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<td>33</td>
<td>4</td>
<td>2</td>
<td>When modifying existing clauses, the change instructions are: change, delete and insert. For &quot;change&quot; strikethrough and underscore are used to indicate removal of old material and adding of new material respectively. For &quot;delete&quot; and &quot;insert&quot; normal font is used. Throughout the draft, this convention is not followed.</td>
<td>D</td>
<td></td>
<td>The following are example corrections. There are many, many more places that need to be fixed. Page 15 remove underscore from text added with insert (2 places) Page 16 show the added text (change) in the clause 14 title with an underscore Page 24 show the added text (change) in the 14.10 title with an underscore Page 24 show the changes to LS4 (change) Page 25 the &quot;22-3&quot; on line 15 should not be underlined Page 34 remove underscore from text added with insert in 24.1.1 Page 214 remove underscore from text added with insert in 74.5.4 Page 215 remove strikeout text from 74.5.4.1 which has been added with an (insert)</td>
<td>Anslow, Pete Nortel Networks</td>
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<td>D</td>
<td></td>
<td>either show a change to 22.2.2 or remove the first of the two change instructions</td>
<td>Anslow, Pete Nortel Networks</td>
<td>O</td>
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<tr>
<td>00</td>
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<td>E</td>
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<td>4</td>
<td>5</td>
<td>&quot;Add&quot; is not a valid change instruction</td>
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<td>Change all instances of &quot;Add&quot; change instructions to &quot;Insert&quot; e.g. pages 33, 51, 59, 60, 65, 69, etc.</td>
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<td>O</td>
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TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Comment ID
Comments on D2.0

IEEE P802.3az D2.0 Energy Efficient Ethernet comments

September 2009

Cl 24 SC 24.4.1 P 49 L 7 # 6
Anslow, Pete Nortel Networks

Comment Type E Comment Status D
This says "Insert the following new primitive definitions as shown below at the end of clause 24.4.1.3.3;"

Suggested Remedy
change "shown below at the end of clause 24.4.1.3.3;" to "shown below after clause 24.4.1.3.3;"

make the equivalent change in other places in the draft where this occurs.

Proposed Response Response Status O

Cl 70 SC 70.7.2 P 198 L 15 # 7
Anslow, Pete Nortel Networks

Comment Type E Comment Status D
nano seconds is "ns" not "nS"
Also applies to Table 71-6

Suggested Remedy
Change "nS" to "ns" in Table 70-6 (two places)
Change "nS" to "ns" in Table 71-6 (two places)

Proposed Response Response Status O

Cl 74 SC 74.0.1 P 213 L 9 # 9
Anslow, Pete Nortel Networks

Comment Type E Comment Status D
The Functional block diagram title (actually Figure 74-2 not as shown here) is being modified by 802.3ba

Suggested Remedy
Coordinate changes to clause 74 with 802.3ba so that 802.3az does not reverse changes made by 802.3ba

Proposed Response Response Status O

Cl 78 SC 78.1.4 P 231 L 31 # 10
Anslow, Pete Nortel Networks

Comment Type E Comment Status D
The title is "Relation of EEE to other standards" but the text seems to relate to 802.3.
802.3az is an amendment to 802.3, so "other standards" is inappropriate.
The title of Table 78-1 "Relation between EEE PHY's and IEEE protocols" is similarly inappropriate

Suggested Remedy
Change subclause title to "EEE PHY types"
Change title of Table 78-1 to "EEE PHY types and associated clauses"

Proposed Response Response Status O

Cl 78 SC 78.3 P 233 L 12 # 11
Anslow, Pete Nortel Networks

Comment Type E Comment Status D
why is most of the page blank?

Suggested Remedy
Move 78.4 to start on page 233

Proposed Response Response Status O
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**Comment ID # 18**

Cl 36, SC 36.2.5.2.6 P 80 L 2 # 18

Barrass, Hugh Cisco

Comment Type: E Comment Status: D
Reference is to Figure 36-9b

Suggested Remedy
- Change 36-9b to Figure 36-9b

Proposed Response
Response Status: O

**Comment ID # 19**

Cl 36, SC 36.2.5.2.2 P L # 19

Barrass, Hugh Cisco

Comment Type: E Comment Status: D
Arrow heads & tails not well aligned.

Suggested Remedy
- Clean up arrows in Fig 36-7a

Proposed Response
Response Status: O

**Comment ID # 20**

Cl 48, SC 48.2.6.2.5 P 134 L 8 # 20

Barrass, Hugh Cisco

Comment Type: E Comment Status: D
Many arrows in fig 48-9a & 48-9b are not properly aligned.

Suggested Remedy
- Align the arrow heads & tails in fig 48-9a & 48-9b.

Proposed Response
Response Status: O

**Comment ID # 22**

Cl 22, SC 22.2.2.9a P 30 L 6 # 22

Barrass, Hugh Cisco

Comment Type: T Comment Status: D

**Clock Stoppable**
- Refer also to comment #6, rev 1.5
- The clock stoppable bit as currently defined is not useful. It is better to split the control into two directions - PHY-MAC & MAC-PHY.
- The MAC needs to assert a bit to allow the PHY to stop the clock in the PHY-MAC direction; The PHY needs to assert a bit to allow the MAC to stop the clock in the MAC-PHY direction

Suggested Remedy
- Change "RX_CLK_stoppable bit" to "Clock stop enable bit"
- Also, make the reference an active link.

Proposed Response
Response Status: O

**Comment ID # 25**

Cl 35, SC 35.2.2.6a P 66 L 54 # 25

Barrass, Hugh Cisco

Comment Type: T Comment Status: D

**Clock Stoppable**
- Refer also to comment #6, rev 1.5
- The clock stoppable bit as currently defined is not useful. It is better to split the control into two directions - PHY-MAC & MAC-PHY.
- The MAC needs to assert a bit to allow the PHY to stop the clock in the PHY-MAC direction; The PHY needs to assert a bit to allow the MAC to stop the clock in the MAC-PHY direction

Suggested Remedy
- Change "Clock stoppable bit" to "Clock stop capable bit"
- Also, change the reference to 45.2.3.2.2a and make it an active link.

Proposed Response
Response Status: O
**Clock Stoppable**

Refer also to comment #6, rev 1.5

The clock stoppable bit as currently defined is not useful. It is better to split the control into two directions - PHY-MAC & MAC-PHY.

The MAC needs to assert a bit to allow the PHY to stop the clock in the PHY-MAC direction; The PHY needs to assert a bit to allow the MAC to stop the clock in the MAC-PHY direction.

**Suggested Remedy**

Change "clock stoppable bit" to "clock stop enable bit"

Also, make the reference an active link.

**Proposed Response**

Response Status O

---

**State diagram conventions**

It is not clear which state diagram conventions are relevant for each section in this amendment. Notes need to be added so that the conventions for each clause are clear.

The conventions may be cleaned up and coordinated in the next revision when all clauses are open.

**Suggested Remedy**

Add a note (at the beginning of 24.2.2):

Note: The state diagram conventions described in 24.1.7 apply to all of the state diagrams in this clause.

**Proposed Response**

Response Status O
** State diagram conventions **

It is not clear which state diagram conventions are relevant for each section in this amendment. Notes need to be added so that the conventions for each clause are clear.

The conventions may be cleaned up and coordinated in the next revision when all clauses are open.

Suggested Remedy

Add a note:

Note: The state diagram conventions described in 40.1.6 apply to all of the state diagrams in this clause.

Proposed Response  

Response Status O
**State diagram conventions**

It is not clear which state diagram conventions are relevant for each section in this amendment. Notes need to be added so that the conventions for each clause are clear.

The conventions may be cleaned up and coordinated in the next revision when all clauses are open.

**Suggested Remedy**

Add a note:

Note: The state diagram conventions described in 49.2.13.1 apply to all of the state diagrams in this clause.

---

**State diagram conventions**

It is not clear which state diagram conventions are relevant for each section in this amendment. Notes need to be added so that the conventions for each clause are clear.

The conventions may be cleaned up and coordinated in the next revision when all clauses are open.

**Suggested Remedy**

Add a note:

Note: The state diagram conventions described in 55.1 apply to all of the state diagrams in this clause.

---

**State diagram conventions**

It is not clear which state diagram conventions are relevant for each section in this amendment. Notes need to be added so that the conventions for each clause are clear.

The conventions may be cleaned up and coordinated in the next revision when all clauses are open.

**Suggested Remedy**

Replace item LP-01 with:

LP-01 - receive state machine: Support additions to Figure 48-9 for LPI operation: 48.2.6.2
LP-02 - LPI transmit state machine: Meets the requirements of Figure 48-9a: 48.2.6.2.5
LP-03 - LPI receive state machine: Meets the requirements of Figure 48-8b: 48.2.6.2.5
LP-04 - LPI transmit timing: Meets the requirements of Table 48-9: 48.2.6.2.5
LP-05 - LPI receive timing: Meets the requirements of Table 48-10: 48.2.6.2.5
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<td>Underline changes - lines 5, 29</td>
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Comment on D2.0

Proposed Response

Suggested Remedy

Barrass, Hugh Cisco

Need separate PICS items for Rx & Tx direction LPI.

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Type: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

Comment Status: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

Sort Order: Comment ID

Page 8 of 101 9/3/2009 11:34:42 AM
Proposed Response

Cl 45 SC 45.2.3.1 P 113 L 3 # 40
Barrass, Hugh Cisco

Comment Type T Comment Status D
Table reference is wrong - the table numbers have been changed by 802.3av. Also the table heading is wrong.

SuggestedRemedy
Change the instruction and the table heading to match:

"Change Table 45-84 (as renumbered by 802.3av) for LPI clock control."

Proposed Response Response Status O

Cl 45 SC 45.2.3.2 P 114 L 10 # 41
Barrass, Hugh Cisco

Comment Type T Comment Status D
Table reference is wrong - the table numbers have been changed by 802.3av.

SuggestedRemedy
Change the instruction and the table heading to match:

"Change Table 45-85 (as renumbered by 802.3av) for LPI status."

Proposed Response Response Status O

Cl 45 SC 45.2.7 P 116 L 33 # 42
Barrass, Hugh Cisco

Comment Type T Comment Status D
Table reference is wrong - the table numbers have been changed by 802.3av.

SuggestedRemedy
Change the instruction and the table heading to match:

"Change Table 45-141 (as renumbered by 802.3av) for EEE AN registers."

Proposed Response Response Status O

Cl 48 SC 48.2.4 P 127 L 12 # 44
Barrass, Hugh Cisco

Comment Type T Comment Status D
Code group column is not underlined in new row of Table 48-2.

SuggestedRemedy
Underline all columns of row "Low Power Idle"

Proposed Response Response Status O

Cl 48 SC 48.2.4 P 127 L 38 # 45
Barrass, Hugh Cisco

Comment Type T Comment Status D
Code group column is not underlined in new row of Table 48-3.

SuggestedRemedy
Underline all columns of row "Low Power Idle"

Proposed Response Response Status O

Cl 48 SC 48.2.4.2 P 128 L 3 # 46
Barrass, Hugh Cisco

Comment Type T Comment Status D
The additional text in the title is not underlined.

SuggestedRemedy
Underline - "and Low Power Idle ([|LPIDLE|])"

Proposed Response Response Status O
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**Comment Type:** T
**Comment Status:** D

Additional information is needed for the note.

**Suggested Remedy**

Add the sentence to the note:

"If Low Power Idle is not supported then the transition to the optional state is never true."

**Proposed Response**

**Response Status:** O

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**Comment Type:** E

"Unfilter jitter in low power mode" should be "Unfiltered"

**Suggested Remedy**

Change "unfilter" to "unfiltered"

**Proposed Response**

**Response Status:** O
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**Comment:** The text "Differential peak-to-peak output voltage (min.) with TX enabled (Vtw)" is confusing.

**Suggested Remedy:** Change to "Transmitter activation/deactivation measurement upper threshold"
IEEE P802.3az D2.0 Energy Efficient Ethernet comments

September 2009

Cl 71 SC 6.6 P 201 L 34 # 57
Beckwith, Jonathan UNH-IOL

Comment Type T Comment Status D
Need to specify a lower voltage threshold for the activation time. Deactivation measurement explicitly states 30mV.

Suggested Remedy
Specify a 30mV threshold as the beginning of the activation time measurement.

Proposed Response Response Status O

Cl 72 SC 6.5 P 208 L 9 # 58
Beckwith, Jonathan UNH-IOL

Comment Type T Comment Status D
Need to specify a lower voltage threshold for the activation time. Deactivation measurement explicitly states 30mV.

Suggested Remedy
Specify a 30mV threshold as the beginning of the activation time measurement.

Proposed Response Response Status O

Cl 49 SC 49.2.4.4 P 139 L 25 # 59
Bennett, Michael LBNL

Comment Type ER Comment Status D
Note: entered on behalf of Jonathan Ebbers, jpebbers@us.ibm.com 802-769-5034 (T/L 446-5034)

Sentence: Otherwise fec_block_lock is fec_normal_block_lock OR fec_rapid_block_lock is inaccurate and does not match the behaviour implied by Figure 74-2. On this figure 74-2, transition from false to true of signal fec_rapid_block_lock is used as a trigger to the fec_normal_block_lock state machine. In fact, it is assumed that other mechanism (as per 2nd paragraph and Note in section 74.7.4.8) will activate the signal fec_rapid_block_lock.

Suggested Remedy
Remove this sentence

Proposed Response Response Status O

Cl 74 SC 74.7.4.7 P 216 L 53 # 60
Bennett, Michael LBNL

Comment Type ER Comment Status D
Note: entered on behalf of Jonathan Ebbers, jpebbers@us.ibm.com 802-769-5034 (T/L 446-5034)

Sentence: Otherwise fec_block_lock is fec_normal_block_lock OR fec_rapid_block_lock is inaccurate and does not match the behaviour implied by Figure 74-2. On this figure 74-2, transition from false to true of signal fec_rapid_block_lock is used as a trigger to the fec_normal_block_lock state machine. In fact, it is assumed that other mechanism (as per 2nd paragraph and Note in section 74.7.4.8) will activate the signal fec_rapid_block_lock.

Suggested Remedy
Remove this sentence

Proposed Response Response Status O

Cl 74 SC 74.8.3 P 220 L 7 # 61
Bennett, Michael LBNL

Comment Type ER Comment Status D
In Figure 74–2—FEC Lock state diagram there is a dashed box around fec_rapid_block_lock_edge but there is no note to identify the addition of the variable to support LPI

Suggested Remedy
Add a note

NOTE: If the optional Low Power Idle function is supported then fec_rapid_block_lock_edge is mandatory

Proposed Response Response Status O

Cl 70 SC 70.2 P 195 L 3 # 62
Bennett, Michael LBNL

Comment Type E Comment Status D
There is a space missing between 'in' and 36.2.5.1.6

Suggested Remedy
insert the space

Proposed Response Response Status O

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Comment ID
Please define the acronym LPI after the first instance of Low Power Idle in the paragraph, as was done for Energy Efficient Ethernet and Media Access Control.

**Suggested Remedy**

Insert (LPI) between Low Power Idle and mode.

In the next sentence, replace Low Power Idle with LPI.

**Proposed Response** Response Status O

---

This paragraph seems verbose and repeats "is/are supported" several times. Why not use a table of supported PHYs instead?

**Suggested Remedy**

Replace paragraph with:

The EEE operational mode supports the IEEE 802.3 MAC operation at 100 Mb/s, 1000 Mb/s, and 10 Gb/s. The following PHYs are supported:

- 100BASE-TX
- 1000BASE-T
- 10GBASE-T
- 1000BASE-KX
- 10GBASE-KX4
- 10GBASE-KR

**Proposed Response** Response Status O

---

I think the word 'clause' is missing from the end of the sentence.

**Suggested Remedy**

Change the last sentence to:

The actual specification of PHY LPI operation can be found in the respective PHY clause (see Table 78-1).

**Proposed Response** Response Status O

---

the apostrophe in the title of the table should not be there

**Suggested Remedy**

remove the apostrophe

**Proposed Response** Response Status O

---

"/I/ 64B/65B" to "IDLE 64B/65B" in two places in paragraph.

**Suggested Remedy**

**Proposed Response** Response Status O
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Page</th>
<th>Line</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>#68</td>
<td>165</td>
<td>36</td>
<td>E</td>
<td>D</td>
<td>No LDPC frames during Quiet-Refresh. Refer to length in terms of LDPC frame periods.</td>
<td>Change &quot;LDPC frames to &quot;LDPC frame periods&quot; in two places in paragraph.</td>
<td>O</td>
</tr>
<tr>
<td>#69</td>
<td>168</td>
<td>32</td>
<td>E</td>
<td>D</td>
<td>“when the sleep is detected” to &quot;when the sleep signal is detected”.</td>
<td>Change “when the sleep is detected” to “when the sleep signal is detected”.</td>
<td>O</td>
</tr>
<tr>
<td>#70</td>
<td>169</td>
<td>7</td>
<td>E</td>
<td>D</td>
<td>Equations for REFRESH_A/B/C/D is hard to read and somewhat ambiguous.</td>
<td>Put brackets around &quot;rx_active_pair==PAIR_A/B/C/D&quot;. State that result of equation must be true. Put equation on new line. Example: The variable is set to REFRESH_A when (tx_lpi_active * (tx_active_pair==PAIR_A) * tx_refresh_active) is TRUE.</td>
<td>O</td>
</tr>
<tr>
<td>#71</td>
<td>158</td>
<td>21</td>
<td>E</td>
<td>D</td>
<td>Not clear whether each end or each direction can go into low power mode independently.</td>
<td>Change “Each side” to &quot;Each direction”.</td>
<td>O</td>
</tr>
<tr>
<td>#72</td>
<td>158</td>
<td>42</td>
<td>E</td>
<td>D</td>
<td>Signal is framed LDPC not characters.</td>
<td>Change &quot;composed of IDLE characters&quot; &quot;composed of LDPC frames containing only IDLE characters&quot;.</td>
<td>O</td>
</tr>
</tbody>
</table>
#73

**Comment Type**: E  
**Comment Status**: D  

**Suggested Remedy**

Change:
"The PCS 64/65B Transmit state diagram includes additional states for EEE as specified in Figure 55–15 and Figure 55–15a."

To:
"The PCS 64/65B Transmit state diagram as specified in Figure 55–15 and Figure 55–15a includes additional states for EEE."

AND

Change:
"The PCS 64/65B Receive state diagram includes additional states for EEE as specified in Figure 55–16 and Figure 55–16a."

To:
"The PCS 64/65B Receive state diagram as specified in Figure 55–16 and Figure 55–16a includes additional states for EEE."

**Proposed Response**

**Response Status**: O

---

#74

**Comment Type**: E  
**Comment Status**: D  

**Suggested Remedy**

Change 64/65B to 64B/65B. Two instances in paragraph.

**Proposed Response**

**Response Status**: O

---

#75

**Comment Type**: E  
**Comment Status**: D  

**Suggested Remedy**

Replace column 3 for table 55-1b as follows:

<table>
<thead>
<tr>
<th>Row</th>
<th>Expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$60 \leq \text{mod}(u,128) \leq 63$</td>
</tr>
<tr>
<td>2</td>
<td>$\text{mod}(u,128) = 60$</td>
</tr>
<tr>
<td>3</td>
<td>$192 \leq u \leq 319$</td>
</tr>
<tr>
<td>4</td>
<td>$320 \leq u \leq 447$</td>
</tr>
<tr>
<td>5</td>
<td>$448 \leq u \leq 551$ or $0 \leq u \leq 63$</td>
</tr>
<tr>
<td>6</td>
<td>$64 \leq u \leq 191$</td>
</tr>
</tbody>
</table>

**Proposed Response**

**Response Status**: O

---

#76

**Comment Type**: E  
**Comment Status**: D  

**Suggested Remedy**

In first sentence of paragraph, remove: "When preceded by control characters /I/, " and capitalize first letter of "low".

**Proposed Response**

**Response Status**: O

---

#77

**Comment Type**: ER  
**Comment Status**: D  

**Suggested Remedy**

Tables 55-1b defines time bounds with complex equations containing fixed value variables. For easy reference and clarity replace variable names with fixed values.

**Proposed Response**

**Response Status**: O
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Cl SC</th>
<th>P L</th>
<th>#</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
<th>Proposed Response</th>
<th>Response Status</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>78</td>
<td>55 55.3.4a.1</td>
<td>167 29</td>
<td></td>
<td>ER</td>
<td>D</td>
<td>Tables 55-1c defines time bounds with complex equations containing fixed value variables. For easy reference and clarity replace variable names with fixed values.</td>
<td>Replace column 3 for table 55-1b as follows: Row 1: 124 &lt;= mod(v,128) &lt;= 127 Row 2: mod(v,128) = 124 Row 3: 0 &lt;= v &lt;= 127 Row 4: 128 &lt;= v &lt;= 255 Row 5: 256 &lt;= v &lt;= 383 Row 6: 384 &lt;= v &lt;= 511</td>
<td></td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>55 55.3.5.4</td>
<td>176 24</td>
<td></td>
<td>ER</td>
<td>D</td>
<td>In Figure 55-16a, in several cases several boolean variable are redundantly equated with boolean values which is out of style with the rest of Clause 55 and adding extra clutter to a crowded SM.</td>
<td>Replace all instances of: &lt;variable_name&gt;=true with &lt;variable_name&gt; &lt;variable_name&gt;=false with !&lt;variable_name&gt; Example: Change &quot;tx_lpi_active=false&quot; to &quot;!tx_lpi_active&quot;.</td>
<td></td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>81</td>
<td>55 55.3.5.4</td>
<td>177 24</td>
<td></td>
<td>ER</td>
<td>D</td>
<td>In Figure 55-16b, in several cases several boolean variable are redundantly equated with boolean values which is out of style with the rest of Clause 55 and adding extra clutter to a crowded SM.</td>
<td>Replace all instances of: &lt;variable_name&gt;=true with &lt;variable_name&gt; &lt;variable_name&gt;=false with !&lt;variable_name&gt; Example: Change &quot;tx_refresh_active=false&quot; to &quot;!tx_refresh_active&quot;.</td>
<td></td>
<td>O</td>
<td></td>
</tr>
</tbody>
</table>
Cl 55 SC 55.3.5.2.3  P 170 L 19 # 85
Brown, Matt AppliedMicro (AMCC)

Comment Type  T  Comment Status  D
Number of LDPC frames is defined by fixed variable specified on another page. To make this definition clear put the value here.

Suggested Remedy
Change "equal to lpi_wake_time LDPC frames" to "equal to 9 LDPC frame periods".

Proposed Response  Response Status  O

Cl 55 SC 55.3.5.2.3  P 170 L 24 # 86
Brown, Matt AppliedMicro (AMCC)

Comment Type  T  Comment Status  D
Number of LDPC frames is defined by fixed variable specified on another page. To make this definition clear put the value here.

Suggested Remedy
Change "equal to lpi_wake_time LDPC frames" to "equal to 9 LDPC frame periods".

Proposed Response  Response Status  O

Cl 55 SC 55.3.5.2.3  P 170 L 26 # 87
Brown, Matt AppliedMicro (AMCC)

Comment Type  T  Comment Status  D
lpi_tx_wake_timer is not used in Clause 55.

Suggested Remedy
Remove definition of lpi_tx_wake_timer, lines 25 to 31.

Proposed Response  Response Status  O
Comments on D2.0

Proposed Response

Change "tx_ldpc_frame_cnt" to "rx_ldpc_frame_cnt".

SuggestedRemedy

Change "tx_ldpc_frame_cnt" to "rx_ldpc_frame_cnt".

Proposed Response

Response Status O

Proposed Response

Response Status O

Proposed Response

Response Status O

Proposed Response

Response Status O

Proposed Response

Response Status O
Li is specified as including case with either 8 /LI/ or 4x/LI/+4x/I/.
As the state machine in Figure 55-15 is currently defined this allows and requires transition to low power mode if either is detected. Transition to low power mode upon detection of 4x/LI/+4x/I/ should not be permitted. Provision is required to allow for this special case during low power mode in Figure 55-15a.

Suggested Remedy

Define LII as...
"LII: If the optional Low Power Idle function is supported then LII occurs when the vector contains four /LI/ control characters followed by four /I/ control characters."

Re-define Li as...
"Li: If the optional Low Power Idle function is supported then the Li type occurs when the vector contains eight control characters of /LI/.

In Figure 55-15...
Change the criteria for transition for the following transition to include LII:
TX_C to TX_E
TX_INIT to TX_E
TX_D to TX_E
TX_E to TX_E
TX_T to TX_E

In Figure 55-15a...
Change the criteria for transition from TX_L to TX_L (loop) to "T_TYPE(tx_raw)="(LII+LII)"
Alternately, change the criteria for transition from TX_L to TX_WN to "T_TYPE(tx_raw)="(LII+LII)"

Proposed Response

Response Status O
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Type</th>
<th>Comment Status</th>
<th>Response Status</th>
<th>Comment ID</th>
<th>Type</th>
<th>Comment Status</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td>TR</td>
<td>D</td>
<td>O</td>
<td>96</td>
<td>TR</td>
<td>D</td>
<td>O</td>
</tr>
<tr>
<td>97</td>
<td>TR</td>
<td>D</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comment**

**Proposed Response**

- **LI** is specified as including case with either 8 /LI/ or 4xLI/+4xLI/.
- As the state machine in Figure 55-15 is currently defined this allows and requires transition to low power mode if either is detected. Transition to low power mode upon detection of 4xLI/+4xLI/ should not be permitted. Provision is required to allow for this special case during low power mode in Figure 55-15a.

This comment is a duplicate of one against 55.3.5.2.4.

**Suggested Remedy**

- Define LII as...
  - "LII: If the optional Low Power Idle function is supported then LII occurs when the vector contains four /LI/ control characters followed by four /I/ control characters."
- Re-define LI as...
  - "LI: If the optional Low Power Idle function is supported then the LI type occurs when the vector contains eight control characters of /LI/;"  

In Figure 55-15...

- Change the criteria for transition for the following transition to include LII:
  - TX_C to TX_E
  - TX_INIT to TX_E
  - TX_D to TX_E
  - TX_E to TX_E
  - TX_T to TX_E

In Figure 55-15a...

- Change the criteria for transition from TX_L to TX_L (loop) to "T_TYPE(tx_raw)=(LI+LII)".
- Alternately, change the criteria for transition from TX_L to TX_WN to "T_TYPE(tx_raw)=(I+LII)".

**Proposed Response**

- **Suggested Remedy**
  - Add transition from RX_T to RX_L with criteria "LII"; use connector labelled "L".

- **Proposed Response**

**Comment**

**Proposed Response**

- **Suggested Remedy**
  - Restate...
    - "When the transmitter is in the lower power mode or when the receiver is in lower power mode on a SLAVE PHY the transmitter clock short term rate of frequency variation shall be less than 0.1 ppm/second.*"

**Proposed Response**

- **Suggested Remedy**
  - Restate...
    - "When the transmitter is in the lower power mode or when the receiver is in lower power mode on a SLAVE PHY the transmitter clock short term rate of frequency variation shall be less than 0.1 ppm/second.*"
Proposed Response

Cl 48 SC 48.2.6.2.5 P 135 L 22 # 98
Brown, Matt AppliedMicro (AMCC)

Comment Type TR Comment Status D

Transitions from RX_WAKE and RX_WTF to RX_QUIET will restart quiet timer so realistic failure scenarios can cause undetected failure. One scenario is link partner driver failing or interconnect failure enough to attenuate but not kill the signal.

Instead, the return transition should not restart quiet timer.

Suggested Remedy

Create new state RX QUIET_INIT between RX_SLEEP and RX_QUIET.
RX_SLEEP to RX QUIET_INIT when "signal_detect=FAIL".
RX QUIET_INIT to RX QUIET WHEN "UCT"
In RX QUIET delete "Start rx_tq_timer".
In RX QUIET_INIT add "Start rx_tq_timer".

The above will permit the dead loop to continue until the quiet timer (3-4 ms) is done then a fault will be detected.

Comment Type TR Comment Status D

In Figure 48-9b, transitions out of RX_SLEEP are ambiguous.

Suggested Remedy

Change criteria for RX_SLEEP-RX_SLEEP to "||LP/IDLE||*!rx_tq_timer_done".
Change criteria for RX_SLEEP-RX_ACTIVE to "||IDLE||*!rx_tq_timer_done".
criteria for RX_SLEEP-RX_ACTIVE to "(signal_detect=FAIL)*!rx_tq_timer_done".

Proposed Response Response Status O

Cl 49 SC 49.2.13.3.1 P 149 L 25 # 99
Brown, Matt AppliedMicro (AMCC)

Comment Type TR Comment Status D

In Figure 48-9b, transitions out of RX_SLEEP are ambiguous.

Suggested Remedy

Change criteria for RX_SLEEP-RX_SLEEP to "||LP/IDLE||*!rx_tq_timer_done".
Change criteria for RX_SLEEP-RX_ACTIVE to "||IDLE||*!rx_tq_timer_done".
criteria for RX_SLEEP-RX_ACTIVE to "(signal_detect=FAIL)*!rx_tq_timer_done".

Proposed Response Response Status O

Cl 36 SC 36.2.5.2.8 P 81 L 24 # 101
Brown, Matt AppliedMicro (AMCC)

Comment Type TR Comment Status D

In Figure 36-9b, transitions from RX_WAKE and RX_WTF to RX_QUIET will restart quiet timer so realistic failure scenarios can cause undetected failure. One scenario is link partner driver failing or interconnect failure enough to attenuate but not kill the signal.

Another is the Tx taps have changed.

Instead, the return transition should not restart quiet timer.

Suggested Remedy

Create new state RX QUIET_INIT between RX_SLEEP and RX_QUIET.
RX_SLEEP to RX QUIET_INIT when "signal_detect=FAIL".
RX QUIET_INIT to RX QUIET WHEN "UCT"
In RX QUIET delete "Start rx_tq_timer".
In RX QUIET_INIT add "Start rx_tq_timer".

The above will permit the dead loop to continue until the quiet timer (3-4 ms) is done then a fault will be detected.

Proposed Response Response Status O
Cl. 78 SC 78.1.3.1 P 229 L 43 # 103
Chalupsky, David
Intel Corp.

Comment Type E Comment Status D
grammar: "starts to assert"

SuggestedRemedy
replace "starts to assert" with "starts to transmit"

Proposed Response Response Status O

Cl. 78 SC 78.1.4 P 231 L 33 # 104
Chalupsky, David
Intel Corp.

Comment Type T Comment Status D
The statement "EEE defines a Low Power Idle mode of operation for the following seven 802.3 PHYs" is inconsistent with the remainder of the draft as 10BASE-Tc does not have an LPI mode.

SuggestedRemedy
strike "Low Power Idle" from line 33.

Proposed Response Response Status O
Table 78-2, \( T_q \) values for 10GBASE-T: The max value is lower than the min value. I can't provide the correct values, but these appear to be in error.

**Suggested Remedy**
Correct \( T_q \) max & min for 10GBASE-T.

**Proposed Response**

---

The abbreviation "EEE" is used pervasively throughout this draft before it is defined. Add an abbreviation definition to section 1.5.

**Suggested Remedy**
Add an abbreviation definition to section 1.5., i.e. "EEE Energy Efficient Ethernet"

**Proposed Response**

---

Bits 47:23 are sent as zeros and could be used to send a 24 bit NIC specific mac address. I assume this part is for message code 11 although the subclause title says message code 10.

**Suggested Remedy**
Use registers 2 and 3 in subclause 22.2.4.3.1 to fill in the 24 bits. Use bits 7:0 of register 2 and then 15:0 of register 3. Then add an optional format for the PHY identifier in subclause 22.2.4.3.1 to allow the registers to contain a NIC specific mac address.

**Proposed Response**

---

Unnecessary carriage return for entry for Clause 36

**Suggested Remedy**
remove carriage return between Independent and Interface

**Proposed Response**

---

The "xMII" notation does not cover XGMII and is inconsistent with other places in the draft where "xxMII" is used

**Suggested Remedy**
change "xMII" to "xxMII"

**Proposed Response**

---
Comments on D2.0 Energy Efficient Ethernet

IEEE P802.3az D2.0 Energy Efficient Ethernet comments

September 2009

Cl 14 SC 14.1.1 P 16 L 21 # 114
D'Ambrosia, John Force10 Networks

Comment Type: E  Comment Status: D

The added note seems to imply an implementation, which seems unnecessary, given that there are two distinct PHY types already.

Suggested Remedy:
Delete note.

Proposed Response:
Response Status: O

Cl 01 SC 1.4 P 15 L 20 # 115
D'Ambrosia, John Force10 Networks

Comment Type: ER  Comment Status: D

add definition for "Low Power Idle Mode"

Suggested Remedy:
Low Power Idle Mode - an optional mode intended to save power that may be enabled during periods of low link utilization in which both sides of a link may disable portions of device or system functionality.

Proposed Response:
Response Status: O

Cl 78 SC 78.5 P 242 L 31 # 116
D'Ambrosia, John Force10 Networks

Comment Type: ER  Comment Status: D

The first column is labeled PHY type, but the inclusion of the case with the PHY name could cause confusion.

Suggested Remedy:
Create a new column called "CASE" and indicate that there are different CASES for the same PHY type.

Proposed Response:
Response Status: O

Cl 40 SC 40.1.3 P 84 L 16 # 117
D'Ambrosia, John Force10 Networks

Comment Type: ER  Comment Status: D

This could be confusing, as terminology in Clause 78 is Low Power Idle mode
A 1000BASE-T PHY may optionally enter a low power mode...

This was also found in Clause 55.

Suggested Remedy:
change sentence to
A 1000BASE-T PHY may optionally enter a low power idle mode...
do global replace on low power mode to low power idle mode

Proposed Response:
Response Status: O

Cl 69 SC 69.1.2 P 192 L 41 # 118
D'Ambrosia, John Force10 Networks

Comment Type: ER  Comment Status: D

P802.3ba will be adding the objective "a 4 lane 40Gb/s PHY. The addition by 802.3az of "Optionally support Energy Efficient Ethernet will imply that 40GBASE-KR4 will support EEE.

Suggested Remedy:
Change added objective text to
"Optionally support Energy Efficient Ethernet for PHYs that support MAC rates of 10 Gb/s or lower."

Proposed Response:
Response Status: O
Proposed changes in 802.3az are only applicable to appropriate PHYs that support MAC rates of 10Gb/s. Proposed changes in 802.3ba are altering Clause 74 to support BASE-R PHYs, which would also include 40Gb/s and 100Gb/s. Therefore, it needs to be clear that the text in 802.3az should only be applied to sections specific to 10GBASE-R PHYs.

Suggested Remedy

coordination between 802.3az and 802.3ba is necessary.

Add editor's note indicating that changes in 802.3az are only applicable to 10GBASE-R PHYs.

Proposed Response
Response Status O

The second note to Fig 40-3 reads:

NOTE—Signals and functions shown with dashed lines are optional.

are these dashed lines associated with low power idle mode?  
are these lines mandatory if the optional mode is supported?

Suggested Remedy

Change note to read

NOTE— If optional Low Power Idle mode is supported, signals and functions shown with dashed lines are mandatory.

Proposed Response
Response Status O
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>48.2.4</td>
<td>T</td>
<td>D</td>
<td>Update 48.2.4.2.3 to include the capability to perform clock compensation on 4 Low Power Idle characters or a column containing 3 /R/ and 1 /D20.5/.</td>
<td>O</td>
</tr>
<tr>
<td>48</td>
<td>48.2.4.2.3</td>
<td>E</td>
<td>D</td>
<td>Change &quot;An boolean variable&quot; to &quot;A Boolean variable&quot;.</td>
<td>O</td>
</tr>
<tr>
<td>48</td>
<td>48.2.4.2.5</td>
<td>E</td>
<td>D</td>
<td>Create a subclause for timers.</td>
<td>O</td>
</tr>
</tbody>
</table>

D’Ambrosio, John
Force10 Networks

Comment Type TR Comment Status D
PIICS call out "additional interface variables to support LPI, but no SHALL statement in corresponding text.

Suggested Remedy
add appropriate SHALL statement

Proposed Response Response Status O
Cl  48  SC  48.2.6.2.5  P 135  L  # [129]
Estes, Dave  UNH - IOL
Comment Type  T  Comment Status  D

RX_SLEEP: The rx_tq_timer that is started in this state is defined in 48.2.4.2.5 to be
started when the RX_QUIET state is entered not the RX_SLEEP state. Also, the
||LPIDLE|| exit condition from this state that goes back to this state and will cause the timer
to be restarted upon each re-entry.

RX_WAKE: The signal_detect=FAIL exit condition does not seem appropriate because it
allows the device to receive data or other non-idle and non-LPIDLE characters while in the
RX_WAKE state while signal_detect=OK, only LPIDLE should be received.

SuggestedRemedy
RX_SLEEP: If a timer is intended to be utilized in this state then a rx_ts_timer should be
declared.
RX_WAKE: Remove the signal_detect=FAIL exit condition.

Proposed Response  Response Status  O

Cl  49  SC  49.2.4.7  P 140  L  # [130]
Estes, Dave  UNH - IOL
Comment Type  T  Comment Status  D

The encoding from XGMII control codes of 0x06 to 10GBASE-R control codes of 0x07 is
inconsistent with the Clause 55 encoding from XGMII control codes of 0x06 to 10GBASE-R
control codes of 0x06.

Regarding the 8B/10B cell containing "K28.0 or K28.3 or K28.5 with D20.5 in one row",
D20.5 is only included when K28.0 or K28.5 is transmitted.

SuggestedRemedy
Change the encoding from XGMII control codes of 0x06 to 10GBASE-R control codes of
0x06. Also reflect this change on page 139 line 52 and page 141 line 43 (type LI).

Change the cell "K28.0 or K28.3 of K28.5 with D20.5 in one row" to "K28.0 with D20.5 in
one row, or K28.3, or K28.5 with D20.5 in one row"

Proposed Response  Response Status  O
Proposed Response

Bullet a) of Type C currently states "eight valid control characters /O/, /S/, /T/, /E/ and all eight of which are not /LI/ (note that the eight /LI/ characters are only excluded if the optional Low Power Idle function is supported)". The wording "all eight of which are not /LI/" is confusing and can be mis-interpreted (does all eight of which are not /LI/ mean that none are /LI/ or less than 8 are /LI/?).

Type LI is defined as eight /LI/ characters or four /LI/ followed by four /I/ characters, however this is inconsistent with R_BLOCK_TYPE which classifies four /LI/ followed by four /I/ characters as type C.

Suggested Remedy

Change Bullet a) of Type C from "eight valid control characters /O/, /S/, /T/, /E/ and all eight of which are not /LI/ (note that the eight /LI/ characters are only excluded if the optional Low Power Idle function is supported)" to "eight valid control characters /O/, /S/, /T/, /E/ and where less than eight of the characters are /LI/".

Change the definition of type LI from "If the optional Low Power Idle function is supported then this vector contains eight /LP/ characters, or contains four /LI/ followed by four /I/ characters" to "If the optional Low Power Idle function is supported then this vector contains eight /LP/ characters"

Proposed Response

wake_error_counter should be in the counter subclause not the variable subclause.

Suggested Remedy

Move wake_error_counter to the counter subclause.

Proposed Response

The sentence "When the PHY supports EEE the PCS also supports a low power mode" is unnecessary because the PCS is part of the PHY and therefore must support EEE if the PHY does.

Suggested Remedy

Remove the sentence "When the PHY supports EEE the PCS also supports a low power mode".

Proposed Response

The sentence "When the PHY supports EEE the PMA also supports a low power transmit mode and a low power receive mode" is unnecessary because the PMA is part of the PHY and therefore must support EEE if the PHY does.

Suggested Remedy

Remove the sentence "When the PHY supports EEE the PMA also supports a low power transmit mode and a low power receive mode".
Comment Type: E  Comment Status: D
Type, change maximise to maximize.

Suggested Remedy
Change maximise to maximize.

Proposed Response  Response Status: O

Comment Type: E  Comment Status: D
Table 55-1b

The value cell for tx_active_pair=PAIR_C incorrectly references v instead of u.

Suggested Remedy
Change "\( lpi\_offset + 3 \times lpi\_qr\_time \leq u \leq 4 \times lpi\_qr\_time \) OR \( 0 \leq v \leq lpi\_offset \)" to
"\( lpi\_offset + 3 \times lpi\_qr\_time \leq u \leq 4 \times lpi\_qr\_time \) OR \( 0 \leq u \leq lpi\_offset \)"

Proposed Response  Response Status: O

Comment Type: T  Comment Status: D
R_BLOCK_TYPE

Bullet a) of Type C currently states "A block_type field of 0x1E and eight valid control characters, none of which are /E/ and, if the low power idle function is supported, all of which are not /LI/ ". The wording "all of which are not /LI/" is confusing and can be mis-interpreted (does all of which are not /LI/ mean that none are /LI/ or less than 8 are /LI/?).

The I type should be its own type and not a subset of C type, so this will need to be reflected in the C type definition.

Suggested Remedy
Change bullet a) of Type C to "A block_type field of 0x1E and eight valid control characters other than /E/ and, if the low power idle function is supported, less than eight of the characters are /LI/ and less than eight of the characters are /I/ ".

Change the definition for type I to remove the references to this type being a subcause of type C.

Proposed Response  Response Status: O
**Comments on D2.0**

**IEEE P802.3az D2.0 Energy Efficient Ethernet comments**

**September 2009**

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**Comment ID # 140**

**Cl 55 SC 55.3.5.2.4 P 171 L 12**

**Comment Status** D

**Comment Type** T

**Estes, Dave**

**UNH - IOL**

**Comment**

Bullet a) of Type C currently states "eight valid control characters other than /O/, /S/, /T/, and /E/, and, if the low power idle function is supported, which are not eight /LI/ characters and which are not four /LI/ control characters followed by four /I/ control characters". This is not consistent with the R_BLOCK_TYPE definition which does not allow for LI blocks to contain less than eight /LI/ characters.

The I type should be it's own type and not a subset of C type, so this will need to be reflected in the C type definition.

Type LI is defined as eight /LI/ characters or four /LI/ followed by four /I/ characters, however this is inconsistent with R_BLOCK_TYPE which classifies four /LI/ followed by four /I/ characters as type C.

**Suggested Remedy**

- Change bullet a) of Type C to "eight valid control characters other than /O/, /S/, /T/, and /E/, and, if the low power idle function is supported, ess than eight of the characters are /LI/ and less than eight of the characters are /II/"
- Change the definition for type I to remove the references to this type being a subcause of type C.
- Change the definition of type LI so that it requires eight LI characters.

**Proposed Response**

**Response Status** O

---

**Comment ID # 141**

**Cl 55 SC 55.3.5.4 P 173 L**

**Comment Status** D

**Comment Type** T

**Estes, Dave**

**UNH - IOL**

**Comment**

ldpc_frame_done is not defined

**Suggested Remedy**

- Define ldpc_frame_done

**Proposed Response**

**Response Status** O

---

**Comment ID # 142**

**Cl 55 SC 55.3.5.4 P 175 L**

**Comment Status** D

**Comment Type** T

**Estes, Dave**

**UNH - IOL**

**Comment**

- Figure 55-15

- In Clause 49 it is valid to transmit LI while exiting the TX_T state, however this is not shown as a valid transition in Clause 55.

**Suggested Remedy**

- Add an exit condition from TX_T to TX_L if T_TYPE(tx_raw)=LI, and remove type LI in the transition to the TX_E state.

**Proposed Response**

**Response Status** O

---

**Comment ID # 143**

**Cl 55 SC 55.3.5.4 P 177 L**

**Comment Status** D

**Comment Type** T

**Estes, Dave**

**UNH - IOL**

**Comment**

- Figure 55-16

- In Clause 49 it is valid to receive LI while exiting the TX_T state, however this is not shown as a valid transition in Clause 55.

**Suggested Remedy**

- Add an exit condition from RX_T to RX_L if R_TYPE(rx_coded)=LI, and add type LI in the transition from state RX_D to RX_T in R_TYPE_NEXT(rx_coded)=(S or C or LI).

**Proposed Response**

**Response Status** O

---

**Comment ID # 144**

**Cl 55 SC 55.3.5.4 P 177 L**

**Comment Status** D

**Comment Type** E

**Estes, Dave**

**UNH - IOL**

**Comment**

Type, change lpdc_frame_done to ldpc_frame_done.

**Suggested Remedy**

- Change lpdc_frame_done to ldpc_frame_done.

**Proposed Response**

**Response Status** O

---

**Type:** TR/technical required  
**ER/editorial required**  
**GR/general required**  
**T/technical**  
**E/editorial**  
**G/general**

**COMMENT STATUS:** D/dispatched  
A/accepted  
R/rejected  
**RESPONSE STATUS:** O/open  
W/written  
C/closed  
U/unsatisfied  
Z/withdrawn

**SORT ORDER:** Comment ID

---

Page 30 of 101  
9/3/2009 11:34:43 AM
IEEE P802.3az D2.0 Energy Efficient Ethernet comments

September 2009

Cl 78 SC 78.1 P 226 L 32 # 145
Estes, Dave UNH - IOL

Comment Type E Comment Status D
Change "and selection best set of parameters" to "and select the best set of parameters"

SuggestedRemedy
Change "and selection best set of parameters" to "and select the best set of parameters"

Proposed Response Response Status O

Cl 78 SC 78.3 P 233 L 5 # 146
Estes, Dave UNH - IOL

Comment Type E Comment Status D
EEE cannot be used in only one direction for 1000BASE-T

SuggestedRemedy
Change "If EEE is supported by both link partners for the negotiated PHY type then the EEE function may be used independently in either direction" to "If EEE is supported by both link partners for the negotiated PHY type then the EEE function may be used independently in either direction, with the exception of 1000BASE-T which requires that both link partners use EEE at the same time"

Proposed Response Response Status O

Cl 24 SC 24.2.4.4 P 43 L 43 # 148
Frazier, Howard Broadcom Corporation

Comment Type TR Comment Status D
This looks like an accidental typo in the receive state diagram, but it demonstrates the kind of inadvertent damage that can be done when significant changes are made to existing specifications.

It appears that there is a mistake in the transition condition from the state "RECEIVE" to the state "DATA". The transition condition in the draft is gotCodeGroup.indicate * rx_bits[9:5] {is not an element of} DATA. I believe that this transition condition should be gotCodeGroup.indicate * rx_bits[9:5] {is an element of} DATA.

SuggestedRemedy
Change the transition condition to be gotCodeGroup.indicate * rx_bits[9:5] {is an element of} DATA,

and then implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

Proposed Response Response Status O

Cl 24 SC 24.2.4.4 P 43 L 20 # 149
Frazier, Howard Broadcom Corporation

Comment Type TR Comment Status D
Why was the transition condition from the state "CARRIER DETECT" to the state formerly known as "CONFIRM K" changed from rx_bits[9:0]=/I/J/ to rx_bits[9:0]=1111111000 ? These should be equivalent.

This sort of change obfuscates the real set of changes that are needed to support EEE, and will cause unnecessary confusion.

SuggestedRemedy
Change the transition condition back to rx_bits[9:0]=/I/J/

and then implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

Proposed Response Response Status O

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Comment ID

Comment ID # 149 9/3/2009 11:34:43 AM
Comments on D2.0

IEEE P802.3az D2.0 Energy Efficient Ethernet comments

September 2009

Frazier, Howard

Broadcom Corporation

Comment ID # 150

Cl  24  SC  24.2.4.4  P  43  L  17

Why was the transition condition from the state "CARRIER DETECT" to the state "BAD SSD" changed from rx_bits[9:0] {not equal to} /I/J/ to rx_bits[9:0] {not equal to} /I/J/? The trailing slash indicates that /J/ is a code group.

Suggested Remedy

Change the transition condition back to be rx_bits[9:0] {not equal to} /I/J/ and then implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

Proposed Response  Response Status  O

Frazier, Howard

Broadcom Corporation

Comment ID # 151

Cl  24  SC  24.2.4.2  P  42  L  15

It appears that a single bit error in a /K/ in the SSD /J/K/ can synthesize the sequence rx_bits[9:0] = /I/P/. In the "classic" 100BASE-X receive state machine, this would be counted as a BAD SSD, a packet would be discarded, and life would go on. In this new 100BASE-X receive state machine, it appears that such a single bit error in a /K/ will send the state machine to START_RX_SLEEP.

Suggested Remedy

May want to consider a more robust transition condition for going to sleep, and then implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

Proposed Response  Response Status  O

Frazier, Howard

Broadcom Corporation

Comment ID # 152

Cl  24  SC  24.2.4.2  P  42  L  15

The variable tx_quiet is not used by a "classic" 100BASE-X PCS. If a 100 Mbps PHY does not implement EEE (e.g. a 100BASE-FX PHY), then it should not have to set or clear this variable.

Suggested Remedy

Implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

Proposed Response  Response Status  O

Frazier, Howard

Broadcom Corporation

Comment ID # 153
The link monitor in a "classic" 100BASE-X PHY should not have to test the variable rx_lpi or lpi_link_fail.

**Suggested Remedy**
Implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

**Proposed Response**

---

The far-end fault generator in a "classic" 100BASE-X PHY should not have to test the variable rx_lpi.

**Suggested Remedy**
Implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

**Proposed Response**

---

These new service primitives are only relevant for a 100BASE-TX PHY which implements EEE. There is no need to include them in the list of service primitives that must be supported by all 100BASE-X PHYs.

**Suggested Remedy**
Implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

**Proposed Response**

---
Cl 24 SC 24.2.2.1.1 P 38 L 27 # 159
Frazier, Howard
Broadcom Corporation

**Comment Type:** TR  **Comment Status:** D

The 00000 code group, defined as /P/ for EEE, will still be an invalid code group for a "classic" 100BASE-X PHY. This amendment should not mandate that devices that have treated 00000 as an invalid code for the last 17 years are suddenly non-compliant.

**Suggested Remedy:**
Implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

**Proposed Response**  **Response Status:** O

---

Cl 25 SC 25.3 P 52 L 25 # 161
Frazier, Howard
Broadcom Corporation

**Comment Type:** TR  **Comment Status:** D

It is not necessary to reproduce Table 25-1 in P802.3az. It appears that was included in the draft only for the sake of adding three rows to the end of the table for the three new service primitives introduced by EEE. The purpose of the table, however, is to present a mapping of FDDI terms or concepts into 100BASE-TX terminology. Since there is not comparable mapping of the new service primitives into FDDI terms or concepts, there is no need to include them in the table.

**Suggested Remedy:**
Delete the table, and then implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

**Proposed Response**  **Response Status:** O

---

Cl 22 SC 22.2.2.2 P 27 L 25 # 163
Frazier, Howard
Broadcom Corporation

**Comment Type:** TR  **Comment Status:** D

The MII is supposed to be media independent, so why are there references to 100BASE-X receive state machine states associated with normative requirements in Clause 22? The PCS specific material should be deleted from this subclause, and the allowance for a stretched clock period should be re-written in more generic terms.

**Suggested Remedy:**
Re-write the sentence that was added to the end of 22.2.2.2 in generic terms, and then implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

**Proposed Response**  **Response Status:** O
Cl 22 SC 22.2.2.4 P 27 L 45 # 164
Frazier, Howard Broadcom Corporation

Comment Type TR Comment Status D

"Other values of TXD<3:0> shall have no effect upon the PHY"? How does the MAC convey transmit data to the PHY?

Suggested Remedy
Change the sentence to read "Other values of TXD<3:0> while TX_EN is deasserted and TX_ER is asserted shall have no effect upon the PHY" and then implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

Proposed Response Response Status O

Cl 22 SC 22.7a.2.3 P 32 L 15 # 165
Frazier, Howard Broadcom Corporation

Comment Type TR Comment Status D

A state diagram in the MII clause. Wow. Why can't the PHY assert/deassert the CRS signal to indicate when the transmit path is in LPI?

Suggested Remedy
Take out the state diagram. The 100BASE-TX PHY with LPI should be responsible for asserting and deasserting CRS, and then implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

Proposed Response Response Status O

Cl 22 SC 22.2.2.6a P 28 L 46 # 167
Frazier, Howard Broadcom Corporation

Comment Type TR Comment Status D

What do the little triangles in Figure 22-6a represent? The figure presents what appears to be a timing diagram that shows the relationship between various logical signals. How does an abstract service primitive fit into a logical timing diagram, and what does a triangle indicate?

Suggested Remedy
Remove the abstract service primitive from the timing diagram, and then implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

Proposed Response Response Status O

Cl 22 SC 22.2.1.3.2 P 26 L 12 # 168
Frazier, Howard Broadcom Corporation

Comment Type TR Comment Status D

The text as altered reads "The values CARRIER_ON and CARRIER_OFF can be derived from the MII signal CRS and also from the transmit LPI state machine", which is a far different statement from the original, which said "The values CARRIER_ON and CARRIER_OFF are derived from the MII signal CRS."

The "can be ... and also" construction is so ambiguous as to have no meaning.

Suggested Remedy
Move the transmit LPI state machine into the 100BASE-X PCS with LPI annex, and then implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

Proposed Response Response Status O

Cl 22 SC 22.7a.2.2 P 32 L 6 # 166
Frazier, Howard Broadcom Corporation

Comment Type TR Comment Status D

The statement "Condition that is true until such time as the power supply for the device that contains the RS has reached the operating region" sounds pretty vague. What about the L.O.? What about power-on transients? This is an example of why it is a bad idea to have state machines in the RS/MII clause.

Suggested Remedy
Move this state machine into the 100BASE-X with LPI PCS annex, and then implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

Proposed Response Response Status O
The sentence “See 22.2.4.4.2 for a description of the conditions under which a PHY will provide a False Carrier indication” is obviously wrong, since 22.2.4.4.2 describes the 1000BASE-X half duplex ability extended status register bit. It looks like this bug was inserted some time ago since it also appears in 802.3-2005.

Suggested Remedy
Change the cross reference to be 24.2.4.4.2.

The sentence “The notation ++ after a counter indicates it is to be incremented” appears to be superfluous.

Suggested Remedy
Delete the sentence, and then implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.

What does the numeric value "0001" in the middle of Figure 35-9a indicate? Is it supposed to be the value of the RXD<7:0> bundle? If so, it should be shown as a two digit hexadecimal number.

Suggested Remedy
Change the value to 0x01 or simply 01, and then implement the Suggested Remedy in my general comment concerning the structure of the draft amendment.
This is a general comment regarding the structure of the draft amendment.

As an amendment to IEEE Std 802.3, the material in this draft will eventually be folded into the base standard. When this happens, the definitions for the 100BASE-X and 1000BASE-X Physical Coding Sublayers will be substantially changed, and the changes will be difficult to discern. The definitions for the MII and GMII will also be substantially changed.

The 100BASE-X and 1000BASE-X PCSs are used for many other port types besides 100BASE-TX and 1000BASE-KX. Among these are 100BASE-FX, 100BASE-LX10, 1000BASE-BX10, 1000BASE-SX, 1000BASE-LX, 1000BASE-CX, 1000BASE-LX10, 1000BASE-BX10, 1000BASE-PX10, 1000BASE-PX20, 10G/1GBASE-PRX-D/U1, 10G/1GBASE-PRX-D/U2, and 10G/1GBASE-PRX-D/U3.

These port types are not included in the set of objectives for P802.3az, and the specifications for the PCS and MII for these port types must not be changed or effected in any way by P802.3az. Each of these port types must have a current IEEE Std 802.3 PCS and MII to reference.

**Proposed Remedy**

There are many ways to solve this problem. I prefer the following approach:

1. Preserve the definitions for the MII, GMII, 100BASE-X PCS, and 1000BASE-X PCS without change.
2. Define the changes required to support EEE in a set of normative annexes, i.e., Annex 24A for Clause 24, and Annex 25A for Clause 25, etc. Example text for Annex 24A and Annex 25A have been provided by me to the task force chair.
3. Refer to these normative annexes from the body of Clause 78.

**Proposed Response**

Add the following on page 3:

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**Suggested Remedy**

This text is part of IEEE master pages. Use appropriate master page with this background text for the abstract page 3.

**Proposed Response**
Add IEEE 802.3bc, 802.3ba and 802.3-2008/Cor1 to the list

Insert the following amendments/corrigendum to the list in order:

IEEE Std 802.3bc™–20XX
This amendment includes changes to IEEE Std 802.3-2008 and adds Clause 79. This amendment transfers the IEEE 802.3 Organizationally Specific TLVs that were originally specified in IEEE Std 802.1AB Station and Media Access Control Connectivity Discovery to IEEE Std 802.3.

IEEE Std 802.3-2008™/Cor 1–20XX
This corrigendum corrects the PAUSE reaction timing delay value for the 10GBASE-T PHY type.

IEEE Std 802.3ba™–20XX
This amendment includes changes to IEEE Std 802.3-2008 and adds Clause 80 through Clause 88 and Annex 83A through Annex 83C, Annex 85A and Annex 86A. This amendment includes IEEE 802.3 Media Access Control (MAC) parameters, physical layer specifications, and management parameters for the transfer of IEEE 802.3 format frames at 40 Gb/s and 100 Gb/s.

Update URL and hyper link as follows:

Add Title to Table of contents
Add title: "Contents" to the title of this page

Update the list with the following (see base document for reference):
Annex 28B (normative) IEEE 802.3 Selector base page definition
Annex 28C (normative) Next page Message Code field definitions
Annex 73A (normative) Next page message code field definitions
Annex 74A (informative) FEC block encoding examples

Show only changes from base text by underline or strikethrough in this subclause and elsewhere in Clauses 70, 71, 72.

For example in 70.6.5 first paragraph, "optional" is already in the base text and hence should not be underlined.
Comments on D2.0

IEEE P802.3az D2.0 Energy Efficient Ethernet comments

September 2009

Cl 74A SC 74A.5 P 250 L 47 # 182
Ganga, Ilango Intel

Comment Type E Comment Status D
Also update table numbering for Annex 74A. Should be 74A-1 etc., also underline the subclause title 74A.5

SuggestedRemedy
As per comment

Proposed Response Response Status O

Cl 45 SC 45.2.3 P 112 L 16 # 183
Ganga, Ilango Intel

Comment Type ER Comment Status D
The table 45-83 and other tables in Clause 45 have been modified by P802.3ba. So the editing instructions should include the appropriate source document where the source is other than IEEE Std 802.3-2008. Also the table numbers should be changed to indicate the latest renumbered table numbers from previous amendment(s). Also other PCS registers have been modified by the P802.3ba document (or other amendments e.g. P802.3av). So update the editing instructions and the change text as per the draft P802.3ba/D2.2.
For example change editing instruction as follows:
45.2.3.1 PCS control 1 register Change Table 45-83 (IEEE P802.3ba/D2.2) for LPI clock control: Update the table such that the base text is from the above source.

SuggestedRemedy
Update the Editing instructions and Table numbers to indicate appropriate source for base text and use the renumbered table number from appropriate amendment to 802.3-2008. Also update the base text as appropriate as per the source document (for example IEEE P802.3ba/D2.2).

Proposed Response Response Status O
The PMD transmit disable function was previously controlled only by the PMD_transmit_variable, however when energy efficient Ethernet is supported the PMD transmit disable function is also controlled by the PMD_TXQUIET.request primitive (both TX disable variable and the tx_quiet signal). This information should be added to item d.

Also move the timing requirement to a separate item e.

**Suggested Remedy**

If Energy Efficient Ethernet is supported, the PMD_transmit_disable function is controlled by the PMD_transmit_disable variable and the tx_quiet signal. When PMD_transmit_disable variable is set to ONE or tx_quiet signal is set to TRUE the transmit disable function shall turn off the transmitter such that the differential peak-to-peak output voltage is less than 30mV. When the PMD_transmit_disable variable is set to ZERO or the tx_quiet signal is set to FALSE the PMD_transmit_disable function shall turn on the transmitter such that the differential peak-to-peak output voltage is greater than 800mV (see Table 70-4).

e. When the PMD transmit disable function is controlled by the tx_quiet signal the Transmitter shall be turned off within 500ns from the tx_quiet signal set to TRUE and the transmitter shall be turned on within 500ns from the tx_quiet signal set to FALSE (see Table 70-4).

**Comment Status** D

**Response Status** O

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**Comment Type** TR/technical required

**Comment ID** #188

**Proposed Response**

As per comment

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**Comment Type** TR/technical required

**Comment ID** #189

**Proposed Response**

As per comment
EEE is modifying some of the earlier 802.3 clauses adding optional EEE/LPI support, some of the state diagram are getting too complicated to know what is required and what is added for EEE

Suggested Remedy
Propose to duplicate the state diagram in earlier clauses instead of changing them so it is clear what is optional EEE

Proposed Response

Comment Type E
In R_BLOCK_TYPE, there are 7 types enumerated, not 5.

Suggested Remedy
Change "five types" to "seven types".

Proposed Response

Comment Type E
In T_BLOCK_TYPE, there are 7 types enumerated, not 5.

Suggested Remedy
Change "five types" to "seven types".

Proposed Response

The specification is not explicit with respect to how /LI/ characters are treated when low-power idle is not supported.

Suggested Remedy
Add the following sentence to the end of the paragraph:
If low power idle is not supported, then /LI/ is not a valid control character.
Cl 22 SC 22.2.2.4 P 27 L 42 # 195
Grow, Robert Intel
Comment Type ER Comment Status D
Awkward and possibly misleading text.
Suggested Remedy
The PHY shall interpret the combination of TX_EN deasserted, TX_ER asserted and TXD<3:0> equal to 0001 shown in Table 22–1 as a request to enter, or remain in low power idle. Other values of TXD<3:0> with this combination of TX_EN and TX_ER shall have no effect upon the PHY.
Proposed Response Response Status O

Cl 00 SC 0 P 27 L 50 # 196
Grow, Robert Intel
Comment Type ER Comment Status D
The style manual 21.2.1 isn't followed for numbering inserts, where for example, 22.2.2.6A would follow 22.2.2.6, it doesn't precede it and the draft insert instructions do not indicate a convention other than that of the style manual.
Suggested Remedy
Don't insert a TX subclause in the middle of receive subclauses. If the style manual convention is being used, what is currently 22.2.2.6a should be 22.2.2.5A. If not following the style manual all change instructions need to be clear about the insertion point. Fix all inserts consistently.
Proposed Response Response Status O

Cl 78 SC 78.1.4 P 231 L 30 # 198
Grow, Robert Intel
Comment Type ER Comment Status D
Bad subclause title, though some of the PHY types may have been defined in an amendment, they are all part of one standard IEEE Std 802.3. Also, bad table title.
Suggested Remedy
78.1.4 Supported PHY types
Table 78–1 -- Specifications for Energy Efficient Ethernet PHY types
Proposed Response Response Status O

Cl 14 SC 14.1.1.2 P 17 L 40 # 199
Grow, Robert Intel
Comment Type TR Comment Status D
The standard footnote that the 1995 Class D requirement is met by 2001 Class D should be included.
Suggested Remedy
Add footnote.
Proposed Response Response Status O

Cl 22 SC 22.2.1.3.2 P 26 L 12 # 200
Grow, Robert Intel
Comment Type TR Comment Status D
We don't have state machines in the standard, we have state diagrams, and I believe the LPI operation is split into the LPI assert and detect functions (at least in Clause 78). The text is also not properly marked ('can be' is not underscore). There is no reason to weaken the statement from an "are" to a "can be".
Suggested Remedy
The values CARRIER_ON and CARRIER_OFF are derived from the MII signal CRS and if implemented the LPI assert function (78.1.3).
Proposed Response Response Status O
I can't figure out what the last sentence is trying to specify. It also seems that the edits treat service primitives as logic signals. Service primitives are not logic signals, they are events and therefore can't remain in any state. Though the value sent in a primitive may have state, the primitive is only generated when the value changes state. So, it may not be best to use the term set in earlier sentences either.

**Suggested Remedy**

If I understand the intent right, the following would be more accurate, though I don't believe there is a way to put timing requirements in the service primitives, (only in the layers that cause generation of the primitive) so the following isn't correct either (this needs thought and work):

An LPI_IDLE.request primitive with value ASSERT shall not be generated unless the attached link is operational (i.e. link_status = OK, according to the underlying PCS/PMA). The PHY shall not cause an LP_IDLE.request primitive with value ASSERT to be generated for at least one second following a link_status change to OK.

A similar problem exists in 46.1.7.

**Comment Status**

D

**Response Status**

O

---

Is signaling of LPI between an RS and its link partner, or between the RS and the lower parts of the PHY? If the PHY has no option to signal the request, then the language is appropriate, but it seems inconsistent with MII text describing the xMII signals. The effect of the primitive is to generate signals on the MII and that isn't specified here, but should be.

**Suggested Remedy**

Assure MII clause are consistent in what layer is signaling to what peer layer, and that any additional requirements on conveying the LPI request in lower sublayers is properly represented. Add generic text that covers the three MII types – how the assert or deassert is signaled, can probably be generic using the MII definition of assert low power idle.

**Comment Status**

D

**Response Status**

O

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This is really old and in fact inaccurate (there are four editing instructions, not three).

**Suggested Remedy**

Replace with current NOTE -- as found on page 35 of the style manual. The additional paragraphs are acceptable, though if any base text needs to reference another amendment, the first paragraph needs to be updated to indicate that unless otherwise indicated in the editing instructions, base text comes from IEEE Std 802.3-2008.

**Comment Status**

D

**Response Status**

O

---

The acronym should be in lower case "low power idle" unless consistently used as a proper noun throughout the draft. (I don't think capitalization is consistent.)

**Suggested Remedy**

**Comment Status**

D

**Response Status**

O
Comments on D2.0

The draft contains far more text than considered appropriate for publication. For example it is very typical to say change the nth paragraph as follows and not include the complete subclause as seems to be the case for much of this draft. In some clauses the the changes instructions are written for the smaller volume of text and others not.

SuggestedRemedy
Either remove superfluous text (my preference) or include Editor's Note (to be removed prior to publication) that indicates that more base text than is required for publication is included for convenience of review and will be removed during publication preparation.

Proposed Response

Response Status  O

---

SuggestedRemedy
I'm uncomfortable with mixing two sides of the RS in the figure

SuggestedRemedy
Remove the PLS_CARRIER.indication line for consistency with other figures.

Proposed Response

Response Status  O

---

SuggestedRemedy
Though the style manual could be more clear, the base document generally uses the form "(see 35.2.1)" not the square form(s) used on this draft.

SuggestedRemedy
Replace square brackets with parenthesis, use the prevailing format consistently. Some examples (not an exhaustive list) that should be fixed include P. 30, L. 5, 6, and P. 68, L. 50, 51 and P. 122, L. 13.

Proposed Response

Response Status  O
Comments on D2.0

IEEE P802.3az D2.0 Energy Efficient Ethernet comments

Grow, Robert Intel

Cl 78 SC 78.1.2.1.1 P 228 L 12 # 212

Comment Type: E Comment Status: D

Primitive and value are separated by a space.

Suggested Remedy:

LP_IDLE.request (LPI_REQUEST), also similar on line 39.

Proposed Response: Response Status: O

Grow, Robert Intel

Cl 99 SC 4 P 4 L 19 # 213

Comment Type: ER Comment Status: D

Comments on similar front matter have been recommended to the WG Chair for acceptance. For example, this statement about the historical listing of projects is appropriate for the base standard, but not for amendments.

Suggested Remedy:

Assure front matter is current before beginning Sponsor ballot.

Proposed Response: Response Status: O

Grow, Robert Intel

Cl 00 SC 0 P L # 214

Comment Type: ER Comment Status: D

This draft uses the term 'state machine' extensively. This term is not generally used in the base standard. In general an implementation may have a state machine, but we have state diagrams, functions, etc.

Suggested Remedy:

Search and replace 'state machine' with appropriate terminology.

Proposed Response: Response Status: O

Grow, Robert Intel

Cl 49 SC 49.2.4.7 P 139 L 52 # 217

Comment Type: T Comment Status: D

In the following statement, the (0x07) can be confusing, since we don't know if it refers to the XGMII or 10GBASE-R code, and the XGMII code for Idle is also 0x07.

To communicate Low Power Idle, low power idle control character /LI/ (0x07) is sent continuously in place of /I/.

Suggested Remedy:

Change to:

To communicate Low Power Idle, low power idle control character /LI/ is sent continuously in place of /I/.

Proposed Response: Response Status: O

Gustlin, Mark Cisco

Cl 74 SC 74.0.1 P 213 L 28 # 216

Comment Type: T Comment Status: D

Why isn't the signal scrambler_reset shown in figure 74-1?

Suggested Remedy:

Add it.

Proposed Response: Response Status: O

Gustlin, Mark Cisco

Cl 49 SC 49.2.4.7 P 139 L 52 # 217

Comment Type: T Comment Status: D

In the following statement, the (0x07) can be confusing, since we don't know if it refers to the XGMII or 10GBASE-R code, and the XGMII code for Idle is also 0x07.

To communicate Low Power Idle, low power idle control character /LI/ (0x07) is sent continuously in place of /I/.

Suggested Remedy:

Change to:

To communicate Low Power Idle, low power idle control character /LI/ is sent continuously in place of /I/.

Proposed Response: Response Status: O

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Comment ID
Comment ID # 218

Gustlin, Mark
Cisco

Comment Type: T
Comment Status: D

I believe the reference should be to 49-17, not 49-15?

Suggested Remedy
Change the reference to 49-17.

Proposed Response
Response Status: O

Comment ID # 219

Gustlin, Mark
Cisco

Comment Type: T
Comment Status: D

This clause is not consistent with what it calls the low power option. Here it is Energy Efficient Ethernet, elsewhere it is called Low power idle. I think it would be good to be consistent, stick with one or the other when calling out the optional functions.

Suggested Remedy
As above.

Proposed Response
Response Status: O

Comment ID # 220

Gustlin, Mark
Cisco

Comment Type: T
Comment Status: D

This statement is confusing:
"Change Figure 49-14 for LPI transmit state diagram and 49-15 for LPI receive state diagram"

Does it refer to the transmit state diagram (49-14) and receive (49-15), or the LPI transmit state diagram (49-16) and the LPI receive state diagram (49-17)?

Suggested Remedy
Clarify the statement accordingly.

Proposed Response
Response Status: O

Comment ID # 221

Gustlin, Mark
Cisco

Comment Type: T
Comment Status: D

The term broken seems strange in this statement:

The rx_wf_timer allows the receiver an additional period in which to synchronize or return to the quiescent state before the link is declared broken.

Should it be declared down or some other term?

Suggested Remedy
As above.

Proposed Response
Response Status: O

Comment ID # 222

Gustlin, Mark
Cisco

Comment Type: T
Comment Status: D

This statement is confusing:

If the optional Low Power Idle function is implemented the transmit and receive functions are modified as shown in Figures 49-16 and 49-17.

The transmit and receive functions are specified by 49-14 and 49-15, clarify this statement.

Suggested Remedy
As above.

Proposed Response
Response Status: O
It seems to me that resetting the scrambler to all 0s each time the link comes out of LPI is dangerous and will allow malicious users to send killer packets. The original scrambler for 10GE was chose as a very long polynomial to prevent attacks. Walker's presentation shows a Mean Time to Jamming of 29 years, but that is without resetting the scrambler. [http://grouper.ieee.org/groups/802/3/10G_study/public/jan00/walker_1_0100.pdf](http://grouper.ieee.org/groups/802/3/10G_study/public/jan00/walker_1_0100.pdf)

When you reset the scrambler often, that means someone could construct a packet to reverse the scrambler, and if this packet is sent immediately after LPI for instance, it could reverse the scrambler and bring down the link.

**Suggested Remedy**

Either find another way to sync up the FEC after LPI or do an analysis that shows the possibility of jamming the scrambling even though it is being reset is not significant.

**Proposed Response**

**Response Status** O
Comment ID # 229

Cl 22 SC 22.7.3.4a P 33 L 37
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
Item L7 contains 'shall' - what for?

Suggested Remedy
Change "RS shall continue to indicate" to "RS continues to indicate". Shall is not needed in the PICS already. Item feature is a description of the function only.

Proposed Response Response Status O

Comment ID # 230

Cl 24 SC 24.1.1 P 34 L 8
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"When a transmitting station of a link with this capability does not need the full bandwidth, the LPI agent can put the local PHY transmitter and the link partner's receiver into low power idle mode to conserve energy". The idea that I got from EEE proceedings is that EEE is about energy conservation and not about 'needing / not needing full bandwidth'. This sentence confuses cause and effect.

Suggested Remedy
"When a transmitting station of a link with this capability detects conditions, under which the link remains idle for extended period of time, the LPI agent can put the local PHY transmitter and the link partner's receiver into LPI mode to conserve energy". The original sentence talks about bandwidth as if the LPI agent was controlling / observing bandwidth usage.

Proposed Response Response Status O

Comment ID # 231

Cl 24 SC 24.1.1 P 34 L 11
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"Energy is conserved by deactivating some or all functional blocks." - blocks in exactly? In Tx PHY and Rx PHY in the peer? If so, state that clearly.

Suggested Remedy
Per comment

Proposed Response Response Status O

Comment ID # 232

Cl 24 SC 24.1.2 P 34 L 33
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
Strange language in "The only 100BASE-X PHY that supports this capability is 100BASE-TX" - it seems easier to say "From all 100BASE-X PHYs, only 100BASE-TX supports this capability".

Suggested Remedy
Per comment

Proposed Response Response Status O

Comment ID # 233

Cl 24 SC 24.1.4.1 P 34 L 53
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
What is "MII opcode"? in the existing standard, I could only find references to "MII nibbles" - is this the same?

Suggested Remedy
Clarify what "MII opcode" is...

Proposed Response Response Status O
Cl 24 SC 24.2.2 P 36 L 33 # 235
Hajduczenia, Marek
ZTE Corporation

Comment Type: T
Comment Status: D

One of the arrows should be dashed and it is solid. Check arrow to box "FAR-END FAULT DETECT". Also, arrow arriving to box "LINK MONITOR" from the bottom (condition link_control) does not seem to have any ending.

Suggested Remedy
Fix the errors in the figure as described in the comment.

Proposed Response
Response Status: O

Cl 24 SC 24.2.2.1 P 37 L 38 # 236
Hajduczenia, Marek
ZTE Corporation

Comment Type: T
Comment Status: D

What is the 'low power state' - is this the same as 'low power idle mode'?

Suggested Remedy
Clarify and if both terms mean the same, use only one as needed.

Proposed Response
Response Status: O

Cl 24 SC 24.2.2.5 P 39 L 11 # 237
Hajduczenia, Marek
ZTE Corporation

Comment Type: T
Comment Status: D

"commands from the Reconciliation Sublayer and MII" - RS is the acronym for Reconciliation Sublayer which is used consistently in the standard. Change to read "commands from the RS and MII"
The same comment for page 39, line 44

Suggested Remedy
Per comment

Proposed Response
Response Status: O

Cl 24 SC 24.2.2.5 P 39 L 12 # 238
Hajduczenia, Marek
ZTE Corporation

Comment Type: T
Comment Status: D

What is the "low power transmit state" - is this the same as "low power idle transmit state"? If so, do not create new terms but use existing ones.
This term is used later on in the text. Scrub teh draft accordingly.

Suggested Remedy
Per comment

Proposed Response
Response Status: O

Cl 24 SC 24.2.2.5 P 39 L 31 # 239
Hajduczenia, Marek
ZTE Corporation

Comment Type: T
Comment Status: D

"The start of a LPI state is indicated by a series of SLEEP code-groups for fixed amount" should probably read "The start of a LPI state is indicated by a series of SLEEP code-groups transmitted!!! for fixed amount" (remove ! signs).

Suggested Remedy
Per comment

Proposed Response
Response Status: O

Cl 24 SC 24.2.2.5 P 39 L 32 # 240
Hajduczenia, Marek
ZTE Corporation

Comment Type: E
Comment Status: D

Editorial issues on page 39 line 32 missing space in "inTable 24–2."
line 33 "to low power idle mode" > "to a low power idle mode"

Suggested Remedy
Per comment

Proposed Response
Response Status: O
### Comments on D2.0

#### IEEE P802.3az D2.0 Energy Efficient Ethernet comments

**September 2009**

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| 241        | 24 | 24.2.2.5 | 39 | 35 | T | D | "which is consuming less power than the normal state" - from the sentence, it seems that a state is consuming power. Probably equipment / hardware is ... refine the sentence accordingly.
| Comment Type | Comment Status | Comment | Proposed Response | Response Status |
| T | D | "which is consuming less power than the normal state" - from the sentence, it seems that a state is consuming power. Probably equipment / hardware is ... refine the sentence accordingly.
| T | D | "which is consuming less power than the normal state" - from the sentence, it seems that a state is consuming power. Probably equipment / hardware is ... refine the sentence accordingly.
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#### Proposed Response

**Per comment**

- **Comment Status**: D (dispatched)
- **Response Status**: O (open)

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| 242        | 24 | 24.2.2.5 | 39 | 43 | T | D | What is the "low power receive state" - is this the same as "low power idle receive state"? If so, do not create new terms but use existing ones. This term is used later on in the text. Scrub teh draft accordingly.
| Comment Type | Comment Status | Comment | Proposed Response | Response Status |
| T | D | What is the "low power receive state" - is this the same as "low power idle receive state"? If so, do not create new terms but use existing ones. This term is used later on in the text. Scrub teh draft accordingly.
| T | D | What is the "low power receive state" - is this the same as "low power idle receive state"? If so, do not create new terms but use existing ones. This term is used later on in the text. Scrub teh draft accordingly.
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#### Proposed Response

**Per comment**

- **Comment Status**: D (dispatched)
- **Response Status**: O (open)

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| 243        | 24 | 24.2.3.1 | 40 | 5  | T | D | Three new constants are defined and not two ....
| Comment Type | Comment Status | Comment | Proposed Response | Response Status |
| T | D | Three new constants are defined and not two ....
| T | D | Three new constants are defined and not two ....
| T | D | Three new constants are defined and not two ....

#### Proposed Response

**Per comment**

- **Comment Status**: D (dispatched)
- **Response Status**: O (open)

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| 244        | 24 | 24.3.1.8 | 45 | 4  | ER | D | in line 4: "PMA. See Clause 24.2.4.4 and Figure 24–11b" should read "PMA - see 24.2.4.4 and Figure 24–11b."
| Comment Type | Comment Status | Comment | Proposed Response | Response Status |
| ER | D | in line 4: "PMA. See Clause 24.2.4.4 and Figure 24–11b" should read "PMA - see 24.2.4.4 and Figure 24–11b."
| ER | D | in line 4: "PMA. See Clause 24.2.4.4 and Figure 24–11b" should read "PMA - see 24.2.4.4 and Figure 24–11b."
| ER | D | in line 4: "PMA. See Clause 24.2.4.4 and Figure 24–11b" should read "PMA - see 24.2.4.4 and Figure 24–11b."

#### Proposed Response

**Per comment**

- **Comment Status**: D (dispatched)
- **Response Status**: O (open)

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| 245        | 24 | 24.3.1.9.3 | 45 | 53 | T | D | Language in "Far-End fault is not generated during the low power idle mode." > "Far-End fault is not generated when in the low power idle mode."
| Comment Type | Comment Status | Comment | Proposed Response | Response Status |
| T | D | Language in "Far-End fault is not generated during the low power idle mode." > "Far-End fault is not generated when in the low power idle mode."
| T | D | Language in "Far-End fault is not generated during the low power idle mode." > "Far-End fault is not generated when in the low power idle mode."
| T | D | Language in "Far-End fault is not generated during the low power idle mode." > "Far-End fault is not generated when in the low power idle mode."

#### Proposed Response

**Per comment**

- **Comment Status**: D (dispatched)
- **Response Status**: O (open)

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| 246        | 24 | 24.3.3.2 | 46 | 7  | T | D | "When low power idle mode is executed, this" should probably read "In the low power idle mode, this"
| Comment Type | Comment Status | Comment | Proposed Response | Response Status |
| T | D | "When low power idle mode is executed, this" should probably read "In the low power idle mode, this"
| T | D | "When low power idle mode is executed, this" should probably read "In the low power idle mode, this"
| T | D | "When low power idle mode is executed, this" should probably read "In the low power idle mode, this"

#### Proposed Response

**Per comment**

- **Comment Status**: D (dispatched)
- **Response Status**: O (open)

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**TYPE:** TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general

**COMMENT STATUS:** D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn

**SORT ORDER:** Comment ID

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**TYPE:** TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

**COMMENT STATUS:** D/dispatched A/accepted R/rejected

**RESPONSE STATUS:** O/open W/written C/closed U/unsatisfied Z/withdrawn

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**Cl 14 SC 14.1.1.1**

**Comment:** by Category 5 cable and components* - 'components' of what?

**Suggested Remedy:** Either clarify what these 'components' are or where one can find what that means.

**Proposed Response**

**Comment Type:** T

**Comment Status:** D

**Cl 14 SC 14.1.1.1**

**Comment:** "Provides for operation with reduced transmit amplitude" - does EEE reduce the amplitude of the transmitted signal or provide a mechanism for the PMD to enter into sleep mode when not transmitting anything? This sentence is confusing

**Suggested Remedy:** Clarify what "reduced transmit amplitude" means in this case and whether it is really the reduced signal amplitude that is meant in here.

**Proposed Response**

**Comment Type:** T

**Comment Status:** D

**Cl 14 SC 14.3.1.2.1**

**Comment:** Inconsistent use of units. Units in 802.3 are always separated from the numeric value i.e. "between 1.54V and 1.96V for all data" should read "between 1.54-SPACE-V and 1.96-SPACE-V for all data"

**Suggested Remedy:** Scrub the draft accordingly.

**Proposed Response**

**Comment Type:** E

**Comment Status:** D

---

**Cl 14 SC 14.10.4.5.12**

**Comment:** Change e) to read: "10BASE-Te support (optional). MAU supporting 10BASE-T does not have any labelling for backward compatibility reasons."

**Proposed Response**

**Comment Type:** T

**Comment Status:** D

**Cl 14 SC 14.10.4.5.12**

**Comment:** Changes to PICS in 14.10.4.5.12 (LS4 / LS5) are not marked accordingly. Also changes in header 14.10 in line 3 on page 24 are not marked accordingly.

**Suggested Remedy:** Introduce the marking as in e.g. 14.10.4.5.12 (TS1 / TS2) and in header 14.10 in line 3 on page 24

**Proposed Response**

**Comment Type:** E

**Comment Status:** D

**Cl 14 SC 14.10.4.5.12**

**Comment:** "14.10.4.5.12" is repeated in line 8 and 24

**Suggested Remedy:** Second occurrence of "14.10.4.5.12" should read "14.10.4.7.1"

**Proposed Response**

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**Type:** TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general

**Comment Status:** D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn

**Sort Order:** Comment ID

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**Page 52 of 101**
Comments on D2.0

Cl 22 SC 22.2.1 P 25 L 9 # 259
Hajduczenia, Marek ZTE Corporation

Comment Type E Comment Status D

"The mapping changes slightly" - how much is "slightly"? Avoid such void quantitative adjectives in the standard text since it is meaningless. There are changes, full stop.

SuggestedRemedy
Strike word "slightly" in line 9 on page 25.

Proposed Response Response Status O

Cl 22 SC 22.2.2.6a P 28 L 19 # 261
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D

Strange language "the LPI client asserts that it wishes the PHY to transition to the low power idle state"

SuggestedRemedy
Change "the LPI client asserts that it wishes the PHY to transition to the low power idle state" to read "the LPI client requests the PHY to transition to the LPI state". a PHY cannot deny such a request if it is EEE compatible, right? Similarly in line 24.

Proposed Response Response Status O

Cl 22 SC 22.2.2.9a P 29 L 51 # 263
Hajduczenia, Marek ZTE Corporation

Comment Type E Comment Status D

Text is confusing "When the PHY receives signals from the link partner to indicate transition into the low power state it indicates this to the LPI client by asserting RX_ER and setting RXD<3:0> to 0001 while keeping RX_DV deasserted." Consider adding commas or dividing the sentence into two logical blocks.

SuggestedRemedy
Per comment

Proposed Response Response Status O

Cl 22 SC 22.2.2.9a P 30 L 5 # 264
Hajduczenia, Marek ZTE Corporation

Comment Type E Comment Status D

What are these square brackets about? The provided values are neither part of any table nor references

SuggestedRemedy
Fix the use of the square brackets and replace them with parentheses (?).

Proposed Response Response Status O

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Comment ID
Comments on D2.0  

Comment ID # 265

Cl 79  SC 79.3.a.1  P 244  L 3  
Hajduczenia, Marek  ZTE Corporation

Comment Type  E  Comment Status  D

Missing opening parenthesis in "Transmit Tw_sys 2 octets wide)" - should be "Transmit Tw_sys (2 octets wide)

SuggestedRemedy

Per comment

Proposed Response

Response Status  O

---

Comment ID # 266

Cl 28D  SC 28D.7  P 248  L 10  
Hajduczenia, Marek  ZTE Corporation

Comment Type  E  Comment Status  D

Change "Clause 78 (Energy Efficient Ethernet)" to "Energy Efficient Ethernet (Clause 78)"
The same in line 12

SuggestedRemedy

Per comment

Proposed Response

Response Status  O

---

Comment ID # 267

Cl 36  SC 36.2.5.1.5  P 72  L 49  
Hajduczenia, Marek  ZTE Corporation

Comment Type  E  Comment Status  D

"This timer is started when the PMD's receiver" > "This timer is started when the PMD receiver"

SuggestedRemedy

Per comment

Proposed Response

Response Status  O

---

Comment ID # 268

Cl 36  SC 36.2.5.2.9  P 82  L 26  
Hajduczenia, Marek  ZTE Corporation

Comment Type  E  Comment Status  D

"If the optional Low Power Idle function is implemented the PCS indicates to the management system that LPI is currently active in the receive and transmit directions using the status variable shown in Table 36-3c."
should read
"If the optional Low Power Idle function is implemented##,## the PCS indicates to the management system that LPI is currently active in the receive and transmit directions using the status variable##s## shown in Table 36-3c."

SuggestedRemedy

Per comment

Proposed Response

Response Status  O

---

Comment ID # 269

Cl 40  SC 40.1.4  P 89  L 3  
Hajduczenia, Marek  ZTE Corporation

Comment Type  E  Comment Status  D

"an optional low power mode." > "and optional low power mode. - missing 'd' at the end of line 3

SuggestedRemedy

Per comment

Proposed Response

Response Status  O

---

Comment ID # 270

Cl 40  SC 40.2.2  P 87  L 13  
Hajduczenia, Marek  ZTE Corporation

Comment Type  E  Comment Status  D

In general case, editorial instructions should avoid specifying the exact number of added variables, since these things change along the draft development. In this line, it is stated that 3 new items are added, while the list below contains 6 items marked as added. Which is it? Such a problem exists in many places in the draft, and while not critical, it is confusing the reader to suspect that the mark-up is wrong ...

SuggestedRemedy

Please scrub the draft and remove references to the number of added variables or correct the number of variables / entrie added in each editorial instruction

Proposed Response

Response Status  O
<table>
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<th>Comment ID</th>
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<tr>
<td>271</td>
<td>40</td>
<td>40.2.12.1</td>
<td>30</td>
<td>&quot;is in progress hence 1000BTtransmit (refer to 40.3.3.1) will also be FALSE&quot; - it is not common to use &quot;refer to&quot; in 802.3. Use &quot;see&quot; instead. Also in like 29, missing separator between 'Note' and &quot;Assert low power idle&quot; terms.</td>
</tr>
<tr>
<td>272</td>
<td>40</td>
<td>40.3.4</td>
<td>11</td>
<td>Condition &quot;.(Rx nextState) = IDLE) * (rem_lpi_req = TRUE + lpi_mode = ON)&quot; is located a little bit too much to the left and it does not seem to apply to the transit between IDLE and LP_IDLE states. Move it to the right, please.</td>
</tr>
<tr>
<td>273</td>
<td>40</td>
<td>40.4.5.1</td>
<td>49</td>
<td>&quot;or not the remote PHY is has completed the&quot; - either 'is' or 'has'</td>
</tr>
<tr>
<td>274</td>
<td>40</td>
<td>40.4.2.4</td>
<td>3</td>
<td>&quot;signal at the MDI, as defined in 40.6.1.3.5.&quot; &gt; &quot;signal at the MDI as defined in 40.6.1.3.5.&quot; - missing comma.</td>
</tr>
<tr>
<td>275</td>
<td>40</td>
<td>40.4.5.2</td>
<td>20</td>
<td>&quot;This timer defines the maximum time the PHY will remain quiet before initiating transmission to&quot; etc. in the same section. It would be more natural to use &quot;...PHY dwells... / ...PHY remains...&quot; etc. Avoid using Future Simple since it does not relay the idea that such an operation of the underlyign function/element is certain.</td>
</tr>
<tr>
<td>276</td>
<td>36</td>
<td>36.2.5.2.8</td>
<td>23</td>
<td>Do not use &quot;&lt;=&quot; in figures as an assignment operator. There is a specific symbol for that - see page 11 in your own draft (&quot;Assignment operator&quot;)</td>
</tr>
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</table>
Comments on D2.0

IEEE P802.3az D2.0 Energy Efficient Ethernet comments

September 2009

Cl 79 SC 79.3.1.2 P 244 L 21 # 277
Hajduczenia, Marek ZTE Corporation

Comment Type T  Comment Status D
"A receiving link partner may inform of the transmitter of what" should be rewritten, e.g. "A receiving link partner may inform the transmitter of"

Suggested Remedy
Per comment

Proposed Response
Response Status O

Cl 79 SC 79.3.a P 243 L 26 # 278
Hajduczenia, Marek ZTE Corporation

Comment Type T  Comment Status D
"The EEE TLV is used to perform the EEE Data Link Layer capabilities" - how does one 'perform' capabilities? Do you mean 'exchange' information about capabilities?

Suggested Remedy
Please rewrite consistently

Proposed Response
Response Status O

Cl 78 SC 78.4.3 P 240 L 32 # 279
Hajduczenia, Marek ZTE Corporation

Comment Type T  Comment Status D
The text says "The state diagrams above" - which ones precisely?

Suggested Remedy
Add references to which state diagrams are referred to...

Proposed Response
Response Status O

Cl 78 SC 78.4.3.1 P 240 L 46 # 280
Hajduczenia, Marek ZTE Corporation

Comment Type T  Comment Status D
What is a "link partner machine"? Do you mean a specific state machine?

Suggested Remedy
Please clarify

Proposed Response
Response Status O

Cl 78 SC 78.4 P 234 L 9 # 281
Hajduczenia, Marek ZTE Corporation

Comment Type T  Comment Status D
What is exactly the 'link rate' - is this the 'MAC rate' or a 'PHY rate'?

Suggested Remedy
Clarity. Try not to add new terms to the already existing nomenclature.

Proposed Response
Response Status O

Cl 78 SC 78.4 P 234 L 20 # 282
Hajduczenia, Marek ZTE Corporation

Comment Type T  Comment Status D
What "the nomenclature was edited to align" with P802.3bc? Does this note need to be here at all?

Suggested Remedy
Clarify or remove

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Response Status O
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<td>232</td>
<td>3</td>
<td>T</td>
<td>D</td>
<td>&quot;sleep signal&quot;</td>
<td>Per comment</td>
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<td>284</td>
<td>232</td>
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<td>&quot;Tx system&quot;</td>
<td>Per comment</td>
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<td>285</td>
<td>232</td>
<td>26</td>
<td>T</td>
<td>D</td>
<td>&quot;service interface as normal.&quot;</td>
<td>Search for any other similar references of this term and scrub the draft.</td>
<td>Response Status O</td>
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<td>286</td>
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<td>14</td>
<td>T</td>
<td>D</td>
<td>&quot;No data frames are lost or corrupted during the transition to or from the Low Power Idle mode.&quot;</td>
<td>Per comment</td>
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<td></td>
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<td>287</td>
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<td>288</td>
<td>230</td>
<td>7</td>
<td>T</td>
<td>D</td>
<td>&quot;service interface as normal.&quot;</td>
<td>Search for any other similar references of this term and scrub the draft.</td>
<td>Response Status O</td>
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</table>
Cl 78 SC 78.1.3.3 P 230 L 21 # 289
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"can be found in the respective PHY." - which is? It would be very good to have reference to the PHYs supported by EEE in this place.

Suggested Remedy
Per comment

Proposed Response Response Status O

Cl 78 SC 78.1.3.3.1 P 230 L 26 # 290
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
Clarify what the meaning of "sleep signal" is. Typically, we avoid using the word "signal" since it has no clear meaning in this context. Probably an 'encoding / code-word' is sent instead.

Suggested Remedy
Per comment

Proposed Response Response Status O

Cl 78 SC 78.1.3.3.1 P 230 L 30 # 291
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"PHY enters a quiet mode after the sleep signal transmission." > "PHY enters the quiet mode after transmission of the sleep signal."
See also the comment on the "sleep signal"

Suggested Remedy
Per comment

Proposed Response Response Status O

Cl 78 SC 78.1.3.3.1 P 230 L 34 # 292
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"quiet mode" - there are many different modes which are used in this draft, with different capitalization, and potentially with the same meaning / or similar. To avoid reader confusion, please consider adding a section which describes all the modes which you use in this draft and then provide reference to them in the text. Also, use consistent capitalization

Suggested Remedy
Per comment

Proposed Response Response Status O

Cl 78 SC 78.1.3.3.1 P 230 L 34 # 293
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"receives sleep", 'transmits sleep' - probably 'sleep signal' or something alike?

Suggested Remedy
Please clarify

Proposed Response Response Status O

Cl 78 SC 78.1.3.3.1 P 230 L 34 # 294
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"can go quiet" - what does this mean? Does this mean that the transmission is suspended?
Please clarify.

Suggested Remedy
Per comment

Proposed Response Response Status O

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Comment ID


Comments on D2.0  
IEEE P802.3az D2.0 Energy Efficient Ethernet comments  
September 2009

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Hajduczenia, Marek  
ZTE Corporation

Comment Type  T  Comment Status  D

"system energy savings can be achieved even if the PHY link does not go quiet." - not sure what is really meant in here. Does that mean that the link can be maintained active and still there is power saving potential? If so, this needs to be clarified.

Suggested Remedy
Per comment

Proposed Response  Response Status  O

Comment Type  T  Comment Status  D

"The specific media independent interface is dependent on the speed of operation therefore this interface is shown as xMII in the diagram." > "The xMII interface in this diagram represents any of the family of medium independent interfaces, supported by EEE."

Suggested Remedy
Per comment

Proposed Response  Response Status  O

Comment Type  T  Comment Status  D

"transition time to and from the lower level of power consumption is kept small enough to be transparent to* and not a "lower power period" or status or mode

Suggested Remedy
Per comment

Proposed Response  Response Status  O

Comment Type  T  Comment Status  D

"is expected and components may use this* - what are these 'components'?"

Suggested Remedy
Per comment

Proposed Response  Response Status  O
Comments on D2.0
IEEE P802.3az D2.0 Energy Efficient Ethernet comments
September 2009

Cl 78 SC 78.1.1 P 226 L 38 # 301
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"Similarly, it informs the LPI" - what is this 'it' in this context?

SuggestedRemedy
Please clarify the meaning

Proposed Response Response Status O

Cl 25 SC 25.4.11.1.1 P 54 L # 302
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"This variable is from the Transmit process of PCS to control the power saving function of local transmitter" - this variable is part of the Transmit process and it is used by PCS to control the power saving ... ? Is this what is meant?
Similar question for page 56, line 3

SuggestedRemedy
Per comment

Proposed Response Response Status O

Cl 35 SC 35.2.1 P 65 L 30 # 304
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"slightly" - how much is 'slightly'? Remove all such indefinite determiners from the text - they do not add anything to the description and may cause questions about the volume / quantity.

SuggestedRemedy
Per comment

Proposed Response Response Status O

Cl 35 SC 35.2.2.6 P 67 L 1 # 305
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"When the LPI client wishes ... " - indicates that the LPI client has a free will. "When the LPI client requests ... " sounds better. Please scrub the draft, there are many locations where this term occurs.

SuggestedRemedy
Per comment

Proposed Response Response Status O

Cl 35 SC 35.2.2.7 P 67 L 41 # 306
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"while driving the value <01> onto RXD<7:0>" - how big is <01>? If it is two bits long, how do to drive it into an 8-bit wide variable? If it is a hex representation, I think the correct way is to designate it as 0x01 to avoid confusion. What does it mean to 'drive' a value into something?

SuggestedRemedy
Please clarify the issues

Proposed Response Response Status O
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<td>35</td>
<td>35.2.2.4</td>
<td>66</td>
<td>9</td>
<td>T</td>
<td>D</td>
<td>What does this mean &quot;generate an assertion of low power idle&quot;? Is a signal generated by the PHY? Same in line 16 on the same page.</td>
<td>Clarify the meaning / change the description</td>
</tr>
<tr>
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<td>35</td>
<td>35.2.2.6a</td>
<td>66</td>
<td>48</td>
<td>T</td>
<td>D</td>
<td>&quot;and setting TXD&lt;7:0&gt; to 01.&quot; is this 01 a hex representation, binary representation or something completely different? Please clarify</td>
<td>Per comment</td>
</tr>
<tr>
<td>309</td>
<td>35</td>
<td>35.2.2.9a</td>
<td>68</td>
<td>43</td>
<td>T</td>
<td>D</td>
<td>&quot;The LPI client maintains the same state for these signals for the entire time that it wishes the PHY to remain in the low power idle state.&quot; - this is a very complicated way of saying &quot;The LPI client keeps the signals' state as long as the PHY is requested to remain in the low power idle state.&quot; Feel free to modify this further if needed.</td>
<td>Consider the proposal of the change plus answer the question</td>
</tr>
<tr>
<td>310</td>
<td>36</td>
<td>36.2.4.12a</td>
<td>71</td>
<td>52</td>
<td>T</td>
<td>D</td>
<td>'indicating &quot;assert low power idle.&quot;' - missing '&quot;' at the end. Additionally, wouldn't it be possible to say that GMII is signalling the request to assert the LPI?</td>
<td>Per comment</td>
</tr>
<tr>
<td>311</td>
<td>36</td>
<td>36.2.5.1.3</td>
<td>72</td>
<td>19</td>
<td>T</td>
<td>D</td>
<td>&quot;(xmit=DATA * TX_OSET.indicate * TX_EN=FALSE * TX_ER=TRUE * (TXD&lt;7:0&gt; =01))&quot; the 01 is hexadecimal or not? Otherwise, which bits are compared?</td>
<td>Per comment</td>
</tr>
</tbody>
</table>

**Comment ID**: 312

**Response Status**: O

**Proposed Response**

"(xmit=DATA * TX_OSET.indicate * TX_EN=FALSE * TX_ER=TRUE * (TXD<7:0> =01))"

the 01 is hexadecimal or not? Otherwise, which bits are compared?


Comment ID # 313

Cl 36 SC 36.2.5.1.5 P 73 L 35 # 313
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"When TRUE this indicates" - probably "When equal to TRUE, it indicates" ... similar in line 40

SuggestedRemedy
Per comment

Proposed Response Response Status O

Comment ID # 314

Cl 36 SC 36.2.5.2.6 P 80 L 2 # 314
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"is given by 36-9b ..." - probably Figure 36-9b. Also remove the repetition of the figure caption after the 36-9b from line 3.

SuggestedRemedy
Per comment

Proposed Response Response Status O

Comment ID # 315

Cl 40 SC 40.1.3.1 P 86 L 10 # 315
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"When the PHY supports Energy Efficient Ethernet, the idle mode encoding conveys information to the remote PHY indicating whether the local PHY is requesting it to enter into the low power mode or not. Such requests are a direct translation of the assertion of low power idle at the GMII. In addition, the idle mode encoding conveys information to the remote PHY indicating whether the local PHY has completed the update of its receiver state or not, as indicated by the PMA PHY Control function" Also some questions:
(1) what is 'idle mode encoding' ? is this like 'low power idle assertion' ?
(2) capitalization of terms like 'idle mode', 'low power idle' etc. needs to be scrutinized.

SuggestedRemedy
Per comment

Proposed Response Response Status O

Comment ID # 316

Cl 40 SC 40.2.11.1 P 89 L 5 # 316
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"This value is asserted with then PHY is operating in low power mode." > "This value is asserted when the PHY is operating in the low power mode."

Questions
(1) is 'low power mode' the same as 'low power idle mode' ?
(2) capitalization of vital terms needs to be consistent across the draft

SuggestedRemedy
Per comment

Proposed Response Response Status O

Comment ID # 317

Cl 40 SC 40.4.5.1 P 99 L 10 # 317
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"Note that when the PHY supports Energy Efficient Ethernet, when signal_detect is FALSE, scr_status is set to NOT_OK" - this sentence does not read right. There are two "when" conditions? Perhaps one should be changed to an "if" condition. Are the conditions mutual?

SuggestedRemedy
Per comment

Proposed Response Response Status O

Comment ID # 318

Cl 40 SC 40.4.2.4 P 98 L 7 # 318
Hajduczenia, Marek ZTE Corporation

Comment Type T Comment Status D
"When the PHY supports Energy Efficient Ethernet, PHY Control will transition to a low power mode in response to concurrent requests for low power operation from the local PHY (loc_lpi_req = TRUE) and remote PHY (rem_lpi_req = TRUE)." - how do you guarantee that the remote and local PHYs transit to the lower power idle mode at the same moment of time? There is something like transmission delay in P2P links which will make it impossible. Could you clarify this concept in the draft?

SuggestedRemedy
Per comment

Proposed Response Response Status O
"LPI assert function starts to transmits the 'assert low power idle' encoding on the xMII." - it would be much more correct for the LPI client to transmit such data through the RS rather than for data to be generated locally in the RS. LPI assert function should in such a case disable the MAC and enable local generation of control frames in the LPI client.

**Suggested Remedy**
Consider removing the function of generating 'assert low power idle' encoding on xMII from LPI assert function in RS per comment.

---

**Comment ID # 320**

**Cl 79 SC 79**

**Comment Type** E

**Comment Status** D

Missing space between "79" and "IEEE 802.3"

**Suggested Remedy**
Per comment

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**Comment ID # 321**

**Cl 78 SC 78.5**

**Comment Type** E

**Comment Status** D

Editorial changes on page 242

"In full duplex mode" to "In a full duplex mode" (scrub also the draft for the occurrences of the word 'mode' and make sure that the use of 'a' / 'the' before statement like 'full duplex mode', 'lower power mode' etc is consistent.). Additionally decide whether it is 'in ... mode' or 'at ... mode' since it is not used consistently. Also make sure that the 'Lower Power Idle' is superceded by a correct preposition i.e. either 'the' or 'a'.

"propagation delays through the network" to "propagation delay through the network" - there is only one delay through the network rather than multiple delays.

"mode, PHY device" to "mode, a PHY device" - also, scrub the draft for the term "PHY device" and make sure that 'a' / 'the' is used consistently. For data transmission request" to "for a data transmission request" - also, scrub the draft for the term "request" and make sure that 'a' / 'the' is used consistently.

"normal idle code" or "normal IDLE code"? Capitalization of the word "IDLE " is not consistent throughout the draft.

"the systems designer" to "a system designer"

---

**Comment ID # 322**

**Cl 78 SC 78.4.3.2**

**Comment Type** E

**Comment Status** D

Missing comma between 'operation' and 'the receiving'

**Suggested Remedy**
Per comma
<table>
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</table>
| 323        | E    | D      | Editorial changes in section 78.4.3.1<br>"If presently advertised value" to "If the presently advertised value"
|            |      |        | "During normal operation the transmitting link" to "During normal operation, the transmitting link"
|            |      |        | "If the transmitting link partner wants to initiate a change to the presently resolved value of Tw_sys, the local_system_change is asserted and the transmitting link partner enters the LOCAL CHANGE state where NEW_TX_VALUE is computed" - this sentence is probably missing a comma or two.<br>"Otherwise it returns" to "Otherwise, it returns"
|            |      |        | "receiving link partner it" to "receiving link partner, it"
|            |      |        | "is lesser than either" - probably "is smaller than either"
|            |      |        | **SuggestedRemedy**
|            |      |        | per comment
|            |      |        | **Proposed Response** | Response Status | O |
| 324        | E    | D      | certain words in 78.4.2.3 are in smaller font e.g. aLldpXdot3LocTxTwSys and other names of register attributes
|            |      |        | **SuggestedRemedy**
|            |      |        | Check the size of the font and adjust to the overall font format.
|            |      |        | **Proposed Response** | Response Status | O |
| 325        | E    | D      | "for the supported PHY's."
|            |      |        | - probably "for the supported PHYs."
|            |      |        | **SuggestedRemedy**
|            |      |        | Per comment
|            |      |        | **Proposed Response** | Response Status | O |
Comment ID # 328

Hajduczenia, Marek  ZTE Corporation

Comment Type E  Comment Status D

Editorial changes in section 78.1
"operation in Low Power Idle" > "operation the in Low Power Idle"
"When Low Power Idle" > "When the Low Power Idle"
"EEE also specifies a means for the capabilities negotiation to enable link partners to
determine whether EEE is supported and selection best set of parameters common to both
devices." > "EEE also specifies ## means for ## capabilities negotiation to enable link
partners to determine whether EEE is supported and selection ##the## best set of
parameters common to both devices."
"The definition of 10BASE-Te allows reduced power consumption" > "The definition of
10BASE-Te allows for a reduced power consumption"

Suggested Remedy
Per comment

Proposed Response  Response Status O

Comment ID # 329

Hajduczenia, Marek  ZTE Corporation

Comment Type E  Comment Status D

Why in some locations terms 'Transmitter', 'Receiver', 'Descrambler' etc are capitalized and
in other they are not? Does it have to do with specific subclauses?

Suggested Remedy
Per comment

Proposed Response  Response Status O

Comment ID # 330

Hajduczenia, Marek  ZTE Corporation

Comment Type E  Comment Status D

"de-assert' or 'deassert' ? In various different locations, different spellings are used. Please
confirm with 802.3 staff editors which version is the correct one and should be used. Snub
the draft.

Suggested Remedy
Per comment

Proposed Response  Response Status O
Comment Type E Comment Status D

The document structure introducing the EEE texts into the old ones must have already been fully discussed in the TF. But I still have a little concern that the current old texts will be mixed up and become confusing for the readers, when the editorial underlines finally disappear and conditional statements appear everywhere; if the optional EEE function is supported... if the optional low power idle function is implemented... and when the PHY supports EEE..

Suggested Remedy

The new Section6 of 802.3 with new Clause numbers may possibly be allocated to the whole EEE specifications, and old texts up to Section5 can basically keep the current description..

Proposed Response Response Status O

---

Comment Type E Comment Status D

The middle paragraph says that the LPI detect function "continues to indicated idle", but last paragraph does not say that it resumes normal operation when 'assert low power idle' encoding.

Suggested Remedy

Add the following to the last sentence:

and the RS receive function resumes normal decode operation.

Proposed Response Response Status O

---

Comment Type E Comment Status D

Pronoun 'it' ambiguous in sentence "Receive Tw_sys (2 octets wide) is the time (expressed in microseconds) that the receiving link partner is requesting the transmitting link partner to wait before it starts transmitting data following the Low Power Idle."

Suggested Remedy

Change to "Receive Tw_sys (2 octets wide) is the time (expressed in microseconds) that the receiving link partner is requesting the transmitting link partner to wait before transmitting data following the Low Power Idle.

Proposed Response Response Status O

---

Comment Type E Comment Status D

The FEC encoder will not always be receiving unscrambled data if the PHY supports EEE.

Suggested Remedy

Change sentence to: "If the optional Energy Efficient Ethernet function is supported (see Clause 78) then the reverse gearbox of the remote FEC encoder will receive unscrambled data low power idle periods. PCS sublayer will be encoding /I/ during the wake state, which produces the deterministic FEC frame."

Proposed Response Response Status O

---

Comment Type TR Comment Status D

The EEE TLV type is not define in 78.4.1. Bad reference

Suggested Remedy

I believe the reference you want here is 79.3a where it defines the EEE TLV.

Proposed Response Response Status O
Cl 14 SC 14.8 P 23 L 51 # 339
Law, David 3Com

Comment Type E Comment Status D
Suggest that '10BASE-T or 10BASE-Te support.' should be changed to read 'Whether 10BASE-T MAU or 10BASE-Te MAU.'.

SuggestedRemedy
See comment.

Proposed Response Response Status O

Cl 55 SC 55.1.3.2 P 158 L 38 # 340
Law, David 3Com

Comment Type E Comment Status D
As XGMII means 10 Gigabit Media Independent Interface 'XGMII interface' expands to '10 Gigabit Media Independent Interface Interface'.

SuggestedRemedy
Change 'XGMII interface' to read 'XGMII'.

Also:
Page 159, line 25
Page 168, line 53
Page 232, line 11
Page 232, line 19
Page 232, line 20

Proposed Response Response Status O

Cl 48 SC 48.2.3 P 126 L 17 # 342
Law, David 3Com

Comment Type E Comment Status D
The encoding on the receive path of the XGMII when the PHY is receiving the Low Power Idle on its RX MDI is Table 46-4 as 'assert low power idle', not 'receive Low Power Idle' (see also my comment on subclause 22.2.2.7).

SuggestedRemedy
Change 'receive Low Power Idle' to read 'assert low power idle'.

Proposed Response Response Status O

Cl 49 SC 49.2.4.4 P 138 L 52 # 343
Law, David 3Com

Comment Type E Comment Status D
The encoding on the receive path of the XGMII when the PHY is receiving the Low Power Idle on its RX MDI is Table 46-4 as 'assert low power idle', not 'receive Low Power Idle' (see also my comment on subclause 22.2.2.7).

SuggestedRemedy
Change 'receive Low Power Idle' to read 'assert low power idle'.

Proposed Response Response Status O

Cl 46 SC 46.3.2.2 P 123 L 10 # 344
Law, David 3Com

Comment Type E Comment Status D
Typo.

SuggestedRemedy
'assert low ...' should read 'Assert low ...'.

Proposed Response Response Status O
Proposed Response

1. Comment Type: T  Comment Status: D
   The overview text for the 10BASE-Te MAU should parallel the construct of the similar text for the 10BASE-T MAU, in addition I don't think that the one mention of the 10BASE-Te MAU name in the first overview paragraph should be parenthetical.

   Suggested Remedy
   Suggest that 'This clause also specifies characteristics of the Energy Efficient version of 10BASE-T (type 10BASE-Te) MAU.' should be changed to read 'This Clause also specifies the functional, electrical, and mechanical characteristics of the Energy Efficient version of 10BASE-T, the type 10BASE-Te MAU, and one specific medium for use with that MAU.'

2. Comment Type: T  Comment Status: D
   Isn't 'new' a relative term - in a few years this text could be read to mean legacy devices did do this - also to me the text could be simplified as suggested below.

   Suggested Remedy
   Suggest that 'NOTE - It is expected that new 10 Mb/s devices for twisted pair media will not support both 10BASE-T and 10BASE-Te.' be changed to read 'The performance specifications of the 10BASE-T simplex link segment that has to meet the Class D channel. (See also similar comment on subclause 14.4.1)

   Suggested Remedy
   [1] Suggest that (Page 17, line 32) 'The performance specifications of the simplex link ..' be changed to read 'The performance specifications of the 10BASE-T simplex link ..'

   [2] Suggest that 'The medium for 10BASE-Te is a channel meeting or exceeding the requirements of ..' be changed to read 'The medium for 10BASE-Te is twisted-pair wire. The performance specifications of the 10BASE-Te simplex link segment is a channel meeting or exceeding the requirements of ..'

   Proposed Response

3. Comment Type: T  Comment Status: D
   I didn't think the reduced transmit amplitude was optional for 10BASE-Te (see 14.3.1.2.1) therefore don't understand the parenthetical 'optional' after 10BASE-Te.

   Suggested Remedy
   Change the text '... for type 10BASE-Te (optional)' to read '... for type 10BASE-Te'.

   Proposed Response

4. Comment Type: T  Comment Status: D
   This subclause states that 'For all measurements, the TD circuit shall be connected through a balun to section 1 and the signal measured across a load connected to section 4 of the model.' and I don't see any changes to exclude this statement from applying to 10BASE-Te however Figure 14-7a doesn't contain any such annotations.

   Suggested Remedy
   The simplest fix would seem to be to label the left hand section of Figure 14-7a as 'Section 1' and the right hand section of Figure 14-7a as 'Section 4'.

   Proposed Response
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>Comment Type</th>
<th>P</th>
<th>L</th>
<th>Comment Status</th>
<th>#</th>
<th>Proposed Response</th>
<th>Suggested Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>14.4.1</td>
<td>T</td>
<td>22</td>
<td>48</td>
<td>D</td>
<td>350</td>
<td>Law, David 3Com</td>
<td>I don't think the medium for 10BASE-Te is 'a channel meeting ...', the medium for 10BASE-Te is twisted-pair wire. I believe that it is the performance specifications of the 10BASE-Te simplex link segment that has to meet the Class D channel. (See also similar comment on subclause 14.1.1.2)</td>
</tr>
<tr>
<td>14</td>
<td>14.4.1</td>
<td>T</td>
<td>22</td>
<td>48</td>
<td>D</td>
<td>351</td>
<td>Law, David 3Com</td>
<td>This is not the format used everywhere else for referencing the international (ISO/IEC) and then national (TIA) cabling standards (see page 17, line 13 for an example).</td>
</tr>
<tr>
<td>35</td>
<td>35.2.2.9a</td>
<td>T</td>
<td>69</td>
<td>4</td>
<td>D</td>
<td>353</td>
<td>Law, David 3Com</td>
<td>While there is a minimum of 9 RX_CLK clock cycles required on the entry to low power idle mode there is no specification of the minimum number of RX_CLK clock cycles required to exit low power idle mode although from the figure it could be implied that there is only one required.</td>
</tr>
</tbody>
</table>

Suggested Remedy

To allow Clause 78 to refer globally to the same encoding on the MII, GMII and XGMII, as well as just being a good idea, I believe that the encoding on the receive path of the MII, GMII and XGMII when the PHY is receiving the Low Power Idle on its RX MDI should have the same description. At the moment we have:

MII: Receive low power idle
GMII: Assert low power idle
XGMII: Assert low power idle

79.1.3.2 assert low power idle

I suggest that for consistency we use 'assert low power idle'.

Change 'Receive low power idle' in Table 22-2 to read 'Assert low power idle'.

Also make this change:

Page 29, line 46
Page 40, line 17
Page 68, line 40
Page 105, line 15
Page 105, line 20
Page 115, line 12
Page 124, line 1
To allow Clause 78 to refer globally to the same encoding on the MII, GMII and XGMII, as well as just being a good idea, I believe that the encoding on the transmit path of the MII, GMII and XGMII when the RS is transmitting Low Power Idle on the xMII should have the same description. At the moment we have:

- MII: Assert low power idle
- GMII: Assert low power idle
- XGMII: LP_IDLE - assert low power idle

I suggest that for consistency we use 'assert low power idle'.

Suggested Remedy
Change 'LP_IDLE - assert low power idle' to read 'Assert low power idle'.

Also change 'transmit low power idle' to read 'assert low power idle' in the following locations:

- Page 27, line 50
- Page 66, line 43
- Page 105, line 13
- Page 105, line 18
- Page 114, line 47
- Page 115, line 7
- Page 121, line 39

At a minimum mention has to be made that the use of LPI requires that Annex 4A MAC. I'm also not so sure I'm crazy about the idea of just including subclause 22.7 be reference and applying it to the GMII rather than doing an equivalent subclause for the GMII, example just looking at the first subclause of 22.7a I note it references TXD<3:0> which isn't correct for the GMII (See same comment against Clause 46).

Suggested Remedy
[1] Add the text 'The definition of low power idle signaling assumes the use of the MAC defined in Annex 4A for simplified full duplex operation (with carrier sense deferral). This provides full duplex operation but uses the carrier sense signal to defer transmission when the PHY is in low power idle mode.'.

[2] Add equivalents to subclause 22.7a through 22.7a.3.1 for the XGMII to the changes to Clause 46. Another idea may be to add much of 22.7.a, changed to be non onterface specific, to 78.1.3 to apply to all xMIIs.
Cl 46  SC 46.1.7  P 120  L 17  # 358
Law, David  3Com

Comment Type  TR  Comment Status  D

At a minimum mention has to be made that the use of LPI requires that Annex 4A MAC. I'm also not to sure I'm crazy about the idea of just including subclause 22.7 be reference and applying it to the GMII rather than doing an equivalent subclause for the GMII, for example just looking at the first subclause of 22.7a I note it references TXD<3:0> which isn't correct for the XGMII (See same comment against Clause 35).

SuggestedRemedy

[1] Add the text 'The definition of low power idle signaling assumes the use of the MAC defined in Annex 4A for simplified full duplex operation (with carrier sense deferral). This provides full duplex operation but uses the carrier sense signal to defer transmission when the PHY is in low power idle mode.'.

[2] Add equivalents to subclause 22.7a through 22.7a.3.1 for the XGMII to the changes to Clause 46. Another idea may be to add much of 22.7.a, changed to be non onterface specific, to 78.1.3 to apply to all xMIIs.

Proposed Response  Response Status  O

Cl 45  SC 45.2.3.1  P 113  L 8  # 360
Lynskey, Eric  Teknovus

Comment Type  T  Comment Status  D

Clause 45 needs to be updated to reflect the changes introduced by 802.3av and possibly other Task Forces. Table 45-83, which is incorrectly marked as Table 45-2, does not have the updated speed selection in bits 3.05:2. There may be other updates that have not been included.

SuggestedRemedy

Get the latest version of Clause 45 and use that as the baseline for all changes.

Proposed Response  Response Status  O

Cl 70  SC 70.6.10  P 195  L 47  # 361
Marris, Arthur  Cadence

Comment Type  ER  Comment Status  D

Incorrect underlining

SuggestedRemedy

Delete the underlining from the subclause title and following text.

Also remove underlining on page 196.

Proposed Response  Response Status  O

Cl 71  SC 71.6.12  P 201  L 40  # 362
Marris, Arthur  Cadence

Comment Type  ER  Comment Status  D

Incorrect underlining

SuggestedRemedy

Remove underlining from subclause title and following text.

Also on following page 202.

Proposed Response  Response Status  O
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Commenter</th>
<th>Type</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>#363</td>
<td>Marris, Arthur Cadence</td>
<td>ER</td>
<td>Unnecessary under-lining</td>
<td>D</td>
<td>remove the unnecessary under-lining in 72.6.11 on pages 208 and 209</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>#364</td>
<td>Marris, Arthur Cadence</td>
<td>ER</td>
<td>Two new items added not one.</td>
<td>D</td>
<td>Change text to: Insert two new primitives after item (c) as shown below: and underline item e)</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>#365</td>
<td>Marris, Arthur Cadence</td>
<td>ER</td>
<td>Why is this paragraph crossed out?</td>
<td>D</td>
<td>Remove crossed out text. Also remove all underlining from 74.5.4 and 74.5.5</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>#366</td>
<td>Obara, Satoshi Fujitsu Limited</td>
<td>E</td>
<td>Add abbreviation &quot;EEE&quot; which is used in Clause 45 and 78.</td>
<td>D</td>
<td>Add the description &quot;EEE Energy Efficient Ethernet&quot; in Clause 1.5.</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>#367</td>
<td>Ofelt, David Juniper Networks</td>
<td>TR</td>
<td>The cross reference for Tw_sys is wrong and it would match the text in clause 78 better if &quot;Transmit Tw_sys&quot; was given as &quot;Tw_sys_tx&quot;.</td>
<td>D</td>
<td>Replace the crossreference to &quot;78.4.2.3&quot; with &quot;78.2&quot;. Replace &quot;Transmit Tw_sys&quot; with &quot;Tw_sys_tx&quot;.</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>#368</td>
<td>Ofelt, David Juniper Networks</td>
<td>TR</td>
<td>There is a reference to &quot;Resolved Transmit Tw&quot;. I think this is one of the variables in the clause 78 state diagrams. If so, it doesn't exactly match one of the current variables and there is no cross reference.</td>
<td>D</td>
<td>Add a cross reference to 78.4.2.3 where the variables are defined and change the &quot;Resolved Transmit Tw&quot; to match one of the variables in that section.</td>
<td></td>
<td>O</td>
</tr>
</tbody>
</table>
Comments on D2.0  
IEEE P802.3az D2.0 Energy Efficient Ethernet comments  
September 2009

Cl  22  SC  7a.3.1  P  32  L  0  # 369
Ofelt, David  
Juniper Networks

Comment Type: TR  
Comment Status: D
Cross reference is wrong and "Transmit Tw_sys" should be "Tw_sys_tx" 

Suggested Remedy
Cross reference from "78.4.2.3" to "78.2" and change "Transmit Tw_sys" to "Tw_sys_tx" to match the parameter names in that section.

Proposed Response: TR  
Response Status: O

Cl  22  SC 22.9a  P  30  L  0  # 370
Ofelt, David  
Juniper Networks

Comment Type: T  
Comment Status: D
There is no discussion on when the RX_CLK can restart after the deassertion of LPI, and if there is any delay after the deassertion of LPI and the arrival of new receive data.

Suggested Remedy
Add some verbage about the details of what can happen with the RX_CLK, RXDV, and RXD when the LPI state is deasserted.

Proposed Response: TR  
Response Status: O

Cl  78  SC  2  P  232  L  0  # 371
Ofelt, David  
Juniper Networks

Comment Type: T  
Comment Status: D
Figure 78-3 nicely describes the parameters Ts, Tq, and Tr. The other parameters in section 78.2 would benefit from a figure- especially the Tphy_shrink_tx and Tphy_shrink_rx parameters.

Suggested Remedy
Add a figure or an explanation that gives some intuition on what Tphy_shrink_tx and Tphy_shrink_rx signify.

Proposed Response: TR  
Response Status: O

Cl  55  SC 55.3.5.4  P  177  L  0  # 372
Parnaby, Gavin  
Solarflare Communica

Comment Type: E  
Comment Status: D
Case of false is not consistent throughout this diagram (and possibly other diagrams)

Suggested Remedy
Make the case consistent

Proposed Response: E  
Response Status: O

Cl  45  SC 44.2.7.13a  P  117  L  15  # 373
Parnaby, Gavin  
Solarflare Communica

Comment Type: E  
Comment Status: D
In Table 45-145, the descriptions say 'EEE is supported...'. This text should be changed to say 'Advertise that the PHY is EEE capable...'. The descriptions of these bits should also be changed similarly.

Suggested Remedy
As comment

Proposed Response: E  
Response Status: O

Cl  45  SC  45.2.7.14a  P  118  L  16  # 374
Parnaby, Gavin  
Solarflare Communica

Comment Type: E  
Comment Status: D
Add the link partner advertisement table.

Suggested Remedy
Copy Table 45-145, but use the title 'Link Partner EEE Capability Register', change all bits to RO, change description to 'Link Partner has EEE capability for ...'.

Proposed Response: E  
Response Status: O

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general  
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn  
SORT ORDER: Comment ID
Comments on D2.0

Cl  45  SC  25.2.7.13a  P  117  L  5  #  375
Parnaby, Gavin  Solarflare Communica

Comment Type  E  Comment Status  D

The definition of the extended next page here belongs in 55.6.

These bits will fit in the reserved bits in the Extended Next Page in 55-10 (no new extended next page is required).

Also: Do we need to advertise backplane PHY EEE capability in these bits?

SuggestedRemedy

Delete the text here, move to a table in 55.6.

Use the existing reserved bits in the existing extended next page.

[alternatively, we can use a new extended next page, but this will increase startup time (by~1/4 second?)]

Proposed Response  Response Status  O

Cl  55  SC  55.3.5.4  P  174  L  38  #  377
Parnaby, Gavin  Solarflare Communica

Comment Type  T  Comment Status  D

The current EEE Tx state machine enforces 9 LDPC frames of wake (IDLE characters) following alert. During these frames the state machine replaces XGMII data with IDLE characters. The value of tx_coded that goes into the scrambler is ambiguous in some cases (see comment #12).

It would be preferable (and simpler) for the tx state machine to pass XGMII data through transparently. Higher layer system requirements mandate that the wake sequence is at least 9 frames of IDLE.

SuggestedRemedy

See presentation on state machine changes.

Figure 55-16b; EEE transmit state diagram
Transition from SEND_ALERT to TX_NORMAL when tx_lpi_alert_timer_done=true. Delete the SEND_WAKE and SEND_ERROR states and transitions to & from those states.
Figure 55-15a; delete TX_WN and TX_WE and the transitions to and from those states.
Add a transition from TX_L to TX_C when T_TYPE(tx_raw)=I and a transition from TX_L to TX_E when T_TYPE(tx_raw)=(S+E+D+T)

Similarly, it might also be desirable to change the SEND_SLEEP state to pass through XGMII codewords, instead of forcing tx_coded<=LP_IDLE.

Proposed Response  Response Status  O

Cl  55  SC  55.3.5.4  P  174  L  38  #  377
Parnaby, Gavin  Solarflare Communica

Comment Type  TR  Comment Status  D

In Figure 55-15a, the transition from WX_WN to TX_WE should use tx_lpi_active=true. Currently it uses tx_lpi_active=false. [i.e. transition from normal to error if a non-IDLE character is detected before the PHY has completed wake].

SuggestedRemedy

Change the transition from TX_WN to TX_WE to

\[
\text{tx}_\text{lpi}\_\text{active}=\text{TRUE} * \\
\text{T\_TYPE(tx\_raw)=((C.\_I)+D+E+L+S+T)}
\]

Proposed Response  Response Status  O

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID
Proposed Response

The assignments to tx_coded in this state diagram are not made correctly. Also for rx_raw in 55-16a.

New constants should be defined within 55.3.5.2.1 for 1) a 65 bit block of LP_IDLE characters to be sent to the LDPC encoder, 2) a 65 bit block of IDLE characters to be sent to the LDPC encoder, 3) a 72 bit block of LP_IDLE characters to be sent to the XGMII interface and 4) a 72 bit block of IDLE characters to be sent to the XGMII interface [also use existing LBLOCK_T instead of /LF/ within SEND_ERROR]

Suggested Remedy

Add the following definitions to 55.3.5.2.1

LPI_BLOCK_T<64:0>   65 bit vector to be sent to the LDPC encoder containing /LP/ in all the eight character locations
I_BLOCK_T<64:0>   65 bit vector to be sent to the LDPC encoder containing /LP/ in all the eight character locations
LPI_BLOCK_R<71:0>   72 bit vector to be sent to the XGMII interface containing /LP/ in all the eight character locations
I_BLOCK_R<71:0>   72 bit vector to be sent to the XGMII interface containing /LP/ in all the eight character locations

Use these definitions in place of IDLE/LP_IDLE in Figures 55-16b, 55-16a.

Proposed Response

The tx_lpi_active is not used consistently.

State diagram 55-15a relies on tx_lpi_active becoming equal to false after the wake signal. REFRESH_A/.../REFRESH_D/QUIET are set when tx_lpi_active is true; refreshes are not transmitted after the alert, so for this logic to work tx_lpi_active must be set false as soon as the alert state is entered.

In draft 2.0 tx_lpi_active is set to false in SEND_ALERT, which matches the refresh logic, but not 55-15a.

The tx_lpi_active variable cannot be used by both state machines.

Suggested Remedy

Either

i) follow comment #10 and pass XGMII codewords

or if comment #10 is not adopted

ii) Add a second control variable tx_lpi_qr_active. tx_lpi_qr_active is set true when the PHY is sending quiet/refresh signaling, tx_lpi_active is set to true when the PHY is sending sleep, quiet/refresh, alert and wake signaling.

Change the lpi tx_mode description so that the REFRESH_X and QUIET values use tx_lpi_qr_active instead of the existing tx_lpi_active.

Change the lpi tx_mode description to say ‘The variable is set to NORMAL when tx_lpi_qr_active is false, indicating the PCS will encode code-groups as specified by the state diagrams 55-15, 55-15a, 55-16b.’

Change 55-16b so that tx_lpi-active is set to true within SEND_SLEEP. Change the tx_lpi_active within SEND_INITIAL_QUIET and SEND_QR to tx_lpi_qr_active. Change the tx_lpi_active<=FALSE within SEND_ALERT to tx_lpi_qr_active<=FALSE.

Change the text in 55.3.4a and 55.3.4a.3 to reflect these changes

Proposed Response
Comments on D2.0

Proposed Response

Cl 36  SC 36.2.5.2.1  P 75  L # 381
Kasturia, Sanjay  Teraneics

Submitted on behalf of Oren Sela
In figure 36-6 – PCS transmit code-group state diagram, in state IDLE_I2B the current text is:
if tx_oset=/LI/
then (tx_code-group ? /D16.2/)
else (tx_code-group ? /D26.4/)
This looks like an error

Suggested Remedy
Text should be changed to:
if tx_oset=/LI/
then (tx_code-group ? /D26.4/)
else (tx_code-group ? /D16.2/)

Comment Status: D
Response Status: O

Cl 46  SC Table 46-3  P 123  L 10 # 382
Szczepanek, Andre  HSZ Consulting

This is a generic comment on the encoding of LPI as a new XGMII character and applies to 10GBASE-X and 10GBASE-R PCS's

I see no value in creating a new XGMII character for LPI when there already is a viable alternative in the existing standard - Sequence ordered sets L. without requiring wholesale redesign and verification of existing implementations. The 10GBASE-X implementation of LPI is particularly complicated and difficult to validate.

LPI could easily be signalled by defining a new Sequence ordered set for LPI.
Sequence ordered sets already support clock compensation.

Suggested Remedy
Use an existing signaling mechanism (Sequence ordered sets) to signal LPI. This will considerably simplify the impact of EEE on the existing clauses and implementations whilst maintaining functionality.

Proposed Response  Response Status: O

Cl 74  SC Figure 74-1  P 213  L 36 # 383
Szczepanek, Andre  HSZ Consulting

No path is shown for tx_quiet from (or through) the FEC layer to the PMD.

Suggested Remedy
Add tx_quiet, rx_quiet to the PMA service interface of the FEC sublayer

Proposed Response  Response Status: O

Cl 74  SC 74.7.4.8  P 217  L 6 # 384
Thaler, Pat  Broadcom

FEC doesn't have frames, it has blocks. Even though once or twice the current Clause 74 has slipped up and used the wrong word, don't extend that error.

Suggested Remedy
Replace all occurrences of "frame" in the text you have added to Clause 74 with "block".

Proposed Response  Response Status: O

Cl 74  SC 74.7.4.1  P 216  L 30 # 385
Thaler, Pat  Broadcom

The reverse gearbox function in the FEC is suppose to get block lock on the data from the PCS using the block lock state diagram in Figure 49-12. This is in the current standard. This doesn't work if deterministic blocks are to be produced with scrambler_reset.

Suggested Remedy
Add an edit to the subclause to say that when FEC is present, the reverse gearbox is not required when the XSBI is not implemented.

Proposed Response  Response Status: O
The use of "deterministic frame" implies that the FEC will be receiving one frame content that it can look for. This is not the case. It may receive a frame that is all LPI, one that is all normal idle, or one that starts out LPI and switches to normal idle (wake starts during the beginning of a refresh).

I couldn’t find a prohibition on sending frames too early during waking though one would be foolish to do so. There is just informative material to explain the maximum wake up time. If the MAC sends frames too soon, is it assumed that it is okay for rapid block sync to not work. It seems like that should be okay.

Suggested Remedy
If it is acceptable for rapid block lock to only work for blocks that are all LPI or all idle, explain that lock needs to look for one of two deterministic blocks. If it needs to also work for a block with a transition between LPI and idle which means 256 possible blocks, state that.

Thaler, Pat
Broadcom

Comment Type  TR  Comment Status  D

Changes for EEE should only be added in a way that makes it clear what non-EEE devices are required to support. Equations that apply to non-EEE devices should not be changed.

Suggested Remedy
Put in a separate set of equations that apply when EEE mode is enabled to devices that support EEE.

Thaler, Pat
Broadcom

Comment Type  TR  Comment Status  D

Behavior changes for EEE behavior should only be exhibited when connected to an LP that also supports EEE.

Suggested Remedy
Through out the Clause, statements such as "When the PHY supports Energy Efficient Ethernet," or "When Energy Efficient Ethernet is <not> implemented" should be replaced with "When Energy Efficient Ethernet is <not> enabled"

In the case of the state machines, this might also be done with an EEE_enable variable that conditions going into LPI state and any other EEE behaviors.

Thaler, Pat
Broadcom

Comment Type  ER  Comment Status  D

No behavior changes should be exhibited between an EEE supporting device and a non-EEE supporting device. This note implies a new requirement for all Reconciliation sublayers to support a clock that may be halted.

Suggested Remedy
Qualify the new sentence so that it only applies when EEE support is enabled.

Thaler, Pat
Broadcom

Comment Type  TR  Comment Status  D

Changes for EEE should only be added in a way that makes it clear what non-EEE devices are required to support. Equations that apply to non-EEE devices should not be changed.

Suggested Remedy
Put in a separate set of equations that apply when EEE mode is enabled to devices that support EEE.

Thaler, Pat
Broadcom

Comment Type  TR  Comment Status  D

Changes for EEE should only be added in a way that makes it clear what non-EEE devices are required to support. Equations that apply to non-EEE devices should not be changed.
This requirement is stated such that it applies to all PHYs - even those with PMDs that
don't support low power idle. EEE requirements should only apply to those PHYs where it is
applicable and supported.

SuggestedRemedy
Make it clear in the table that the new code should only be sent when EEE is supported
and enabled and that reception of the code is only required in that case. Also make the
new sentence only applicable when EEE is supported and enabled.

Ensure that throughout the clause that new requirements are not placed on non-EEE
devices and that EEE supporting devices are only to exhibit new behavior to peers or
across the XGMII when EEE mode is enabled with EEE supporting partners.

Proposed Response
Response Status O

Since D20.5 is a member of the PCS code group in a way similar to the other codes, it
should appear on the line in the table rather than as a not.

SuggestedRemedy
Proposed Response
Response Status O

This has been added as a requirement on all PCS sublayers even those that are part of
PHY types where EEE support doesn't apply.

This and any other new requirements and behaviors for EEE support should only apply
when EEE is supported and enabled on the PCS.

SuggestedRemedy
After "with the following exceptions that apply when optional EEE operation is enabled:"
or similar language.

Proposed Response
Response Status O

Proposed Response
Response Status O

The variables, counters and messages have been added with no indication that they only
need to be supported devices that support EEE.

SuggestedRemedy
Either group all the variables, counters and messages required for EEE operation only in a
separate subclause or indicate in the description of each one that it only applies when EEE
is supported.

Proposed Response
Response Status O

Proposed Response
Response Status O

The titles of the state diagrams in the note differ from the titles on the diagram.

SuggestedRemedy
Change the titles in the note to those on the diagrams.

Proposed Response
Response Status O
IEEE P802.3az D2.0 Energy Efficient Ethernet comments

Cl 48 SC 48.2.6.2 P 131 L 26 # 397
Thaler, Pat Broadcom

Comment Type T Comment Status D
||LPIDLE|| needs to be added to the list of Constants.

Suggested Remedy
Add ||LPIDLE||

Proposed Response Response Status O

Cl 48 SC 48.2.6.2 P 130 L 1 # 398
Thaler, Pat Broadcom

Comment Type TR Comment Status D
Altering state machine behavior with a note isn't a good idea. It should be done in the state machine or the supporting text for the state machine. Also, "one row" implies that the D20.5 always goes in the same lane which is not the intent.

Suggested Remedy
One approach would be to modify the definitions for the constants ||R|| and ||K|| to state that if TX=||LPIDLE||, one code-group of the column is replaced by /D20.5/ as defined in 48.2.4.2. Or create two new constants to represent the LP Idle versions of ||R|| and ||K|| and in the state boxes use an if TX=||LPIDLE|| to send the correct constant.

Proposed Response Response Status O

Cl 48 SC 48.2.4.2 P 128 L 43 # 400
Thaler, Pat Broadcom

Comment Type E Comment Status D
"in one row" makes it sound like they all go in the same row/lane.

Suggested Remedy
"inserting /D20.5/ in one code-group of each column with a random uniform distribution across the lanes during"

Proposed Response Response Status O

Cl 48 SC 48.2.6.2 P 132 L 1 # 401
Thaler, Pat Broadcom

Comment Type E Comment Status D
Figure 48-8 should appear before Figure 48-9

Suggested Remedy
Correct the ordering of the figures.

Proposed Response Response Status O

---

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Comment ID
IEEE P802.3az D2.0 Energy Efficient Ethernet comments

Cl 48 SC 48.2.6.2.2 P 41 L 132 # 402
Thaler, Pat
Broadcom

**Comment Type** TR  **Comment Status** D

"is not implemented" should be "is not enabled"

New behavior should only occur when the option is enabled

**Suggested Remedy**

Make the change above. Also check for other occurrences of "implemented" or "supported" and change to "enabled" where they describe executing a new behavior.

**Proposed Response**

Thaler, Pat
Broadcom

Cl 00 SC 0 P L # 403

**Comment Type** ER  **Comment Status** D

Insert new subclauses with numbering like 7a to avoid renumbering later ones will make the standard more complex to maintain.

It also isn't clear what the expectation is when this becomes part of a new edition or revision of 802.3 - will the number-letter designations be retained or will renumbering be done then?

**Suggested Remedy**

Make 22.7a be 22.7 and renumber the PICS to 22.8. Treat other insertions of new subclauses, figures and tables similarly.

If the current numbering is to be maintained, put in an editorial instruction at the beginning on what is expected when this is integrated into IEEE Std 802.3.

**Proposed Response**

Thaler, Pat
Broadcom

Cl 73 SC 73.7.6 P 249 L 1 # 405

**Comment Type** TR  **Comment Status** D

EEE needs to be added to Priority resolution. Since EEE is in an annex and unlike Clause 28, priority resolution is in the body, I'm not sure if it should be added to the existing resolution of 73.7.6 or as an additional subclause in Annex 73A but it needs to be somewhere.

**Suggested Remedy**

I suggest that EEE resolution should occur after priority resolution for PHY selection. If both sides support EEE for the selected PHY type, then EEE operation is enabled.

**Proposed Response**

Type: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general

Comment Status: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn

Sort Order: Comment ID
### Comments on D2.0

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<tr>
<td>When is LPI signaling in operation? Is it only when in low power idle or is this intended to apply when LPI operation has been enabled. Given the nature of the change to the figure in 22.7a, it looks like the latter is intended and &quot;LPI signaling is in operation&quot; is a misleading way to describe that.</td>
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<tr>
<td>Suggested Remedy</td>
<td>It would be better to give the ability to operate with low power a name like EEE mode and talk about that mode being enabled or disabled. Leave &quot;LPI signaling&quot; to mean only the signals that are used when actually in the LPI state.</td>
<td></td>
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**Proposed Response**

Response Status O

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<td>What does the editor's instruction mean? How is 22.2.2 to be changed to show LPI signaling? This applies to the other places where this instruction is given with no change to the subclause shown. And where there is a change shown, the editing instruction doesn't need to say &quot;for LPI signaling&quot;</td>
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<tr>
<td>Suggested Remedy</td>
<td>Make the instructions clear.</td>
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**Proposed Response**

Response Status O

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<td>The addition of TX_ER here changes the requirements for non-EEE 100BASE-TX PHYs. In the existing 802.3 standard, when TX_ER is asserted while TX_EN, the PHY is required to insert an error somewhere in the frame but that is not required to happen at the time TX_ER is asserted. Therefore, in the current IEEE 802.3 standard TXD&lt;3:0&gt; may effect the PHY during the time that TX_ER is asserted.</td>
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<tr>
<td>The added new behaviors in the next paragraph and in Table 22-1 are written such that they apply to all 100BASE-T PHYs and would make existing 100BASE-T PHYs non-compliant. 802.3az should not make changes that make a compliant 100BASE-T PHY non-compliant. Any changed requirement should only apply to PHYs supporting an EEE option when EEE is enabled.</td>
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<tr>
<td>Suggested Remedy</td>
<td>Rewrite the changes to this subclause so that they only apply to devices when EEE operation is enabled. That may require insertion of a separate table for EEE PHYs or a column to indicate that a row in the table only applies to EEE operation and is treated as reserved by non-EEE PHYs.</td>
<td></td>
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</table>

**Proposed Response**

Response Status O
The way that EEE operation has been added to the base clauses for PHYs other than 10BASE-T produces a risk that existing non-EEE PHYs and Reconciliation sublayers will be made non-compliant. The requirements have also been added in a way that will make EEE PHYs incompatible with currently compliant non-EEE devices. My comments on 22.2.2.4 and 22.2.2.7 are examples of where that has happened.

The addition of EEE to IEEE 802.3 should not make existing IEEE 802.3 compliant devices non-compliant. EEE devices should be able to work with non-EEE devices at the xMII and MDI interfaces. It should be optional to support and any new requirements and behaviors should only apply to devices that support EEE/LPI operation. Any behaviors at the xMII or MDI that are outside what is specified for non-EEE devices should only apply when EEE operation is enabled so that EEE devices interoperate properly with non-EEE devices.

**Suggested Remedy**

The safest way to do this would be to create separate clauses for behavior when EEE is enabled similar to the creation of annex 4A for full-duplex, though that would greatly increase the size of the document. The alternative is to carefully use the same type of formula any time you change a requirement for EEE. That is, the old requirement needs to be proceeded by something like "When EEE operation is not enabled," and the new requirement by "When EEE operation is enabled;".

I have used enabled rather than supported because a device that supports EEE should not exhibit a new behavior when attached to a device that doesn't support EEE. For a PHY, this applies both to the xMII interface when attached to a Reconciliation layer that doesn't support EEE and to the MDI when the link partner PHY doesn't support EEE or isn't able to enable it because the link partner's Reconciliation sublayer doesn't support it.

**Proposed Response**

Response Status: O

The way that EEE operation has been added to the base clauses for PHYs other than 10BASE-T produces a risk that existing non-EEE PHYs and Reconciliation sublayers will be made non-compliant. The requirements have also been added in a way that will make EEE PHYs incompatible with currently compliant non-EEE devices. My comments on 22.2.2.4 and 22.2.2.7 are examples of where that has happened.

The addition of EEE to IEEE 802.3 should not make existing IEEE 802.3 compliant devices non-compliant. EEE devices should be able to work with non-EEE devices at the xMII and MDI interfaces. It should be optional to support and any new requirements and behaviors should only apply to devices that support EEE/LPI operation. Any behaviors at the xMII or MDI that are outside what is specified for non-EEE devices should only apply when EEE operation is enabled so that EEE devices interoperate properly with non-EEE devices.

**Suggested Remedy**

The safest way to do this would be to create separate clauses for behavior when EEE is enabled similar to the creation of annex 4A for full-duplex, though that would greatly increase the size of the document. The alternative is to carefully use the same type of formula any time you change a requirement for EEE. That is, the old requirement needs to be proceeded by something like "When EEE operation is not enabled," and the new requirement by "When EEE operation is enabled;".

I have used enabled rather than supported because a device that supports EEE should not exhibit a new behavior when attached to a device that doesn't support EEE. For a PHY, this applies both to the xMII interface when attached to a Reconciliation layer that doesn't support EEE and to the MDI when the link partner PHY doesn't support EEE or isn't able to enable it because the link partner's Reconciliation sublayer doesn't support it.

**Proposed Response**

Response Status: O

The way that EEE operation has been added to the base clauses for PHYs other than 10BASE-T produces a risk that existing non-EEE PHYs and Reconciliation sublayers will be made non-compliant. The requirements have also been added in a way that will make EEE PHYs incompatible with currently compliant non-EEE devices. My comments on 22.2.2.4 and 22.2.2.7 are examples of where that has happened.

The addition of EEE to IEEE 802.3 should not make existing IEEE 802.3 compliant devices non-compliant. EEE devices should be able to work with non-EEE devices at the xMII and MDI interfaces. It should be optional to support and any new requirements and behaviors should only apply to devices that support EEE/LPI operation. Any behaviors at the xMII or MDI that are outside what is specified for non-EEE devices should only apply when EEE operation is enabled so that EEE devices interoperate properly with non-EEE devices.

**Suggested Remedy**

This requirement and any other new requirements or behaviors should only apply when low power idle operation is enabled and low power idle operation should only be enabled when attached to other devices that also support low power idle operation.

**Proposed Response**

Response Status: O

This indicates that RX_CLK may be stopped which is not consistent with 22.2.2.2 which says that RX_CLK is continuous and only says that it may be high or low for a period not to exceed twice the nominal clock period.

**Suggested Remedy**

Make the subclauses consistent. If RX_CLK is stoppable, that needs to be indicated in 22.2.2.2.
There is no reason to specify both an extended next page message code and an unextended one. The third paragraph of 28C defines a mechanism for packing a Message page and up to two unformatted code fields into a single extended next page so once you have defined an unextended next page message, you have also defined an extended one that carries the same information.

However, time per next page exchange can be quite long - on the order of a quarter of a second per page which is why we defined extended next pages and required their use for 10GBASE-T. Note that support for extended next page also uses faster bursts and shorter time between bursts which shortens time per page as well as the number of pages.

Suggested Remedy
It would be better to require Extended Next Page support for EEE. If there is a reason to allow for 16 bit page size for next page, then only specify a message code for unextended pages which can be carried in extended pages using the packing already specified for 28.

Comment Type TR
Comment Status D
Proposed Response

There is no reason to send EEE capabilities for backplane PHYs when using Clause 28 auto-neg or for BASE-T PHYs when using Clause 73 auto-neg. They two classes of PHYs use different auto-negotiation. Also, Clause 73 next pages are always equivalent to Clause 28 extended next pages. Therefore "For PHYs that negotiate extended next page support doesn't apply to them" so you need to add text to cover Clause 73 auto neg.

Suggested Remedy
Define the mapping at least for 16 bits for extended next pages and Clause 73.

Consider specifying just sending the relevant bits for the auto-neg type allowing the bit usage to overlap for the two auto-neg types.

Proposed Response

Comment Type T
Comment Status D
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<td>249</td>
<td>33</td>
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<td>D</td>
<td>Since the register is 16 bits, you might as well allow for use of 16 bits here. With extended next pages, 16 bits are available and any new PHY types are likely to support extended. I made a similar comment on 45.2.7.13a.</td>
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<td>TR</td>
<td>D</td>
<td>These additions to the PICS make every existing PCS, even PCS types don't have the option to support EEE, and Clause 45 AN implementation non-compliant. There is no reason to make these registers mandatory for devices that don't support EEE. 45.2 already documents the behavior when registers that the device doesn't support are accessed and that requirement is enough to provide backwards compatibility for management that doesn't know whether a device supports EEE. Also the PCS items need to be conditional on PCS.</td>
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<tr>
<td>419</td>
<td>36</td>
<td>36.2.5.1.2</td>
<td>72</td>
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<td>TR</td>
<td>D</td>
<td>Also applies to 36.2.5.1.3 and 36.2.5.1.5. A great many variables and counters have been added to support EEE when this support applies to only one of the PHY types that use this PCS. It should be made clear here which PHY types EEE support applies to, i.e. 1000BASE-KX. Also it should be made easy for the reader to determine which constant, variables and counters are required only for EEE support.</td>
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<td>TR</td>
<td>D</td>
<td>There is text in the figures that says that the items in the dotted boxes are new but nothing says that they are optional. It isn't even clear whether the dotted boxes are intended to stay once this is integrated into 802.3 or are just to mark the new areas in the draft. New behaviors for EEE support must only be required when the EEE option is applicable to the PHY type and supported by the PHY. Put explicit text in that says that the states in the dotted boxes and transitions to and from them are required only for devices that support EEE. Also, transitions to EEE states are only valid when EEE support is enabled. A PHY might support but be connected to a link partner that does not and in that case it should not exhibit any EEE behaviors. One clear way to do this would be to add an EEE enabled variable and condition any transitions to EEE states on this variable.</td>
</tr>
</tbody>
</table>
Comments on D2.0

Thaler, Pat
Broadcom

Comment ID: 421

Cl 36 SC 36.2.5.1.3 P 72 L 27

Comment Type: TR
Comment Status: D

The text here isn't clear.

Also, the alternate terms should only be used when EEE is enabled.

Suggested Remedy

Either make it clear what the equation for the alias is. I.e.

Alias for detect idle:

When EEE is disabled: (xmit....

When EEE is enabled: (xmit....

Or do the full equation using the variable for EEE enabled to condition use of the additional terms.

Thaler, Pat
Broadcom

Comment ID: 422

Cl 36 SC 36.2.5.2.6 P 79 L 5

Comment Type: TR
Comment Status: D

This state machine has no change marks but it has been changed, at least in the variable name sync_status to code_sync_status.

It would be preferable to have different state diagrams for the new functionality minimize the risk of making changes in the required behavior for existing devices, but if this is not done, then all state machine changes must be marked.

Suggested Remedy

Mark all state machine changes so that they can be reviewed to ensure backwards compatibility with a reasonable amount of effort.

Thaler, Pat
Broadcom

Comment ID: 423

Cl 40 SC 40.1.3 P 84 L 16

Comment Type: TR
Comment Status: D

This behavior should only apply when EEE operation is enabled, not when it is supported but disabled.

This also applies to 36.2.5.2.8.

Suggested Remedy

Begin the paragraph: "When EEE mode has been enabled, a 1000BASE-T PHY may ....

Proposed Response

Response Status: O
There appears to be a small bug in the state machine. If while in LPI, the link becomes degraded such that the receiver can not acquire rx_block_lock, but the signal is still able to trigger energy_detect=OK though perhaps sluggishly or intermittently, then Link Failure will not be detected.

Also note that at these speeds, signal detect is difficult and it is possible that noise on a none terminated line may cause signal detection. It is so difficult at these speeds to set a threshold that doesn't unsquelch for noise and does for signal that we made it optional in Clause 72 and rely mainly on gaining alignment as a measure of link quality.

Each time LPI is sent on the link, energy_detect (which might be due to noise) will cause a transition from quiet to wake. If block lock cannot be acheived by the time the incoming signal returns to quiet, the state returns to quiet and the rx_tq_timer is restarted. This can go on indefiniately without detecting the failure because none of the timers time out.

This may delay failure detection or prevent it which hurts fast fail-over capabilities in end nodes and bridges. Also, if the machine doesn't get to RX_LINK_FAIL to assert block_lock = FAIL, triggering auto-neg to begin to restore the link can not start.

Suggested Remedy
Start rx_tq_timer only in RX_SLEEP state so that cycles of signal detect that don't achieve alignment don't restart the timer.

Also, the definition of rx_tq_timer currently says that it is started in RX_QUIET but doesn't mention that it is also started in RX_SLEEP. Correct the definition to match the resolution of this comment.

Proposed Response Response Status O

The transmitter timers should also specify the acceptable range - either by min and max columns as for the receivers or by stating a tolerance.

Suggested Remedy
"receiver clocks (e.g. timing recovery, adaptive filter coefficients)"

adaptive filter coefficients and possibly other items that might be refreshed are not "receiver clocks"

Suggested Remedy
"receiver clocks" should be "receiver state" as it is in two other clauses.

Proposed Response Response Status O

Delete "optional but" the next sentence covers when EEE isn't supported.

Suggested Remedy

Proposed Response Response Status O
Proposed Response

Thaler, Pat

Cl 71 SC 71.7.1 P 203 L 16 # 431

Comment Type TR Comment Status D

Also applies to 71.7.2

Need to provide an indication that the new characteristics are only required when EEE is supported.

Suggested Remedy

It may be easiest to refer to the new characteristics by putting them in a separate table or tables creating a subclause Additional transmitter and receiver characteristics for EEE.

Proposed Response Response Status O

Thaler, Pat

Cl 72 SC 72.7.1 P 210 L 12 # 433

Comment Type TR Comment Status D

Also applies to 72.7.2

Need to provide an indication that the new characteristics are only required when EEE is supported.

Suggested Remedy

It may be easiest to refer to the new characteristics by putting them in a separate table or tables creating a subclause Additional transmitter and receiver characteristics for EEE.

Proposed Response Response Status O

Thaler, Pat

Cl 74 SC 74.5 P 214 L 12 # 432

Comment Type TR Comment Status D

Editor's instruction says that one new primitive is added, but two are listed and others have been added to the primitives but not to the list. Figure 49-4 shows 5 EEE primitives going between PCS and FEC:

- $tx_{quiet}$, $rx_{quiet}$, $scrambler_reset$ and $rx_{lpi_active}$ going down and energy detect going up.
- Also, indications go up the stack, requests go down the stack. $tx_{quiet}$, $rx_{quiet}$, $scrambler_reset$ (if it is sent to FEC) and $rx_{lpi_active}$ should be requests not indications.

Suggested Remedy

Correct the instruction to say the correct number of new primitives and the $RX_{QUIET}$ primitive and add missing primitives. Also add a statement that the new primitives are only required when EEE is supported. That could be added to the paragraph after the list.

It isn't clear why Clause 49 shows reset_scrambler crossing the interface since it isn't used by the lower layers.

Change primitives that go from PCS to FEC to .request.
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<th>SC</th>
<th>Page</th>
<th>Line</th>
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<th>Comment Status</th>
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<td>74.0.1</td>
<td>213</td>
<td>37</td>
<td>E</td>
<td>D</td>
<td>The EEE primitives also need to go between the FEC and the PMA.</td>
<td>Add lines for the primitives. Also, the subclause number should be 74.4.1.</td>
<td></td>
<td>Thaler, Pat</td>
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<tr>
<td>435</td>
<td>51</td>
<td>51.4.2</td>
<td>154</td>
<td>1</td>
<td>TR</td>
<td>D</td>
<td>These are primitives on the service interface and should have primitive definitions in the style of 51.2</td>
<td>Add primitive definitions</td>
<td></td>
<td>Thaler, Pat</td>
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<td>436</td>
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<td></td>
<td>TR</td>
<td>D</td>
<td>Across Clauses 49, 51, 72 and 74 there is a disconnect on what primitives are crossing the interface.</td>
<td>Make the primitive interfaces between these Clauses consistent. Delete scramble_reset. Perhaps delete energy_detect and use signal_detect. Indicate in Clause 49 that rx_lpi_active is only used by FEC and need not be supplied when FEC is not used.</td>
<td></td>
<td>Thaler, Pat</td>
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<td>437</td>
<td>55</td>
<td>55.2.2.10</td>
<td>161</td>
<td>35</td>
<td>TR</td>
<td>D</td>
<td>Indications are primitives that go up the stack, requests go down the stack. PCS_RX_LPI_STATUS goes down the stack so it is a request, not an indication</td>
<td>Change to .request</td>
<td></td>
<td>Thaler, Pat</td>
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</tbody>
</table>
Cl 74  SC 74.5.4.1  P 215  L 9  # 438
Thaler, Pat  Broadcom

Comment Type  TR  Comment Status  D

If this primitive is not removed (the subject of another comment of mine), this when
generated section is incorrect.

SuggestedRemedy

When generated for this should be similar to 74.5.3.2 - FEC generates the primitive when
the energy_detect primitive it received from the PMA changes. The model of the primitives
for boolean variables (which is different than the real life signals) is that the primitive is
generated when the value changes.

Proposed Response  Response Status  O

Cl 74  SC 74.8.2.2  P 218  L 4  # 439
Thaler, Pat  Broadcom

Comment Type  TR  Comment Status  D

There is no need to rename fec_block_lock. Renaming variables can cause confusion and
it should only be done where necessary or too painful to not change it. Here that isn't the
case.

If it is necessary for signal_detect to go true before fec_block_lock goes true, then change
the description of fec_signal_ok to be based on the received SIGNAL_OK = OK and
(fec_block_lock + fec_rapid_block_lock). In addition, there is a problem with getting signal
detect from combining normal and fec block lock as it will glitch False. In the following
description, I have used fec_block_lock for the name of the signal generated by the block
lock machine rather than fec_normal_block_lock.

fec_rapid_block_lock is described as going false when it doesn't receive the deterministic
block. 4 complete "deterministic" blocks are sent in a 1 us scrambler_reset. Some of those
are eaten by the time for signal detect and clock recovery so there may be only 1 or 2
received. The first one received will cause fec_rapid_block_lock to go true and will cause
the block lock state machine to start trying lock at that slip value. Within another block or
two, the block received isn't deterministic and fec_rapid_block_lock goes false. However, it
takes at least 4 good blocks for the state machine to set fec_block_lock true.

As currently described, at the start of a recovery period or exit from LPI, signal detect will
probably go true for an FEC block or two due to fec_rapid_block_lock, then go false for a
few blocks due to the gap between fec_rapid_block_lock = true and fec_block_lock = true.

SuggestedRemedy

Don't change the name of fec_block_lock in the state machine. Just add
fec_rapid_block_lock to the determination of signal_detect if it is necessary to speed that
detection.

Additionally, if speeding the detection is necessary then fix the glitch where
fec_rapid_block_lock goes false before fec_block_lock goes true.

Proposed Response  Response Status  O
Comment Type: E  Comment Status: D

Including T_TYPE_NEX in the functions appears to be an error in the standard. It isn't used in this Clause.

Suggested Remedy
Do a service to humanity and remove the extraneous function.

Proposed Response  Response Status: O

Comment Type: E  Comment Status: D

The grammar of the note is a bit ambiguous - it could be read as expecting that neither is supported.

Suggested Remedy
"will support either 10BASE-T or 10BASE-Te." would be more clear. One could also use "will support either 10BASE-T or 10BASE-Te but not both."

Proposed Response  Response Status: O

Comment Type: TR  Comment Status: D

The 10BASE-Te sentence isn't parallel to the 10BASE-T one. It doesn't specify a distance which gives the impression that perhaps only 10BASE-T provides for operation up to 100 m.

Suggested Remedy
Add the distance for 10BASE-Te or remove the distance from the 10BASE-T one since the distance is already in the opening sentence.

Proposed Response  Response Status: O
Proposed Response

There are 86 occurrences of "10BASE-T" in IEEE 802.3 section 1 not counting the Table of contents and 95 in section 2. This supplement adds 28 occurrences of 10BASE-Te and it added some occurrences of 10BASE-T so it is clear that it has not inserted "or 10BASE-Te" everywhere where 10BASE-T occurs in IEEE 802.3. Even just Clause 14 in 802.3 has 44 occurrences of 10BASE-T.

Examples of three places where this causes problems are in Clause 28, Clause 30 and Clause 33.

The draft contains no edits to Clause 28 and its annexes so there is no way to auto-negotiate for 10BASE-Te operation. Bits A0 and A1 of the technology ability field apply to only 10BASE-T. Also 28.2.1.1 still requires "Compliant 10BASE-T MAUs transmit link integrity pulses" for autonegotiation so any device wanting to do auto-neg would still have to deliver the 10BASE-T voltage during auto-neg which defeats some of the purpose of doing 10BASE-Te.

In Clause 30, 10BASE-Te hasn't been added to the MAU types in 30.5.1.1.aMAUType.

The draft contains no edits to Clause 33 so it only allows DTE power operation with 10BASE-T and not with 10BASE-Te MAUs.

SuggestedRemedy

My preferred solution to this would be to define two subtypes of 10BASE-T operation, e.g. classic (10BASE-Tc) and EEE (10BASE-Te). Use the subtypes where there is a difference between the two such as transmit voltage level. Use 10BASE-T in statements that apply to both subtypes. I can understand the desire to not change the existing meaning of 10BASE-T, but it isn't working and not including the new subtype in 10BASE-T will cause problems - existing devices won't know that a new technology ability indicates something that is backward compatible with 10BASE-T over the appropriate cable.

If that isn't done, every instance of 10BASE-T in all of 802.3 needs to be examined and modified to include 10BASE-Te as appropriate.

Proposed Response
This text makes it sound like the figures replace or show modifications to the transmit and receive state machines.

Also the text should make a normative statement. For an example see the first sentence of 48.2.6.2.2.

Page 135 line 49 should also make a normative statement.

**Suggested Remedy**

State that a PCS which supports EEE shall implement the LPI transmit and processes as shown in figures 48-9a and 48-9b and that these processes shall run when EEE is enabled. You can go on to explain that the transmit LPI state diagram controls tx_quiet which overrides disables the transmitter when true and that the receive one produces align_status and tells the receive state machine when a receive LPI has ended. Make the reference to the LPI timer tables normative too.

**Proposed Response**

**Response Status** O

---

There appears to be a small bug in the state machine. If while in LPI, the link becomes degraded such that the receiver can not acquire deskew_align_status=OK, but the signal is still able to trigger signal_detect=OK though perhaps sluggishly or intermittently, then Link Failure will not be detected.

Also note that at these speeds, signal detect is difficult and it is possible that noise on a none terminated line may cause signal detection. It is so difficult at these speeds to set a threshold that doesn't unsquelch for noise and does for signal that we made it optional in Clause 71 and rely mainly on gaining alignment as a measure of link quality.

Each time LPI is sent on the link, signal detect (which might be due to noise) will cause a transition from quiet to wake. If alignment cannot be acheived by the time the incoming signal returns to quiet, the state returns to quiet and the rx_tq_timer is restarted. This can go on indefinitely without detecting the failure because none of the timers time out.

This may delay failure detection or prevent it which hurts fast fail-over capabilities in end nodes and bridges. Also, if the machine doesn't get to RX_LINK_FAIL to assert align_status = FAIL, auto-neg to begin to restore the link can not start.

**Suggested Remedy**

Start rx_tq_timer only in RX_SLEEP state so that cycles of signal detect that don't achieve alignment don't restart the timer.

Also, the definition of rx_tq_timer currently says that it is started in RX_QUIET but doesn't mention that it is also started in RX_SLEEP. Correct the definition to match the resolution of this comment.

**Proposed Response**

**Response Status** O

---

The transmitter timers should also specify the acceptable range - either by min and max columns as for the receivers or by stating a tolerance.

**Suggested Remedy**

**Proposed Response**

**Response Status** O
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</table>

**Supported should be enabled since these signals should not be transmitted when the LP (or where there is an XGMII where the Reconciliation sublayer) does not support EEE.**

**Suggested Remedy**
- Change supported to enabled.

**Proposed Response**
- **Response Status**: O

**Comment Type**: TR  
**Comment Status**: D

**Cl 49 SC 49.2.4.4**  
**P 138 L 54**  
Thaler, Pat  
Broadcom

**Comment Type**: TR  
**Comment Status**: D

**Cl 49 SC 49.2.9**  
**P 141 L 15**  
Thaler, Pat  
Broadcom

**Comment Type**: T  
**Comment Status**: D

**Implemented SB enabled**

**Suggested Remedy**

**Proposed Response**
- **Response Status**: O

**Comment Type**: TR  
**Comment Status**: D

**Cl 49 SC 49.2.13.3**  
**P 147 L 2**  
Thaler, Pat  
Broadcom

**Comment Type**: TR  
**Comment Status**: D

This state diagram also needs a note saying the state in the dotted box is optional.

**Suggested Remedy**

**Proposed Response**
- **Response Status**: O

**Comment Type**: TR  
**Comment Status**: D

**Cl 48 SC 48.2.6.2.5**  
**P 134 L 3**  
Thaler, Pat  
Broadcom

**Comment Type**: TR  
**Comment Status**: D

This text makes it sound like the figures replace or show modifications to the transmit and receive state machines.

Also the text should make a normative statement. For an example see the first sentence of 48.2.6.2.2.

Page 150 line 4 should also make a normative statement.

**Suggested Remedy**

State that a PCS which supports EEE shall implement the LPI transmit and processes as shown in figures 49-16 and 49-17 and that these processes shall run when EEE is enabled. You can go on to explain that the transmit LPI state diagram controls tx_quiet which disables the transmitter when true and that the receive one produces block_lock and tells the receive state machine when a receive LPI has ended. Make the reference to the LPI timer tables normative too.

**Proposed Response**
- **Response Status**: O
Thaler, Pat

**Comment:**
This says that holding the scrambler reset aids in block synchronization. Apparently this only applies to FEC block synchronization. The 64B/66B block lock state machine will not obtain lock with the scrambler off because it relies on the scrambler running to ensure that the only spot in a block where a persistent transition occurs is at the sync header. If the scrambler is held reset for 1 us, then the clock state machine can have an incorrect lock until it is released.

There is no statement made of when scrambler reset should/may/shall be enabled. The simplest approach is to require scrambler_reset_enable to be true when the PHY has FEC and false otherwise.

If use of scramble reset is optional outside FEC or not mandatory for FEC, then it would have to be negotiated.

**Suggested Remedy:**
Add the requirements for when scrambler_reset_enable shall be true when FEC is operating and false otherwise. Also, change the description to say that it aids in FEC block synchronization.

Also, once signal detect indicates okay because of FEC lock and unscrambled data is arriving, the R PCS may think it has block lock because it can lock on any transition in the unscrambled data but it won't be producing useable receive data since it may have a bad lock and even if it happened to lock on the sync header, its descrambler is running even though the incoming 64B/66B blocks are not scrambled. Explain how that is to be handled.

If there is an intent for scrambler reset to be used outside FEC, then the mechanism for block lock will need to be specified/explained and enabling of scrambler reset will need to be added to clause 45 and auto-neg. Also, how the receiver knows when to enable its descrambler will need to be explained unless the assumption is that it is okay to get bad blocks out of the 64B/66B from the time that lock occurs until the input data is scrambled.

**Response Status:** 

Thompson, Geoff

**Comment:**
I find no text added anywhere to clause 14 that states or even gives a hint of the compatibility between 10BASE-T and 10BASE-Te. How is a customer to know how to mix the two on a network?

Further, the text in 14.4.1 is not correct in the current market and proposed context. The word "Since" is inappropriate. That is, it is no longer the case that we believe that "a significant number of 10BASE-T networks are expected to be installed utilizing in-place unshielded telephone wiring" rather, the market has evolved to the extent that most telephones and networks (especially autonegotiating multi-speed adapters) are expected to utilize Category 5 or better cabling.

**Suggested Remedy:**
Rewrite the introductory paragraph to better reflect both the current market AND still make provision for the historical context that made use of "left-over" telephone wiring. Also, add a new subclause to clause 14 to address the topic of cross compatibility between 10BASE-T and 10BASE-Te, i.e., the two MDI can be freely mixed as long as the cabling meets the requirements for 10BASE-Te.

**Response Status:**
### Comments on D2.0

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<tr>
<td>#459</td>
<td>ER</td>
<td>D</td>
<td>Thompson, Geoff:</td>
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<td></td>
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<td>The text: &quot;e) 10BASE-T or 10BASE-Te support&quot; is likely to produce a label that ends up saying &quot;Supports 10BASE-T or 10BASE-Te&quot; which is not the intent.</td>
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<td><strong>Suggested Remedy</strong>:</td>
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<td>Change text to read: &quot;Which of the two specifications is implemented, i.e. '10BASE-T' or '10BASE-Te' (not both).&quot;</td>
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<td><strong>Proposed Response</strong>:</td>
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<td>Thompson, Geoff:</td>
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<td>14.5.2 mandates that any port that offers MDI-X connectivity shall be marked with an &quot;X&quot;. That mandate makes no allowance for current technology in which many PHY implementations are not of a fixed configuration with respect to the cross-over function. I expect many implementations of 10BASE-Te to have automatic MDI-X correction.</td>
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<td>Revise text so that the X labeling requirement only applies to ports with fixed MDI/MDI-X configuration. It would be nice if we could all agree on a single character width symbol for auto-correction.</td>
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<td><strong>Proposed Response</strong>:</td>
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<td>TR</td>
<td>D</td>
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<td>There is mention of an &quot;LPI agent&quot; in this clause as the active element that causes the 100BASE-X PHY to go back and forth between LPI and normal operation. I find it strange that (a) there is no definition or specification of an LPI agent nor even any mention of it anywhere else in the draft, not even in the other clauses where one would expect a parallel use of such an agent to cause the same sort of switch for the other LPI PHYs (except 10BASE-Te).</td>
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<td><strong>Suggested Remedy</strong>:</td>
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<td>Fully define and specify the operation and service interfaces for the activating function for LPI (be it an &quot;LPI agent&quot; or other mechanism). Further, have that mechanism act on each of the LPI PHYs in a manner that is architecturally consistent across the entire standard.</td>
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<td>#462</td>
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<td>D</td>
<td>Thompson, Geoff:</td>
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<td>I don't understand what this attribute indicates. Is it the state of the standard at time of implementation? Or is it the PHYs for which the PCS and higher can support EEE operation?</td>
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<td><strong>Suggested Remedy</strong>:</td>
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<td>Revise &quot;BEHAVIOUR DEFINED AS:&quot; text to clarify.</td>
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<td><strong>Proposed Response</strong>:</td>
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**TYPE:** TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general  
**COMMENT STATUS:** D/dispatched  A/accepted  R/rejected  
**RESPONSE STATUS:** O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn  
**SORT ORDER:** Comment ID  
**Page 95 of 101**  
**9/3/2009 11:34:44 AM**
There is a corner case inside the state diagram of Figure 40–15b in the outbound transitions from UPDATE. The main reason for this corner case is the asynchronous behavior of the state-machine but the synchronous transfer (symbol-period) of the inband control signals like loc_lpi_req, loc_update_done, loc_rcvr_status. This implies that signals may be received in parallel, e.g. rem_update_done=true and rem_lpi_req=false when in POST_UPDATE state. This, however, is assumed by the current version of the state machine not to occur.

Here's the description of the corner case:
The Slave transitions into POST_UPDATE due to timeout of lpi_update_timer. The Master is assumed to stay in UPDATE and it's loc_lpi_req stays true the whole time. When the Slave enters POST_UPDATE it will send its loc_update_done to the MASTER. Assume that loc_lpi_req gets deasserted at the Slave shortly (<8ns) after entering into POST_UPDATE. This will cause a signaling of loc_lpi_req on the line to the MASTER. Now, by nature of the inband signaling both loc_update_done=true and loc_lpi_req=false of the Slave are synchronized to the same symbol period and transferred synchronously to the Master. As such the Master receives both signals simultaneously. By current implementation the Master will take its way back to IDLE because rem_lpi_req=false, although rem_update_done=true. This causes a problem to the Master since the Slave will do its normal wake cycle via WAKE_SILENT, QUIET, WAKE and TRAINING. However, when the Slave enters QUIET it will stop signaling to the Master. As such the Master will break the link.

A better introduction into this corner case is handled in the presentation traeger_02_0909.pdf

Suggested Remedy

(1) Define a sequence ordering of the exchanged Next-Pages which is mandatory
(2) Define that these pages are sent autonomously before the SW Next-Pages

Change the Standard Draft:
(A) Include EEE MP and EEE UP into Figure 40C-2
(B) Include EEE MP and EEE UP into Figure 40C-3
(C) Add and Annex 25A which describes the clause 25 Next-Page ordering/autonomous for EEE pages similar to Annex 40C
(D) The concept shall be applied similarly to Extended Next-Pages, e.g. 10GbE
<table>
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<th>Proposed Response</th>
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<tbody>
<tr>
<td>00</td>
<td>ER</td>
<td>ER</td>
<td>D</td>
<td>Agree with H. Frazier's concerns (raised in July meeting) regarding existing compliant pre-802.1az 802.3 PHY needs to be preserved and clearly referenceable as valid 802.3 PHY. I see numerous area of concern when 802.3az text is integrated into existing 802.3-2008 PHY sections, including invalidating current compliant PHY as non-compliant. Also my assumption is 1) PHY behavior without .3az option must not change, 2) PHY with .3az option connected to a legacy PHY, they must interoperate (presumably without the benefits of .3az), in dealing with this issue.</td>
<td>Please adopt this approach (or suitable equivalent).</td>
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<tr>
<td>14</td>
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<td>D</td>
<td>&quot;This specification is generally met by 0.5 mm telephone twisted pair&quot; is unclear and does not add any useful reference.</td>
<td>Reference to (original) 14.4 is sufficient. Delete.</td>
</tr>
</tbody>
</table>

**TYPE:** TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general  
**COMMENT STATUS:** D/dispatched  A/accepted  R/rejected  
**RESPONSE STATUS:** O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn  
**SORT ORDER:** Comment ID
Comments on D2.0

IEEE P802.3az D2.0 Energy Efficient Ethernet comments

September 2009

Cl 24  SC 1.1  P 34  L 13  # 471
Kim, Yong  Broadcom

Comment Type  ER  Comment Status  D
"The only 100BASE-X PHY that supports this capability is 100BASE-TX." should have "optionally" word inserted.

SuggestedRemedy
Adopt Nomative Annex (or equivalent), or
change to "The only 100BASE-X PHY that optionally supports this capability is 100BASE-TX."

Proposed Response  

Response Status  O

Cl 24  SC 2.3.2  P 41  L 2  # 473
Kim, Yong  Broadcom

Comment Type  TR  Comment Status  D
signal_status is only used for LPI portion of the statemachine, but the description does not indicate as such (missing, and not reader-friendly at best). This signal was used in normal operation to drive link monitor statemachine (24.3.4.4). It is not clear whether .3az PHY were to implement 24.3.4.4 link monitor statemachine and turn it off (or not!) if option is not used. Also not clear what normal PHY were to implement after all the changes are integrated.

SuggestedRemedy
Adopt Nomative Annex (or equivalent), or
Clarify the relationship between this state variable use in the RX statemachine and link monitor statemachine.

Proposed Response  

Response Status  O

Cl 24  SC 2.4.2  P 42  L 11  # 472
Kim, Yong  Broadcom

Comment Type  T  Comment Status  D
In idle state, for a PHY, if TXD[3:0]=TX_LP_IDLE, the transition to the optional implementation must be taken. Or TX_ER=TRUE path to START ERROR J state transition must be taken, if option is not implemented. It is not (technically) clear, since TX_ER defined in 22.2.1.6 and 22.2.2.5(originally intended to “repeat” data errors) could take on any value (and the text says, not required to implement in RS, shall implement in PHY, and may implement in MAC) including TX_LP_IDLE, coincidentally.

SuggestedRemedy
Adopt Nomative Annex (or equivalent), or
Adding text to 22.2.1.6 to address this concern -- but I see catch 22 -- perhaps the TG could address this better. If we add text to avoid TX_LP_IDLE, then we are changing the legacy PHY.

Proposed Response  

Response Status  O

Cl 24  SC 24.8.2.3  P 51  L 10  # 474
Kim, Yong  Broadcom

Comment Type  T  Comment Status  D
Shouldn't PICs for PCS (this clause) and PMA (25.5) be aligned? Meaning the standard does not prevent PCS to have .3az option and PMA not, which is fine. But there is no indication that .3az option ought to be implemented in both or neither. Perhaps there is a better place to specify (or recommend) .3az option to be implemented consistently, and have PICS reflect the resulting text.

SuggestedRemedy
Should be T (not TR) but submitted after comment submission deadline. If adopting Nomative Annex (or equivalent) approach, there may be a good place to include this comment.

Proposed Response  

Response Status  O

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

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<tr>
<td>475</td>
<td>5.1.1.21</td>
<td>60</td>
<td>52</td>
<td>E</td>
<td>D</td>
<td>LATE</td>
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<tr>
<td>Kim, Yong</td>
<td>Broadcom</td>
<td>Understand why aMAUTypeList was not touched, and aEEESupportList was added. But the descriptions of the MAU type are different than aMAUTypeList. Did not see any rationale for the differences. For example, aMAUTypeList -- 100BASE-TX Two-pair... Clause 25, duplex mode unknown. 100BASE-TXFD Two-pair... Clause 25, Full duplex mode. aEEESupportList -- 100BASE-TX Clause 24, Clause 25 MLT-3</td>
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</tr>
<tr>
<td>Kim, Yong</td>
<td>Broadcom</td>
<td>Perhaps already addressed in .3az (in which case, ignore this comment). Pause/Flow control use of the MAC Control - should it benefit from LPI/EEE? LPI timing and Pause timing overlap enough to make explicit statement (allowed, not allowed, orthogonal, etc).</td>
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<td>Kim, Yong</td>
<td>Broadcom</td>
<td>The clause title is &quot;mapping of GMII signals to PLS service primitives...&quot;. The new text &quot;The mapping changes... shall not be set to ASSERT unless... state to OK.&quot; looks like a behavioral specification. Is there a good way to just reference the right statemachine (if none, then perhaps this specification should be moved to a separate clause, as done in 22.7a).</td>
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<td>SuggestedRemedy</td>
<td>Should be T (not TR) but submitted after comment submission deadline. Please make it so.</td>
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<tr>
<td>Kim, Yong</td>
<td>Broadcom</td>
<td>The inserted notes &quot;NOTE—GTX_CLK may be halted during periods of low utilization according to 35.2.2.6a. and &quot;NOTE—RX_CLK may be halted during periods of low utilization according to 35.2.2.9a.&quot; is not clear whether this note applies to legacy PHY (pre .3az). 35.2.2.6a and .9a does not reference LPI clause.</td>
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<td>SuggestedRemedy</td>
<td>Should be TR but submitted after comment submission deadline. Adopt Nomative Annex (or equivalent), or Add optional implementation wording to the notes or 35.2.2.6a and .9a or both. Otherwise, legacy PHY must deal w/ no-clock period in their design (or risk of making existing PHY based systems all non-conformant).</td>
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The text "The PHY shall interpret the combination of TX_EN, TX_ER and TXD<7:0> as shown in Table 35–1 as an assertion of low power idle. Transition into and out of the low power idle state is shown in Figure 35–6a." breaks the legacy PHY and [unintentionally] make all systems based on legacy PHY non-conformant.

**Suggested Remedy**

Should be TR but submitted after comment submission deadline.

- Adopt Nomative Annex (or equivalent), or
- Add optional implementation wording text or correct via reference.

**Proposed Response**

**Response Status**  O

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The text "While RX_DV is de-asserted, the PHY may provide a False Carrier indication or assert low power idle by asserting the RX_ER signal while driving the value <01> onto RXD<7:0>.

**Suggested Remedy**

Should be ER but submitted after comment submission deadline.

- Adopt Nomative Annex (or equivalent), or
- Please clarify.

**Proposed Response**

**Response Status**  O

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- It's not clear which behavior has priority, and 35.2.2.9a does NOT indicate whether this only refers to .3az option -- "When the PHY receives signals from the link partner to indicate transition into the low power state it indicates this to the LPI client by asserting RX_ER and setting RXD<7:0> to 01 while keeping RX_DV deasserted."

**Suggested Remedy**

Should be TR but submitted after comment submission deadline.

- Adopt Nomative Annex (or equivalent), or
- Add optional implementation wording text in 35.2.2.7. or in 35.2.2.9a on LPI, and that if the option is not implemented, false carrier takes precedence (whereas if option is implemented, it is the other way around).

**Proposed Response**

**Response Status**  O
This note, along with RX statemachine and Sync statemachine, changes the legacy PHY, and makes legacy implementation not even referenceable once the new texts are all accepted.

"Add a note in 36.2.5.1.3 below the definition for "sync_status"
NOTE: If the optional low power idle function is implemented, then this variable is affected by the LPI receive state machine."

 sync_status in legacy is used in Synchronization Statemachine. In .3az, sync_status is used in receive statemachine. .3az Sync SS uses code_sync_status, with equivalent description as sync_status. After the .3az changes integrated it would read:

"sync_status
A parameter set by the PCS Synchronization process to reflect the status of the link as viewed by the receiver.
Values: FAIL; The receiver is not synchronized to code-group boundaries.
OK; The receiver is synchronized to code-group boundaries.
NOTE: If the optional low power idle function is implemented, then this variable is affected by the LPI receive state machine.

code_sync_status
Variable used to by the synchronization state machine to indicate that receiver is synchronized to code-group boundaries.
Values: FAIL; The receiver is not synchronized to code-group boundaries.
OK; The receiver is synchronized to code-group boundaries."

We now have legacy PHY with no sync statemachine, since the variable sync_status does not exist in the RX SS, and where does code_sync_status come from?

SuggestedRemedy
Should be TR but submitted after comment submission deadline.

Adopt Nomative Annex (or equivalent), or

Please clarify such that legacy PHY behaves as before, and .3az enhancement is compatible.