Cl **0** *SC* **0** *P* **8** *L* **46** # I-3

McClellan, Brett — Marvell Semiconductor, Inc.

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

typo

SuggestedRemedy

change Mcclellan to McClellan

Response *Response Status* **C**

ACCEPT.

Cl **1** *SC* **1.4.389** *P* **22** *L* **42** # I-24

Hajduczenia, Marek — RG Nets

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

The definition for "master Physical Layer device" uses a dash in "side-stream scrambling" while other clauses vary.

SuggestedRemedy

Ensure consistent hyphenation of "side-stream" throughout the definitions. Consider using non-breakinh hyphen.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: Clarified remedy. There is no occurrence of "side stream" or "side-stream" with a broken hyphen in the document.)

On P24, L26:
Replace breaking hyphen with a non-breaking hyphen in "side-stream".

Cl **30** *SC* **30.5.1.1.10** *P* **30** *L* **31** # I-25

Hajduczenia, Marek — RG Nets

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

The behavior definition contains "nextCarrierEvent" without a space.

SuggestedRemedy

Change "nextCarrierEvent" to "next CarrierEvent".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: Corrected location of change.)

P32, L43,
Replace, "nextCarrierEvent"

with, "next CarrierEvent"

Cl **45** *SC* **45.2.7.36** *P* **50** *L* **21** # I-5

Ran, Adee — Cisco Systems, Inc.

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

"entries 0 & 1"
The ampersand symbol usage as a shorthand of "and" is rare in 802.3, apparently limited to a few figures. There is no instance of this shorthand in Clause 45.
There is no need for shorthand notation in headings.

SuggestedRemedy

Change "&" to "and" in the headings of 45.2.7.36 & 45.2.7.37, & in corresponding references (Table 45-378, Table 45–402i, Table 45–402j), & wherever else required, with editorial license.

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2.7.36** *P* **50** *L* **22** # I-57

Murray, Brian — Analog Devices Inc.

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

In many applications, it is reasonable to limit the downshift/upshift sequence to certain PHYs or link settings. There are various variables and registers defined related to this. But it is not clear if there is a mechanism defined to achieve this.
The section 98D.2.2 Variables, lists PreferredLinkList, MostPreferredLink, LeastPreferredLink, CurrentLink, NextLowerLink & NextHigherLink as variables and a set of enumerations in section 98D.2.7. These are used in the Downshift state diagram And in section 45.2.7.36 and 45.2.7.37 there are clause 45 registers 7.536 and 7.537 for the downshift preference list entries 0, 1, 2 & 3. It seems reasonable to assume that MostPreferredLink will be the first entry, e.g. entry 0. And LeastPreferredLink would be set to the "last" link settings in the PreferredLinkList. But there is no defined way to tell which should be that last setting, e.g. which of entries 1, 2 or 3 are meant to be the last.

SuggestedRemedy

Maybe this could be resolved with a register to indicate which is the last entry.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change 45.2.7.36 and 45.2.7.36 text by inserting the following before “The assignment of bits”. (P50 L24 & P51 L2)
"45.2.7.36 and 45.2.7.37 specify the downshift preference list. The list is ordered from most preferred (entry 0) to least preferred (entry 3). Unused entries contain 0xff (all ones)."

Cl **104** *SC* **104.5.7.4** *P* **57** *L* **31** # I-6

Ran, Adee — Cisco Systems, Inc.

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

This second paragraph of 104.5.7.4 contains one introductory statement: "The PD DUT is connected to a power supply through a dc bias coupling network as shown in Figure 104–9", followed by eight statements about ripple and transient specifications, which are all the same other than the PD type and the reference to different clauses.
The result is a large block of text, and the reader has a hard time understanding the different requirements and locating the specific reference for each type. The problem is exacerbated by the addition of new classes.

ideally this paragraph should have included a table for the mapping of PD type to specification. If that is too much work, at least the paragraph can be broken into multiple paragraphs with one statement in each, possibly in a list format. The suggested remedy takes the latter approach, which is less pervasive, but if the editor prefers to "factor out" the text further or add a table it would be welcome.

A similar improvement could be applied to the third and fourth paragraphs, although they are slightly less repetitive.

SuggestedRemedy

Rewrite the paragraph by moving the repeating sentence to a dashed list, as follows:
The PD DUT is connected to a power supply through a dc bias coupling network as shown in Figure 104–9. The PD ripple and transient specifications are as follows:
- The ripple and transient specifications for a Type A or Type C PD shall be met <...> as specified by Equation (96–12), and over the range of PPD
- The ripple and transient specifications for a Type B PD shall be met <...> as specified by Clause 97, and over the range of PPD
<...>

Or in another way, with editorial license. Consider applying the similar changes to the second and third paragraphs.

Response *Response Status* **C**

REJECT.
CRG disagrees with the commenter.

While this is organizationally a good idea, overhauling the organization of this text (and similar) in clause 104 goes beyond the scope of this project, which is limited to 100BASE-T1L. Suggest the Commenter submit this for IEEE 802.3 standard maintenance so that it will have attention of the entire 802.3 community in the revision process.

Cl **190** *SC* **190.1** *P* **62** *L* **38** # I-7

Ran, Adee Cisco Systems, Inc.

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

"100BASE-T1L PHYs can be used with power delivered over the signal conductors, such as Clause 104, or other power schemes specifically designed to be compatible with this standard"

"such as Clause 104" is poor language. Clause 104 is an example of a clause, not an example of power. It could be "such as with the Power over Data Lines (PoDL) specifications in Clause 104".

But there is a separate issue - why is clause 104 listed as an example rather than the normative way of power delivery? is there another power scheme " specifically designed to be compatible with this standard"? and with what part of this standard? For interoperability, it should be compatible with PoDL, which is not trivial; If there is any non-PoDL method that is meant here it should be listed explicitly; but if the intent is to generally allow things that are beyond the scope of the standard, then this sentence is redundant - there is always a possibility that something outside of the standard will be compatible, but the standard should not address that. Otherwise, we could have sentences like that all over the place.

SuggestedRemedy

Change the quoted sentence to
"100BASE-T1L PHYs can be used with power delivered over the signal conductors, as specified in Clause 104".
If deemed necessary, add an informative NOTE such as
"NOTE—Usage and interoperability of power delivery schemes other than PoDL specified in Clause 104 is beyond the scope of this standard."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change the quoted sentence to

"100BASE-T1L PHYs can be used with power delivered over the signal conductors (e.g., Clause 104 powering)."

Cl **190** *SC* **190.1.1** *P* **63** *L* **24** # I-8

Ran, Adee Cisco Systems, Inc.

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

"NOTE 2—Auto-Negotiation is mandatory"
Everything in the diagram (and in the standard in general) is mandatory unless stated as optional.
The fact that AN is mandatory is stated in 190.1.2.
A NOTE in a figure is informative, and does not make AN mandatory on its own.
There is no precedence for having such "mandatory" statements in similar figures of PHYs for which AN is also mandatory (e.g., Figure 40–1).

SuggestedRemedy

Delete the quoted note.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Delete "NOTE 2—…" (in its entirety)

Delete footnote mark from AN sublayer

Replace "NOTE 1—" with "NOTE—"

Cl **190** *SC* **190.1.2** *P* **63** *L* **34** # I-9

Ran, Adee Cisco Systems, Inc.

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

"The link segment specifications defined in 190.7 support operation with up to five in-line connectors using a single balanced pair of conductors for up to at least 500 m."
"a single balanced pair of conductors" and the reach are the primary information of this sentence; "up to five in-line connectors" is secondary.

Also in 190.7.

SuggestedRemedy

Change the quoted sentence to
"The link segment specifications defined in 190.7 support operation over a single balanced pair of conductors for up to at least 500 m with up to five in-line connectors."

Make a similar change in 190.7.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

190.1.2 (P63 L33)
Replace, "The link segment specifications defined in 190.7 support operation with up to five in-line connectors using a single balanced pair of conductors for up to at least 500 m."
with,
"The link segment specifications defined in 190.7 support operation over a single balanced pair of conductors for up to at least 500 m with up to five in-line connectors."

190.7 (P135 L19)
Replace, "The link segment specified in this clause is based on process control application requirements and supports up to five in-line connectors using a single balanced pair of conductors for up to at least 500 m."
with,
"The link segment specified in this clause is based on process control application requirements and supports up to at least 500 m with up to five in-line connectors."

Cl **190** *SC* **190.1.2** *P* **64** *L* **6** # I-10

Ran, Adee Cisco Systems, Inc.

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

"mandated" is not typically used in 802.3 (only 3 instances in ancient clauses). We usually write "required" for this purpose.
Also in the next paragraph, line 12.

SuggestedRemedy

Change "mandated" to "required" in both places.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

On page 64, line 6 replace,
"Auto-Negotiation, as specified in Clause 98, is supported and mandated by 100BASE-T1L devices."
with,
"Auto-Negotiation, as specified in Clause 98, is always used by 100BASE-T1L devices (see 190.6.1)."

On page 64, line 12 replace,
"100BASE-T1L PHYs are mandated to be capable of operating as LEADER or FOLLOWER (see 190.6.1)."
with,
"Each 100BASE-T1L PHY is capable of operating as both a LEADER and a FOLLOWER (see 190.6.1)."

Cl **190** *SC* **190.1.4** *P* **65** *L* **40** # I-11

Ran, Adee Cisco Systems, Inc.

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

"All 100BASE-T1L PHY implementations are compatible at the MDI and at the MII, if implemented"
This is an intent, but not a statement that can be made in a standard (have we checked all implementations?)
What it seems to mean is that the compatibility is required at these interfaces.

SuggestedRemedy

Change the quoted sentence to
"100BASE-T1L PHY implementations are specified to be compatible at the MDI and at the MII, if implemented".

Response *Response Status* **C**

REJECT.
CRG disagrees with commenter.
Text is consistent with BASE-T PHY style in 802.3.

Cl **109** *SC* **109.2.2.15** *P* **75** *L* **32** # I-35

Ward, Lisa — Rohde & Schwarz

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

Extremely minor editorial comment, a comma should be used after 'when the PHY supports the EEE capability"

SuggestedRemedy

Change "When the PHY supports the EEE capability this primitive is generated by the PCS Receive function to indicate the status of the receive link at the local PHY"
to
"When the PHY supports the EEE capability, this primitive is generated by the PCS Receive function to indicate the status of the receive link at the local PHY"

Response *Response Status* **C**

ACCEPT.

Cl **190** *SC* **190.3.2.2** *P* **80** *L* **10** # I-13

Ran, Adee — Cisco Systems, Inc.

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

The label on the left says "Output of PCS (8N)B/(8N + 1)B Transmit state diagram"
This diagram (Figure 190-11) does not have an output.
It is not clear what the label refers to, unless the reader understands it already.
Also, it is informative, so could be a NOTE.

SuggestedRemedy

Change the label to read "tx_coded is assigned by the PCS (8N)B/(8N + 1)B Transmit state diagram".
Consider moving that label to a NOTE at the bottom of the figure.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add to Figure 190-4:
"NOTE 3—txcoded is assigned by the PCS (8N)B/(8N + 1)B Transmit state diagram (see Figure 190-11)."

Cl **190** *SC* **190.3.2.6.2** *P* **86** *L* **1** # I-26

Hajduczenia, Marek — RG Nets

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

The text uses "reminder of polynomial division" instead of "remainder".

SuggestedRemedy

Change "reminder" to "remainder".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: Corrected location of change.)

P89, L1,
Replace, "reminder"

with, "remainder"

Cl **190** *SC* **190.3.4.2** *P* **99** *L* **42** # I-51

Zimmerman, George — Analog Devices,Cisco Systems, Inc.,CME Consulting,

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

MEC indicated to review words with absolute verbiage which might be construed as a guarantee - one of them is "ensure". While its use here is correct, it might be avoided.

SuggestedRemedy

Change "The definition of the training frame ensures that Sdn[1] is inverted..." to "The definition of the training frame inverts Sdn[1]..."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change "The definition of the training frame ensures that Sdn[1] is inverted for the first..." to "The definition of the training frame inverts Sdn[1] for the first..."

Cl **190** *SC* **190.3.4.3** *P* **102** *L* **39** # I-1

Chen, Chi-Hua — Chunghwa Telecom Laboratories

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

It is suggested that the expression Fn = SXn × TEn described in Line 39 on Page 102 be revised to Fn = SXn × TFn.

SuggestedRemedy

Fn = SXn × TFn

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: No change to Suggested Remedy. Clarifying implementation.)

Replace, "Fn = SXn × Ten" described in Line 39 on Page 102 with "Fn = SXn × TFn"

Cl **190** *SC* **190.3.5.1** *P* **104** *L* **48** # I-52

Murray, Brian — Analog Devices Inc.

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

In Table 190–10—Synchronization signals derived from LEADER PFC, the expression for tx_sleep_start_next is incorrect. Transmission of the sleep signal may start at the beginning of any multiple of 16 PCS partial frame periods (sleep_period), and thus the expression should be calculated using modulo sleep_period not modulo sleep_time.

SuggestedRemedy

In the 2nd body row, replace mod(PFC, sleep_time) with mod(PFC, sleep_period)

Response *Response Status* **C**

ACCEPT.

Cl **190** *SC* **190.3.5.1** *P* **104** *L* **50** # I-53

Murray, Brian — Analog Devices Inc.

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

In Table 190–10—Synchronization signals derived from LEADER PFC, the expression for tx_alert_start_next is incorrect. The alert signal may start at the beginning of any multiple of 16 PCS partial frame periods (alert_period), and thus the expression should be calculated using modulo alert_period not modulo alert_time.

SuggestedRemedy

In the 3rd body row, replace mod(PFC, alert_time) with mod(PFC, alert_period)

Response *Response Status* **C**

ACCEPT.

Cl **190** *SC* **190.3.5.1** *P* **105** *L* **6** # I-54

Murray, Brian — Analog Devices Inc.

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

In Table 190–11—Synchronization signals derived from FOLLOWER PFC, the expression for tx_sleep_start_next is incorrect. Transmission of the sleep signal may start at the beginning of any multiple of 16 PCS partial frame periods (sleep_period), and thus the expression should be calculated using modulo sleep_period not modulo sleep_time.

SuggestedRemedy

In the 2nd body row, replace mod(PFC, sleep_time) with mod(PFC, sleep_period)

Response *Response Status* **C**

ACCEPT.

Cl **190** *SC* **190.3.5.1** *P* **105** *L* **8** # I-55

Murray, Brian — Analog Devices Inc.

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

Table 190–11—Synchronization signals derived from FOLLOWER PFC, the expression for tx_alert_start_next is incorrect. The alert signal may start at the beginning of any multiple of 16 PCS partial frame periods (alert_period), and thus the expression should be calculated using modulo alert_period not modulo alert_time.

SuggestedRemedy

In the 3rd body row, replace mod(PFC, alert_time) with mod(PFC, alert_period)

Response *Response Status* **C**

ACCEPT.

Cl **190** *SC* **190.3.6.1.2** *P* **106** *L* **25** # I-32

Hajduczenia, Marek — RG Nets

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

"tx_4x_pcs_partial_frame_done" reset timing is unclear in Figure 190-12.

SuggestedRemedy

Clarify if this is a single-event pulse or define its duration.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
At P106 L5, Change the definition of tx_4x_pcs_partial_frame_done to read:

Boolean variable that is set TRUE when the final symbol of each PCS partial frame has completed transmission while the associated PFC satisfies the condition mod(PFC, 4) = 3. It resets to FALSE immediately at the start of transmission of the next symbol. Default value is FALSE.

Cl **190** *SC* **190.3.6.2** *P* **112** *L* **47** # I-12

Ran, Adee
Cisco Systems, Inc.

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

In Figure 190-12:
"NOTE—This figure is mandatory when EEE is enabled for the link."
A note in a figure is informative and cannot include mandatory requirements.
Also, implementation of the state diagram is required for support of EEE, even if it is not used in a specific link.

The latter point also applies to Figures 190-13 and 190-14. The comment also applies to Figure 190-15 (for RS-FEC).

SuggestedRemedy

Change the note in Figure 190-12 to:
"NOTE—This state diagram is not required if EEE is not supported."
Change the notes in Figures 190-13 and 190-14 to:
"NOTE—Signals and functions shown with dashed lines are only required if EEE is supported."
Change the note in Figure 190-15 to:
"NOTE—This state diagram is not required if RS-FEC is not supported."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
The requirement in the text at 190.3.3 for Figures 190-13 and 190-14 missed the statement that the dashed rectangles only apply to operation when EEE is enabled.)

Insert new 2nd paragraph to 190.3.3 (P95 L35): "Dashed rectangles in Figure 190–13 and Figure 190-14 are used to indicate states and state transitions that are supported by a PHY with the EEE capability when EEE is enabled for the link. A PHY without the EEE capability enabled does not support these states or transitions."

Cl **190** *SC* **190.3.6.2** *P* **113** *L* **3** # I-14

Ran, Adee
Cisco Systems, Inc.

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

once for every 2 cycles

SuggestedRemedy

once per two cycles

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace, "once for every 2 cycles"

with, "once every two cycles"

Cl **190** *SC* **190.4** *P* **116** *L* **35** # I-15

Ran, Adee
Cisco Systems, Inc.

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

The label on the right of figure 190-16 says "Technology Dependent Interface (optional)"
I think it is not optional, since auto-negotiation is mandatory. It is also not labeled optional in Figure 190-2.

SuggestedRemedy

Delete "(optional)".

Response *Response Status* **C**

ACCEPT.

Cl **190** *SC* **190.4.2** *P* **117** *L* **14** # I-16

Ran, Adee
Cisco Systems, Inc.

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

"The PMA Transmit function comprises a transmitter to generate a three-level modulated signal on the single balanced pair of conductors"
The word "comprises" does not match "to generate".
Based on 190.4.3, it seems that it should read "comprises a transmitter for PAM3 signals on the balanced pair".
Also "comprises" usually describes something that is made of several parts; it is not adequate in this case.

SuggestedRemedy

At the minimum, change to "<...> comprises a transmitter for PAM3 signals on the balanced pair".

Consider changing "comprises" to "is", here and in 190.4.3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "comprises" to "is" at P117 L14 and P117 L37.

Cl **190** *SC* **190.4.3** *P* **118** *L* **2** # I-17

Ran, Adee
Cisco Systems, Inc.

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

"pair polarity swaps"
There is only one pair, so only one swap is possible.

SuggestedRemedy

change "swaps" to "swap".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace, " to detect and correct for pair polarity swaps."

with, "detect and correct for swapped pair polarity."

Cl **190** *SC* **190.4.4.2** *P* **118** *L* **45** # I-18

Ran, Adee
Cisco Systems, Inc.

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

"Thus, the Leader and Follower PCS frames are synchronized and PHY capabilities are exchanged"
The word "thus" is unclear here; it has not been described how PCS frames are synchronized and how PHY capabilities are exchanged.
I assume the formatted training frames mentioned in the last paragraph enable that.

SuggestedRemedy

Change the quoted sentence to
"Using the formatted training frames, the Leader and Follower synchronize the PCS frames and exchange PHY capabilities".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace, "Thus, the Leader and Follower PCS frames are synchronized and PHY capabilities are exchanged."

with, "The Leader and Follower synchronize PCS frames and exchange PHY capabilities using the formatted training frames."

Cl **190** *SC* **190.5.3** *P* **128** *L* **25** # I-19

Ran, Adee
Cisco Systems, Inc.

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

The text says "All the transmitter tests are defined at the MDI" but the figures do not show where the MDI is. I assume it is the boundary of the "Transmitter Under Test".

SuggestedRemedy

Add an indication of the MDI in Figures 190-23 through 190-25.

Response *Response Status* **C**

REJECT.
CRG disagrees with commenter.
Figures are consistent with style for BASE-T, BASE-T1, and BASE-T1L PHYs. While some optical and BASE-R PHYs have this indicated, it may be needed there because of other tests at defined test points which do not exist in BASE-T and BASE-T1L PHYs.

Cl **190** *SC* **190.5.4** *P* **129** *L* **26** # I-20

Ran, Adee
Cisco Systems, Inc.

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

"The PMA shall operate with ac coupling to the MDI."
This sentence a normative requirement, but is ambiguous: it could be read as if AC coupling is external to PMA and the PMA has to operate with it, or that the PMA needs to include AC coupling.
In figure 190-22 the AC coupling is not shown, so I assume it is part of the "Hybrid" box.
Also the remainder of this paragraph mentions a resistive load connected to the "transmitter output", suggesting that the AC coupling in internal to the transmitter.

SuggestedRemedy

Clarify the requirment.
I assume the following sentence can be used:
"The PMA shall include AC coupling to the MDI."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace, "The PMA shall operate with ac coupling to the MDI."

with, "The PMA shall include ac coupling to the MDI."

In PICS PMAE11,
Replace, "AC coupling at MDI"

with, "ac coupling to MDI"

Cl **190** *SC* **190.5.4.2** *P* **129** *L* **50** # I-45

Zimmerman, George — Analog Devices,Cisco Systems, Inc.,CME Consulting,

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

The physical constraints that require the droop spec to be different for Clause 104 powering apply because of the power-data splitting circuitry, and are dependent only on the fact that DC power is on the differential balanced pair. They are not dependent on clause 104 being used - clause 104 is just an example.

SuggestedRemedy

Change "When a Clause 104 PSE or PD PI…", to read:
"When DC power is not provided differentially over the MDI conductors, such as when a clause 104 PSE or PI…"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace, "When a Clause 104 PSE or PD PI is not encompassed within the MDI, the magnitude of both the positive and negative droop shall be less than 10% measured with respect to an initial value at 37.5 ns after the zero crossing and a final value at 100 ns after the zero crossing."

with,
"When dc power is not provided differentially over the MDI conductors (e.g., when a Clause 104 PSE or PD PI is not encompassed within the MDI), the magnitude of both the positive and negative droop shall be less than 10% measured with respect to an initial value at 37.5 ns after the zero crossing and a final value at 100 ns after the zero crossing."

Cl **190** *SC* **190.5.4.2** *P* **130** *L* **1** # I-46

Zimmerman, George — Analog Devices,Cisco Systems, Inc.,CME Consulting,

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

The physical constraints that require the droop spec to be different for Clause 104 powering apply because of the power-data splitting circuitry, and are dependent only on the fact that DC power is on the differential balanced pair. They are not dependent on clause 104 being used - clause 104 is just an example.

SuggestedRemedy

Change "When a Clause 104 PSE or PD PI…", to read:
"When DC power is provided differentially over the MDI conductors, such as when a clause 104 PSE or PI…"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace, "When a Clause 104 PSE or PD PI is encompassed within the MDI, the magnitude of both the positive and negative droop shall be less than 12.5% measured with respect to an initial value at 37.5 ns after the zero crossing and a final value at 100 ns after the zero crossing."

with,
"When dc power is provided differentially over the MDI conductors (e.g., when a Clause 104 PSE or PD PI is encompassed within the MDI), the magnitude of both the positive and negative droop shall be less than 12.5% measured with respect to an initial value at 37.5 ns after the zero crossing and a final value at 100 ns after the zero crossing."

Cl **190** *SC* **190.6.1** *P* **134** *L* **40** # I-21

Ran, Adee Cisco Systems, Inc.

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

"All 100BASE-T1L PHYs shall provide support for Auto-Negotiation"
There is an MDIO bit indicating Auto-Negotiation ability (7.513.3).
If a device supports both 100BASE-T1L and 10BASE-T1L but has an option to operate without AN for the latter (because it is optional), things become complicated. How should the bit be set?

It seems preferable to ignore this bit for 100BASE-T1L.

SuggestedRemedy

Add a statement in 45.2.7.21.4 that the value of this bit is ignored when a PMA/PMD operates as 100BASE-T1L.

Alternatively, add a requirement that this bit is set to 1 for a PMA/PMD that supports 100BASE-T1L.

Response *Response Status* **C**

REJECT.
CRG DISAGREES WITH COMMENTER.
The referenced bit is a read-only status bit. It is not "set". An implementation that includes 100BASE-T1L is required to implement auto-negotiation, and therefore this bit will be one. No explanation is needed. It is similar to the operation of 7.1.3 for BASE-T PHYs where auto-negotiation is mandatory (1000BASE-T and above), where there is no special note.

Cl **190** *SC* **190.6.1** *P* **134** *L* **47** # I-49

Zimmerman, George Analog Devices,Cisco Systems, Inc.,CME Consulting,

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

MEC instructed the WG to replace negotiate with either "specify" or "indicate" to avoid possible legal implication.

SuggestedRemedy

change "negotiate" to "indicate" in item (a)

Response *Response Status* **C**

ACCEPT.

Cl **190** *SC* **190.7.1.4** *P* **139** *L* **3** # I-22

Ran, Adee Cisco Systems, Inc.

Comment Type **T** *Comment Status* **R** *Link Segment*

This clause defines TCL, (Scd11/Scd22) but does not address TCTL (Scd12/Scd21) (or alternatively LCTL).
100BASE-T1, for a lower reach, specifies both LCL and LCTL in 96.7.1.4.

It seems that without a limiting the transmission loss, a link segment can be severely skewed and convert (partially) the differential signal at the Tx to common mode at the Rx. The Rx will suffer from attenuated differential signal and strong common-mode signal. I suspect that this could severely degrade performance in practical implementations

Is there a reason not to limit this effect?

As a wild guess, since in 96.7.1.4 both LCL and LCTL are limited by the same equation, perhaps it is appropriate to use equation 190-15 for both TCL and TCTL?

SuggestedRemedy

Add requirements for TCTL with the same limits as TCL, in both 190.7.1.4.1 and 190.7.1.4.2.
Alternatively, use other appropriate limits for the transmission conversion losses.

Response *Response Status* **C**

REJECT.

CRG disagrees with commenter.
TCTL and TCL characterize the balance of twisted-pair cable to minimize modal conversion, which can couple from one pair into an adjacent pair or cable. Modal conversion (either from disturbing or from being disturbed) is not a concern for shielded pairs and cables. TCL is required at each end of the link segment and it has not been demonstrated that proposed TCTL requirements would not be satifisfied for either end when TCL is satisfied at both ends.

Cl **190** *SC* **190.7.2.1** *P* **141** *L* **13** # I-41

Maguire, Valerie Analog Devices,Cisco,CME Consulting,Copperopolis

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

The near-end crosstalk being measured and specified is NEXT loss

SuggestedRemedy

Replace "NEXT" with "NEXT loss" in the following two locations: P141, L13 an P141, L14

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: Typo in Suggested Remedy.)

Replace "NEXT" with "NEXT loss" in the following two locations: P141, L13 and P141, L14

Cl **190** *SC* **190.7.2.1** *P* **141** *L* **26** # I-44

Maguire, Valerie — Analog Devices,Cisco,CME Consulting,Copperopolis

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

There is a very minor inconsistency between the PSANEXT loss equation call-out in 190.7.2.1 and the PSAACRF equation call-out in 190.7.2.2 (i.e., one says "power sum ANEXT" and the other says "PSAACRF").

SuggestedRemedy

Replace, "power sum ANEXT" with "PSANEXT"

Response *Response Status* **C**

ACCEPT.

Cl **190** *SC* **190.7.2.2** *P* **142** *L* **25** # I-42

Maguire, Valerie — Analog Devices,Cisco,CME Consulting,Copperopolis

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

There is a very minor inconsistency between the first sentence of 190.7.2.1 and 190.7.2.2 where "near" and far" is used to refer to the end of the link segment (i.e., one says "near end" and the other says "far-end").

SuggestedRemedy

Replace, "at the far-end of a" with "at the far end of a"

Response *Response Status* **C**

ACCEPT.

Cl **190** *SC* **190.7.2.2** *P* **142** *L* **34** # I-43

Maguire, Valerie — Analog Devices,Cisco,CME Consulting,Copperopolis

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

The far-end crosstalk being measured and specified is FEXT loss

SuggestedRemedy

Replace "FEXT" with "FEXT loss"

Response *Response Status* **C**

ACCEPT.

Cl **190** *SC* **190.8.2.1** *P* **144** *L* **8** # I-47

Zimmerman, George — Analog Devices,Cisco Systems, Inc.,CME Consulting,

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

The physical constraints that require the MDI return loss spec to be different for Clause 104 powering apply because of the power-data splitting circuitry, and are dependent only on the fact that DC power is on the differential balanced pair. They are not dependent on clause 104 being used - clause 104 is just an example.

SuggestedRemedy

Change "For MDIs that are not also Clause 104 PIs" to "For MDIs where DC power is not provided differentially over the MDI conductors,"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace, "For MDIs that are not also Clause 104 PIs,..."

with, "For MDIs where dc power is not provided differentially over the MDI conductors,..."

Cl **190** *SC* **190.8.2.1** *P* **144** *L* **17** # I-2

Chen, Chi-Hua — Chunghwa Telecom Laboratories

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

It is suggested that the expression $16 - 20 \times \log_{10}(f/80)$ described in Line 17 on Page 144 be revised to $16 - 20 \times \log_{10}(f/40)$.

SuggestedRemedy

$16 - 20 \times \log_{10}(f/40)$

Response *Response Status* **C**

ACCEPT.

Cl **190** *SC* **190.8.2.1** *P* **145** *L* **1** # I-48

Zimmerman, George — Analog Devices,Cisco Systems, Inc.,CME Consulting,

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

The physical constraints that require the MDI return loss spec to be different for Clause 104 powering apply because of the power-data splitting circuitry, and are dependent only on the fact that DC power is on the differential balanced pair. They are not dependent on clause 104 being used - clause 104 is just an example.

SuggestedRemedy

Change "For MDIs that are also Clause 104 PIs" to "For MDIs where DC power is provided differentially over the MDI conductors, for example, MDIs that are also Clause 104 PIs,"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace, "For MDIs that are also Clause 104 PIs,..."

with, "For MDIs where dc power is provided differentially over the MDI conductors (e.g., MDIs that are also Clause 104 PIs),..."

Cl **190** *SC* **190.8.2.2** *P* **146** *L* **6** # I-34

Graber, Steffen — Pepperl+Fuchs SE

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

The provided limit for the MDI mode conversion loss is seen to be too optimistic, especially for powered systems. See presentation graber_3dg_01_01202026.pdf.

SuggestedRemedy

Suggest to modify the MDI mode conversion loss to the limit given in presentation graber_3dg_01_01202026.pdf, page 5.

Response *Response Status* **C**

ACCEPT.

Cl **190** *SC* **190.10** *P* **146** *L* **31** # I-28

Hajduczenia, Marek — RG Nets

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

The transmit path delay limit (360 ns) may be too restrictive for 8B6T encoding.

SuggestedRemedy

Verify if 36 bit times is the intended maximum for this PHY.

Response *Response Status* **C**

REJECT.
CRG disagrees with the commenter.
Individuals intending implementation have reviewed the specification and are comfortable with the 36 BT maximum.

Cl **190** *SC* **190.9.3** *P* **148** *L* **21** # I-50

Zimmerman, George — Analog Devices,Cisco Systems, Inc.,CME Consulting,

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

MEC indicated to review and try to consider removing words that may by considered implicit or explicit guarantees. "avoid" is one of them.

SuggestedRemedy

Consider changing "to avoid such connections" to "to reduce the chance of such connections"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Replace, “Care should be taken to avoid such connections as they can damage equipment.”

With, “Such connections can damage equipment.”

Cl **190** *SC* **190.11.4.2.1** *P* **149** *L* **25** # I-27

Hajduczenia, Marek — RG Nets

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

PICS item PCST7 uses the term "interframe" without a hyphen.

SuggestedRemedy

Change "interframe" to "inter-frame" to match usage in 190.3.2.5.2.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: Corrected location of change.)

P151, L25,
Replace, "interframe"

with, "inter-frame"

Cl **190** *SC* **190.11.4.2.1** *P* **149** *L* **38** # I-30

Hajduczenia, Marek RG Nets

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

PICS item PCST12 lacks exact codeword structure details.

SuggestedRemedy

Add 'Conforms to RS-FEC(128,122) as specified in 190.3.2.6.2'.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

P151, L37,
Replace, "See 190.3.2.6.2"

with, "Conforms to RS-FEC(128,122) as specified in 190.3.2.6.2."

Cl **190** *SC* **190.11.4.8** *P* **156** *L* **40** # I-31

Hajduczenia, Marek RG Nets

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

PICS TR1 and TR2 missing nanosecond equivalents for delay.

SuggestedRemedy

Add '(360 ns)' and '(960 ns)' to the Value/Comment field.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

On P158, L38 (PICS TR1):
Replace, "Does not exceed 36 BT"

with, "Does not exceed 36 BT (360 ns)"

On P158, L40 (PICS TR2):
Replace, "Does not exceed 96 BT"

with, "Does not exceed 96 BT (960 ns)"

Cl **98D** *SC* **98D.2.2** *P* **160** *L* **46** # I-29

Hajduczenia, Marek RG Nets

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

Variable "mr_ds_upshift_enabled" mismatch with diagram "ds_us_enabled".

SuggestedRemedy

Change "ds_us_enabled" to "mr_ds_upshift_enabled" in Figure 98D-1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
On P164, L44 (Figure 98D-1)
Replace, "ds_us_enabled"

with, "mr_ds_upshift_enabled"

Cl **98D** *SC* **98D.1** *P* **161** *L* **21** # I-23

Ran, Adee Cisco Systems, Inc.

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

"Each “family” of PHYs (e.g., BASE-T1L or BASE-T1) or “technology category” defines its own default sequence, but these can be modified using Clause 30 and Clause 45"
This sentence is unclear. Does it mean that Clause 30 or Clause 45 can include specifications that override what is written in this annex?
Or (my guess) that implementations can configure a non-default sequence using the registers in Clause 45 or management objects in Clause 30?

Also, this annex only defines downshift/upshift support for BASE-T1L (98D.1.1 and Table 98D–2), so BASE-T1 should not be mentioned.

Editorially, the quotes in "family" and "technology category" are unnecessary.

SuggestedRemedy

Change to the following
"Each family of PHYs (e.g., BASE-T1L) that supports downshift/upshift has a default sequence specified in this annex, but other sequences can be configured using management, e.g. management objects in 30.6 or registers in 45.2.7."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace, "Each “family” of PHYs (e.g., BASE-T1L or BASE-T1) or “technology category” defines its own default sequence, but these can be modified using Clause 30 and Clause 45."

with, "Each family of PHYs (e.g., BASE-T1L) that supports downshift/upshift has a default sequence specified in this annex, but other sequences can be configured using management (e.g., management objects in 30.6 or registers in 45.2.7)."

Cl **98D** *SC* **98D** *P* **162** *L* **10** # I-4

McClellan, Brett — Marvell Semiconductor, Inc.

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

line 10 and line 48
link_status[HCD] and transmit_disable are undefined variables within 98D

SuggestedRemedy

change the definition of link_status_ok_transition to "Boolean variable set as TRUE when the value of link_status[HCD] as defined in 98.5.1 changes from any state to OK and set FALSE otherwise."
change the definition of transmit_disable_true_transition to "Boolean variable set as TRUE when the value of transmit_disable as defined in 98.5.1 changes from false to true and set FALSE otherwise."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Insert definition "link_status[HCD] See 98.5.1"

Insert definition "transmit_disable See 98.5.1"

Cl **98D** *SC* **98D.2.5** *P* **164** *L* **2** # I-40

Jones, Peter — Cisco Systems, Inc.

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

*** Comment submitted with the file jones_3dg_D3_0_downshift_state_diagram_012926.pdf attached ***

Figure 98D–1—Downshift state diagram has a number of serious problems as discussed in https://www.ieee802.org/3/dg/public/May_2025/zimmerman_3dg_01_012026.pdf

SuggestedRemedy

"Make changes to Figure 98D–1 as shown in page 1 of file jones_3dg_D3_0_downshift_state_diagram_012926.pdf attached
Additions are show in bold italic, deletions in strikethrough.
Text inside red dashed boxes is explanatory only, and is not intended to be included in the standard.

Response *Response Status* **C**

ACCEPT.

Cl **98D** *SC* **98D-2** *P* **164** *L* **3** # I-33

Hajduczenia, Marek — RG Nets

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

Technology Category bit mismatch: defined as 0 here , but 2 in Annex 98B.

SuggestedRemedy

Change Category value in Table 98D-2 from 0 to 2.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: Corrected location of change. Clarified exact change.)

Change "0" to "2" in six locations in the first (Technology Category) column in Table 98D-2 on P166.

Cl **98D** *SC* **98D.2.5** *P* **164** *L* **25** # I-56

Murray, Brian — Analog Devices Inc.

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

It appears that the Downshift state diagram, Figure 98D–1, does not support downshift unless you have already brought a link up. I do not believe this is the desired behaviour.
In the downshift state diagram, in the DS_LINKDOWN state the 4th IF statement is used to implement a downshift if ds_fail_count is greater than the mr_ds_fail_threshold.
It does this with CurrentLink = NextLowerLink. But the downshift timer must be running, e.g. ds_downshift_timer_running = True, to get to this IF statement. This is a problem if the link has not previously been brought up, as the down shift timer is ony started in the DS_LINKUP state, e.g. with the start ds_downshift_timer.

SuggestedRemedy

Maybe this could be resolved by also starting the down shift timer elsewhere.

Response *Response Status* **C**

REJECT.
Commenter provides insufficient information for a remedy.