Cl **1** *SC* **1.4.35b** *P* **23** *L* **9** # I-50

Dawe, Piers J G NVIDIA

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

What the Clause 153 SC-FEC sublayer does is much the same as what the Clause 50 WAN Interface Sublayer does: it takes a 64B/66B encoded stream and puts it in a telecoms style wrapper. The SC-FEC is quite different to the "KR4" or "KP4" FEC. Also, this PHY uses a telecoms style clock domain on the line. It doesn't work by "using 100GBASE-R encoding". While it may carry a 64B/66B stream, what it actually uses is SC-FEC framing, and is significantly different to all in-force BASE-R (or BASE-P) PHYs.

SuggestedRemedy

Change "using 100GBASE-R encoding, DP-DQPSK modulation" to "using 100GBASE-R encoding, GMP mapping, SC-FEC framing, and DP-DQPSK modulation".
(If the group is ashamed of using all those things, it could change how the PHY works, but that would be more disruptive.)

Response *Response Status* **U**

REJECT.

The commentor has not demonstrated how changing it would improve the quality of the draft. The same comment was submitted as technical, not required in D2.0, comment 139 (see https://www.ieee802.org/3/ct/comments/D2P0/8023ct_D2p0_comments_final_by_clause.pdf, page 5) and the working group modified the wording to the current definition.

Cl **1** *SC* **1.4.237b** *P* **23** *L* **35** # R2-13

Dawe, Piers J G NVIDIA

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

As D3.0 comment 87 and D3.1 comment 82 pointed out, the path between PMDs is not from TP2 to TP3 because TP2 is not at the PMD, so a transmitting DWDM PHY is not TP2 (even though a receiving DWDM PHY can be called TP3).
The path between PMDs is from MDI to MDI, or PMD to PMD, or transmitter to receiver, or PHY to PHY. As almost every optical clause says, "NOTE--Transmitter compliance testing is performed at TP2 as defined in 121.5.1, not at the MDI." If G.698.2 means that Ss is at Tx and Rs is at Rx, the DWDM channel is from MDI to MDI and TP2 is not relevant here, as well as being incorrect by 802.3. If G.698.2 means that there is something between Ss and Tx and between Rs and Rx, then TP3 is not relevant here.

SuggestedRemedy

Change "1.4.237b DWDM channel: DWDM channel: The transmission path from a transmitting DWDM PHY (TP2) to a receiving DWDM PHY (TP3). to "1.4.237b DWDM channel: DWDM channel: The transmission path from a transmitting DWDM PHY to a receiving DWDM PHY." or, following
Correct misuse of TP2 throughout the draft.

Response *Response Status* **U**

REJECT.

As noted by the commenter this same change was proposed in D3.0 comment 87 and D3.1 comment 82. In both cases the wording of the definition was modified but the use of TP2 and TP3 was maintained. As consistent with existing IEEE language, the draft states "the optical transmit signal is defined at the output end of a single-mode fiber patch cord (TP2)" and "the optical receive signal is defined at the output of the fiber optic cabling (TP3) at the MDI" so the supporting medium which in this case is a DWDM channel, has to be from TP2 to TP3.

Cl **153** *SC* **153.2.3.2.4** *P* **84** *L* **22** # I-60

Dawe, Piers J G NVIDIA

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

The GMP mapper and SC-FEC encoder are far too complicated to be implemented with high confidence based on only these sections, G.709 and G.709.2 Annex A.

SuggestedRemedy

As requested before, please provide a sample SC-FEC frame. There is provision for a downloadable file if it is larger than one would want in the standard. It may be acceptable to publish the beginning and end of the frame, omitting most of the payload if what is omitted really is obvious.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.
An example SC-FEC codeword is expected to be generated and provided in the http://standards/ieee.org/downloads/802.3/, with the expected filename 802.3ct-2021_downloads.zip.

Add to the end of clause 153.2.3.2.5 SC-FEC Encoder the following:
"NOTE-A file containing an example SC-FEC codeword is available at http://standards.ieee.org/downloads/802.3/."

Cl **153** *SC* **153.2.3.2.5** *P* **92** *L* **36** # R2-9

Dawe, Piers J G NVIDIA

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

The need for an example file containing an example SC-FEC codeword published at http://standards.ieee.org/downloads/802.3/ has not gone away, and before this project can complete, it needs to be reviewed. If reviewers do not agree on its correctness and consistency with the draft, one or both of draft and file would need to be re-issued and reviewed again.

SuggestedRemedy

Reinstate the text "NOTE-A file containing an example SC-FEC codeword is available at http://standards.ieee.org/downloads/802.3/.
Upload a draft file for review, e.g. in the P802.3ct web area, before or at the same time as the next draft.

Response *Response Status* **U**

REJECT.

The proposed change in the comment does not contain sufficient detail so that the CRG can understand the specific changes that would satisfy the commenter.

No file containing an example SC-FEC codeword has been submitted to the Task Force. Without a suitable file, the note should not be reinstated.

Cl **154** *SC* **154.5.4** *P* **106** *L* **45** # I-59

Dawe, Piers J G NVIDIA

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

A table with only one row isn't a table.

SuggestedRemedy

Reinstate the row "All other conditions Unspecified"
then it makes sense as a table and works the same way.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See resolution to comment #i-28.

Response to comment i-28 was:

Replace the current content of clause 154.5.4 with the following new text:
"The PMD global signal detect function shall set the state of SIGNAL_DETECT parameter to a fixed OK level. Fixing the value of
SIGNAL_DETECT from the PMD sublayer at OK allows upper layers to determine whether a valid signal is being received, e.g., according to the ability to acquire frame alignment.
NOTE-Average input power is not a reliable indication of signal failure in an optically amplified system."

Cl **154** *SC* **154.7.1** *P* **114** *L* **3** # R1-84

Dawe, Piers J G NVIDIA

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

With regard to D3.0 comment 58, tolerance to chromatic dispersion was not enforced: optical clauses usually have something like TDP or TDECQ involving a measurement of the transmitted after chromatic dispersion to enforce good transmitter behaviour. I believe EVMrms does not do this, so is there a gap that needs to be filled? Does the maximum spectral excursion provide the necessary protection?

SuggestedRemedy

Ensure that the combination of transmitter and max / min dispersion will deliver a usable signal.

Response *Response Status* **U**

REJECT.

The commenter has not provided any evidence that the specification is allowing devices passing the requirements while not operating not satisfactorily in the field for the range of DWDM black links specified.
The technology generally used for DP-DQPSK modulated devices inherently have an extremely high tolerance to chromatic dispersion by design, not requiring the addition of specific parameters. The dispersion limits specified in Table 154-9 for the DWDM black link are a sufficient condition in combination with the optical path penalties specified.

Cl **154** *SC* **154.7.2** *P* **111** *L* **22** # I-58

Dawe, Piers J G NVIDIA

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

In this draft, the black link must comply with chromatic dispersion (max) and (min), but there is no corresponding spec on the receiver. Compare G.698.2:
"7.3.2 Maximum and minimum (residual) chromatic dispersion
These parameters define the maximum and minimum value of the optical path end-to-end chromatic dispersion that the system shall be able to tolerate."
This draft has lost something very important in translation. Not specifying the receiver for tolerance to chromatic dispersion is contrary to all 802.3 SMF specs since 2002.

SuggestedRemedy

Add a requirement for the receiver to tolerate the range of chromatic dispersion, e.g. similar to the stressed sensitivity spec in any 802.3 SMF clause.

Response *Response Status* **U**

REJECT.
The final sentence of the comment reads "Not specifying the receiver for tolerance to chromatic dispersion is contrary to all 802.3 SMF specs since 2002."
None of recent in-force and draft receiver specifications contain a requirement for tolerance to chromatic dispersion. Instead chromatic dispersion requirements are provided in the channel requirements. Therefore it is very appropriate to include the chromatic dispersion requirements in the black link specifications.

Cl **154** *SC* **154.7.2** *P* **111** *L* **25** # I-55

Dawe, Piers J G NVIDIA

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

This draft lacks a sensitivity or stressed sensitivity spec, but has a spec for receiver OSNR tolerance(193.6), defined in 154.8.16 by reference to G.698.2, where 7.4.3 defines it as at: worst EVM_RMS, IQ offset, optical return loss at point SS, receiver connector degradations and measurement tolerances, but excluding chromatic dispersion, non-linear effects, reflections from the optical path, PMD, PDL and optical crosstalk. This would need a great deal of interpretation to turn into an actual measurement, with too much opportunity for alternative choices and disagreement. 802.3 doesn't put measurement tolerances in parameter values like that; they are the measurer's problem not the standard's. Not specifying the receiver for tolerance to chromatic dispersion is contrary to all 802.3 SMF specs since 2002. Not having a specific stressed sensitivity spec is contrary to all 802.3 SMF specs since 1998. It is not clear that receiver OSNR tolerance(193.6) enforces the right receiver sensitivity for the unamplified link.

SuggestedRemedy

Add clear, specific receiver sensitivity criteria, addressing signal strength, sinusoidal jitter, EVM_RMS, IQ offset, chromatic dispersion, and for the amplified case, OSNR.
Make the unamplified case a "major option" if it's more onerous than the amplified case.
If it makes sense to specify tolerance to OSNR and some other things in one spec item, and chromatic dispersion and some others in another spec item, as G.698.2 does, do so.
Because this PMD has its own clock domain, the sinusoidal jitter won't be the usual amount.
Add associated PICS.

Response *Response Status* **U**

REJECT.
The comment does not provide a specific proposal or provide evidence that the suggested change will improve the quality of the draft.
Furthermore it is very similar to previously submitted comments #15 to D2.1 and #140 to D2.0 which were both rejected.

Straw poll: I support not making any changes to the draft based on this comment.

Y - 19
N - 5
A - 3

There was no consensus to make a change to the document at this time.

Cl **154** *SC* **154.9.15** *P* **119** *L* **13** # R1-95

Dawe, Piers J G NVIDIA

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

I could not find a statement as to whether signals for average receive power and receiver OSNR qualification include chromatic dispersion, interferometric crosstalk, reflections... or not. As the path penalty may be 3 dB, this seems like a large ambiguity. Considering that the numbers in Table 154-8 (receiver) and 154-9 (black link) match, I would think the major ones should be included. D3.0 comment 58 pointed out this or a similar issue.

SuggestedRemedy

Please clarify.
Preferably, explain more fully how this measurement would be done: e.g. that it should be after max / min chromatic dispersion.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See response to comment R1-98.

The response to comment R1-98 was:

ACCEPT IN PRINCIPLE.

Implement proposed remedy with editorial license.

Suggested remedy was:

Modify "The Receiver OSNR shall be within the limits given in Table 154-8 over the average receive power range specified in Table 154-8" to indicate that this includes the black link impairments.

Cl **154** *SC* **154.9.16** *P* **119** *L* **22** # R1-79

Dawe, Piers J G NVIDIA

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

With respect to D3.0 comment 85 about jitter bandwidth: there is a jitter bandwidth implied in the EVMrms definition, although it is done in a way that is very specific to a real-time scope, unlike other 802.3 optical clauses. "worst-case values of EVMrms" could mean worst distortion/noise but little jitter or worst jitter but little distortion/noise. Different receivers will react differently to these alternatives.

SuggestedRemedy

Clarify the signal jitter in the definition of receiver OSNR tolerance. It may be that two conditions will be needed, analogous to the stressed sensitivity/RITT and jitter tolerance requirements in other clauses.

Response *Response Status* **U**

REJECT.

Reference is made to comment 85 IEEE P802.3ct/D3.0, which is about the number of samples N in EVM testing and not about jitter bandwidth.
Therefore this comment does not apply to the substantive changes between IEEE P802.3ct/D3.0 and IEEE P802.3ct/D3.1 or the unsatisfied negative comments from the previous ballot.
Hence it is not within the scope of the recirculation ballot.

The proposed remedy would imply that the receiver performance would be specified for various different cases of worst case EVM and thus for all kinds of different impairments. This would imply that various transmitter impairments, for instance IQ offset, IQ skew, jitter would need to be specified separately for impact on the receiver performance, which is something the Task Force has not agreed to do for the specification of OSNR tolerance, because it would be virtually impossible to specify the worst case condition.
Related comment I-55 to D3.0 to add clear, specific receiver sensitivity criteria, addressing signal strength, sinusoidal jitter, EVM_RMS, IQ offset, chromatic dispersion, and for the amplified case, OSNR, was rejected by the Task Force after a straw poll was taken: "I support not making any changes to the draft based on this comment."
Y - 19
N - 5
A - 3
As a result it was concluded that there was no consensus to make a change to the document on comment I-55.
Because OSNR tolerance is a parameter similar to receiver sensitivity, except that it applies to low OSNR conditions (lower than 35 dB) in contrast to receiver sensitivity applying to high OSNR conditions (equal to or larger than 35 dB).

Cl **154** *SC* **154.9.19** *P* **119** *L* **36** # R1-87

Dawe, Piers J G NVIDIA

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

Need to specify what receiver would be used.

SuggestedRemedy

Is it the reference receiver in Annex A of G.698.2?

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Modify first sentence of 154.9.19 to:
"The optical path penalty shall be within the limit given in Table 154-9 and is defined as the apparent reduction of receiver sensitivity due to distortion of the signal during its transmission over the DWDM black link, using the reference receiver as defined in Annex A of Recommendation ITU-T G.698.2."

Cl **154** *SC* **154.9.19** *P* **120** *L* **42** # R2-18

Dawe, Piers J G NVIDIA

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

It is not clear what the reference receiver in Annex A of Recommendation ITU-T G.698.2 is. Annex A says "The reference receiver includes the following steps as defined in the EVM calculation in clause 7.2.12, except the first item: compensate for chromatic dispersion and differential group delay". This might mean that the first item "compensate for chromatic dispersion and differential group delay" is included in EVM but not in Annex A, or vice versa. If these are additional steps that are not defined in 7.2.12, where are they defined?

SuggestedRemedy

Define more clearly what the differences between 7.2.12 and Annex A are.

Response *Response Status* **U**

REJECT.
Even though the wording of Annex A in Recommendation ITU-T G.698.2 is somewhat different than common in IEEE 802.3 documents, it still is sufficient and adequate.
The definition of EVM in G.698.2 does not include compensating for effects of the optical path (and thus chromatic dispersion) while for the definition of "Maximum optical path OSNR penalty", for which the reference receiver in Annex A is specifically defined, it is necessary to compensate for the effects of the path.
The conditions for the defintion of "Optical path power penalty" in 154.9.19, are similar to the definition of "optical path OSNR penalty" and therefore the same reference receiver can be used.

Improving the text of G.698.2 is out of scope of IEEE 802.3.