**Responses: D2.3 comment**

**IEEE P802.3az Energy Efficient Ethernet comments**

March 2010

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**Cl 45 SC 45.2.1.76a.3**

Anslow, Peter  Nortel Networks

<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
</tr>
</thead>
</table>
| T            | A              | The title says "LP fast retrain count (1.147.10:6)" but the bits should be "(1.147.15:11)"

**Suggested Remedy**

In the title of 45.2.1.76a.3 change "(1.147.10:6)" to "(1.147.15:11)"

**Response**  
Response Status: C  
ACCEPT.

---

**Cl 46 SC 46.3.4**

Anslow, Peter  Nortel Networks

<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
</tr>
</thead>
</table>
| E            | A              | The editing instruction says "Insert text into the second paragraph of 46.3.4 as follows:"

The heading below is 46.3.4.

**Suggested Remedy**

change heading to 46.3.4

**Response**  
Response Status: C  
ACCEPT.

---

**Cl 47 SC 47.1**

Anslow, Peter  Nortel Networks

<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
</tr>
</thead>
</table>
| T            | A              | This says "Transition to the low power state is enabled by register 4.0.9 (for a PHY XS) or 5.20.0 (for a DTE XS). This should be "or 5.0.9 (for a DTE XS)"

**Suggested Remedy**

Change "or 5.20.0 (for a DTE XS)" to "or 5.0.9 (for a DTE XS)"

**Response**  
Response Status: C  
ACCEPT.

---

**Cl 55 SC 55.4.2.2**

Anslow, Peter  Nortel Networks

<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
</tr>
</thead>
</table>
| E            | A              | The editing instruction is "Insert the following text after the existing text in 55.4.2.2 PMA Transmit function:"

Since this is all inserted text it should not be shown in underline font.

**Suggested Remedy**

Remove the underline from the second and third sentences

**Response**  
Response Status: C  
ACCEPT.
IEEE P802.3az Energy Efficient Ethernet comments March 2010

**Comment ID # 7**

**Cl 55 SC 55.4.2.2.2 P 208 L 26**

Anslow, Peter  Nortel Networks

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

The editing instruction says "Insert the following text after subclause 55.4.2.2.1 in draft 2.2" which is inappropriate as this is an amendment to IEEE 802.3-2008

**Suggested Remedy**

Delete this editing instruction and change the previous one from "Insert a new clause 55.4.2.2.1 after the existing text in 55.4.2.2 PMA Transmit function as shown below:" to "Insert new subclauses 55.4.2.2.1 and 55.4.2.2.2 after the existing text in 55.4.2.2 PMA Transmit function as shown below."

**Response**  **Response Status** C

ACCEPT.

**Comment ID # 8**

**Cl 55 SC 55.4.2.5.15 P 209 L 48**

Anslow, Peter  Nortel Networks

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

This refers to "Figure 55-27bb" which should be "Figure 55-27b"

**Suggested Remedy**

Change "Figure 55-27bb" to "Figure 55-27b"

Similar issue with "Figure 55-16ab" Page 210 line 30

**Response**  **Response Status** C

ACCEPT.

**Comment ID # 9**

**Cl 55 SC 55.4.6.4 P 217 L 1**

Anslow, Peter  Nortel Networks

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

The editing instruction to insert subclause 55.4.6.4 should appear before the heading for 55.4.6.4. Also, the subclause 55.3.6.3" should be "after subclause 55.4.6.3" Same issues for 55.4.6.5

**Suggested Remedy**

Move the editing instruction before the heading and change "after subclause 55.3.6.3" to "after subclause 55.4.6.3."

Move the editing instruction for 55.4.6.5 before the heading and change "after subclause 55.3.6.4" to "after subclause 55.4.6.4."

**Response**  **Response Status** C

ACCEPT.

**Comment ID # 10**

**Cl 55 SC 55.6.1.2 P 219 L 11**

Anslow, Peter  Nortel Networks

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

Editing instruction refers to Table 55-11, but table heading is 55-7. Also, only additions to existing rows are shown. Deletions should also be shown in strikethrough font as described on page 14 of the draft.

**Suggested Remedy**

Change table heading to Table 55-11

In the first table row show "21" in strikethrough font

In U19 show "Reserved, transmit as 0" in strikethrough font

**Response**  **Response Status** C

ACCEPT.

**Comment ID # 11**

**Cl 55 SC 55.12.2 P 221 L 13**

Anslow, Peter  Nortel Networks

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

Both new rows use the "insert" editing instruction, so don't need to be in underline font

**Suggested Remedy**

Remove underline from *FR row

**Response**  **Response Status** C

ACCEPT.

**Comment ID # 12**

**Cl 55 SC 55.12.4 P 223 L 9**

Anslow, Peter  Nortel Networks

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

All of the new rows use the "insert" editing instruction, so don't need to be in underline font

**Suggested Remedy**

Remove underline from all rows in this subclause

Scrub the rest of the draft for similar instances of text added with the insert instruction which is shown with underline font.

**Response**  **Response Status** C

ACCEPT IN PRINCIPLE.

Change the edit instruction to read:

Change the table by adding new rows.
<table>
<thead>
<tr>
<th>Comment ID #</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Response</th>
<th>Response Status</th>
<th>Comment ID #</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>T</td>
<td>A</td>
<td>There is no editing instruction for 71.7.2, but changes are shown.</td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td>E</td>
<td>This says &quot;This amendment add changes required to enable ...&quot;, &quot;add&quot; should be &quot;adds&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Add an editing instruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Change to &quot;This amendment adds changes ...&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>E</td>
<td>A</td>
<td>This says &quot;for 1usec before&quot; 1usec should be &quot;1&quot; followed by the greek letter mu, then &quot;s&quot; with a non-breaking space (Ctrl space) between 1 and mu.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Change to &quot;1&quot; followed by the greek letter mu, then &quot;s&quot; with a non-breaking space (Ctrl space) between 1 and mu. Also on page 245 lines 4 and 16 for &quot;30usec&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Accept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Accept.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>E</td>
<td>A</td>
<td>This says &quot;that have a fractional usec value shall be rounded up to the nearest integer number in usecs.&quot; &quot;usec&quot; and &quot;usecs&quot; are not correct.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Change to &quot;that have a fractional value shall be rounded up to the nearest integer number in microseconds.&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Accept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Accept.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>E</td>
<td>A</td>
<td>This says &quot;This amendment add changes required to enable ...&quot;. &quot;add&quot; should be &quot;adds&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>When tx_mode is QUIET, the PMD Transmit function may deactivate functional blocks to conserve energy. When tx_mode is DATA, the PMD Transmit function operates normally. PMD cannot be in energy saving while tx_mode is in ALERT.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Change to &quot;This amendment adds changes ...&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>When tx_mode is QUIET, the PMD Transmit function may deactivate functional blocks to conserve energy. When tx_mode is ALERT, the PMD Transmit function is expected to transmit the alert pattern. And when it is DATA, the PMD Transmit function operates normally.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Accept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Accept in Principle.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>T</td>
<td>A</td>
<td>In Table 45-157a, the references to the clause 55 extended next page bits are not correct.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>For 7.60.3, change &quot;U23&quot; to &quot;U24&quot; For 7.60.2, change &quot;U22&quot; to &quot;U23&quot; For 7.60.1, change &quot;U21&quot; to &quot;U22&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Accept.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Accept.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In Table 45-157b, the references to the clause 55 extended next page bits are not correct.

Suggested Remedy:
- For 7.61.3, change "28.2.3.4.1 / 55.6.1; U3" to "28.2.3.4.1; U3 / 55.6.1; U24"
- For 7.61.2, change "28.2.3.4.1 / 55.6.1; U2" to "28.2.3.4.1; U3 / 55.6.1; U23"
- For 7.61.1, change "28.2.3.4.1 / 55.6.1; U1" to "28.2.3.4.1; U3 / 55.6.1; U22"

Response Type: C

ACCEPT IN PRINCIPLE.

There is a cut-and-paste typo in the description of the link failure signal. Also, clarify that the other pairs transmit quiet (as was done for alert).

Suggested Remedy:
- "The link failure signal is transmitted on pair A when the PHY operates as a MASTER. The alert signal is transmitted on pair C when the PHY operates as a SLAVE."
- To:
  - "The link failure signal is transmitted on pair A when the PHY operates as a MASTER. The link failure signal is transmitted on pair C when the PHY operates as a SLAVE. All other pairs transmit quiet as described in subclause 55.3.4a."

Response Type: C

ACCEPT.

As defined bit 1.147.0 determines whether fast retrain is enabled or not via the lpi_fr_en variable. However, the lpi_fr_en is to be set based on the result of auto-negotiation not explicit configuration by station manager. AN will enable fast re-train if the local (7.32.1) and the received (7.33.1) fast re-train ability are both equal to 1. The intent of this bit was to enable the station manager disable fast retrain if it had been enabled by auto-negotiation.

Make it clear that this bit enables fast retrain only for PHYs which support fast re-train. In other, the bit can enable fast retrain only if auto-negotiation has enabled fast retrain.

Suggested Remedy:
- For PHYs that support fast re-train, this bit maps to lpi_fr_en as defined in 55.4.5.1.
- Also, change the definition of lpi_fr_en on page 211 line 25 to:
  - "This bit maps to lpi_fr_en as defined in 55.4.5.1."
  - to
  - "For PHYs that support fast re-train, this bit maps to lpi_fr_en as defined in 55.4.5.1."

Also see comment #42

Response Type: C

ACCEPT IN PRINCIPLE.

Change:
- "This bit maps to lpi_fr_en as defined in 55.4.5.1."
- to
- "For PHYs that support fast re-train, this bit maps to lpi_fr_en as defined in 55.4.5.1."

Also see comment #42
IEEE P802.3az Energy Efficient Ethernet comments

Responses: D2.3 comments

Cl 48  SC 48.2.6.1.2  P 149  L 30  # 26
Brown, Matt  Applied Micro (AMCC)

Comment Type  E  Comment Status  A
||LI|| is never used in this section, except to define ||LPIDLE||. Why are there two labels for the LPI ordered set?

SuggestedRemedy
Rename ||LI|| to ||LPIDLE|| and delete current definition for ||LPIDLE||.

Response  Response Status  C
ACCEPT.

Cl 48  SC 48.2.6.2.5  P 157  L 5  # 28
Brown, Matt  Applied Micro (AMCC)

Comment Type  TR  Comment Status  R
Tolerance on TSL and TUL are too tight and will preclude implementations that control EEE through firmware.

SuggestedRemedy
Change tolerance from 1% to 1 us.

Response  Response Status  C
REJECT.

The tolerance of 1% was set by the consensus of the task force via Comment #449 against draft 2.0
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>SC</th>
<th>Type</th>
<th>Comment Status</th>
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</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>49</td>
<td>T</td>
<td>A</td>
<td>C</td>
<td>Reference to 72.6.5 is not correct for the ALERT signal.</td>
<td>ACCEPT.</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>49</td>
<td>T</td>
<td>A</td>
<td>C</td>
<td>Paragraph implies scrambler bypass is perpetually enabled during EEE. Also, this is a really long sentence.</td>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>49</td>
<td>TR</td>
<td>D</td>
<td>Z</td>
<td>This comment was WITHDRAWN by the commenter.</td>
<td>REJECT.</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>49</td>
<td>TR</td>
<td>A</td>
<td>C</td>
<td>No change is proposed for this state diagram.</td>
<td>ACCEPT.</td>
<td></td>
</tr>
</tbody>
</table>
IEEE P802.3az Energy Efficient Ethernet comments

March 2010

Responses: D2.3 comments

Cl 49  SC 49.2.13.3.1  P 174  L 18  # 33
Brown, Matt  Applied Micro (AMCC)

Comment Type  TR  Comment Status  R
Table 49-2
1% tolerance on TSL, TUL, and TWL precludes firmware implementation.

Suggested Remedy

Change tolerance to +/- 1us.

Response  Response Status  C
REJECT.

The tolerance of 1% was set by the consensus of the task force.

This was set via comment #426 on Draft 2.0

Cl 49  SC 49.2.13.3.1  P 174  L 42  # 34
Brown, Matt  Applied Micro (AMCC)

Comment Type  TR  Comment Status  A
Table 49-3
No tolerance on TWTF.

Suggested Remedy

Either specify maximum only (this should be okay) or specify minimum of 0.98 us.

Response  Response Status  C
ACCEPT IN PRINCIPLE.

Specify the maximum only. Remove the entry in the min column for this row.

Cl 51  SC 51  P 177  L 35  # 35
Brown, Matt  Applied Micro (AMCC)

Comment Type  ER  Comment Status  A
Figure 51-3
Show proper EEE service primitives.

Suggested Remedy

On PMA SI, replace EEE signals with...
PMA_TXMODE.request
PMA_RXMODE.request
PMA_ENERGY.indication

On PMD SI, show...
PMD_TXMODE.request
PMD_RXMODE.request

Response  Response Status  C
ACCEPT.

Also make the same fix to the diagrams in 49 (Figure 49-4) and 74 (Figure 74-2) for all the new EEE service primitives

Use names as they are in their respective clauses.

Cl 51  SC 51  P 177  L 37  # 36
Brown, Matt  Applied Micro (AMCC)

Comment Type  E  Comment Status  A
Figure 51-3

Suggested Remedy

Add note to indicate that dashed lines are only for PHYs that support EEE.

Response  Response Status  C
ACCEPT IN PRINCIPLE.

Delete "(optional)"
Add a dashed box and label it as required for EEE
PMA_RXMODE not correctly specified.

Suggested Remedy

Change 51.2.4 as follows:
The rx_mode primitive is generated by the PCS receiver process for EEE capability to indicate the current RX LPI state.

In section 51.2.4.1 change "rx_quiet" to "rx_mode"

Change Section 51.2.4.2 as follows:
This primitive is generated by the PCS.

Change Section 51.2.4.3 as follows:
When received the PMA is configured appropriately for the indicated state and the value is propagated to PMD_RXMODE.request(rx_mode). When rx_mode is DATA the PMA operates normally. When rx_mode is QUIET, the PMA may go into a low power mode.

ACCEPT IN PRINCIPLE.

Change 51.2.4:
This primitive is generated by the PCS Receive Process for EEE capability to indicate when the PMA and PMD receive functions may go into a low power mode, see 49.3.6.6. Without EEE capability, the primitive is never invoked and the PMA behaves as if rx_mode = DATA.

In section 51.2.4.1 change "rx_quiet" to "rx_mode"

Change 51.2.4.2:
The PCS generates this primitive to indicate the low power mode of the receive path.

Change 51.2.5.3:
When received the PMA is configured appropriately for the indicated state and the value is propagated to PMD_RXMODE.request(rx_mode). When rx_mode is DATA the PMA operates normally. When rx_mode is QUIET, the PMA may go into a low power mode.

PMA_TXMODE not correctly specified.

Suggested Remedy

Change section 51.2.5 as follows:
The tx_mode primitive is generated by the PCS receiver process for EEE capability to indicate the current TX LPI state.

Change Section 51.2.5.2 as follows:
This primitive is generated by the PCS.

Change Section 51.2.5.3 as follows:
When received the PMA is configured appropriately for the indicated state and the value is propagated to PMD_TXMODE.request(tx_mode). When tx_mode is DATA the PMA operates normally. When tx_mode is QUIET, the PMA may go into a low power mode. When tx_mode is ALERT, the PMA operation is not defined.

ACCEPT IN PRINCIPLE.

Change 51.2.5:
This primitive is generated by the PCS Transmit Process for EEE capability to indicate when the PMA and PMD transmit functions may go into a low power mode and to disable the PMD transmitter, see 49.3.6.6. Without EEE capability, the primitive is never invoked and the PMA behaves as if tx_mode = DATA.

Change 51.2.5.2:
The PCS generates this primitive to indicate the low power mode of the transmit path.

Change 51.2.5.3:
When received the PMA is configured appropriately for the indicated state and the value is propagated to PMD_TXMODE.request(tx_mode). When tx_mode is DATA the PMA operates normally. When tx_mode is QUIET, the PMA may go into a low power mode. When tx_mode is ALERT, the PMA operation is not defined.
energy_detect does not necessarily indicate a good signal when TRUE nor a bad signal when FALSE. Instead TRUE indicates reliable detection of ALERT signal and FALSE means that ALERT signal is reliably not detected.

Suggested Remedy
Simplify the definition of this parameter in section 51.2.6.1 to indicate simply that it reflects the signal_ok parameters from the PMD SI.

The definition of signal_ok in Clause 72 will have to be modified to clearly state the intended behavior for LPI mode. Another comment is submitted to request this change to sub-clause 72.6.4.

Response
ACCEPT IN PRINCIPLE.

Delete lines 6 through 10 (delete all of the first paragraph after the first sentence in the paragraph)

Redundant section 51.4.2. This was to be replace by previous sections.

Suggested Remedy
Delete section.

These signals need to be added to the XSBI interface & therefore must be added in 51.4.2.
IEEE P802.3az Energy Efficient Ethernet comments

Cl 55 SC 55.4.5.1 P211 L25 #42
Brown, Matt
Applied Micro (AMCC)

Comment Type T  Comment Status A

lpi_fr_en should be TRUE only if 1.147.0 is 1 and fast retrain was resolved during auto-
negotiation and FALSE otherwise.

Suggested Remedy
Change the definition of lpi_fr_en to:
Set TRUE if 1.147.0 is set to 1 and fast retrain resolved during auto-negotiation (i.e., fast re-
train is supported) and is otherwise set to FALSE.

Change the definition of MDIO bit 1.147.0 on page 115 line 40 to:
For PHYs that support fast re-train, this bit maps to lpi_fr_en as defined in 55.4.5.1.

Response Response Status C
ACCEPT IN PRINCIPLE.

'This variable is set to TRUE if 1.147.0 is set to 1 and fast retrain is supported. This
variable is set to FALSE otherwise.'

Cl 55 SC 55.3.4a.1 P194 L9 #43
Brown, Matt
Applied Micro (AMCC)

Comment Type T  Comment Status A

Normal training here refers to training on PHYs that do not support EEE. Now that fast and
"not fast" (aka normal) training are supported this phrase needs to be modified.

Suggested Remedy
Change "normal training" to "training without EEE capability".

Response Response Status C
ACCEPT.

Cl 55 SC 55.1.3 P183 L25 #44
Brown, Matt
Applied Micro (AMCC)

Comment Type T  Comment Status A

Figure 55-3
rx_lpi_active signal is shown connecting to PCS transmit block, but is not used there.

Suggested Remedy
Delete rx_lpi_active connection to PCS transmit block.

Response Response Status C
ACCEPT.

Cl 55 SC 55.1.3 P183 L33 #45
Brown, Matt
Applied Micro (AMCC)

Comment Type T  Comment Status A

Connection of pcs_status to link monitor block is missing. This is required for link monitor
state diagram in Figure 55-27. This is an omission in base standard, but is required for
proper operation of newly defined fast retrain.

Suggested Remedy
Add connection of pcs_status to link monitor block.

Response Response Status C
ACCEPT.

Cl 55 SC 55.1.3.3 P184 L15 #46
Brown, Matt
Applied Micro (AMCC)

Comment Type T  Comment Status R

Data frames may be lost if transition out of LPI is due to fast or normal re-train.

Suggested Remedy
Change "during the transition" to "during normal transition".

Response Response Status C
REJECT.

What may happen during an abnormal transition does not need to be called out

Cl 55 SC 55.2.2.3.1 P187 L6 #47
Brown, Matt
Applied Micro (AMCC)

Comment Type E  Comment Status R

consistent use of frame periods

Suggested Remedy
Change "LDPC frames" to "LDPC frame periods".

Response Response Status C
REJECT.

"Time equal to 4 LDPC frames"
is no different from
"Time equal to 4 LDPC frame periods"

Comment does not fix anything that is broken. Editor will revisit consistency in the Sponsor
ballot cycle
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>E</td>
<td>A</td>
<td>rx_lpi_active is boolean</td>
<td>Accept in principle. Change &quot;rx_lpi_active is ACTIVE&quot; to &quot;rx_lpi_is is TRUE&quot;.</td>
<td>C</td>
</tr>
<tr>
<td>49</td>
<td>E</td>
<td>R</td>
<td>consistent (with clause 49) terminology</td>
<td>Replace &quot;idle and lp_idle ordered sets&quot; with either &quot;</td>
<td>l</td>
</tr>
<tr>
<td>50</td>
<td>E</td>
<td>R</td>
<td>Consistent terminology for LPI control characters. Use either &quot;LI/&quot; or &quot;LPI control characters&quot;.</td>
<td>Consider generally replacing &quot;LPI control characters&quot; globally and above with &quot;LI/&quot; or &quot;LPI control characters&quot;.</td>
<td>C</td>
</tr>
</tbody>
</table>

**Notes:**
- Does not fix anything that is broken. Editor will revisit consistency in the Sponsor ballot cycle.
- Comment does not fix anything that is broken. Editor will revisit consistency in the Sponsor ballot cycle.
Cl 55 SC 55.3.4a P 193 L 13 # 51
Brown, Matt Applied Micro (AMCC)

Comment Type T  Comment Status A

pcs_status is not set by PHY control state diagram nor is pcs_status=OK criteria for permitting transitions to LPI

SuggestedRemedy

Change:
"after PCS_status is set to OK by the PHY Control state diagram."

To either
"when the PHY has successfully completed training and is in the PCS_Data state in the PHY Control State Diagram."
or
"when the PHY has successfully completed training and loc_lpi_en is TRUE."

Response  Response Status C

ACCEPT IN PRINCIPLE.

"when the PHY has successfully completed training and loc_lpi_en is TRUE."

Cl 55 SC 55.3.2.3 P 192 L 44 # 52
Brown, Matt Applied Micro (AMCC)

Comment Type T  Comment Status A

pcs_status=OK is not criteria for permitting transitions to LPI

SuggestedRemedy

Change:
"after PCS_status is set to OK."

To either
"when the PHY has successfully completed training and is in the PCS_Data state in the PHY Control State Diagram."
or
"when the PHY has successfully completed training and loc_lpi_en is TRUE."

Response  Response Status C

ACCEPT IN PRINCIPLE.

"when the PHY has successfully completed training and loc_lpi_en is TRUE."

Cl 55 SC 55.3.4a.3 P 196 L 28 # 54
Brown, Matt Applied Micro (AMCC)

Comment Type T  Comment Status A

Now that the definition for the alert_detect variable has been changed, it has a different meaning from the alert_detect primitive from the PMA. Change the name to differentiate and modify definition appropriately.

SuggestedRemedy

c change variable alert_detect to pcs_alert_detect and/or change the name of the PMA primitive alert_detect to pma_alert_detect appropriately rename all instances of alert_detect in Clause 55 to reflect new names

Response  Response Status C

ACCEPT IN PRINCIPLE.

Page 206, In figure 55-17, add arrow going from PMA receive to the PMA service interface for alert_detect.

Editor will revisit the issue of clarifying alert_detect in the Sponsor ballot cycle.

Cl 55 SC 55.3.4a.1 P 194 L 16 # 55
Brown, Matt Applied Micro (AMCC)

Comment Type E  Comment Status R

convention

SuggestedRemedy

Change "low power mode" to "LPI mode."

Response  Response Status C

REJECT.

"Low power mode" was the term agreed for earlier drafts.
### IEEE P802.3az Energy Efficient Ethernet comments

**Cl 55  SC 55.3.4a.3  P 196  L 42  # 56**

Brown, Matt  Applied Micro (AMCC)

<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
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<tbody>
<tr>
<td>E</td>
<td>A</td>
<td></td>
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</table>

**Comment**: tx_active_pair is a variable not a vector

**Suggested Remedy**: Change two instances of "vector" to "variable".

**Response Status**: C

**Response**: ACCEPT.

**Change 'vector' to 'variable' in two locations on line 42.**

---

**Cl 55  SC 55.3.5.4  P 204  L 26  # 57**

Brown, Matt  Applied Micro (AMCC)

<table>
<thead>
<tr>
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<tr>
<td>T</td>
<td>A</td>
<td></td>
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</table>

**Comment**: The RX_WE state was to set the value of two variables and immediately transition to the RX_E state. However, by convention, the transition to RX_E may not occur until the next 64B/65B block is received. 802.3-2008 Section 4 55.3.5.4 on page 484 says that there is "exactly one transition for each receive block processed". This means that without specifying otherwise, the RX_WE state persists for one block cycle and one block of data is ignored.

**Suggested Remedy**: Import the following paragraph from 802.3-2008 Section 4 on page 484...

"The 64B/65B Receive state diagram shown in Figure 55-16 controls the decoding of 65B received blocks. It makes exactly one transition for each receive block processed." and amend as follows...

"The 64B/65B Receive state diagram shown in Figure 55-16 controls the decoding of 65B received blocks. It makes exactly one transition for each receive block processed<except for the transition from RX_WE to RX_E which occurs immediately after the RX_WE processes are complete>."

**Response Status**: C

**Response**: ACCEPT.

---

**Cl 55  SC 55.4.2.5.14  P 209  L 23  # 58**

Brown, Matt  Applied Micro (AMCC)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>T</td>
<td>D</td>
<td></td>
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</table>

**Comment**: The transition to PMA_Training_Init_S is not specified in any way by 55.3.4a.1.

**Suggested Remedy**: Remove the amendment or clarify the connection with 55.3.4a.1.

**Response Status**: C

**Proposed Response**: 

This comment was WITHDRAWN by the commenter.

---

From 55.3.4a.1.

'When both PHYs support the EEE capability, the slave PHY is responsible for synchronizing its PMA training frame to the master's PMA training frame during the transition to PMA_Training_Init_S. The slave shall ensure that its PMA training frames are synchronized to the master's PMA training frames within 1 LDPC frame, measured at the slave MDI on pair A.'

---

**Cl 55  SC 55.4.2.5.15  P 209  L 48  # 59**

Brown, Matt  Applied Micro (AMCC)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>E</td>
<td>A</td>
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</tbody>
</table>

**Comment Type**: text error

**Suggested Remedy**: Change 55-27bb to 55-27b.

**Response Status**: C

**Response**: ACCEPT.
Comment ID # 60

Cl 55 SC 55.4.2.5.15 P 209 L 49
Brown, Matt
Applied Micro (AMCC)

Comment Type T
Comment Status A

link failure signal is not defined in this section

SuggestedRemedy

Change "This causes the transmission of an easily-detected link failure signal." to "This causes the transmission of the link failure signal specified in 55.4.2.2.2."

Response ACCEPT.

Response Status C

Comment ID # 61

Cl 55 SC 55.4.6.1 P 213 L 31
Brown, Matt
Applied Micro (AMCC)

Comment Type TR
Comment Status A

Figure 55-24
In PMA_Coeff_Exch state tx_mode set to SEND_T after coefficients are exchanged. A new state can be created to initialize fast training state.

SuggestedRemedy

Create new state between PCS_Data and PMA_Coeff_Exch called FR_INIT.

Create transition from PCS_Data to FR_INIT on condition fast_retrain_flag.

Create transition from FR_INIT to PMA_Coeff_Exch on condition UCT.

Insert the following assignments in state FR_INIT and delete them from PMA_Coeff_Exch:

- tx_mode = SEND_T
- fast_retrain_flag = FALSE

Response ACCEPT IN PRINCIPLE.

Response Status C

Change figures 55-24 as per parnaby_03_0310.pdf and 55-27b as per parnaby_02_0310.pdf

55.4.5.3 p 212 line 6

Change:
"Determines the period of time the PHY has to set PCS_Status to OKAY following a fast retrain before the fast retrain is aborted and a full retrain performed."

To:
"Determines the period of time the PHY has to transition its PCS Control State to PCS_Test following a fast retrain before the fast retrain is aborted and a full retrain performed."

Also add two variable definitions [these are used in the new state machines]. They are generated through the state diagrams in Figure 55-24 and Figure 55-27b.

Fr_active                Set true when the PHY is performing a fast retrain and set false otherwise.
Fast_retrain_flag        Set true when the PHY generates or detects a fast_retrain request signal and set false otherwise.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>T</td>
<td>R</td>
<td>During a fast re-train, a new PBO is not exchanged, so PBO_next is not defined.</td>
<td>REJECT.</td>
<td>REJECT.</td>
</tr>
<tr>
<td>63</td>
<td>T</td>
<td>R</td>
<td>The recommendation is valid only in ACTIVE not LPI mode.</td>
<td>REJECT.</td>
<td>REJECT.</td>
</tr>
<tr>
<td>64</td>
<td>TR</td>
<td>A</td>
<td>The intent of the ALERT signal is to provide a signal that permits reliable discrimination from noise. In addition to setting the pattern to repeating 0xFF00, disable equalization and set to maximum swing.</td>
<td>ACCEPT.</td>
<td>ACCEPT IN PRINCIPLE.</td>
</tr>
<tr>
<td>65</td>
<td>T</td>
<td>R</td>
<td>PMD service primitives PMD_RX_MODE and PMD_TX_MODE are not specified.</td>
<td>REJECT.</td>
<td>REJECT.</td>
</tr>
<tr>
<td>66</td>
<td>T</td>
<td>A</td>
<td>PMD_SIGNAL.indication as specified in 52.1.1 is not applicable to Clause 72 as it is specified for optical interfaces. Also, the signal detection function has unique characteristics in LPI mode.</td>
<td>ACCEPT IN PRINCIPLE.</td>
<td>Delete the first sentence in 72.2.</td>
</tr>
</tbody>
</table>

When tx_mode is ALERT, the transmitter equalizer taps are set to the PRESET state specified in 72.6.10.3.4. When tx_mode is DATA, the driver coefficients are restored to their states resolved during training.

Response: REJECT.

Comment does not fix anything that is broken.

When tx_mode is ALERT, the transmitter equalizer taps are set to the PRESET state specified in 72.6.10.3.4. When tx_mode is DATA, the driver coefficients are restored to their states resolved during training.

Response: ACCEPT.

Comment does not fix anything that is broken and is out of scope.
Brown, Matt
Applied Micro (AMCC)

Comment Type  E  Comment Status  R

Suggested Remedy
Change "the quiet period" to "LPI mode".

Response  Response Status  C
REJECT.

Comment does not fix anything that is broken and is out of scope

Comment Type  T  Comment Status  A

On EEE capable PHYs in LPI mode, signal detection is used to detect the presence of the ALERT signal.

Suggested Remedy
On line 22 replace "when to exit Low Power if EEE is implemented" with "when the ALERT signal is detected indicating the beginning of a REFRESH or WAKE cycle."

Change the paragraph starting on line 26 to the following:
The value of the SIGNAL_DETECT is defined by the training state diagram shown in Figure 72-5 when the PHY does not support EEE or if the PHY supports EEE and rx_mode is set to DATA. When the PHY supports EEE and rx_mode is set to QUIET, SIGNAL_DETECT indicates OK when an ALERT signal specified in 72.6.2 is detected marking the beginning of a REFRESH or WAKE cycle and otherwise indicates FAIL.

Response  Response Status  C
ACCEPT IN PRINCIPLE.

On line 22 replace "when to exit Low Power" with "when the ALERT signal is detected indicating the beginning of a REFRESH or WAKE cycle"

Change the paragraph starting on line 26 to the following:
The value of the SIGNAL_DETECT is defined by the training state diagram shown in Figure 72-5 when the PHY does not support EEE or if the PHY supports EEE and rx_mode is set to DATA.

When the PHY supports EEE and rx_mode equals QUIET, SIGNAL_DETECT indicates OK when an ALERT signal specified in 72.6.2 is detected marking the beginning of a REFRESH or WAKE cycle and indicates FAIL if no signal is detected.

Comment Type  E  Comment Status  A

on line 45 change "LPI mode is implemented" to "EEE is supported"
on line 47 change "LPI mode is not implemented" to "EEE is not supported".

Response  Response Status  C
ACCEPT.
IEEE P802.3az Energy Efficient Ethernet comments

Response

Cl 72  SC 72.6.11  P238  L 35  # 73
Brown, Matt  Applied Micro (AMCC)

Comment Type: T  Comment Status: A

Text descriptors need to be corrected. This paragraph is not required in PMD definition so it should be deleted, not fixed.

Suggested Remedy

Delete paragraph "The transmitter ... wake phase."

Response  Response Status: C

ACCEPT.

Cl 72  SC 72.6.11.1.2  P239  L 5  # 74
Brown, Matt  Applied Micro (AMCC)

Comment Type: E  Comment Status: R

generated on transitions to QUIET and to DATA

Suggested Remedy

Change definition to ...
Generated in LPI mode and the receiver mode changes from QUIET to DATA or vice versa.

Response  Response Status: C

REJECT.

Cl 72  SC 72.6.11.2  P239  L 16  # 75
Brown, Matt  Applied Micro (AMCC)

Comment Type: E  Comment Status: A

transmitter does not power down when tx_mode is ALERT

Suggested Remedy

change specification to ...
"When tx_mode is QUIET, the PMD transmit function may deactivate functional blocks to conserve energy. When tx_mode is DATA or ALERT, the PMD transmit function operates normally."

Response  Response Status: C

ACCEPT IN PRINCIPLE.

See response to comment #17
There is no way for a FEC enabled design to achieve rx_block_lock since the FEC Scrambler is always active. Disabling the scrambler in Clause 49 feeds constant data to the FEC, but the FEC's data scrambler (pn-2112) will scramble the data preventing a constant, predictable pattern from being transmitted.

**Suggested Remedy**

1) Add scrambler bypass in the FEC mode by changing Figure 74-5 in clause 74 to match the changes that were added to Figure 49-5 for EEE, this reflects the scrambler bypass mode option.

2) Change the existing D2.3 references to scrambler_bypass to scrambler_bypass_tx (sections 49.2.13.2.2 Variables and 49.2.13.3 State diagrams i.e. Figure 49-16)

3) Create a new entry for scrambler_bypass_rx in the section 49.2.13.2.2 Variables

4) And insert the following in the state diagram in Figure 49-17:

```plaintext
RX_SLEEP  
rx_lpi_active <= true  
scrambler_bypass_rx <= false  
start rx_lpi_timer  
RX_WAKE  
rx_mode <= DATA  
scrambler_bypass_rx <= scr_bypass_enable  
start rx_wf_timer  
RX_WTF  
scrambler_bypass_rx = scr_bypass_enable  
start rx_wf_timer
```

**Response**

REJECT.

The FEC uses a simple, cyclic scrambler so the receiver should be able to achieve lock rapidly.

There is no way to utilize a receive scrambler bypass in the receive state diagram as the receiver has no way to synchronize the bypass behavior with the link partner's transmit state diagram.
This subclause states "... the PHY shall transition to the PMA_Coeff_Exch state and ...". However 55.4.2.5.6 Message Field defines that only states in Tables 55-4 or 55-5 are permissible. The issue is that for PMA_state<7,6> = <10>, the only permissible state for loc_rcvr_status is [0]. This will force a link_status=fail.

Suggested Remedy
Modify Table 55-4 and 55-5 on the line for PMA_state<7,6> = <10>, to change the state for loc_rcvr_status to [0/1].

Response
ACCEPT IN PRINCIPLE.
Change proposed in response to comment #61 addresses this.