4.8 dB (~0.25 dB below the hardest stressor in D2.1). For the stressors I propose, a risetime of 105 to 107 ps unfiltered, 108 to 110 ps filtered, TWDP of 3.7 to 3.8 dB might be suitable.

SuggestedRemedy

Add:
NOTE - The TWDP values for this signal is 3.7 dB.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Add: The TWDP without simulated channels, which is measured using the same method as TWDP except that the simulated fiber stressors are set to (0,1,0,0) for this signal is 4 dB

Cl **68** *SC* **68.6.10** *P* **56** *L* **4** # 1077

Dawe, Piers

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

Consistent punctuation

SuggestedRemedy

mode conditioning

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.11** *P* **57** *L* **10** # 1078

Bergmann, Ernest

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

The use of a separate test for jitter such as illustrated in Figure 68-26 is not ""fleshed out"". It would simplify matters to combine jitter testing with the comprehensive stressed receiver test (Figure 68-19).

Making this change means that the jitter would just be an additional stress present for the receiver stress test. If this change is not implemented, it will be necessary to characterize all aspects of the ""optical pattern generator"" of Fig. 68-26 and run a separate battery of tests.

SuggestedRemedy

Remove Figure 68-26.
Revise Figure 68-26 so that a frequency synthesizer drives the clock source.
Revise text in 68.6.11 to reference Fig. 68-26

Proposed Response *Response Status* **C**

This comment was WITHDRAWN by the commenter.

In earlier drafts of Clause 68, frequence modulation of the test pattern generator clock was included. This was removed during the Draft 1.0 to Draft 1.1 revision.
See Draft 1.0 comments:
Comment 62, which removed jitter from the comp stressed rx test
Comment 118, which provided revised text for the comp. stressed rx test. Anong other changes, the revision eliminated the pattern generator clock jitter. Voting was: For 32; Against 0; Abstain: 9.

Cl **68** *SC* **68.6.2** *P* **17** *L* **40** # 1079

Swenson, Norman ClariPhy Communicati

Comment Type **TR** *Comment Status* **R** *D2.0 comment 251*

OMA, as it is used in Clause 68, should be the difference between steady state ""on"" power of the transmitter and steady state ""off"" power of the transmitter. The measurement method proposed does not guarantee that this is the value measured, particularly if there is ringing or precompensation.

SuggestedRemedy

Change the TWDP algorithm to compute OMA from the measured waveform.

Proposed Response *Response Status* **U**

REJECT.
Specific changes not suggested.
For: 15
Against: 3

19th July:

Motion to reconsider.
Moved: Peirs Dawe
Seconded: Mike Dudek
For: 5
Against: 8
Abstain: 22

Motion fails.

Cl **68** *SC* **68.6.2** *P* **17** *L* **45** # 1080

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **R** *D2.0 comment 255*

This definition of signal amplitude leads to measurement inconsistencies. Tying down the square wave pattern more precisely would lead to arbitrariness in our measurement. In 802.3ae these didn't matter because OMA was primarily used as an intermediate token in a calculation of something else - an error in OMA cancels itself out by subtraction. For LRM, we need a more precise measure of signal amplitude for TWDP. If we are to consider or allow transmitter pre-emphasis, we need a definition of signal amplitude that represents a pre-emphasised signal fairly. However, we could create a new one for TWDP use and stick with OMA for general use.

SuggestedRemedy

The histogram-at-crossing-times method is, I believe, more reproducible for non-equalised signals and fairer for equalised ones, both at TP2. But it may not be very reproducible for pre-emphasised signals, and it's not good at TP3 after a difficult fiber. I don't have a wholly satisfactory remedy at present; this TR may hang around until we have done more work to prove out the TWDP method.

Proposed Response *Response Status* **U**

REJECT.

Motion to reject comments:
255, 297, 293, 391, 393, 428, 174, 281, 294,, 299, 304, 302

No consensus to make change.

Moved: Tom Lindsay
Seconded: Sudeep Bhoja

Passed without opposition.

Cl **68** SC **68.6.4** P **33** L **31** # 1081

Dudek, Mike

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

The relationship between OMA, extinction ratio and average power described in 58.7.6 is only approximate due to the difference in patterns and measurement methods between OMA and extinction ratio. This is somewhat covered in 58.7.6 where it says ""aside from these differences"", however with pre-emphasis or at the end of a dispersive fiber there could be significant errors in the equations. Either the Extinction Ratio measurement method should be changed or a more forceful warning should be provided.

SuggestedRemedy

Option 1

Change the method of measuring ER to use the same pattern and measurement method as OMA.
Change Section 68.6.3 to read.

""For the purposes of this clause Extinction Ratio is defined as the the Mean Logic ONE value divided by the Mean Logic ZERO value. These values are those obtained according to Section 68.6.2

Delete the note about different patterns.

Remove the word approximate in Section 68.6.4 (twice on line 33 page 33).
In table 68-9 page 43 change the pattern for Extinction Ratio from 1 or 3 to Square.

Option 2

Add a sentence after ""described in 58.7.6"". Note however that due to the difference in measurment methods for OMA and Extinction Ratio the equations are only approximate and can have significant errors with signals that are distorted with undershoot or overshoot.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Option 2.
Add a sentence after ""described in 58.7.6"". "Note however that due to the difference in measurment methods for OMA and Extinction Ratio the equations are only approximate and can have significant errors for signals with undershoot, overshoot or inter-symbol interference."

Cl **68** SC **68.6.5** P **22** L **49** # 1082

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **R** *D2.0 comment 273*

The appropriate hit ratio was calculated for a non-equalising link. At some point before the end of the project we should confirm or change it as appropriate for our non-equalising situation. I don't expect that any change would be a big deal in practice, so it's not top priority.

SuggestedRemedy

Review the hit ratio; change if appropriate.

Proposed Response *Response Status* **C**

REJECT.
Specific remedy not suggested.

Cl **68** SC **68.6.5** P **23** L **14** # 1083

CUNNINGHAM, DAVID AGILENT TECHNOLO

Comment Type **TR** *Comment Status* **R** *D2.0 comment 276*

The eye mask of Figure 68-6 with co-ordinates from Table 68-3 was arbitrarily relaxed from that of 10GBASE-LR. No clearly articulated case has been presented that justifies the current co-ordinate selection. The eye mask may need change.

SuggestedRemedy

Justify the current co-ordinates or show that another set is required.

Proposed Response *Response Status* **U**

REJECT.
Precise change not specified.

Cl **68** SC **68.6.5.1** P **37** L **51** # 1084

Dudek, Mike

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

The mask test, let alone the hit ratio has not been shown to give good correlation to the transmitter penalty and the reference to 58.7.9.5 doesn't seem helpful

SuggestedRemedy

Delete everything after ""oscilloscope noise"" in the final paragraph of page 37.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.6** *P* **23** *L* **45** # 1085

CUNNINGHAM, DAVID AGILENT TECHNOLO

Comment Type **TR** *Comment Status* **R** *D2.0 comment 278*

TWDP as described in 68.6.6 and specified in Table 68-3, page 18, line 30 needs to be recalculated. There are a few reasons for this as follows: 1) For very long DFE equalizers the correctly normalized TWDP can be shown to be: TWDP = PIE_D - 5log(<P(f)/N(f)>g) + 5log(<P(f)/N(f)>a) (in dBo) where PIE_D is per Bhoja_1_0704 for the NRZ reference case, P(f) is the power spectrum of pre-distorted NRZ with random data, N(f) is the power spectrum of the reference NRZ with random data, < >g represents the geometric mean and < >a represents the arithmetic mean. To get the equation for TWDP in this form I have used an approximation by using PIE_D as the first term - but this a very good approximation and does not affect my argument. The current method of calculating TWDP does not properly account for the last term in this equation. The last term represents the increased transmit power for the waveform under test relative to the NRZ reference waveform. When this term is taken into account it becomes clear that TWDP is approximately constant and equal to PIE_D independent of the waveform. However, non-symmetric pre-distortion is generally damaging as it introduces a line spectrum that can be associated with wasted un-equalised power and jitter. 2) The channels used for estimating TWDP are not yet agreed within 10GBASE-LRM and are expected to change.

SuggestedRemedy

Correct the TWDP method so that it properly normalises the transmit power for waveforms under test relative to the NRZ reference. My comment on making the OMA a more fair representation is relevant to this issue. If that is accepted then I believe it will fix this issue too. Track the agreed test channels within 10GBASE-LRM and calculate TWDP with the most current channels.

Proposed Response *Response Status* **U**

REJECT.
No consensus for change.

Cl **68** *SC* **68.6.6** *P* **23** *L* **47** # 1086

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **R** *D2.0 comment 279*

As Intel have shown, there might be transmitter defects that are not caught by our suite of eye mask, TWDP, SNR and random jitter. This is another comment that will have to stay open 'just in case'.

SuggestedRemedy

If there are likely and serious defects not screened for, decide what to do; e.g. give a warning, do nothing, modify a test, add a new test.

Proposed Response *Response Status* **U**

REJECT.
No specific remedy suggested.

Cl **68** *SC* **68.6.6** *P* **23** *L* **51** # 1087

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **R** *D2.0 comment 281*

I'm not convinced that TWDP needs to include a set of emulated fibers; they may skew the test towards transmitters that perform relatively well with these specific cases, rather than well over a wide range of fibers. And if we can do without the emulated fibers, things get a bit simpler.

SuggestedRemedy

Investigate whether TWDP really needs or benefits from the set of emulated fibers. If not, rename it 'TWP', change 'with standard emulated multimode fibers and receiver' to 'with a standard receiver'. Change 68.6.6.1 p 24 line 22 'This algorithm analyses the waveform in combination with each of three emulated channels, equivalent to those given in Table 68-4 for the comprehensive stressed receiver specifications, and with an emulated reference receiver equalizer.' to 'This algorithm analyses the waveform with an emulated reference receiver equalizer.'. Delete this sentence: 'The TWDP measurement is the largest of the three penalty results.' Change the algorithm (p 24 lines 48-54, p25 lines 1 2 18-24 p26 lines 23-25) and Annex 68A to match.

Proposed Response *Response Status* **U**

REJECT.
See motion recorded in response comment 255.

Cl **68** *SC* **68.6.6** *P* **36** *L* **31** # 1088

Dudek, Mike

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

It appears that we should allow some additional allowance for realistic transmitters in the TWDP max value even if we do not change to a finite equalizer (see separate comment) as the 47ps perfect Gaussian pulse does not appear to be as worst case as expected. (eg according to the Vivek presentation the page 6 left (extremely good looking eye) is very close to failing the TWDP test with the post-cursor (assuming the TWDP max is set equal to the Pie D of the 47ps Gaussian pulse).

SuggestedRemedy

Change TWDP max to 5.4dB.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

TWDP (max) of 4.7dB

The committee has selected to add 0.5dB to the largest receiver test stressor PIE-D value to allow for implementation concerns in making TWDP measurements.

Also, modify the stressor values in the TWDP MATLAB code to match the comprehensive stressed receiver test stressors.

Cl **68** *SC* **68.6.6** *P* **39** *L* **48** # 1089

Dudek, Mike

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

The present TWDP code uses a very long equalizer as the reference receiver. This can equalize transmitter impairments that realistic equalizers cannot. Also due to the finite length PRBS pattern used in the test(511 bits) some non-linearities in the transmitter waveform which equalizers cannot equalize will be converted into time shifted linear interfers which the very long equalizer will equalize. Vivek Telang presented a paper at the TP2 conference call on 7/12/05 that showed that there was better correlation between a wide variety of realistic equalizers than between the realistic equalizers and the very long equalizer. We should use a shorter equalizer for the reference receiver. The choice of which shorter equalizer does not seem to make much difference based on Vivek's presentation and I propose a 14,5 (14 feedforward and 5 feedback). The TWDP allowed penalty needs to be adjusted as it now includes the implementation penalty of the shorter equalizer. I am suggesting a change that is equivalent to the difference in TWDP for the 47ps Gaussian pulse for the pre-cursor case between the very long equalizer and the 14,5 equalizer, (0.51dB) plus an additional allowance of 0.29dB for realistic transmitters. (see separate comment)

SuggestedRemedy

Page 39 line 48 change ""equalizer with many taps"" to ""equalizer with 14 feedforward taps and 5 decision feedback taps.
Section 68.6.6.2 Associated changes to the TWDP code.
Table 68-4 page 36 line 31. change ""TWDP Max 5dB"" to ""TWDP Max 5.8dB""
page 68 line 10 change ""with 100 feedforward taps (at T/2 spacing) and 50 feedback taps"" to ""with 14 feedforward taps (at T/2 spacing) and 5 feedback taps""
page 68 line 25 (change W(-25),W(-24.5),...W(24.5)"" to ""W(-7),W(-7.5),...W(6.5)""
page 68 line 30 Change ""B(1),B(2),...,B(50)"" to ""B(1),B(2),...,B(5)""
page 68 line 32 Change ""50 anticausal taps and 50 causal taps"" to ""7 anticausal taps and 7 causal taps""

Proposed Response *Response Status* **U**

REJECT.
Committee recognizes that there is interest in further study of this topic. However, evidence that proposed changes are required has not been presented.
Yes: 29
No: 6
Abstain: 10

Cl **68** *SC* **68.6.6.1** *P* **24** *L* **18** # 1090

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **R** *D2.0 comment 285*

We need to give the reader the information needed to get from a captured waveform at e.g. 7 samples/UI to a processable one. How is the interpolation to be done? Is an oversampling rate of 16 a requirement? Would 8 work? Would 32 be better? Would an odd number work? (I believe not). How is the alignment done? We'll try to bring partial information on these subject to the meeting. I expect we will be able then to start writing text along the lines of 'Measurement at 7 samples/UI would give a measurement-related error about x dB (sign?), 8 or 10 samples/UI would... Interpolation methods Y and Z may have consequences A and B. A timestep of 1/c UI for the calculation is OK/bad; an even number of c is required.' Notice that there's an alignment in 40.6.1.2.4.

SuggestedRemedy

Remove the sentence at line 18 'effective sample rate of at least 7 samples per unit interval is required.', insert a new paragraph (to be written) at line 27.

Proposed Response *Response Status* **U**

REJECT.
No specific remedy suggested.

Cl **68** *SC* **68.6.6.1** *P* **39** *L* **37** # 1091

Dawe, Piers

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

One 'the' too many? specific or specified?

SuggestedRemedy

Change to 'If test pattern 1 is transmitted, then the specified sub-pattern ...' ?

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.6.1** *P* **39** *L* **40** # 1092

Dawe, Piers

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

Missing a word

SuggestedRemedy

... for a waveform ...

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.6.1** *P* **39** *L* **48** # 1093

Dawe, Piers

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

The TWDP measurement is a procedure, not a result.

SuggestedRemedy

Change 'The TWDP measurement' to 'The reported TWDP' or 'The measured TWDP'.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Good point. Opted for: "The TWDP value is .."

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **30** # 1094

Swenson, Norman ClariPhy Communicati

Comment Type **TR** *Comment Status* **R** *D2.0 comment 293*

The TWDP algorithm scales the OMA of the measured waveform to 1 and sets the noise spectral density accordingly. A matched filter bound for a rectangular pulse with OMA 1 is used as a reference point for determining TWDP. This penalizes waveforms with larger OMAs and less predistortion in a manner that does not accurately predict link performance.

SuggestedRemedy

Change the TWDP algorithm to accurately measure the matched filter bound of the transmitted waveform and compare that to the effective SNR at the slicer of the reference equalizer. Define limits that will ensure link closure with a compliant channel and receiver.

Proposed Response *Response Status* **U**

REJECT.
See motion recorded in response comment 255.

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **42** # 1095

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **R** *D2.0 comment 297*

re 'OMA and steady-state ZERO power must also be specified.': I don't think this is viable as it stands. The assumed steady-state ZERO power matters remarkably little but the assumed OMA is too important.

SuggestedRemedy

Make the program calculate the things it needs, or at least explain clearly how they can be found with adequate accuracy. OMA may not be the right (robust, accurate, fair) metric.

Proposed Response *Response Status* **U**

REJECT.
See motion recorded in response comment 255.

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **47** # 1096

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **R** *D2.0 comment 298*

Is an oversampling rate of 16 a requirement?

SuggestedRemedy

Decide and make clear.

Proposed Response *Response Status* **U**

REJECT.
16 is not a firm requirement, but it works, and consistency should help. The commenter is encouraged to propose a specific alternative if it is needed.

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **52** # 1097

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **R** *D2.0 comment 300*

The emulated fiber tap weights are wrong.

SuggestedRemedy

Revise them following table 68-4.

Proposed Response *Response Status* **U**

REJECT. .
No specific remedy suggested.

Cl **68** *SC* **68.6.6.2** *P* **24** *L* **52** # 1098

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **R** *D2.0 comment 299*

It's a nuisance that the test cases are arranged in columns here while they are in rows in table 68-4.

SuggestedRemedy

FiberResp = [...
0.000000 0.072727 0.145455 0.218182
a b c d
e f g h
I j k l];
Delays = FiberResp(1,:); need to check if that should be FiberResp(1,:)';
(in STEP 1)
Pcoefs = FiberResp(i+1,:); need to check if that should be FiberResp(i+1,:)';

Proposed Response *Response Status* **C**

REJECT.
See motion recorded in response comment 255.

Cl **68** *SC* **68.6.6.2** *P* **25** *L* **29** # 1099

Dawe, Piers Agilent

Comment Type **TR** *Comment Status* **R** *D2.0 comment 303*

The functions butter and freqs are toolbox functions (extra cost, probably not readily portable). As the details of the anti-aliasing filter are not supposed to matter, can we replace this with something simpler? It's easy to avoid butter, if one knows that a = 1 123.14 7581.8 273450 4931300 and b = 0 0 0 0 4931300. Not sure how to get rid of freqs. Can we just write down a filter in a form like 1+cos(f/f0)^4 ?

SuggestedRemedy

Replace toolbox functions with 'plain vanilla' code, changing the filter type if it helps.

Proposed Response *Response Status* **U**

REJECT.
Specific remedy not provided.

Cl **68** *SC* **68.6.6.2** *P* **42** *L* **40** # 1100

Diab, Wael

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

Remove the Matlab code. Maintaining Matlab code over time may be difficult if something underlying to the matlab changes so that the code does not comply.

SuggestedRemedy

Replace with Math functions.

Proposed Response *Response Status* **W**

REJECT.
After extensive discussion at the June meeting, it was decided that the benefits of using MATLAB code outweight the disadvantages. The benefits being that the code is: testable; unambiguous; compact; open source alternatives exist, with which the code runs correctly; useful to implementers. Also, there is precedent in 802.3 standards for the use of MATLAB code.

Cl **68** *SC* **68.6.6.2** *P* **43** *L* **43** # 1101

Dawe, Piers

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

Table of test patterns should at present allow three options for pattern for TWDP. Test pattern is not 'based on', it IS.

SuggestedRemedy

Change 'The transmit data sequence is based on either of the TWDP test patterns defined in Table 68-5.' to 'The transmit data sequence is one of the TWDP test patterns defined in Table 68-5.'.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.6.2** *P* **44** *L* **21** # 1102

Dawe, Piers

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

No need to mention headers or footers, the format is visible just a few lines below.

SuggestedRemedy

Change '...delays in nanoseconds in columns with no headers or footers.' to '...delays in nanoseconds, in columns.'.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.6.2** *P* **44** *L* **26** # 1103

Lindsay, Tom

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

A straw poll in London requested a zero length (zero dispersion) channel be added for TWDP.

SuggestedRemedy

Add a 5th column to the array to represent the new channel.
1
0
0
0
Also, change the loop counter from 3 to 4 in line 50.

Proposed Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

This comment was WITHDRAWN by the commenter.

Cl **68** *SC* **68.6.6.2** *P* **45** *L* **19** # 1104

Dawe, Piers

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

Can this be simplified: 'one period (which is the same as the period of the input data sequence)'? I think the statement is true for any section of waveform an integral number of UI long whose end matches its beginning for several UI, but we don't need to generalise. Did we check that the subsequence pattern matched for long enough?

SuggestedRemedy

Change to 'the period of the input data sequence'.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.6.2** *P* **45** *L* **24** # 1105

Dawe, Piers

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

It's arguable whether the program produces the 'optimal' W and B, although they are near enough. But the point is that THIS program generates W and B on this basis.

SuggestedRemedy

Change 'optimal' to 'calculated' or 'computed'.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change "optimal" to "computed".

Cl **68** *SC* **68.6.6.2** *P* **45** *L* **28** # 1106

Dawe, Piers

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

The sentence beginning 'Compute the noise autocorrelation sequence ...' was not part of the preceding paragraph; it's an explanation of the four lines of code following.

SuggestedRemedy

Put this sentence on a separate line.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.6.2** *P* **46** *L* **17** # 1107

Dawe, Piers

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

In the 'plain' version there is no gap between 'max(TrialTWDP)' and '% End of program'

SuggestedRemedy

Insert some spaces

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.7** *P* **46** *L* **35** # 1108

Dawe, Piers

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

Unnecessary words.

SuggestedRemedy

Change 'The polarization rotator is required to be capable ...' to 'The polarization rotator is capable ...'.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.7** *P* **46** *L* **51** # 1109

Dawe, Piers

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

Subscript x in RINxOMA

SuggestedRemedy

If Frame allows, make the x a subscript in eq 68-3 and 68-4.

Proposed Response *Response Status* **C**

REJECT.
Subscripts do not seem to be available for use with plain text when used within an equation.

Cl **68** *SC* **68.6.8** *P* **36** *L* **3** # 1110

Thaler, Pat

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

""A clock recovery unit (CRU) should be used to trigger the oscilliscope as shown in Figure 52-9.""

It appears that the waveform in Figure 52-9 is triggered synchrously with the pattern so that it is always capturing the same point in the data pattern. This seems correct since doing otherwise would add correlated jitter to the measurement. However the text on triggering only says triggering is synchronous to the clock and doesn't mention pattern.

SuggestedRemedy

If the measurement needs to be synchronized to the data pattern say so. If it doesn't, then I think the figure should be changed to make that clear.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See response to comment 1113.

Cl **68** *SC* **68.6.8** *P* **43** *L* **14** # 1111

Dudek, Mike

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

The measurement method using an oscilloscope to measure Rj on the edges of a pattern is unlikely to give valid results with very long patterns

SuggestedRemedy

In table 68-9 delete patterns 1 and 2 for Transmitter uncorrelated jitter.

Proposed Response *Response Status* **C**

This comment was WITHDRAWN by the commenter.

Cl **68** *SC* **68.6.8** *P* **47** *L* **18** # 1112

Dawe, Piers

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

Equation (68-5) does not implement D2.0 comment 328 correctly: missing a /2

SuggestedRemedy

square-root((sigma-r^2 + sigma-f^2)/2)

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.8** *P* **47** *L* **45** # 1113

Dawe, Piers

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

Concern about whether this UJ test has positive cost/benefit. We seek to use a recovered clock for three reasons - to track out wander, to allow for testing complete transmitting systems, and because XENPAK like modules have internal clock sources. We know how to use a clock recovery unit to make a scope show an eye diagram. But to trigger to the pattern from a recovered clock needs a divider after the CRU, or a new scope. As Tx UJ appears not to be a significant issue, is the expense of this extra test equipment worthwhile? Is there another way to do the test? Remember we have separate tests to guard against Tx noise, which is the main cause of Tx UJ in a marginal transmitter.

SuggestedRemedy

Either agree that the test can be done cost-effectively, or delete the test and spec.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accept in principle
Remove transmitter uncorrelated jitter test, as the jitter is considered unlikely to cause a significant penalty, and the test may be expensive to implement.
Yes: 6
No: 10
Abstain: 13

Accept in principle
Prior to last sentence, starting P47, L47, insert: "The oscilloscope is to be synchronized to the data pattern".

Cl **68** *SC* **68.6.8** *P* **48** *L* **23** # 1114

Dallesasse, John

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

Sentance needs improvement, and ""should"" needs to be removed.

SuggestedRemedy

Change: ""The measurement should be compensated for jitter in the measurement system.""

to

""Compensation for measurement system jitter is encouraged.""

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.9** *P* *L* # 1115

king, jonathan

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

Clauses 68.6.9 to 68.6.9.4

Mixing sensitivity testing and overload testing in the same subclauses is confusing to the reader, especially since the test conditions differ slightly. Rx overload should be separated out into a distinct subclause.

SuggestedRemedy

Add a separate sub clause to address overload testing
68.6.9.5 Receiver Overload Test
Move all references to comprehensive stressed receiver test and simple stressed receiver test from subclauses 68.6.9 to 68.6.9.4 into this new subclause

Proposed Response *Response Status* **C**

REJECT.
Editor sympathizes with point made by commenter. However, as the comprehensive test is normative and the simple test is informative, not appropriate to combine the two overload tests into a single subclause . One possibility is two create two new subclauses, one for each overlead test. View of editor is that this would help to make clear that they are separate tests, but it would also involve considerable repitition, as the sensitivity and overload tests are very similar. After consideration by editor, text left unchanged in this respect.

Cl **68** *SC* **68.6.9.1** *P* *L* # 1116

Dallesasse, John

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

See Paul Kolesar's comment #333 in recirculation package.

SuggestedRemedy

Per Kolesar's comment #333, or George's comment 369.

Proposed Response *Response Status* **U**

REJECT.

This is a proposal to reconsider a resolved comment.

21st July 2005
Motion to reconsider Draft 2.0 comment 333 (here as 1117)
Moved: Paul Kolesar
Seconder: John Abbott
Motion withdrawn by mover and seconder.

Cl **68** *SC* **68.6.9.1** *P* **28** *L* **11** # 1117

Kolesar, Paul

Systimax

Comment Type **TR** *Comment Status* **R** *D2.0 comment 333*

The comprehensive stressed receiver sensitivity test insufficiently tests the capability of the receiver. Experimental reports from more than one laboratory (e.g. Balemarthy_1_0105) have shown that waveform changes induced by variations in singlemode polarization state cause variations up to 2.5 dB in PIE-D. The ability of the receiver to track such changes is untested, although the ability to support such waveform changes is required in clause 68.5.2. While arguments have been put forth that these waveform variations happen at speeds well below the feedback loop time constants of EDC chips, there are other aspects besides speed of adjustment that determine the ability of the equalizer to faithfully track such changes without inducing bit errors. For examples, the chips ability to hold accurate clock recovery, correctly adjust its coefficients (tracking accuracy), and have sufficient headroom in its adjustment range are not established only by the speed of its feedback loop. These aspects can be checked in aggregate by a test that induces variation in the received waveform that emulate changes induced by mechanical perturbation observed experimentally.

SuggestedRemedy

Add a dynamic aspect to the comprehensive stressed receiver sensitivity test. One means of accomplishing this would be to vary the tap weights of the ISI generator of figure 68-10 to emulate experimentally captured waveform changes induced by polarization state variations or multimode fiber shaking. This approach has the advantage of leveraging the measurement configuration of the existing test. The frequency of the variation should be at least 10 Hz, and the amplitude of the tap weight changes within a full cycle should be sufficient to cause an increase of 2.5 dB in PIE-D relative to the three presently defined comprehensive stressed receiver test signals of table 68-6. A possible alternative approach, if it can be shown to impart similar rigor, would be to continuously vary the test signals from the defined pre-cursor to split symmetrical to post-cursor conditions (and back again) at a rate of at least 10 Hz during the comprehensive stressed receive test.

Proposed Response *Response Status* **U**

REJECT. See proposed response to comment 1.

Also, to further address specific points raised in the comment:
Commenter> .. The chips ability to hold accurate clock recovery
Editor> This is tested during the separate comprehensive stressed receiver tests.
Commenter> .. Correctly adjust its coefficients (tracking accuracy)
Editor> Correct (and accurate) adjustment of coefficients is verified by the existing comprehensive stressed receiver tests. Tracking ability is the only aspect that would be verified by a dynamic test, and this is easily verified using informal methods.
Commenter>.. Have sufficient headroom in its adjustment range
Editor> This is verified by the existing comprehensive stressed receiver tests.

Motion to accept above response:
Moved Scott Schube
Seconded Jan Peeters Weem

Motion to call the question:
For: 24
Against: 5
Abstain: 4

Vote on motion:
For: 24
Against: 5
Abstain: 5

Cl **68** *SC* **68.6.9.1** *P* **49** *L* **10** # 1118

Bergmann, Ernest

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

The 2 sentences:

""Any implementation may be used, provided that the resulting signal and noise in the optical domain match those defined here. This consideration includes the shaping of the noise by the ISI generator.""

applies to the reference measurement configuration.

SuggestedRemedy

Relocate this pair of sentences to the end of the section (just before 68.6.9.2).

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.9.1** *P* **50** *L* **33** # 1119

Dawe, Piers

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

Blank line. Maybe it will disappear automatically in the next draft.

SuggestedRemedy

If not, delete it.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.9.1** *P* **50** *L* **8** # 1120

Dawe, Piers

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

While Gaussian noise that extends, positively and negatively, to at least 7 times its rms value is adequate, it may be far more than necessary and a burden on the test equipment.

SuggestedRemedy

I'll try (again) to work out what's reasonable.

Proposed Response *Response Status* **C**

This comment was WITHDRAWN by the commenter.

Cl **68** *SC* **68.6.9.2** *P* **50** *L* **39** # 1121

Dawe, Piers

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

There could be said to be six tests, not three, if one counts sensitivity and overload.

SuggestedRemedy

Change 'These conditions include three sets of ISI parameters that are used separately for three different tests.'
to
'These conditions include three sets of ISI parameters that are applied in turn.'

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.9.3** *P* **29** *L* **46** # 1122

Lindsay, Tom — ClariPhy Communicati

Comment Type **T** *Comment Status* **R** *D2.0 comment 358*

The current text says that calibration should be done without the ISI generator. The note above Figure 68-10 says that other implementation options for pulse shaping are allowed, so that a block named ISI generator might not even be used. We need a calibration procedure that is not dependent on the implementation that is shown.

SuggestedRemedy

Change the text to ""The extinction ratio of the optical output test signal is intended to represent the extinction ratio of a minimally compliant transmitter, where eye closure causes the extinction ratio to be lower than what would be determined by a ratio of the two levels used to determine OMA. The extinction ratio can be calibrated with the same square wave signal used to calibrate OMA of the test signal, but to account for the eye closure, the target value for extinction ratio should be 4.3 dB with the square wave pattern.""

Proposed Response *Response Status* **C**

REJECT.

Users are expected to understand that this is an option, without text to explain it.
For: 11
Against: 5

Accept in principle:
Add text to sentence:
Alternatively, the extinction ratio can be calibrated with the same square wave signal used to calibrate OMA of the test signal, but to account for the eye closure, the target value for extinction ratio should be 4.3 Db with the square wave pattern.
For:8
Against: 7

No consensus reached.

20th July 2005
Reject,
Committee does not see need for this alternative technique, provided for user convenience, to be included in the document.
Yes: 13
No: 3
Abstain: 13

Cl **68** *SC* **68.6.9.3** *P* **51** *L* **25** # 1123

Dawe, Piers

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

Reference receiver does not need a multimode compatible input, if one is careful with patchcord types and power calibration - this care is needed anyway.

SuggestedRemedy

Delete 'a multimode compatible input and'.

Proposed Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

This comment was WITHDRAWN by the commenter.

Cl **68** *SC* **68.6.9.3** *P* **51** *L* **31** # 1124

Dawe, Piers

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

Sometimes this section says something 'is' (calibrated), other times 'should be' (adjusted), giving the impression that some parts of the calibration are not needed.

SuggestedRemedy

Change 'should be' to 'is', three times in this subclause.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.9.3** *P* **51** *L* **48** # 1125

Dawe, Piers

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

In the text, the whole of BT4_7.5 GHz is in italics, but only part of it in the equation.

SuggestedRemedy

Make consistent.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.9.3** *P* **52** *L* **49** # 1126

Dawe, Piers

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

The title of figure 68-13 is too long. I think the detail has been stated in the text already, 'pre-cursor case' is no longer correct, and the arbitrary time offsets have gone away.

SuggestedRemedy

Shorten to 'Figure 68-23-Comprehensive stressed receiver test signals with lone bit pattern'

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Figure title: "Comprehensive stressed receiver test pulse signals (i.e. signals corresponding to an isolated ONE bit)"

Cl **68** *SC* **68.6.9.3** *P* **53** *L* **1** # 1127

Thaler, Pat

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

Table 68-10 is fine in the comparison version of the pdf, but in the draft without changes it is printing funny - the first row appears on a page by itself (page 41 in 802.3aqD2.1.pdf) and the rest of the table on the next page.

SuggestedRemedy

fix to print table on one page.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.9.3** *P* **54** *L* **1** # 1128

Dudek, Mike

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

In the note TWDP is not the correct name as TWDP includes the ISI stressors which are already present in the signal at TP3.
Also if the values are not achieved the standard does not give any guidance as to what to do.

SuggestedRemedy

Change ""TWDP"" to ""RWP (Receiver Waveform Penalty which is measured using the same method as TWDP except that the simulated fiber stressors are set to 0,1.0,0,0)""

In addition add the following to this sentence.
Option 1.
Differences of over 0.5dB between the measured value of RWP and these expected values indicate significant problems with the test equipment (probably non linearities) and indicate that the test equipment will not provide valid results. Any differences less than 0.5dB should be compensated by increasing the input OMA by the difference between the measured RWP and the expected value.

Also on Page 54 line 15 Change ""comprehensive stressed receiver sensitivity in OMA"" to ""comprehensive stressed receiver sensitivity in OMA compensated for RWP inaccuracies""

Option 2.
Differences of over 0.5dB indicate significant problems with the test equipment (probably non linearities) and indicate that the test equipment will not provide valid results. For differences less than 0.5dB the ISI generator should be adjusted (by changing the least delayed tap weight if a transversal equalizer is used) to obtain the expected RWP.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change ""TWDP" to "TWDP without simulated channels which is measured using the same method as TWDP except that the simulated fiber stressors are set to (0,1,0,0)"
Significant differences from the intended penalty indicate problems with the test equipment (probably non linearities) and indicate that the test equipment will not provide valid results. For small differences the ISI generator should be adjusted to obtain the expected penalty.

Cl **68** *SC* **68.6.9.3** *P* **54** *L* **2** # 1129

Bergmann, Ernest

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

""NOTE - The TWDP values for ..."" is actually refering to PIE-D values

SuggestedRemedy

change ""TWDP"" to ""PIE-D""

Proposed Response *Response Status* **C**

This comment was WITHDRAWN by the commenter.

Cl **68** *SC* **68.6.9.3** *P* **54** *L* **2** # 1130

Weiner, Nick

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

Use of TWDP to calibrate comprehensive stressed receiver test signal generator: TWDP, as specified in 68.6.6, convolves the measured waveform with a selection of channel responses. This is not appropriate for calibration of the comprehensive stressed receiver test signal generator. Whist we could work to on a variation of TWDP to calibrate the test signal generator, this is really beyond the scope of the standard.

SuggestedRemedy

Replace:
""NOTE - The TWDP values for the test cases are: 5.1 dB, 4.75 dB, 5.1 dB for the pre-cursor, split-symmetric and postcursor cases, respectively.""
with:
""NOTE - For calibration of the of a comprehensive stressed receiver test signal generator, captured waveforms corresponding to a single ONE bit surrounded by ZEROs may be insufficient. Proper calibration may require consideration of waveforms corresponding to more complex bit sequences.""

Proposed Response *Response Status* **C**

This comment was WITHDRAWN by the commenter.

Cl **68** *SC* **68.6.9.4** *P* **54** *L* **15** # 1131

Dawe, Piers

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

Have to set the noise generator differently for sensitivity and overload now.

SuggestedRemedy

Change to 'and set the attenuator and Gaussian white noise source to obtain either the comprehensive stressed receiver sensitivity in OMA or comprehensive stressed receiver overload in OMA, with the appropriate noise, as specified in Table 68û6.'

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.9.4** *P* **54** *L* **18** # 1132

Dawe, Piers

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

'Finally, connect the test signal' is not good advice. It's more convenient to leave the SUT connected while switching from test to test - no need to unconnect and reconnect.

SuggestedRemedy

Delete 'Finally,'.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.6.9.4** *P* **56** *L* **17** # 1133

Thaler, Pat

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

The new text at the end of the subclause appears to be redundant with new text in 68.6.9.2.

SuggestedRemedy

Delete the duplicated information.

Proposed Response *Response Status* **C**

REJECT.
The content is duplicated, as pointed out by the commenter, but for two different tests - the Comprehensive stressed receiver tests (normative) and Simple stressed receiver tests (informative). The same procedure regarding OMA, extinction ratio and average power for the sensitivity and overload tests applies to both.

Cl **68** *SC* **68.8** *P* **34** *L* **4** # 1134

Thompson, Geoff

Comment Type **TR** *Comment Status* **A** *D2.0 comment 367*

The text:
"Insertion loss measurements of installed multimode fiber cables are made in accordance with ANSI/TIA/EIA-526-14A/Method B or IEC 61280-4-1/Method 1." is ambiguous. I don't know how to do a conformance check on this unless I do both tests. Since this is supposed to be drafted as an international standard the TIA reference should be deleted.

SuggestedRemedy

Change the text to read:
"Insertion loss measurements of installed multimode fiber cables are made in accordance with IEC 61280-4-1/Method 1."

Proposed Response *Response Status* **U**

ACCEPT IN PRINCIPLE.
Change the text to read:
"Insertion loss measurements of installed multimode fiber cables are made in accordance with IEC 61280-4-1/Method 2"
Method 1 was incorrectly referenced in Draft 2.0.

Cl **68** *SC* **68.8** *P* **57** *L* **51** # 1135

Dawe, Piers

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

Another comma would be nice

SuggestedRemedy

... connector loss, meet the ...

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **68.9** *P* **58** *L* **35** # 1136

Dawe, Piers

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

Table can be tidied up

SuggestedRemedy

Re-fit the columns to their contents. Also some PICS tables.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Table 68-13 adjusted, as suggested by commenter.

Cl **68** *SC* **68.9.1** *P* **28** *L* **1** # 1137

George, John

Comment Type **TR** *Comment Status* **R** *D2.0 comment 369*

The comprehensive stress receiver sensitivity test does not include response variations caused by polarization changes and fiber shaking. Such impairments have been shown to occur in MMFs in balemarthy_1_0105, king_1_1104, and meadowcroft_1_0105.

SuggestedRemedy

A dynamic component must be added to the comprehensive stressed receiver sensitivity test. A suggested approach: During the comprehensive stressed receiver sensitivity test, the tap weights of the ISI stressors should be randomly varied at a frequency from 6 to 20 Hz in such a way as to produce PIE-D variations, relative to the statically measured PIE-D, of +/- 1.25 dB for offset launch and +/- 1.75 dB for center launch.

Proposed Response *Response Status* **U**

REJECT.
See response to comment 1.

Response agreed by consensus

Cl **68** *SC* **68.9.1** *P* **58** *L* **44** # 1138

Dawe, Piers

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

I'd like to check again that IEC 60793-2-10 (a fiber spec) does not burden our **cable** with an unexpected requirement. Compare clause 52.14.1: 'the requirements of IEC 60793-2 and the requirements of Table 52û25 where they differ ...' Adding the 'where they differ' would be a safe precaution - then in case of a conflict, what we are reading and balloting on would take precedence.

SuggestedRemedy

Change to '... 60793-2-10 and the requirements given in Table 68û14 where they differ.'

Proposed Response *Response Status* **C**

ACCEPT.
Yes: 12
No: 4
Abstain: 12

Cl **68** *SC* **68.9.3** *P* **59** *L* **35** # 1139

Dawe, Piers

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

Saying that this requirement is additional is making a statement about the contents of 38.11.4 or 59.9.5, thus creating more work in maintenance. Also, the low reflectance might be good advice for Gigabit Ethernet anyway.

SuggestedRemedy

Delete 'An additional requirement is that'.

Proposed Response *Response Status* **C**

ACCEPT.
Yes:12
No: 4
Abstain: 10

Cl **68** *SC* **Equation 68-2** *P* **46** *L* **42** # 1140

Lindsay, Tom

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

Residual ISI at the slicer input may preclude optimizing the threshold between the Gaussian noise levels, and the noise on logic1 may dominate the BER (assuming logic1 noise is higher, a safe bet).

SuggestedRemedy

Revert to Qsq = OMA/(2*logicONE noise (rms)).
This change would also require removing the logicZERO histogram from the waveform sketch, and removing logicZERO from line 31 on page 46.

Another option is
Qsq = OMA/max(logicONE noise (rms), logicZERO noise (rms)). This option would be easier for the editor.

Proposed Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

This comment was WITHDRAWN by the commenter.

Cl **68** *SC* **Equation 68-5** *P* **48** *L* **18** # 1141

Lindsay, Tom

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

The present equation can overstate jitter by sqrt(2). Whereas I expect amplitude noise may be worse at the logic1 level than at logic0, I do not expect that rising and falling edge jitter will be much different, so simple averaging should work well.

SuggestedRemedy

Rewrite equation to
Uncorrelated jitter (rms) = 0.5*(sigmar + sigmaf)

Another option is
Uncorrelated jitter (rms) = max(sigmar, sigmaf)

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 1112.

Cl **68** *SC* **Figure 68-19** *P* **49** *L* **25** # 1142

Bergmann, Ernest

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

The Gaussian white noise source is not constrained on its high frequency end, contrary to what is expected for RIN passing through 300m of dispersive fiber.

This variablity of tester performance will not be apparent in the Oscilloscope

SuggestedRemedy

Revert to the old position: inject the noise source before the Gaussian low pass filter.

Proposed Response *Response Status* **C**

REJECT.
The noise is intended to emulate RIN, which can be expected to extend to very high frequencies for some transmitters. Band limiting is therefore not considered appropriate. Also, some fibers do pass this high frequency RIN, despite attenuating lower frequencies.

Cl **68** *SC* **Figure 68-19** *P* **49** *L* **34** # 1143

Bergmann, Ernest

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

The connection point for the Oscilloscope is unclear. The intent is for it to be at TP3

SuggestedRemedy

Add to end of ""Oscilloscope with.... for waveform calibration"":
""at TP3""

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Label on oscilloscope symbol: "Oscilloscope with 4th-order, 7.5 GHz Bessel-Thomson response for calibration of waveform at TP3"

Cl **68** *SC* **Figure 68-5** *P* **30** *L* **10** # 1144

Dallesasse, John

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

Percent coverage curve needs to reflect the chosen receiver sensitivity stressors for a duplex link.

SuggestedRemedy

Adjust the curve to reflect the new stressors, if new stressor are chosen. This will likely result in percentile coverage for a duplex link dropping to 90% at 300 meters as opposed to the 95% value shown in the current figure.

Proposed Response *Response Status* **C**

REJECT.
See response to comment 1036.

Cl **68** *SC* **Figure 68-5** *P* **30** *L* **22** # 1145

Bergmann, Ernest

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

Although the ""editor's note"" refers to ""duplex coverage numbers"", the figure caption just says ""percentile coverage""[less clear].

SuggestedRemedy

change ""Percentile coverage"" to ""Percentile duplex coverage"".

Proposed Response *Response Status* **C**

REJECT.
Figure removed. See comment 1036.

Cl **68** *SC* **Previous comment 116** *P* *L* # 1146

Lindsay, Tom

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

There are several reasons for implementing a finite length EQ in TWDP.
1. In a straw poll in London, the committee made it clear that finite EQ lengths should be used in TWDP. Specifically,
2. Finite EQ length would better represent practical equalizers.
3. TP3 recommends verification of the stress level via use of TWDP. Reflections are quite possible in TP3 tester setups, and a very long equalizer would compensate these reflections, potentially causing TWDP to underestimate the stress imposed on practical receivers.
4. Nonlinearities can appear as linear distortions shifted by some length of time. A long equalizer will more likely span these shifts and unfairly correct for them, whereas as a practical length receiver may not be able to.
5. It is known that pre-cursor pulse shapes are more difficult to equalize for finite length equalizers, and so the standard should discourage such pulse shapes and even encourage pre-compensation for such pulse shapes. A finite EQ in TWDP would naturally do that.

SuggestedRemedy

Implement a finite length EQ with 14 T/2 feedforward and 5 T feedback taps into the TWDP algorithm. MATLAB code can be made available if this is accepted.

Proposed Response *Response Status* **U**

REJECT.
Committee recognizes that there is interest in further study of this topic. However, conclusive evidence that the proposed changes are required has not been presented.
For: 25
Against: 4
Abstain: 8

Cl **68** *SC* **Previous comment 117** *P* *L* # 1147

Lindsay, Tom

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

This comment helps along multiple fronts, as described in the original comment. The most important benefit is that provides some offsetting and compensation for OMA measurement errors.

SuggestedRemedy

Implement the suggested remedy for previous comment 117.

Proposed Response *Response Status* **C**

REJECT.

Draft 2.0, comment 117 remains open. It appears here as comment 1026.

See response to comment 1050.

Cl **68** *SC* **Previous comment 166** *P* *L* # 1148

Lindsay, Tom

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

Not satisfied before, and the previous recommendation was unnecessarily complex.

SuggestedRemedy

Rather than changing the TWDP stressors from the ones used for the TP3 tester, simply reduce the TWDP limit by 0.07 dB. Given the current D2.1 TWDP limit, the new limit would be 4.93 dB.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The committee has considered this input, but consider other implementation issues to dominate. See response to comment 1088.

Cl **68** *SC* **Previous comment 173** *P* *L* # 1149

Lindsay, Tom

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

This comment (eye mask coordinates) was not satisfied, but the work must still be done.

SuggestedRemedy

Keep this comment open until satisfied.

Proposed Response *Response Status* **U**

REJECT.
Proposal to reconsider Draft 2.0 comment 173 (now 1044), which was rejected.
Evidence that a change is needed has not been presented.

Cl **68** *SC* **Previous comment 216** *P* *L* # 1150

Lindsay, Tom

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

This has not been resolved and should be decided.

SuggestedRemedy

Keep this comment open until satisfied.

Proposed Response *Response Status* **U**

REJECT.
Draft 2.0, comment 216 was resolved.
Alternatives to OMA are being investigated by members of the committee, however conclusive evidence that a change is warranted has not been presented.

Cl **68** *SC* **Previous comment 251** *P* *L* # 1151

Lindsay, Tom

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

OMA measurement is not an exact science, even if done within the TWDP code. However, doing it in the code will improve consistency across the industry.

SuggestedRemedy

Add OMA extraction into TWDP code. Also, extract the decision threshold from the mean of waveform.

MATLAB code can be made available if the committee wants to do this.

Proposed Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Vote to reject, with explanation:
Task Force agrees that suplementing the TWDP code with an OMA calculation may be helpful to users. However, Task Force has not been shown evidence that existing algorithm does not provide acceptable results.
Yes:18
No: 9
Abstain: 12

Vote to Accept In Principle
With new code, to be provided by Piers Dawe.
Yes: 21
No: 5
Abstain: 13

Petar, Jan, Jim McVey, Tom, Norm and Sudeep have all agreed to review changes to code prior to publication.

Committee agrees that new code will used provided at least 75% of reviewes respond positively.

4th August 2005:
Extract from email received from Tom Lindsay (commenter):

.. A group of Jim, Petar, Piers, Norm, and myself have met several times by phone and have shared numerous emails and data. Our objective has been to discuss and decide about the automation of OMA in TWDP via the code that has been submitted by Piers ..
.. Today, we decided by a vote 3N and 2Y to not include Pier's code in D2.2. We assume that Jan and Sudeep are non-votes or abstains. So, please proceed in your release of D2.2 without the automation code.

Note from editor:
No code changes made following this comment.

Cl **68** *SC* **Previous comment 255** *P* *L* # 1152

Lindsay, Tom

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

The normalization method is currently based on OMA. Other approaches have been offered, and the choice of which to use is not yet resolved.

SuggestedRemedy

If we decide to stay with normalization with OMA, add a statement to line 54, page 38 (after Figure 68-14): ""The TWDP value is intended as a pass/fail result for compliance to the standard. It integrates many aspects of the waveform, and it should not interpreted to represent only the quality of the shape of the signal. For example, a lower value may not indicate that the signal has more signal energy but may not be easier to equalize.""

Proposed Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

This comment was WITHDRAWN by the commenter.

Cl **68** *SC* **Previous comment 358** *P* *L* # 1153

Lindsay, Tom

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

The comment has not been resolved. Here is another proposed remedy.

SuggestedRemedy

Alternatively, the extinction ratio can be calibrated without removing the ISI generators and with the same square wave signal used to calibrate OMA of the test signal. The target value for extinction ratio should be 4.3 dB with the square wave pattern.

Proposed Response *Response Status* **C**

REJECT.
See response to comment 1122.
Draft 2.0, comment 358 remains open. Appears here as comment 1122.

Cl **68** *SC* **Previous comment 393** *P* *L* # 1154

Lindsay, Tom

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

This comment was submitted to help ensure interoperability between TP2 and TP3, which was a goal presented back in October and November 2004. At this point in time, I don't believe we have yet determined how to margin the implementation penalties between TP2 and TP3.

SuggestedRemedy

Keep this comment open until satisfied.

Proposed Response *Response Status* **U**

REJECT.
Draft 2.0, comment 393 was resolved.
Finite equalizer representations are being investigated by members of the committee, however conclusive evidence that a change is warranted has not been presented.

Cl **68** *SC* **Previous comment 413** *P* *L* # 1155

Lindsay, Tom

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

When Qsq was 11.5, the TP3 tester noise caused more jitter than expected during normal operation. Recently, Qsq was reduced to about 1/2 of its previous value. reducing the jitter by roughly the same amount. If TP2 jitter is allowed to increase per previous comment 413, these two changes may result in the case where the jitter being applied to TP3 may not sufficiently represent the jitter allowed by TP2.

SuggestedRemedy

Determine if TP3 tester jitter adequately represents the uncorrelated jitter allowed by TP2.

Proposed Response *Response Status* **U**

REJECT.

Draft 2.0, comment 413 appears here as comment 1170.

20th July 2005:
No evidence shown that change to spec needed.

Cl **68** SC **Previous comment 435** P L # 1156

Lindsay, Tom

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

I thought this comment was resolved shortly after the London meeting.

SuggestedRemedy

An email is attached that includes the recommended changes sent to the editor after London.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

• Page 67, line 48. Change to "… the transmitted sequence x(k), where x(k)={x(0),x(1), … (x(N-1)}, and where k is a vector of bit positions in the sequence and N is the length of one period (e.g., 511 for PRBS9)."

• Remove the sentence starting at line 14 and that includes the equation.

• Change 'measured waveform' in line 12, page 68, to 'captured waveform' to be consistent with a change per previous comment 437.

Cl **68** SC **Previous comment 458** P L # 1157

Lindsay, Tom

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

This comment addresses an important need for future EDC designs and should be implemented.

SuggestedRemedy

Implement the proposed remedy of the previous comment.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Draft 2.0 comment 458 appears here as comment 1030.

See comment 1023 for different delay value.

Cl **68** SC **Table 68-10** P **53** L # 1158

Bergmann, Ernest

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

The table is fine in the ""comparison"" draft (here), but somehow got cut into two pages in the ""pure"" D2.1

SuggestedRemedy

Have editor verify that the table is not split across 2 pages

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** SC **Table 68-2** P **17** L **7** # 1159

Dallesasse, John Emcore Corporation

Comment Type **TR** *Comment Status* **A** *D2.0 comment 389*

The operating range of 300 meters has an unspecified statistical success rate. Because the goal of a low-cost module is not consistent with the goal of > 99% link success due to the added cost associated with more complex equalizer architectures, the standard needs to explicitly state the best estimate of link success for a duplex link.

SuggestedRemedy

Add a footnote f to Table 68-2: f) The estimated statistical success rate for achieving a BER of less than 10^-12 on 300 meter links is less than 91%. This assumes a single-link success rate of 95% or higher, and may need to be adjusted as final parameters are selected by the group.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
See comment 158.

Cl **68** SC **Table 68-2** P **29** L **29** # 1160

Weiner, Nick

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

Footnote a, Table 68-2:
Fiber types are identified by core diameter, not radius. (whoops!)

SuggestedRemedy

Change ""Each fiber types is identified by its core radius .."" to ""Each fiber type if identified by its core diameter .."""

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Each fiber type is identified by its core diameter ..

Cl **68** *SC* **Table 68-3** *P* **18** *L* **17** # 1161

Lindsay, Tom ClariPhy Communicati

Comment Type **TR** *Comment Status* **R** *D2.0 comment 391*

General communication theory tells us that RF signal energy or power is the best measure of signal strength. This especially applies to EDC systems such as LRM, where receivers can approach matched filter bounds. In contrast, OMA is a point-property of selected bits in special square wave patterns û it does not consider signal power of other bits in complex patterns and so is not complete as a characteristic of signal strength for LRM. An example of the problem is pre-emphasis, which can increase SNR via an increase in the RF signal strength, but the gain is not apparent in the use of OMA which ignores the pre-emphasized bits. Further, OMA is difficult to define and measure accurately, especially for waveforms with overshoot, ringing, tilt, etc. Ideally, the signal strength metric should allow a tradeoff between power and penalty (see separate penalty comment) as done with TDP in LR.

SuggestedRemedy

Modify the TWDP code to calculate signal strength based on the full RF signal power and to be variable depending on a penalty result.

Proposed Response *Response Status* **U**

REJECT.
See motion recorded in response comment 255.

Cl **68** *SC* **Table 68-3** *P* **18** *L* **28** # 1162

Lindsay, Tom ClariPhy Communicati

Comment Type **TR** *Comment Status* **R** *D2.0 comment 392*

I am not yet convinced that we've really evaluated the range of possibilities of Tx waveforms. As an example, it is known that pre-cursor fiber responses can lead to higher implementation penalties for finite length equalizers, and so the standard might want to encourage (at least not discourage) transmitter pre-compensation for such channels, providing they have small impact to penalties for post-cursor channels. Another concern is that we have not seen data from real transmitters over conditions such as temperature and aging and how they affect link budget penalties. We should also assess VCSEL waveforms.

SuggestedRemedy

Study pre-compensation carefully and gather transmitter characteristics over more operating conditions. Modify the eye mask coordinates as appropriate in response to this work. This could also affect 68.6.5.

Proposed Response *Response Status* **U**

REJECT.
Specific remedy not suggested.

Cl **68** *SC* **Table 68-3** *P* **18** *L* **30** # 1163

Lindsay, Tom ClariPhy Communicati

Comment Type **TR** *Comment Status* **R** *D2.0 comment 393*

The TWDP value should track the TP3 stress levels. However, it has been observed that stress levels for real waveforms can be greater than TP3 stress levels for finite length EQs, even though their infinite length results are equal or better. So, perhaps TWDP should consider finite EQs and/or some margin that forces real Tx waveforms to have tighter results than the TP3 levels. Finite equalizer lengths may also be able to discriminate and encourge the benefits of pre-compensation of Tx waveshaping. This could be helpful for finite EQs in real applications.

SuggestedRemedy

This issue requires more study. Possible outcomes are 1. Run TWDP with shorter equalizer(s) and require the penalty results be not greater than the corresponding TP3 stresses with the same shorter EQs. 2. Set TWDP limits to be somewhat more stringent than the TP3 stress levels to ensure interoperability.

Proposed Response *Response Status* **U**

REJECT.
See motion recorded in response comment 255.

Cl **68** *SC* **Table 68-3** *P* **18** *L* **30** # 1164

Bhoja, Sudeep Big Bear Networks

Comment Type **TR** *Comment Status* **R** *D2.0 comment 394*

The 5dB value for the Transmitter Waveform Dispersion Penalty needs to be changed. Previous contributions such as lindsay_3_1104 have shown that TP2 & TP3 tests and limits should be linked. The PIE-D value for 99% coverage based on a 47.1ps reference Tx and Gen67YY fiber model with connectors is 4.5dB. This number is lower than the 5dB currently specified.

SuggestedRemedy

Change the 5dB value to 4.5dB

Proposed Response *Response Status* **U**

REJECT.
No consensus to change.

Cl **68** *SC* **Table 68-4** *P* **19** *L* **31** # 1165

Bhoja, Sudeep — Big Bear Networks

Comment Type **TR** *Comment Status* **A** *D2.0 comment 401*

The Pre-cursor, Symmetrical & Post-cursor ISI parameter values need updating. These numbers predated the inclusion of the composite launch and hence exceed the 99th percentile PIE-D value of 4.5dB based on Gen67YY fiber model with 2 connectors. In the weekly TP3 calls, we agreed without dissent that the TP3 stressors will be chosen from the set provided by John Ewen and presented in the following message on the reflector: <<http://www.ieee802.org/3/10GMMFSG/email/msg00767.html>> Propose using pre-cursor #23, Symmetrical row #22 and Post-cursor row #20 which corresponds to approx PIE-D target of 4.5dB

SuggestedRemedy

Replace the values as specified below:
Pre-cursor{A1, A2, A3, A4} = {0.354 0.038 0.412 0.196}
Symmetrical{A1, A2, A3, A4} = {0.086 0.387 0.096 0.430}
Post-cursor{A1, A2, A3, A4} = {0.256 0.397 0.110 0.237}

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Motion to accept.
Moved by Steve Swanson
Seconded by Paul Kolesar

For: 7
Against: 19
Abstain: 11

Motion

Reject

No consensus within Task Force to accep

Moved: Mike Dudek
Seconded: Petre Popescu

For: 19
Against: 12
Abstain:10

Fails

This comment remains unresolved at 10am Thurdsay 16th June 2005.

19th July 2005
See vote on comment 1069, 1070 and 1071.

20th July:
See response to comment 1036

Cl **68** *SC* **Table 68-4** *P* **19** *L* **32** # 1166

Lindsay, Tom — ClariPhy Communicati

Comment Type **TR** *Comment Status* **A** *D2.0 comment 402*

Stressors need to be updated. Stress levels should represent the coverage levels that 802.3 is accustomed to.

SuggestedRemedy

For pre-cursor, symmetrical, and post-cursor, cases respectively, change to 0.354 0.038 0.412 0.196 0.086 0.387 0.096 0.430 0.256 0.397 0.110 0.237 These represent PIE-Ds of just over 4.5 dB when convolved with the 47.1 psec Gaussian waveshape. They are from John Ewen's tables. Figure 68-12 and Table 68-6 will also need to be updated to reflect the new responses. I have not created a tool to do this, but others have.

Proposed Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

This comment remains unresolved at 10am Thur 16th June 2005
See responses to comment 196 and 401.

Comments 201, 219, 220, 221, 402 unresolved.
This agreed by Task Force without opposition.

19th July 2005
See vote on comments1069, 1070 and 1071.

20th July:
See response to comment 1036

Cl **68** *SC* **Table 68-6** *P* **40** *L* **10** # 1167

Weiner, Nick

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

Receive characteristics table. Names of sensitivity and overload parameters ..

- ""Received power in OMA for signal detect and jitter tolerance"" is a long name, making the references to it cumbersome and a little confusing. I don't think that there is any particular reason for signal detect and jitter tolerance to be grouped together in this way.

- All of the sensitivity parameters now take the same value, so we have an opportunity to simplify the presentation.

- The two overload parameters take the same value, so we have an opportunity to simplify the presentation.

SuggestedRemedy

Change name of ""Received power in OMA for signal detect and jitter tolerance"" to ""Sensitivity in OMA""; remove the separate rows for ""Comprehensive stressed receiver sensitivity in OMA"" and ""Simple stressed receiver sensitivity in OMA""; modify references to these parameters to references to the ""Sensitivity in OMA"" parameter.

Change name of ""Comprehensive stressed receiver overload in OMA"" to ""Overload in OMA"", remove the row for ""Simple stressed receiver overload in OMA"", and modify the references to these two parameters accordingly.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
As suggested, except use "stressed sensitivity in OMA" instead of "sensitivity in OMA".

Cl **68** *SC* **Table 68-6** *P* **40** *L* **25** # 1168

Babla, Chet

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

The current ISI stressors are incorrect as they do not align with the project goals of power, cost, and timescale.

SuggestedRemedy

Update parameters to:

Pre - 0.168, 0.188, 0.527, 0.117
Symm - 0.000, 0.513, 0.000, 0.487
Post - 0.254, 0.453, 0.155, 0.138

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

See votes on 1056.

20th July:
See response to comment 1036

Cl **68** *SC* **Table 68-8** *P* **40** *L* **22** # 1169

Bergmann, Ernest

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

Two different Qsq values are given in the table for testing One for sensitivity and the other for overload. It would simplify testing and be more realistic to use a common value. The value of 22.5 is the more conservative test

SuggestedRemedy

remove the qualification catagories and simply have:
Test transmitter signal to noise ratio, Qsq ... 22.5

Proposed Response *Response Status* **C**

REJECT.
The committee believe that the different Qsq values for the sensitivity and overload tests could make a difference to the results, and that the test should not be changed for the sake of convenience.

Cl **68A** *SC* **6** *P* **18** *L* **31** # 1170

Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **R** *D2.0 comment 413*

Uncorrrelated jitter value of 0.033 RMS is too high and puts unreasonable penalty. Reduce 0.033 UI to 0.023. You also need to define what uncorrelated jitter is or provide a reference.

SuggestedRemedy

Proposed Response *Response Status* **U**

REJECT.

Propose reject: (Tuesday 14 June 2005)
Value: Value in Draft 2.0 has been discussed in detail by the Task Force.
Definition: Defined by means of the measurement method.
Yes: 8
No: 7

Propose reject: (Thursday 16 June 2005)
Value: Task Force has reconsidered the value in Draft 2.0 and does not see need to change.
Definition: Defined by means of the measurement method.
Yes: 13
No:5
Fails.

Comment remains unresolved.

20th July 2005
Propose reject
The committee has not seen justification for changing this specification.
Definition is by means of the measurement method.
Yes: 9
No: 5
Abstain: 2

Propose accept in principle.
Change spec as suggested.
Definition is by means of the measurement method.
Yes: 6
No: 6
Abstain: 1

Not resolved by committee.

Resolution by TF Chair and Editor:
No concensus reached that change is required. Specification believed to be complete.
Commenter is asked to submit further evidence that a change is needed.

Cl **68A** *SC* **6** *P* **19** *L* **44** # 1171

Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **A** *D2.0 comment 414*

Current jitter tolerance test only at a single frequncy will not detect potential weakness in the receiver. Suggest to use jitter tolerance mask per IEEE 802.3ae Fig 52-4.

SuggestedRemedy

Proposed Response *Response Status* **U**

ACCEPT IN PRINCIPLE.
See response to comment 222.

Cl **68A** *SC* **68A** *P* **42** *L* **17** # 1172

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **R** *D2.0 comment 428*

Need to change the list of inputs when we have worked out how to make the algorithm measure a signal strength.

SuggestedRemedy

per comment

Proposed Response *Response Status* **U**

REJECT.
See motion recorded in response comment 255.

Cl **68A** *SC* **68A** *P* **42** *L* **20** # 1173

Dawe, Piers Agilent

Comment Type **ER** *Comment Status* **R** *D2.0 comment 430*

Need to change description of alignment when we have worked out how it's done.

SuggestedRemedy

per comment

Proposed Response *Response Status* **U**

REJECT.
Specific remedy not suggested

Cl **68A** *SC* **68A** *P* **42** *L* **31** # 1174

Dawe, Piers — Agilent

Comment Type **ER** *Comment Status* **R** *D2.0 comment 433*

Need to change description of anti-aliasing filter to follow changes in 68.6.6.

SuggestedRemedy

per comment

Proposed Response *Response Status* **U**

REJECT.
Specific remedy not suggested.

Cl **68A** *SC* **68A** *P* **42** *L* **39** # 1175

Dawe, Piers — Agilent

Comment Type **ER** *Comment Status* **R** *D2.0 comment 435*

Out of place? Does this sentence really mean channel input: 'The channel input is a periodic data sequence ... where N is the length of one period (e.g. 511 for PRBS9).'?

SuggestedRemedy

If it's the captured waveform, move it to line 17, and say 'The captured waveform x(k)' on line 25. If it's the data sequence, move it to line 20 and say 'The data sequence x(k) used'. If it's the FFE input, to line 33. Avoid the term 'channel input', correct the terminology, put a label {x} or x(k) by the thing it is, to give the reader a clue. It would help to write x(k) = {x(0),x(1)... (if that is the case) to tie these vectors back to figure 68A-1.

Proposed Response *Response Status* **C**

REJECT.
Suggested remedy does not appear to the be complete.

Cl **68A** *SC* **68A** *P* **66** *L* **12** # 1176

Dudek, Mike

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

Poor English

SuggestedRemedy

Change ""by normative"" to ""by the normative""

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
"..by the test procedure.."

Cl **68A** *SC* **68A** *P* **66** *L* **14** # 1177

Dawe, Piers

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

'Reference ideal channel model' hasn't been introduced yet. When it is, it's called 'reference channel model'.

SuggestedRemedy

Change 'for the reference ideal channel model' to 'for an ideal reference channel model'.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Computations are for an ideal reference channel. The word "model" is not needed. Nor is it for the simulated fiber channel.
Sentence becomes: "The penalty is defined as the difference (in dB) of the equivalent signal to noise ratios (SNR) at the slicer input for an ideal reference channel and for the measured waveform after propagation through a simulated fiber channel."

Cl **68A** *SC* **68A.1** *P* **66** *L* **22** # 1178

Dawe, Piers

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

More variables to be put in italics

SuggestedRemedy

OMA_RCV, T (also twice in 68A.4 text and in fig 68A-1), N_0 in 68A.4, N in 68A.4

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68A** *SC* **68A.1** *P* **66** *L* **36** # 1179

Dawe, Piers

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

Looks like Q-cubed, confusing. Also, should footnote numbers start afresh for each annex?

SuggestedRemedy

Suggest move the superscript to follow 'function'. Change to footnote 1?

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68A** *SC* **68A.4** *P* **67** *L* **36** # 1180

Dudek, Mike

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

poor English

SuggestedRemedy

Change ""from system"" to ""from the system""

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68A** *SC* **68A.4** *P* **67** *L* **36** # 1181

Dawe, Piers

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

Missing word 'the'

SuggestedRemedy

from the system ...

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68A** *SC* **68A.4** *P* **67** *L* **39** # 1182

Dawe, Piers

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

Spelling

SuggestedRemedy

Thomson

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68A** *SC* **68A.4** *P* **67** *L* **4** # 1183

Dawe, Piers

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

Problem with subclause numbering?

SuggestedRemedy

Should 68A.4 be 68A.2 ?

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68A** *SC* **68A.4** *P* **67** *L* **4** # 1184

Dudek, Mike

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

What happened to 68A.2 and 68A.3

SuggestedRemedy

Change 68A.4 to 68A.2

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68A** *SC* **68A.4** *P* **67** *L* **42** # 1185

Dawe, Piers

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

In the 'plain' version of D2.1, the line 'The inputs to the algorithm are the following:' is a widow.

SuggestedRemedy

Keep with next.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68A** *SC* **68A.4** *P* **68** *L* **2** # 1186

Dawe, Piers

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

Doesn't scaling the OMA to 1 not just effectively set something, but actually (in the program) set it?

SuggestedRemedy

Delete 'effectively'.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **99** *SC* *P* **10** *L* **13** # 1187

Dawe, Piers

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

Duplication. A longer version of the sentence at line 10: 'Editorial notes will not be carried over into future editions.' follows at the end of the paragraph.

SuggestedRemedy

Remove the sentence at line 10.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **99** *SC* *P* **3** *L* # 1188

Dawe, Piers

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

This page 'List of Special Symbols' is at least 6 months out of date. Both the table and the notes are wrong.

SuggestedRemedy

1. Use the right page - get the latest from P802.3am.
2. Fix the system of version control so that all editors use the correct, current Frame elements for their work.

Proposed Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Updated table taken from 802.3am.

Cl **99** *SC* *P* **4** *L* **37** # 1189

Dawe, Piers

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

Gratuitous capitals.

SuggestedRemedy

Change 'Section One includes' to 'Section one includes'. Similarly for sections two to five.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **99** *SC* *P* **4** *L* **53** # 1190

Dawe, Piers

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

I know it's hard to describe EFM, but 'services and protocol elements that permit the exchange of IEEE Std 802.3 format frames between stations in a subscriber access network' seems to miss the mark - it's not just a software spec. Most of EFM (by page count) is new PHYs and PMDs, at least one of which (100BASE-LX10) is part of the set of 'regular datacoms' PMDs.

SuggestedRemedy

Change to:
Section five adds new physical layers and sublayers for operation from 512 kb/s to 1000 Mb/s, and defines services and protocol elements that permit the exchange of IEEE Std 802.3 format frames between stations in a subscriber access network.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **99** *SC* *P* **4** *L* **9** # 1191

Dawe, Piers

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

Hard carriage return within a sentence

SuggestedRemedy

Remove any carriage return after 'Operation,'.

Proposed Response *Response Status* **C**

REJECT.
Intention of CR is to keep Type 10GBASE-LRM all together.

Cl **99** *SC* *P* **5** *L* **23** # 1192

Dawe, Piers

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

Give us a clue - what is P802.3as about?

SuggestedRemedy

Add sentence 'It extends the size of the IEEE 802.3 frame format with an envelope frame.'

Proposed Response *Response Status* **C**

ACCEPT.

Cl **99** *SC* *P* **5** *L* **38** # 1193

Dawe, Piers

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

Missing comma and space

SuggestedRemedy

2001, provides

Proposed Response *Response Status* **C**

ACCEPT.

Cl **99** *SC* *P* **6** *L* **5** # 1194

Grow, Robert

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

A paragraph on downloads should be added to the fornt matter.

SuggestedRemedy

Downloads

Select portions of IEEE Std 802.3 and files included by reference within IEEE Std 802.3 can be downloaded from the Internet. This material include PICs tables, data tables and executable code. These files can be accessed at the following URL: [URL currently under discussion with IEEE staff].

Proposed Response *Response Status* **C**

ACCEPT.

Cl **99** *SC* *P* **9** *L* **14** # 1195

Grow, Robert

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

Use the same format for all Editor's Notes.

SuggestedRemedy

I recommend a boxed paragraph as used in the other parts of the introduction.

Proposed Response *Response Status* **C**

ACCEPT.

Cl **68** *SC* **6.9** *P* **40** *L* # 1196

king, jonathan

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

Table 68-6 10GBASE-LRM receiver characteristics, page 40 line 14 comprehensive stressed receiver overload in OMA
and line 32 simple stressed receiver overload in OMA (informative)
Also clauses 68.6.1 to 68.6.10

The draft 2.1 definition of the receiver overload test is an over constraint and needs to be amended. The LRM specification allows a maximum input level to the receiver of +1.5dBm for a zero loss link, which is achievable only with low offset connectors or centre launch, and very short link lengths (<<100m) - this would result in a clean eye into the receiver, not a worst case channel, thus the overload test should be a clean eye at +1.5dBm OMA. (This approach would be more consistent with LR for example, where overload power is specified for a zero loss system and clean eye input to the receiver).

SuggestedRemedy

change line 14 in table 68-6 to
'received overload in OMA' in first column,
and move line above line 12 (line 12 starts 'comprehensive stressed receiver sensitivity in OMA')
delete line 32

delete all references to comprehensive stressed receiver test and simple stressed receiver test in subclauses 68.6.9 to 68.6.9.4

Add a separate sub clause to address overload testing
68.6.9.5 Receiver Overload Test
For the receiver overload test, a BER of better than 10-12 shall be achieved for a test signal without ISI impairment. The OMA of the test signal is set to the receiver overload in OMA, given in Table 68-6, and with the maximum average power specified in Table 68-4.

Proposed Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.