Cl **1** *SC* **1.5** *P* **13** *L* **45** # 1

James, David V

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

I believe I was not eligible for this ballot and the status should therefore be nonbinding. Feel free to override this binding note as appropriate.

This document does not meeting the requirements of the IEEE Style Manual. Please do any/all of the following:
1) Perform a careful review with an IEEE Editor or experienced (outside of 802.3) editor.
2) Read the IEEE Style Manual and update the draft accordingly. This can be found at: http://standards.ieee.org/guides/style/2005Style.pdf
3) Read/use descriptive comments and templates, found at: http://grouper.ieee.org/groups/msc/WordProcessors.html

A specific examples is the following from page 13, line 44:
CRU Clock recovery unit
==> CRU clock recovery unit

From past experience, the 802.3 leadership rarely corrects my comments in recirculations, preferring to forward them to the IEEE Editors. With the assistance of the WG Chair, these are then quietly/privately rejected.

In light of that experience, and with less time to waste, the preceding references are viewed as sufficient for any motivated editor to find/correct other style errors. Thus, these have not been identified in detail.

SuggestedRemedy

Review and revise, as suggested.

Proposed Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

We agree that the commenter is not a member of the P802.3aq ballot group.

As required by IEEE-SA process, the draft will go through an editorial review prior to Sponsor ballot, and IEEE editorial staff will provide mandatory coordination during Sponsor ballot. We will work with IEEE-SA Editorial Staff on any issues they bring to our attention in respect to the IEEE-SA Style Manual or any other issue.

In respect to templates, the IEEE-SA Style Manual states 'It is strongly advised that drafts be developed using the official template, otherwise there may be delays during publication.' and based on this recommendation these templates have been used.

It however has to be understood that this project is developing an amendment to the base standard, and as such it is not within the scope of this project to perform global changes to the base standard. Instead consistency with the base standard will be maintained.

Cl **68** *SC* **68.6.9** *P* *L* # 6

Dawe, Piers

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

Regarding my D2.0 comment 87: 'Assure ourselves that a complete real stressed eye generator can be made with adequate tolerance and stability, and give the intended/expected results.' I'm now reassured that the complete real stressed eye generator can be made with adequate tolerance and stability - but NOT convinced that we are getting the intended/expected results. This comes down to choice of stressors, powers and Qsq.

SuggestedRemedy

See other comments: in particular, need to put more time into finding a reasonable split-symmetric stressor.

Proposed Response *Response Status* **U**

REJECT.
No specific remedy proposed. The committee believes that the current specification is adequate, but the commenter is encouraged to study the issue and present further results at the November meeting.

Cl **68** *SC* **68.5.1** *P* **30** *L* **12** # 9

Dawe, Piers

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

Thinking about the maximum loss in a link: OM3 at 300 m uses centre launch only, where the connector offset loss is negligible, while FDDI grade and OM2, at 220 m, have less fiber-attenuation loss than we calculated before (because they are shorter than 300 m). The maximum loss is set by the 220 m links, at 1.83 dB - as we don't deal in hundredths of dB, call that 1.8 dB. Now, do we want to allow less sensitive receivers, or reduce the transmit power and overload requirements? If we have adequate sensitivity, we save (thermal) power by choosing the latter.

SuggestedRemedy

Reduce the transmit OMA max and min, and receiver overload, all by 0.2 dB. Consider reducing the transmit average power min. I don't think it's worth changing the transmit average power max. Consider reducing the transmit peak power. Change entries in table 68-4, compliant signal in channel, in step.

Proposed Response *Response Status* **U**

ACCEPT IN PRINCIPLE.
Change Table 68-9, Fiber insertion loss, max, to 0.4 dB,
Change Table 68-2, Maximum channel insertion loss to 1.9dB.

Cl **68** *SC* **68.5.3** *P* **32** *L* **25** # 17

Dawe, Piers

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

The symmetrical stressor is too extreme: the Monte Carlo simulations I have done have not shown such a cleanly split pulse.

SuggestedRemedy

Find another stressor of similar PIE-D, but less cleanly split. Specifically, see if the stressor I proposed at the last meeting or another similar to it, have the property of 'fairness to different equalizers'.

Proposed Response *Response Status* **U**

REJECT.

4pm Tuesday 9th Oct

Straw poll
a) reject: 10
b) hear presentation and then consider comment (today or tomorrow): 10

Revisit on Wednesday morning.

Motion 1 to accept in principle
Change symmetric stressor to [0, 0.507, 0.093, 0.4]
(Stressor F on page 2 of dawe_2_1005)
And make consequential change to Figure 68-12 (in plain doc) and Table 68-7 (in the plain doc).
Moved: Mike Dudek
Seconder: Piers Dawe

Comment resolution committee voting:
Yes: 7
No: 15
Abstain: 7

802.3 voters:
Yes: 4
No: 13
Abstain: 2
Fails

Motion 2 to reject with explanation
The symmetrical stressor helps to cover cases of impulse responses seen in dynamically changing channels. It is expected that, although this condition is rare it can occur in dynamic channels. Also, some committee members felt that it was not clear as to why this change is necessary.

Moved: Norm Swenson
Seconded: Paul Kolesar

Comment resolution committee voting:
Yes: 19
No: 4
Abstain: 5

802.3 voters:
Yes: 16
No: 2
Abstain: 2

Passes

Cl **68** *SC* **68.6.5** *P* **34** *L* **50** # 20

Popescu, Petre

Comment Type **TR** *Comment Status* **R** *[Editor: Page 43]*

Transmitter random noise is not included in any transmitter measurements
68.6.5 (use CRU to trigger the scope, it tracks "acceptable" levels of low frequency jitter),
8.6.6 (use averaging for waveforms),
68.6.8 (use same CRU as for 68.6.5, and not include random jitter and "equalizable" jitter).

SuggestedRemedy

Replace "A clock recovery unit (CRU) should be used to trigger the scope .. To the end of the paragraph"
with "Transmitter reference clock should be used to trigger the scope".

Proposed Response *Response Status* **U**

REJECT.

Committee has not seen evidence that difficulty exists. The intent is that low frequency jitter will be tracked by receiver, and should not impact transmitter jitter measurement.

Transmitter reference clock not always available.

Cl **68** *SC* **69.9.3** *P* **54** *L* **22** # 30

Kolesar, Paul

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

The benchmarking of the OM2 Monte Carlo results against the spread sheet link model for 10GBASE-LX4 and 1000BASE-LX10 by John Ewen at the September 2005 interim showed equivalence at the 85 percentile level causing the OM2 MC model to appear very pessimistic. However, it is likely that the more sophisticated MC model is more accurate with respect to link percentile than the spread sheet. One explanation is that the MC simulation has uncovered a problem with the launch specification of the 50um OSL patch cord. The OSL patch cord specification allows offsets between 10 and 16 um (13 +/- 3 um). These values are disproportionately low when scaled by core diameter relative to those of the 62.5um OSL patch cord that has an offset range between 17 and 23 um. The equivalent offset range for the 50 um cord when scaled by core size is 13.6 to 18.4 um (16 +/- 2.4 um). The effect of launching at offsets in the low end of the present spec is that low order modes will carry a larger fraction of the signal, and hence impart more of their mode delay characteristics to the signal. These modes delays are the least controlled by the fibers OFL bandwidth measurement and can give rise to lower link percentile. The effect of varying the OSL offset should be explored to find the optimal specification. If found to be sub-optimal, adjust the 50um OSL spec to be optimal.

SuggestedRemedy

Investigate the link percentile as a function of OSL offset for OM2. If the present specification is found to be sub-optimal, specify the optimal range. For example, add the following sentence. The optical center offset between the SMF and 50 um fiber shall be 13.6 < Offset < 18.4 um.

Proposed Response *Response Status* **U**

REJECT.

Yes: 23
No: 1
Abstain: 8

Possible new patch cord spec recommendation would be for a patch cord that is different from the existing one.

Network equipment vendors have consistently given the IEEE802.3aq committee feedback that they will not support another MCP specification. On this basis this committee has already rejected proposals for new MCP specifications for example a proposed centre launch SMF patch cord was not added to the specification.

A summary of the modelling that was completed to define the MCP for Gigabit can be found in: A Statistical Analysis of Conditioned Launch for Gigabit Ethernet Links Using Multimode Fiber: JOURNAL OF LIGHTWAVE TECHNOLOGY, VOL. 17, NO. 9, SEPTEMBER 1999, pp 1532-1541.

This shows that there was significant modelling done, including yield studies, for the 50MMF case and the IEEE 802.3 MCP specification was based on that modelling (see figure 8 for example).

The committee has not seen sufficient evidence of significant improvement in system performance, made possible by the proposed change, to justify delaying the completion of the standard.

Cl **68** *SC* **68.6.6** *P* **40** *L* **21** # 50

Abbott, John

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

Symmetric Stressors: Draft 2.3 contains a significant modification to TWDP, enabling penalties for finite equalizers & allowing a basis for review of the stressors. The current stressor set does not adequately mirror the typical pulses from offset launches, which tend to reflect a local alpha error and to be unimodal, near-symmetric, and somewhat Gaussian - pulses which for a given bandwidth have a high PIE-D (PIE-D and PIE(12,5) are nearly equal) and are relatively hard to equalize. The current set of stressors is approximately equivalent to offset BWs on 220m of 700MHz.km and hence are not a worst-case estimate of the installed OM1 base.

Worst-case OM1 fibers are characterized by center perturbations large enough that a center pulse cannot be equalized (an adequate 220 LRM Center Launch pulse cannot be guaranteed or specified by an OFL BW spec of 500MHz.km) ; for these fibers the constraint of 700MHz.km will result in a higher failure rate than typically seen in MM systems in the past. 1000BASE-LX required only 500MHz.km for 550m operation (and had excess margin, actually requiring only

SuggestedRemedy

271MHz.km for 300m); LX-4 requires only 500MHz.km for 300m operation. Thus the 700MHz.km requirement tied to the current stressors is a significantly higher bar for the same OM1 fiber.
~REMEDY: Add a 4th stressor A1=A4 = 0.11; A2=A3= 0.39; This has PIE-D = 4.42, PIE(12,5)=4.48. See presentation abbott_1_1005.pdf Note that although the PIE-D level is higher, there is no additional PIE(12,5) ""penalty"" as with split pulses.

The stressor set should include an additional symmetric stressor, either with A1=A4 and A2=A3, or A1=0, A2=A4 (i.e. a 2-pulse symmetric stressor or a 1-pulse symmetric stressor) which is consistent with an offset BW of approximately 625-650MHz.km (PIE-D = PIE(12,5) = 4.4 to 4.6dB). Two sequences of stressors were constructed varying the relative level of (A1&A4) vs (A2&A3), or (A2&A4) vs A3, and the above recommendation gives a pulse representative of worst case fibers.

If the task force finds a 4th stressor is too burdensome for TP3, this stressor could appear in an informative annex. Or this stressor could replace one of the others. For purposes of TP2 testing, it could be incorporated in the TWDP code without difficulty.

Proposed Response *Response Status* **U**

REJECT.
The commenter is suggesting a fourth stressor. The committee believes that the exisiting post-cursor and pre-cursor stressors adequately test for this kind of response.

Cl **68** *SC* **68.5.3** *P* **36** *L* **25** # 51

Abbott, John

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

Referring to Piers Dawe comment 66 in draft 2.2, 9/2005 meeting in Nashua. Piers has identified a potential problem with the split symmetric stressor, because the frequency response is sensitive to the weights.

Piers suggests changing the stressor so that it is less sensitive.

The concern I have is that Piers has identified a specific stressor which can be used for a dynamic test relevant to other parts of this standard. His experience proves that such a test is necessary, and he provides us with a stressor which can be used. At the very least his information should be appended to the informative section about dynamic effects. The test appears to be to take the split symmetric stressor and change the relative weights from A2=0.513 A4=0.487 to A2=0.487 A4=0.513 over a range of frequencies.

Again, a problem with the implementation of LRM in real systems where the modal weights can vary, has been seen experimentally. This supplements similar experimental data previously presented to the task force.

SuggestedRemedy

Take the Piers Dawe comment 66 in draft 2.2 and use it as the basis of a normative dynamic test.

If this remedy is rejected, the author recommends the information be documented in an informative annex, highlighting the problem.

Proposed Response *Response Status* **U**

REJECT.
The committee has repeatedly rejected proposals for a normative dynamic test.
The document already includes an informative note regarding dynamic behaviour.
Yes: 16
No: 5
Abstain: 8
Passes

Cl **68** *SC* **Table 68-3** *P* **30** *L* **29** # 54

Tom, Lindsay

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

LR transmitters are allowed reasonable amounts of DCD and DDJ which can lead to increased TWDP values, particularly for the finite length equalizer in the standard. To allow LR transmitters to be used and to keep costs down for LRM systems, the TWDP limit should be increased.

SuggestedRemedy

Increase the TWDP limit to 5 dB.

Proposed Response *Response Status* **U**

REJECT.

Straw poll:
a) 4.7 dB (as Draft 2.3): 17
b) 4.8 dB: 14
c) 4.9 dB: 8
d) 5.0 dB: 5

Proposed reject
TWDP spec is intended to protect receivers from un-equalizable transmitter distortions.
The committee believes that the value specified in Draft 2.3 is appropriate.

Yes: 16
No: 8
Abstain: 3
Fails

Wednesday 12th October

Request made from floor to take votes both on the basis of comment resolution committee members and 802.3 voters.

Motion to accept in principle
Change TWDP value to 4.8dB
Moved: Norm Swenson
Seconded: Ernie Bergmann

Comment resolution committee
Yes: 18
No: 7
Abstain: 6
Fails

802.3 voters
Yes:13
No: 6

Abstain: 1

Motion to accept in principle
Change TWDP value to 4.81dB
Moved: Norm Swenson
Seconded: Ernie Bergmann

Point of order raised by Steve Swanson: That this is a reconsideration of the same motion by same mover and seconder.
Chairs does not rule motion out of order.

Comment resolution committee
Yes: 14
No: 7
Abstain: 4

802.3 voters
Yes: 11
No: 5
Abstain: 3

Fails.

Motion to reject, with explanation
Committee feels that it is inappropriate to change the value at this time. Commenter is encouraged to present further detail during a future meeting. This should include verification that supporting experiemental results are free of measurement error.
Moved: Mike Dudek
Seconded: Tom Lindsay

Comment resolution committee
Yes: 17
No: 0
Abstain: 7

802.3 voters
Yes: 13
No: 0
Abstain: 5

Passes