Tuesday, March 15, 2005

Recorder: John Dallesasse

Introductions and General Information: David Cunningham

- Review of IEEE Standards Process & Requirements for WG Ballot
- Review of Objectives & Timeline
- Review of Meeting Goals & Agenda
- Motion to Accept Agenda
  - Moved: Swanson, Seconded: Weiner
  - Passed by Acclamation

Editor's Report: Nick Weiner

- Review of Comments Received
  - 162 Comments on Draft 1.1
  - 34 Editorial, 92 Technical, 36 Technical Required
- Proposed Agenda for Comment Review
- No Actions Recorded

Report from TP2 Calls — Tom Lindsay & 18 Others — ClariPhy and Others

- Work Required in Several Areas During WG Ballot
  - TWDP: channels, test patterns, etc.
  - Peak power limit for Rx overload proposals needed
  - Mask test & coordinates
  - Uncorrelated jitter limit

COMMENT REVIEW

Motion to Accept Uncontroversial Comments

Editorial: 13, 29, 57, 58, 72, 73, 77, 120, 132, 133, 156, 157
Technical: 48, 50
Moved: Weiner, Seconded: Aronson
Passed by Acclamation

Pre-Circulation Technical Comments

COMMENT 201 (Booth)

- Accepted by Acclamation

COMMENT 223 (Booth)

- Accepted by Acclamation

Characteristics of Fiber Comments

COMMENT 138 (Dawe)

- Accepted by Acclamation

COMMENT 139 (Dawe)

- Edited Remedy for Clarification
- Response Accepted by Acclamation

BREAK

Comments with Incomplete Suggested Remedies

COMMENTS: 1, 5, 7, 9, 10, 11, 12, 19, 20, 23, 26, 31, 33, 34, 38, 40, 49, 51, 52, 53, 54, 55, 56, 62, 62, 66, 67, 70, 71, 90, 92, 94, 97, 108, 113, 114, 115, 118, 130, 150, 154, 160

COMMENTS: 12, 33, 34, 66, 70, 71

- Withdrawn by Petar Pepeljugoski

COMMENT 108

- Withdrawn by Tom Lindsay

COMMENTS 1, 5, 23, 31, 38, 40, 49, 51, 52, 56, 90, 94, 97, 154

- Withdrawn by Steve Swanson

COMMENT 160

- Withdrawn by Paul Kolesar

COMMENT 55

- Withdrawn by John Ewen

COMMENTS 113, 114, 115

- Withdrawn by Robert Lingle, JR.

COMMENTS 9, 7, 10, 11, 20

- Withdrawn by John George

COMMENT 54

- Withdrawn by David Cunningham

COMMENT 130

- Withdrawn by Piers Dawe

Motion to reject incomplete comments & request commenters to resubmit during WG ballot.

COMMENTS 19, 26, 53, 62, 67, 92, 118, 150 (Various)

- Moved: Weiner, Seconded: Lingle
- Approved by Acclamation

Cabling Configuration Comments

COMMENT 134 (Dawe)

- Withdrawn
- Need to discuss the topic of allowed number of interconnects further in WG ballot

COMMENT 135 (Pepeljugoski)

- Withdrawn

COMMENT 136 (Pepeljugoski)

- FOR: 1, AGAINST: 21, ABSTAIN: 15 (Rejected)

COMMENT 137 (Gwinn)

- FOR: 17, AGAINST: 2, ABSTAIN: 23
- Need to reconcile overall issue of media specification during WG ballot, possibly by addition of tables describing further media characteristics such as cabling, splice, and connector losses (Swanson)

Launch Comments

COMMENT 8 (George)

- Withdrawn

COMMENT 21 (Swanson)

- Withdrawn
- May need to modify 67YY since this simulation was not focused on center launch and results were not verified for the case where a center launch is used (Swanson)
- Agenda item to be added to 3/16 discussion regarding dual launch (Weiner)

COMMENT 22 (George)

- Withdrawn

COMMENT 27 (Cunningham)

- Withdrawn

COMMENT 28 (Swanson)

- Accepted by show of hands

COMMENT 41 (Swanson)

- Withdrawn

COMMENT 42 (Swanson)

- Withdrawn

COMMENT 43 (Dawe)

- Accepted by acclamation

COMMENT 44 (Ewen)

- Withdrawn
- Need to post OM3 simulation results to reflector (Ewen)

COMMENT 45 (Dawe)

- Vote to Accept Remedy: FOR: 13, AGAINST: 10, ABSTAIN: 20
- The topic of return loss for RIN measurement should be revisited during WG ballot

COMMENT 47 (Swanson)

- Withdrawn
- We should have further discussion on the dual launch topic during WG ballot (Cunningham)

COMMENT 49 (Swanson)

- Withdrawn

COMMENT 46 (Dawe)

- Revised remedy accepted by acclamation

COMMENT 59 (Zivny)

- See Comment 46 resolution
- Revised remedy accepted by acclamation

COMMENT 148 (Lindsay)

- See Comment 46 resolution
- Revised remedy accepted by acclamation

COMMENT 161 (Kolesar)

- Accepted by acclamation

COMMENT 162 (Kolesar)

- Accepted by acclamation

COMMENT 37 (Cunningham)

- Withdrawn

LUNCH

Link/Channel Definition

COMMENT 25

- Two responses were proposed – one by Swanson and one by Weiner. Swanson suggested the addition of a link test, Weiner suggested the removal of the "shall" statement from the referenced section.
- Group voted by acclamation to accept Weiner response. Sentence on specification of BER for a LRM link to be removed.

COMMENT 30

- Accepted by acclamation

Operating Distance

COMMENT 142

- Rejected by show of hands.

Transmitter Waveform and Dispersion Penalty

COMMENT 36 (Swanson)

- Withdrawn

COMMENT 37 (Cunningham)

- Withdrawn (See Above)

COMMENT 61 (Pepeljugoski)

- Concern expressed over the ability of patterns with an even number of bits to fully exercise DUT (Zivny). The Ad-Hoc groups should look into this issue further and make a recommendation.
- Rejected by show of hands.

COMMENT 74 (Swanson)

- Withdrawn

COMMENT 78 (Dawe)

- Accepted by acclamation

COMMENT 79 (Ewen)

- See Comment 78 resolution

COMMENT 80 (Dawe)

- The Ad-Hoc groups need to look at the O.153 document to confirm that a suitable definition of PRBS9 is given and the specified reference is valid.
- FOR: 20, AGAINST: 2, ABSTAIN: 10

COMMENT 81 (Dawe)

- Accepted by acclamation

COMMENT 89 (Dawe)
- Accepted by acclamation

COMMENT 91 (Lindsay)
- Accepted by acclamation

COMMENT 95 (Dawe)
- The TP2 Ad-Hoc group needs to review and confirm the MatLab TWDP code to ensure that it is correct.
- Vote to accept revised remedy, FOR: 21, AGAINST: 1, ABSTAIN: 13

COMMENT 96 (Lindsay)
- Slide presented by Tom Lindsay – update on Comments 95 & 96
- Lindsay to prepare updated MatLab code with suggested changes, and submit comment with full code to first WG recirculation
- Withdrawn

COMMENT 146 (Bhoja)
- Withdrawn
- Will be discussed 3/16 for future consideration during WG ballot

COMMENT 153 (Lindsay)
- Accepted

COMMENT 155 (Fitzgerald)
- Accepted by acclamation

COMMENT 158 (Pepeljugoski)
- Withdrawn

COMMENT 159 (Lindsay)
- Revised remedy accepted by acclamation

BREAK

Transmitted Eye Mask

COMMENT 64 (Pepeljugoski)
- FOR: 10, AGAINST: 1, ABSTAIN: 13 (Accepted)

COMMENT 65 (Pepeljugoski)
- FOR: 2, AGAINST: 5, ABSTAIN: 16 (Rejected)

COMMENT 84 (Swanson)
- Revised remedy accepted by acclamation

COMMENT 85 (Zivny)
- Withdrawn

COMMENT 87 (Abbott)
- Withdrawn

COMMENT 96 (Lindsay)
- Withdrawn

COMMENT 97 (Swanson)
- Rejected – Not Complete

COMMENT 145 (Lindsay)
- Withdrawn
- Tom requested time on 3/16 for further discussion

Transmitted SNR

COMMENT 98 (Dawe)
- This topic will need to be examined further during the WG ballot process. While there is some confusion with the specification of two tests, there is no consensus on what method is preferred.
- Accept revised remedy: FOR: 6, AGAINST: 7, ABSTAIN: 8 (Rejected)

COMMENT 99 (Zivny)
- Revised remedy accepted by acclamation

COMMENT 100 (Zivny)
- Withdrawn
- Topic should

COMMENT 101 (Dawe)
- See Comment 99

COMMENT 102 (Lindsay)
- See Comment 99

COMMENT 103 (Lindsay)
- Revised remedy accepted by acclamation

COMMENT 105 (Lindsay)
- FOR: 7, AGAINST: 8, ABSTAIN: 10 (Rejected)

Comment 106 (Lindsay)
- Withdrawn

COMMENT 107 (Zivny)
- Withdrawn

Transmitted Jitter

COMMENT 76 (Dawe)
- Revised remedy accepted by acclamation

COMMENT 109 (Zivny)
- Withdrawn

COMMENT 110 (Lindsay)
- Accepted by show of hands

COMMENT 111 (Lindsay)
- Withdrawn

COMMENT 112 (Lindsay)
- Revised remedy accepted by show of hands

COMMENT 147 (Lindsay)
- Withdrawn
- Tom requested time to discuss on 3/16

Budget / Tx Power

COMMENT 32 (Pepeljugoski)
- Withdrawn

COMMENT 35 (Swanson)
- Withdrawn

COMMENT 39 (Dudek)
- FOR: 2, AGAINST: 16, ABSTAIN: 3 (Rejected)

Rx Noise and Tx SNR Parameter Name

COMMENT 68 (Pepeljugoski)
- See 88

COMMENT 88 (Weiner)
- Accepted by show of hands

COMMENT 104 (Dawe)
- See 88

OMA Definition

COMMENT 82 (Zivny)
- Rejected by show of hands

COMMENT 83 (Dawe)

- The topic of where & how OMA should be measured should be revisited by the appropriate Ad-Hoc during WG ballot (Weiner)
- Straw poll taken on 3 proposals: No change, Lindsay Recommendation, Modified Dawe
- Revised remedy vote: FOR: 24, AGAINST: 3, ABSTAIN: 3

Comprehensive Receiver Tests

COMMENT 60 (Zivny)

- Withdrawn

COMMENT 69 (Gwinn)

- Rejected by show of hands

COMMENT 75 (Weiner)

- Withdrawn

COMMENT 116 (Dawe)

- Accepted by show of hands

COMMENT 117 (Fitzgerald)

- Rejected by show of hands
- Comment should be re-submitted with revised text for WG ballot

COMMENT 119 (Dawe)

- Rejected by show of hands

COMMENT 121 (Lindsay)

- Withdrawn
- The issue of the distribution of stress between the ISI generator(s) and filter is an issue that needs to be addressed in the WG ballot cycle by the appropriate Ad-Hoc group

COMMENT 122 (Dawe)

- Accepted by show of hands

COMMENT 123 (Zivny)

- Revised remedy accepted by acclamation

COMMENT 124 (Dawe)

- Revised remedy accepted by show of hands

COMMENT 125 (Zivny)

- Withdrawn

COMMENT 126 (Weiner)
- Withdrawn

COMMENT 127 (Zivny)
- Withdrawn

COMMENT 128 (Lindsay)
- Withdrawn

COMMENT 129 (Dawe)
- Accepted by show of hands

COMMENT 131 (Zivny)
- Withdrawn

COMMENT 140 (Fitzgerald)
- Rejected by show of hands
- Commenter invited to resubmit modified comment during TF ballot

COMMENT 141 (Fitzgerald)
- Accepted by show of hands

COMMENT 149 (Lindsay)
- Withdrawn
- Further work is needed during WG ballot to determine what these values need to be changed to, and to understand the affect of rounding on the PIE-D values.

COMMENT 152 (Lindsay)
- Withdrawn
- See Comment 149

Motion to Give Nick Weiner Editorial License to Resolve Editorial Comments Not Yet Addressed

Accepted by Acclamation

Rx Jitter

COMMENT 93 (Weiner)
- Withdrawn

Rx Signal Detect

COMMENT 24 (Fitzgerald)
- Rejected by show of hands

COMMENT 151 (Lindsay)

- Withdrawn
- Needs to be clear in WG ballot

Comments Relating to Other Clauses

COMMENT 2 (Dawe)

- Revised remedy accepted by show of hands

COMMENT 3 (Dawe)

- Accepted by show of hands

COMMENT 4 (Dawe)

- Accepted by show of hands

Representation of Numerical Specifications

COMMENT 143 (Fitzgerald)

- Rejected by show of hands

COMMENT 144 (Fitzgerald)

- Rejected by show of hands

Wednesday, March 16, 2005

Review of Agenda (David Cunningham)

- Presentations
- Rejected/Withdrawn Comment Discussion

Presentations

TP3 Stressed Receiver Test System Progress Report	**Jim McVey and Lew Aronson**	**Finisar**

- Motivation: difficulty in practically implementing test needs to be further addressed.
- 4-Tap Noise & ISI Generator: Reflections in system are limiting accuracy.
- Rigid coax used to implement delays.
- Reflections give additional peaks in pulse response.
- Need 40dB return loss in electrical domain for acceptable performance, this means very high quality microwave components.
- Reflections further out in time look like noise on the eye diagrams (deterministic ripple).
- The source for electrical impulse is a pattern generator (on a BERT) set to provide an isolated "1" on the output.
- To minimize noise, needed to reduce pattern generator output to minimize noise due to reflections. Controlled noise could then be added with a calibrated noise source.
- Further Work – Proving Viability of Method
  - Reduce reflections to acceptable levels
  - Measure accuracy of generated impulse response
  - Add E/O converter
- Questions/Comments
  - Dawe: How are PIE-D measurement done? A: Off of the captured waveform.
  - Aronson: The challenges here highlight the difficulty in going beyond a 4-tap system.

Towards a Comprehensive Stressed Receiver Tester and TWDP Assessment	**Aeneas Massara, Piers Dawe, David Cunningham**	**Agilent Technologies**

- Used "off-the-shelf" microwave components to implement.
- Initial implementation with two-tap system.
- E/O conversion with standard EML.
- PIE-D calculation uses method of bhoja_1_0704.
- PIE-D shown for different optical test signals.

- Measurement stability investigated for low and high PID-D states – initial results good, data shown for 1 hour. (Real-time measurement of PIE-D)
- Implemented TWDP code – main variation was due to variations in DCD and crossing point (1.6 dB). Also observed systematic differences as a function of oversampling rate.
- Further Work:
  - Add additional taps (to 4) and noise source
  - Detailed tolerancing of tester to baseline accuracy
  - Need to compare to TWDP
- Questions/Comments
  - Used 25 GHz BW amplifiers in system.
  - There is no correlation between delay time and State of Experiment [au] on PIE-D variation graphs other than the fact that they are both monotonically increasing.
  - A fixed delay between taps and no more that 4 taps is strongly advised for practical reasons.
- Group Actions:
  - The issue of DCD and crossing percentage induced degradation of TWDP needs to be investigated further.
  - Tom would like the waveform files to be shared with the TP2 group.

The TWDP test applied to 10GBASE-LR optics — **Jan Peeters Weem and Pete Kirkpatrick** — **Intel**

- Motivation: Good eyes are marginal or failing the TWDP test.
- Tested 10GBASE-LR transmitters to LRM draft 1.1 specifications.
- What is the impact of this on the cost of the optics if "good" LR optics fail?
- Reference transmitter showed TWDP of 4.9, removing scope filter decreased TWDP to 4.6 dB. (1550 nm source, Agilent low-noise optical plug-in on DCA)
- Slow eyes, higher TWDP. Eyes with significant overshoot (fast rise/fall times), lower TWDP.
- Passing –LR optics should be allowed, and the test method should differentiate between optics.
- Questions/Comments
  - Even with ideal optics, a TWDP of less than 4.5 is not expected.
- Group Actions:
  - The value of the TWDP penalty needs to be investigated further with appropriate stressors.
  - Further experimental validation of the TWDP method is needed.

Analysis of 1998-99 FDDI fibers for PIE-D and "DMD BW" — **John Abbott** — **Corning Incorporated**

- Data shown on fiber offset bandwidth versus overfilled launch bandwidth for several offset values. A 4 um offset was shown to produce substantially worse bandwidths than the 18 um offset.
- Offset launch bandwidth versus PIE-D values presented. When the center launch data was added, more significant scatter in PIE-D was observed.
- A recommendation of budgeting 5.1-5.7 dB for the PIE-D penalty was suggested.
- Questions/Comments (Highlights)
  - King: Was the data affected by the length of the fibers, causing additional mode mixing? A: Possibly, but artifacts that are observed
  - Cunningham: Estimating a 4% failure rate from these measurement is not valid. David would like to know the confidence level in these estimates given the limited sample size.
  - Swanson feels that the 4% number may be optimistic as opposed to pessimistic.
  - Swenson feels that it is necessary to agree on the method by which coverage curves are calculated for the dual launch case.
  - Swanson: North American fiber shipments: 50.3 % prior to 1998, 68.4% prior to 2000. The curve will be shown during the afternoon session.

Essential Changes to Monte Carlo Model — **John Abbott** — **Corning Incorporated**

- 67YY needs to be improved to give accurate estimates for the center launch.
  - Set approximates 98-99 fiber distribution, underestimates center perturbations.
- Data shows correlation between center and offset launch PIE-D, model does not.
- Predicted BW for center launch (0-1 um offset) unrealistically high.
- Figures showing delay versus mode location presented. Broadening is due to chromatic dispersion. In the calculated pulse plot (top), some broadening was added for visualization purposes.
- Recommendation to include larger number of center perturbations, to test alternate mode power distributions, check correlation of center & offset launch, and to adjust mode delays to better match OFL bandwidth.
- Questions/Comments (Highlights)
  - Weiner: Concern expressed regarding the ongoing changes in the model.
  - Abbott: 67YY models from a certain time period – not necessarily representative of installed base.
  - Cunningham: Expressed general disagreement with the conclusions of the talk.
  - King: Suggested measurement of the installed base, not subsets of fibers, for any future work.
  - Abbot Comment: Kinks and dips can be quite large without putting modal BW out of specification, and are different from the center line defect.

- Shanbhag: Is there data showing that this model correlates to the connector model? Commented that OFL BW agrees with Gen67 model at lower bandwidths.
- Dawe: Commented on the Monte-Carlo method, and expressed the feeling that we are reaching the limits of what we can gain from additional work with it. Abbott: Commented on his feeling that more data would clarify issues and further improve the models.

BREAK

Finite Equalizer Performance for TP3 Stressed Sensitivity Test on Gen67YY — **Robert Lingle, Jr., Kasyapa Balemarthy, Stephen Ralph** — **OFS, Georgia Institute of Technology**

- Motivation: Observation that examination of the implementation penalty for finite equalizers can be large - real equalizer architectures have a large effect on the residual ISI penalty.
- Examine minimum complexity equalizers for TP3 test pulses.
- Showed correlation data between center launch and offset launch – the real fibers behave differently than the Gen67 fibers.
- Examination of finite equalizers ranging from 6 - 12 FF, 3-5 FB.
  - Marginal benefit beyond 8 FF taps, beyond 3 FB taps it is better to add FF taps instead.
- Minimum complexity equalizer is 7+3 or 9+2 DFE for current TP3 pulses.
- 11 tap DFE required to equalize Gen67YY set.
- Discouraged current practice of starting with center launch.
- Questions/Comments
  - Bhoja: Suggest that averaging across patterns for center launch, similar to what was done for TWDP, would be a better approach. Uncancelled ISI could be more of a problem than shown for the 6 FF tap finite equalizers.

TP3 ISI Parameter Selection Methodology — **John Ewen and 14 others** — **JDSU and 10 others**

- Objective: Build consensus on a methodology for selecting new ISI penalties.
- PIE-D is an inadequate selection metric.
- Suggested that a finite DFE metric is required, but want to avoid being implementation specific.
- Proposed method is to use the 67YY set to define percentiles, and to choose ISI penalties that match the percentiles, but not a specific fiber response.
- Proposed method is to adjust the set of tap weights and spacing for a 4-tap FIR to minimize the MSE in the penalties relative to the desired percentile.
- In the example, this method generated a delta t of 0.78 UI, very close to the 0.75 UI value from previous work that was shown to approximate a wide range of fiber responses.
- Observed that different initial conditions give different solutions, but it was felt that sufficient stress to screen less robust implementations is still achieved.

- Proposed Future Work:
  - Group to agree on link configuration, range of finite DFE, etc.
  - Evaluate percentiles for Monte Carlo model
  - Compute ISI parameters
  - Generate symmetric and postcursor responses
- Questions/Comments
  - Aronson: Should the optimization be re-done removing the 0 FB tap option, given the unlikelihood that such a implementation will be used in practice? A: Yes, it is already underway.
- Group Actions
  - Further analysis of this method is required in the TP3 calls.
  - Further coordination of TP2 work is necessary as well to ensure the effect of TP2 TWDP & other penalties on this metric is understood.

How many connections for 10GBASE-LRM? **Piers Dawe and nine others** **Agilent and seven others**

- Motivation: Objective creep and over-engineering may be causing the group to lose site of its original goals.
- The cost of over-engineering here creates more of a problem than for previous optical Ethernet PMDs.
- Connectors are more of a problem than many other issues, and need to receive more attention.
  - The main problem is mode coupling on the Tx side that degrades link bandwidth.
- Claims that more than 90% of installed topologies have a single patch cord from the equipment to the link. The alternative topology that has a patch panel in a wiring closet is less likely, especially since 10 Gb to the desk is unlikely.
- The relevant use scenarios are building backbone and data centers, where a reduced number of connections are typical.
- Suggests limiting the number of interconnects allowed by the standard.
- Showed a trade-off between the number of connectors and the link distance, with the third connector creating a potential impairment of 50 meters.
- Suggests designing to two-connector scenario, but to provide guidance in the standard for cases where more connectors are used.
- Questions/Comments
  - Kolesar: Expressed concern that the 90% figure may not be representative of all applications. His experience & data shows that a larger number of connections are more typical - 75% for two connections, 10% for 3 connections, and 15% with 4 connections. Paul feels that 3 connections at 300 meters is the minimum requirement, and 4 would be preferred.
  - Pepeljugoski: As a user, with a few million multimode links in IBMs network, Petar expressed that the typical link has 4-6 connectors. While a trade-off is expected, he felt that the 20% of installed links with distances greater than 200 meters need to be addressed.
  - Flatman: Concurs that fiber in the horizontal is not widely in use, and is not likely to be in use in the next 5 years. He also feels that 10 Gb/s to the

desktop is not likely for the next 5-10 years. Finally, he concurred in general but was not able to provide a specific percentages on the typical number of interconnects.
  - Pimpinella: Discouraged reduction of the allowed budget below 1.5 dB.
  - Swanson: Provided guidance from Corning Cable Systems that the number of installed links with 2 connections was 25%, and 10% with 3. Additional information provided by Tyco to Steve suggested that 80% have 2 connectors, and 20% have 4.

10GBASE-LRM Interoperability & Technical Feasibility Report | **Sudeep Bhoja & 9 Others** | **Agilent & Big Bear Networks**

- Intent: Initially confirm experimental feasibility.
- Tested with OM1, OM2, and OM3 fibers.
- Questions/Comments
  - Discussion of the degree of compliance of the launch.
  - Discussion of the need (or lack of need) for additional fibers.
  - The need for additional testing and data was expressed as being very desirable to bring the committee together and move the activity forward.
- Group Actions
  - Further discussion is needed on the technical feasibility hurdle and where the bar will be set.

LUNCH

Review of Rejected by Editor / Selected Withdrawn Comments

Percentile Coverage

COMMENT 7 (George)
COMMENT 160 (Kolesar)

- The model should be adjusted because both fibers need to function to have a valid link. This means that the true link probability is the square of the individual fiber probabilities.
- Pepeljugoski: Our statistics & models are not good enough to establish what 99% coverage really means. The group should discuss what is meant by 99% coverage.
- Kolesar: We need to be cautious about relaxing requirements.
- Cunningham: The goal of 99% coverage is not achievable, because we cannot prove it. We should pick a number between 95 and 98%.
- George: Because we do not understand the true nature of the installed base, we should err on the conservative side.
- Dove: There is a history for copper PMDs of accepting lower percent coverage. It is better for the customer to expect that it will not work every time, rather than

to expect that it will work every time when it doesn't. Guidance on percent coverage should be given.

- Dudek: Suggested that the type of fiber and percent coverage should be provided in more detail in the standard.
- Rausch: We need a better characterization of the installed fiber plant if we are going to need to look at single versus dual fiber statistics.
- Kolesar: The fibers are likely to be from different performs in a duplex link.
- Lindsay: Is the 108 fiber model valid in the case of dual launch? Cunningham: yes.
- Group Actions
  - The group needs to answer the question of what defines the link statistics in the model – one fiber or two fibers.
  - The percent coverage needs to be better defined.
  - The committee needs to decide what to do regarding 400/400 MHz-km fiber.

The chair will direct the Task 1 Channel Ad-Hoc to meet regarding the generation of an OM2 108 fiber model.

Inter-Operation Demonstration

COMMENT 1 (Swanson)

- The intent was to have a placeholder to hold the group to the technical feasibility & interoperability requirement.
- Kolesar: The fiber manufacturers should provide a cable for test purposes. These fibers should create an appropriately stressed link.
- The question of what such a stressed fiber would look like was raised by several individuals.
- George: The fibers selected should include a range of fibers with a range of PIE-D values. It would be very difficult for the fiber manufacturers to make a fiber that would represent what is the worst case in the field given modern manufacturing processes.
- Group Actions
  - The round robin fibers need to be defined. The fibers will take 6-8 weeks to fabricate, so this needs to be done rapidly if they are desired by the group.

Straw Poll – interest in fibers for demonstration of technical feasibility

The majority of the committee expressed interest in this.

Tom Lindsay: TP2 Issues (Noise, Jitter, TWDP, and Mask)

Noise

COMMENT 45 (Dawe)
COMMENT 98 (Dawe)

Jitter

COMMENT 108 (Lindsay)

- Slide shown by Tom Lindsay – eyes tested with TWDP code.
- Additional slide shown with optical pre-emphasis on eye. This will impact the eye test, so the group needs to decide if this capability will be supported. (Vitesse IC used by Finisar to create eye with pre-emphasis.)
- The group needs to understand if optical pre-emphasis is a real improvement. It is suspected that the improvement may have more to do with how power is counted as opposed to a real improvement.

COMMENT 147 (Lindsay)

TWDP

COMMENT 96 (Lindsay)
COMMENT 146 (Bhoja)
COMMENT 83 (Dawe)
Test Patterns (No Comment)

Mask

COMMENT 145 (Lindsay)
COMMENT 64 (Pepeljugoski)

Back to Review of Comments Rejected by Editor

ISI Stressors

COMMENTS 9, 10, 11, 12, 20, 52, 53, 54, 55, 113, 114, 115, 118, 130, 150

Summary of Issues in Comments (Cunningham)

- The current ISI stressors are a starting point, but further work is required. The group either needs to change PIE-D or add a finite equalizer penalty.
- Dudek: The precursor is the worst stressor with a DFE. Is this universally the case? There is a question about the value of keeping the postcursor in order to allow the possible future implementation of other equalizer architectures.
- Ewen: The precursor is the worst case for the finite DFE, but he has not looked at linear equalizers or other geometries.
- Cunningham: We need to reasonably rule out bad implementations, but it is impossible for the group to define tests for the standard that fully rule out bad implementations.

Aronson Comments Regarding TP3 group response to these comments.

- Suggests adopting Ewen methodology.
- Goal is to come to the May meeting with specific choices.
- What is the practical limit of what can be equalized?
- Is it appropriate to have 3 stressor types, or should this be reduced?
    - It would be nice to go lower, but this needs to be proven.
- Should the group put technical feasibility & economic drivers first, and then determine what percentage coverage is acceptable based on that?
- Cunningham: We should not accept a PIE-D of greater than 4.5 dB.

- Swanson: Percent coverage, PIE-D and link length are the variables we have to work with. The group should lock in 2 of these 3, and the other is determined automatically.
- Jaeger: We are on a steep slope with the trade-off between PIE-D and cost. The PIE-D value of 4.5 is a reasonable compromise.
- Cunningham: The group needs to stay on track with the objective of providing a lower cost, lower power, small-form-factor compatible module.
- The TP3 group will work to put together an agenda to address these issues.

Straw Poll: Acceptance of Ewen methodology for choosing ISI parameters.
FOR: 30, AGAINST: 0, ABSTAIN: 14

Changes to Document (Weiner)

- All Comments Resolved
- 61 Task Force and 15 Pre-Circulation Comments Folded Into Document
- Individuals responsible for TWTP code should review corrections prior to vote

Further Comments

- Motions will be made tomorrow to pass document on to Sponsor Ballot and to empower the chair to conduct recirculations and call interim meetings.

Thursday, March 17, 2005

10GBASE-LRM Closing Report to IEEE 802.3, 15-17 March 2005, David Cunningham

Comments:

- In order to eliminate 400/400 MHz-km, the group would need to vote to change the objectives.

Motion: Approve November Meeting Minutes

Motion approved by acclamation.

Motion: Approve January Meeting Minutes

Motion approved by acclamation.

Targeted schedule for WG ballot shown (Cunningham)

Comments:

- Swanson: Request to adjust dates based upon conflict with TIA meeting week of June 20th.
- Schedule tentatively adjusted to week of June 13th for LRM-only interim meeting.

Straw poll on allowing David Cunningham to organize additional meetings for comment resolution and recirculation.

Accepted by show of hands.

Editor's Report & Review of Draft (Weiner)

Comments:

- Is everyone happy with the modifications to the document per the accepted resolutions? (Did we do what we said we were going to do?)

Motion: 10GBASE-LRM accepts D1.2/D2.0 D1.2/D2.0 per comment review and motions at this meeting.

Moved: Weiner, Seconded: Dawe
Among those present:
Y: 28, N: 0, A: 4
Among 802.3 Voters:
Y: 16, N: 0, A: 4

Motion to request that the IEEE 802.3 Working Group:
Submit IEEE Draft P802.3aq/D2.0 for a 35 day 802.3 Working Group Ballot, and authorize the IEEE 802.3aq 10GBASE-LRM Task Force to respond to ballot comments and conduct re-circulations as necessary.

Moved: Weiner, Seconded: Jaeger
Among those Present
Y: 31, N: 4, A: 3
Among 802.3 Voters
Y: 15, N: 4, A: 3

- **Start Ballot: 24th March '05**
- **End around: 30th April**
- **Comment resolution: Austin 17-19th May**
- **1st Recirculation: Target 23 May – 8th June, Potential LRM only Interim: Week of June 13th**
- **2nd Recirculation 24th June – 11th July OR Continue comment resolution**
- **Plenary Meeting week of 18th July**

Motion to direct the Chair to use the draft timeline per this slide as the basis of planning Ballots, recirculation and interim meetings until the next 802.3 Plenary.
Moved: Dudek, Seconded: Aronson
Y: 37, N: 0, A: 2

Motion to adjourn.
Moved: Kolesar, Seconded: Abbott
Approved by acclamation