Cl 40 SC 40.4.2.4 P 103 L 42 # 1
McIntosh, James Vitesse
Comment Type ER Comment Status X
Typo: "acheived" should be "achieved".
SuggestedRemedy
Change to "achieved".
Proposed Response Response Status O

Cl 40 SC 40.6.1.2.6 P 110 L 48 # 2
McIntosh, James Vitesse
Comment Type ER Comment Status X
We still have a few inadvertant Clause 46 references that should be to Clause 40. Please find and fix these.
SuggestedRemedy
Change 46.6.1.2.6 to 40.6.1.2.6 (page 110, line 48).
Also, change 46.6.1.3.4 to 40.6.1.3.4 (page 111, line 41) and change 46.6.1.2.7 to 40.6.1.2.7 (page 111, line 47).
Proposed Response Response Status O

Cl 40 SC 40.4.6 P 108 L 25 # 3
McIntosh, James Vitesse
Comment Type T Comment Status X
In Fig. 40-15b, the two transitions out of WAKE_TRAINING with loc_rcvr_status=OK * rem_rcvr_status=OK can be combined into a single transition to UPDATE without any loc_lpi_req or rem_lpi_req qualifiers. The state machine will fall through to SEND IDLE OR DATA from UPDATE using the loc_lpi_req=FALSE + rem_lpi_req=FALSE transition (C) if appropriate. This will result in a slight simplification of the state diagram.
SuggestedRemedy
Remove the transitions to UPDATE and SEND IDLE OR DATA from WAKE_TRAINING in Fig. 40-15b and replace with a single transition to UPDATE with the expression loc_rcvr_status=OK * rem_rcvr_status=OK. Remove the "stop lpi_wake_timer" command in the SEND IDLE OR DATA state as this is handled in the UPDATE state.
Proposed Response Response Status O

Cl 40 SC 40.3.3.1 P 100 L 4 # 6
McIntosh, James Vitesse
Comment Type TR Comment Status X
The variable rem_lpi_req values should be TRUE or FALSE, instead of ON or OFF.
SuggestedRemedy
Change to "TRUE or FALSE".
Proposed Response Response Status O
Comments on IEEE P802.

IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments

Mar 2009

**Comment ID # 7**

McIntosh, James Vitesse

**Comment Type**: TR  **Comment Status**: X

The PMA_RXSTATUS.indication (NOT_OK) term in transition to IDLE in Fig. 40-10a should probably be qualified with lpi_mode=OFF. I suspect that we do not intend for the state machine to transition from LP_IDLE to IDLE while lpi_mode=ON when PMA_RXSTATUS.indication becomes NOT_OK temporarily during the new EEE states.

**Suggested Remedy**

Change PMA_RXSTATUS.indication (NOT_OK) to (PMA_RXSTATUS.indication (NOT_OK) * lpi_mode=OFF).

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

---

**Comment ID # 8**

McIntosh, James Vitesse

**Comment Type**: TR  **Comment Status**: X

Register 3.22 is in Table 40-3 on page 110, but has been left out of Clause 45.

**Suggested Remedy**

Please add register 3.22 to Table 45-1 and any other appropriate table and text thereafter.

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

---

**Comment ID # 9**

D'Ambrosia, John Force10 Networks

**Comment Type**: T  **Comment Status**: X

why is non-EEE mode considered "normal"? What is "normal" should be dictated by the market.

**Suggested Remedy**

change "normal" to "non-EEE supported"

this should be repeated for any other instances.

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

---

**Comment ID # 10**

D'Ambrosia, John Force10 Networks

**Comment Type**: ER  **Comment Status**: X

inconsistent text -

"If the PHY supports Energy Efficient Ethernet option, it will also bring it in and out of Low Power Idle."

other text in clauses 70 - 72 discuss supporting Energy Efficient Ethernet ("option" is not mentioned).

**Suggested Remedy**

Any references to supporting EEE should be changed to "EEE option"

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

---

**Comment ID # 11**

D'Ambrosia, John Force10 Networks

**Comment Type**: E  **Comment Status**: X

Reword - "Low Power Idle mode is optional mode..."

**Suggested Remedy**

reword as "Low Power Idle mode is an optional mode..."

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

---

**Comment ID # 12**

D'Ambrosia, John Force10 Networks

**Comment Type**: E  **Comment Status**: X

Name of "1000-KX" should be "1000BASE-KX"

This was found throughout repeated instances through clause 78

**Suggested Remedy**

**Proposed Response**  **Response Status**: O
Since PMD support for EEE in 10GBASE-KX4 is optional, this sentence is confusing.

PMD signal detect is optional for 10GBASE-KX4 baseline operation but mandatory for support of Energy Efficient Ethernet.

Suggested remedy:

For 10GBASE-KX4 operation PMD signal detect is optional, but is mandatory if Energy Efficient Ethernet is supported.

Comment Type: ER
Comment Status: X

It is not clear why the suffix "EEE" is added at the end of PHY name.

1. In Table 45-88a there is a column entitled "Name" which implies that the column contains names of PHY types. However, the names listed are not actual PHY types: 10GBASE-KR EEE, 10GBASE-KX4 EEE, 1000BASE-KX EEE, 10GBASE-T EEE, 1000BASE-T EEE, and 100BASE-TX EEE. This is repeated in subclause titles.

2. The same use of "EEE" suffix is also used in table 45-145 and subsequent subclause titles.

Suggested remedy:

Use actual names of PHYs. If it is desired to use the EEE to indicate the capability, then put EEE in brackets.

Comment Type: ER
Comment Status: X

The following statement is too broad, as EEE does not apply to 40GBASE-KR4.

Backplane Ethernet optionally supports Energy Efficient Ethernet to reduce energy consumption. The Energy Efficient Ethernet capabilities are advertised during Auto-Negotiation.

Suggested remedy:

Backplane Ethernet PHYs that operate at 10 Gb/s and below optionally support Energy Efficient Ethernet to reduce energy consumption. The Energy Efficient Ethernet capabilities are advertised during Auto-Negotiation.

Comment Type: T
Comment Status: X

Use of "KX PHY" in sentence.

Suggested remedy:

"The 1000BASE-KX PHY will use the 1000BASE-X PCS LPI modes described in 36.2.5.2.8."

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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<thead>
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<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
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<td>70</td>
<td>70.6.4</td>
<td>201</td>
<td>10</td>
<td>18</td>
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<td>70.6.4</td>
<td>201</td>
<td>9</td>
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<td>19</td>
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<td>45</td>
<td>45.2.3</td>
<td>116</td>
<td>27</td>
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<tr>
<td>46</td>
<td>46.3.1.5a</td>
<td>127</td>
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</tr>
<tr>
<td>55</td>
<td>55.3.2.2.21</td>
<td>167</td>
<td>50</td>
<td>23</td>
<td>23</td>
</tr>
</tbody>
</table>

**Comment Type:**
- E: Editorial
- ER: Editorial Required
- G: General
- T: Technical

**Comment Status:**
- D: Dispatched
- A: Accepted
- R: Rejected

**Response Status:**
- O: Open
- W: Written
- C: Closed
- U: Unsatisfied
- Z: Withdrawn

**Proposed Response:**
- D'Ambrosia, John
- Tidstrom, Rick

**Suggested Remedy:**
- Change spelling to "signal"
- Change from TXD<7:0> to TXD<31:0>.
- Change from RXD<7:0> to RXD<31:0>.
- The time should also include one partial frame that occurs when Idle is received just after an LDPC frame has completed.
- The values should be 14 frames and 4.48 usec due to 1 partial frame + 4 alert frames + 9 wake frames.

**Proposed Remedy Examples:**
- PMD signal detect is optional for 1000BASE-KX baseline operation but mandatory for support of Energy Efficient Ethernet.
- For 1000BASE-KX operation PMD signal detect is optional, but is mandatory if Energy Efficient Ethernet is supported.
- Table references register 3.21, EEE reduced energy capability register, which has been removed from the standard.
- Register 3.21 should be removed from the table.

**Suggested Remedy Examples:**
- Indicate that Low Power Idle should be asserted on all four lanes, but refers to TXD<7:0>.
- Indicate that Low Power Idle should be asserted on all four lanes, but refers to RXD<7:0>.
- For lpi_wake timer after sleep values listed as 13 frames and 4.16 usec are incorrect because they only include 4 alert frames + 9 wake frames.
Proposed Response

Line 26 states:
"In the transmit direction the transition to the lower power transmit mode begins when the
PCS transmit function detects an LPI control character in Lane 0 of two consecutive
transfers of TXD[31:0] that will be mapped into a single 64B/65B block."

This contradicts Table 46-3 on page 127, line 14, which states that assert low power idle is
required in all lanes.

Also reference comment #25 for D1.1, which defines Low Power Idle as occurring on all
four lanes.

Suggested Remedy

Change line 26 from lane 0 to all four lanes as shown below:

In the transmit direction the transition to the lower power transmit mode begins when the
PCS transmit function detects an LPI control character in all four lanes of two consecutive
transfers of TXD[31:0] that will be mapped into a single 64B/65B block.

Proposed Response

In state RX_W, the state machine assigns rx_raw <= LI.

Suggested Remedy

The assignment for rx_raw should be changed from LI to I to eliminate wake shrinkage.
Change as shown:

rx_raw <= I.

Note: Also need a mechanism to communicate LF.

Proposed Response

Add a definition of tx_lpi_full_refresh to sub-clause 55.3.5.2.2 as referenced on page 171,
line 20.

Proposed Response

Add a paragraph describing the transition from Sleep to Quiet/Refresh, and that partial
refreshes are not to be transmitted, but instead replaced with Quiet frames.

Proposed Response

This signal is used to prevent a partial refresh from being transmitted.

Suggested Remedy

Add a definition of tx_lpi_full_refresh to sub-clause 55.3.5.2.2 as referenced on page 171,
line 20.
Tidstrom, Rick

**Comment Type**: TR

**Comment Status**: X

There is not a transition condition from state SEND_WAKE to SEND_ERROR when a non-
Idle character is received while transmitting Wake frames.

**Suggested Remedy**

Add transition from SEND_WAKE to SEND_ERROR with transition condition of:

\[ lpi\_wake\_timer\_done = false \]
\[ tx\_lpi\_error = true \]

**Comment ID**: # 28

---

Kasturia, Sanjay

**Comment Type**: E

**Comment Status**: X

Replace TBD by proper reference

**Suggested Remedy**

**Comment ID**: # 29

---

Kasturia, Sanjay

**Comment Type**: T

**Comment Status**: X

Test modes for testing EEE related functions are included in the draft as Editor's notes. Move these from Editor's notes into the text of the draft.

**Suggested Remedy**

As per comment

**Comment ID**: # 32

---

Kasturia, Sanjay

**Comment Type**: T

**Comment Status**: X

Editor's note says:

This synchronization method works well for loop-timed links. Non-loop-timed links require
further attention.

Either verify that the synchronization method works for non-loop-timed links or make loop-
timing mandatory and eliminate references to the non-loop-timed option

**Suggested Remedy**

The non-loop-timed mode is a legacy of past compromises in the development of the standard and not a useful option hence the simple solution is to eliminate it.

**Comment ID**: # 33
Comments on IEEE P802.

Cl 78 SC 78.4.4.5 P 243 L 24 # 34
Kasturia, Sanjay Teranetics

Comment Type T  Comment Status X
Symbol in box on the left titled "remote change" seems to have been garbled. It is showing up as a question mark.
TempRxVar ? RemRxSystemValue

Replace ? with an assignment statement

SuggestedRemedy
As per comment

Proposed Response  Response Status O

Cl 45 SC 45.2.3 P 116 L 25 # 35
Kasturia, Sanjay Teranetics

Comment Type ER  Comment Status X
Replace TBD with proper clause references

SuggestedRemedy

Proposed Response  Response Status O

Cl 49 SC 49.2.13.2.5 P 150 L 32 # 36
Wong, Don Cisco

Comment Type E  Comment Status X
WL should be subscript in TWL

SuggestedRemedy
Change WL of TWL to subscript

Proposed Response  Response Status O

Cl 78 SC 78.3 P 237 L 3234 # 37
Dietz, Bryan Alcatel-Lucent

Comment Type T  Comment Status X
Remove sentence "DME provides a DC àto the network devices." EEE does not change the way backplane autonegotiation works and does not need to justify or explain technique used.

SuggestedRemedy
Remove sentence "DME provides a DC àto the network devices."

Proposed Response  Response Status O

Cl 78 SC 78.4.1.2 P 239 L 4043 # 38
Dietz, Bryan Alcatel-Lucent

Comment Type T  Comment Status X
Clarification from ad-hoc.

SuggestedRemedy
Interchange and edit last two sentences of this paragraph to read:
"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. The default value for Receive Tw_sys is the Tw_phy defined for the PHY that is in use for the link. The Receive Tw_sys value can be larger than the default, and the extra wait time may be used by the receive link partner for power saving mechanisms that require longer wake-up time than the PHY-layer definitions."

Proposed Response  Response Status O

Cl 78 SC 78.4.4.3 P 242 L 28 # 39
Dietz, Bryan Alcatel-Lucent

Comment Type E  Comment Status X
The word "state" is misspelled in the table header.

SuggestedRemedy
Change to "state."

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
Cl 78 SC 78.1.2 P 233 L 45 # 40
Dietz, Bryan Alcatel-Lucent
Comment Type	E Comment Status	X Typo
SuggestedRemedy	Add missing period at end of item b).
Proposed Response	Response Status	O

Cl 78 SC 78.1.3 P 235 L 3 # 41
Dietz, Bryan Alcatel-Lucent
Comment Type	E Comment Status	X Improve grammar
SuggestedRemedy	Add comma after "quiet" to read "then neither PHY can go quiet, however Low Power à"
Proposed Response	Response Status	O

Cl 78 SC 78.2.3 P 237 L 11 # 42
Dietz, Bryan Alcatel-Lucent
Comment Type	E Comment Status	X Missing word in sentence
SuggestedRemedy	Insert words "of the" before "IDLE" and delete word "appearing". Should read "Period of time between reception of the IDLE signal on the xxMII interface and when the first codewords are permitted on the xxMII interface."
Proposed Response	Response Status	O

Cl 78 SC 78.3 P 237 L 46 # 43
Dietz, Bryan Alcatel-Lucent
Comment Type	E Comment Status	X Missing word. Also add extra sentence for clarification.
SuggestedRemedy	Add the word "the" to the end of the line. Should read "without breaking the communication link."
Add the following sentence to the end of the paragraph: "Adjusting Tw_sys allows systems to support sleep modes that require longer times to wake up."
Proposed Response	Response Status	O

Cl 78 SC 78.4.1.1 P 239 L 31 # 44
Dietz, Bryan Alcatel-Lucent
Comment Type	E Comment Status	X Minor editorial tweak.
SuggestedRemedy	Change "following" to "after leaving" and "Low Power Idle" to "Low Power Idle mode."
Proposed Response	Response Status	O

Cl 78 SC 78.4.1.1 P 239 L 3435 # 45
Dietz, Bryan Alcatel-Lucent
Comment Type	E Comment Status	X Rephrase last sentence for clarity.
SuggestedRemedy	Change last sentence in paragraph to read "The Transmitting link partner expects that the Receiving link partner will be able to accept data after the time delay Transmit Tw_sys."
Proposed Response	Response Status	O
Replace word "registered" with "processed". The word "registered" may imply merely that the data was stored. However, later text and the state diagrams show that the data was processed before it was echoed.

Suggested Remedy
Replace word "registered" with "processed".

Proposed Response

Insert new paragraph between last two paragraphs of this section.
"Implementations that do not use the EEE Data Link Layer capabilities shall ignore the EEE TLV if received in a LLDP message. Both link partners will then use the default value of Tw_sys defined by the PHY."
after leaving LPI mode.

"The transmit Tw_sys must be equal to or greater than the receive Tw_sys for proper operation. The purpose of the EEE TLV and state machines is to resolve the correct Tw_sys values.

The state diagrams in sections 78.4.4.5 provide the following features on each direction of the bidirectional link.

"The initial Tw_sys defaults to the Tw_sys values required by the PHYs. This provides loss- and corruption-free EEE operation without exchanging TLVs.

"The state machines initialize the MIB transmit and receive Tw_sys values to larger values if supported by the overall system. These values can provide longer delays that allow deeper sleep modes for the system outside of the PHYs.

"The state machines find the longest "resolved Tw_sys" supported at that time by both the transmitter and receiver. This can provide the largest total system power savings.

"The state machines will update the resolved Tw_sys value when the transmit Tw_sys is increased or decreased.

"The state machines will update the resolved Tw_sys value when the received Tw_sys is increased or decreased.

"The Transmit Tw_sys is considered "resolved" when a local partner's state machine resides in the "RUNNING STATE" as described in section 78.4.4 and the echoed values match the local device's values for that path.

Proposed Response

Response Status O

Cl 55 SC 55.12.3 P 188 L 53 # 50
Grimwood, Mike Broadcom

Comment Type E Comment Status X
PICs identifier PCT15d is repeated.

Suggested Remedy
Change to PCT15e and renumber/letter subsequent entries.

Proposed Response Response Status O

Cl 55 SC 55.12.2.21 P 167 L 39 # 51
Grimwood, Mike Broadcom

Comment Type E Comment Status X
Typo.

Suggested Remedy
Change 7.63 to 7.36 us.

Proposed Response Response Status O

Cl 40 SC 40.5.1.1 P 110 L 24 # 52
Grimwood, Mike Broadcom

Comment Type E Comment Status X
In Table 40-3 for Register 3.22 the type NR is not defined.

Suggested Remedy
Define NR in the footer of Table 40-3.

Proposed Response Response Status O
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</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>53</td>
<td>55</td>
<td>55.3.2.2.21</td>
<td>167</td>
<td>50</td>
<td>T</td>
<td>X</td>
<td><em>lpi_wake_time</em> after sleep can be up to 14 frames since there is a worst-case delay of up to 1 frame to begin transmitting Alert on a frame boundary.</td>
<td><em>In table 52-2, 4th column,</em> change 13 to 14 and in the 5th column, change 4.16 to 4.48. Change text in paragraph preceding table 52-2 accordingly.</td>
<td><em>O</em></td>
</tr>
<tr>
<td>54</td>
<td>55</td>
<td>55.3.5.23</td>
<td>173</td>
<td>8</td>
<td>T</td>
<td>X</td>
<td>Timer values need to have &quot;shall&quot; in their requirements to be picked up in the PICS.</td>
<td>*For <em>lpi_tx_sleep_timer, change:</em> &quot;This timer has a period equal to 9 LDPC frames&quot; to: &quot;This timer shall have a period equal to 9 LDPC frames&quot; Provide similar modifications for other timers and counters: <em>lpi_quiet_time, lpi_refresh_time, lpi_tx_alert_timer, lpi_wake_time, lpi_rx_wake_timer, lpi_tx_wake_timer, tx_ldpc_frame_cnt, rx_ldpc_frame_cnt.</em></td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>55</td>
<td>49</td>
<td>49.2.4.7</td>
<td>146</td>
<td>35</td>
<td>T</td>
<td>X</td>
<td>Clarify /LI/ insertion and deletion in low-power mode.</td>
<td><strong>T</strong></td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>49</td>
<td>49.2.13.2.3</td>
<td>148</td>
<td>1</td>
<td>T</td>
<td>X</td>
<td>If a block contains 4 /LI/ characters and 4 /I/ characters (as might occur during a normal transition to wake), is the R_BLOCK_TYPE = C or E? This comment assumes that this should be C, but the current definition of C does not make this clear.</td>
<td><strong>T</strong></td>
<td></td>
</tr>
</tbody>
</table>
The precise conditions for setting rx_lpi_req require clarification.

Suggested Remedy
Change:
Set to TRUE when the 64B/65B decoder output signal indicates the link partner is requesting that the PHY operate in the lower power receive mode and set to FALSE otherwise.

To:
Set to TRUE when the 64B/65B decoder receives a block of 8 /LI/ characters indicating that the link partner is requesting that the PHY operate in the lower power receive mode and set to FALSE otherwise.

Proposed Response
When scrambler re-initialization is used for initial training, it should continue to be used up to the PCS_Test state (rather than PCS_Data) since at PCS_Test the PHY has successfully completed training.

**Suggested Remedy**

Change:

If scrambler reinitialization was used for initial training, it shall be disabled after the PHY Control state diagram reaches the PCS_Data state.

To:

If scrambler reinitialization is used for initial training, it shall be disabled and the scramblers shall begin free-running when the PHY Control state diagram enters the PCS_Test state.

**Proposed Response**

**Response Status** O

---

Is the InfoField used during Refresh? This comment assumes not and proposes a clarification.

This comment assumes that the inversion on pair A every 256 intervals (intended to delineate LDPC frame boundaries) is performed.

**Suggested Remedy**

Change this sentence:

2-level PAM refresh symbols are generated using the PMA side-stream scrambler polynomials described in subclause 55.3.4.

To:

2-level PAM refresh symbols are generated using the PMA side-stream scrambler polynomials described in subclause 55.3.4 and exactly as is shown in Figure 55-13 with the exception that the InfoField consists of a sequence of 128 zeros.

**Proposed Response**

**Response Status** O

---

Currently LPI slave synchronization is accomplished at the transition to PCS_Test. By instead performing slave synchronization at the transition to PMA_Training, partial frame ambiguity can be eliminated and can simplify the specification and resulting implementations. Performing synchronization at the transition to PMA_Training ensures that the slave’s final PHY frame and final InfoField will be complete.

**Suggested Remedy**

Modify the text in section 55.3.5.1 to perform LPI slave synchronization at the transition to PMA_Training_Init_S instead of at the transition to PCS_Test.

**Proposed Response**

**Response Status** O

---

Change Figure 24-11b introducing the timer lpi_link_fail_timer for the transition from RX_WAKE to RX_LPI_LINK_FAIL.

Introduce lpi_link_fail_timer with a value of 90 us to 110 us.

Introduce a 100BASE-TX wake error counter such that this counter is incremented each time lpi_rx_tw_timer_done transitions from FALSE to TRUE.

**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  U/unsatisfied  Z/withdrawn

**Sort Order:** Comment ID

---
The RX_LINK_FAIL state, the time lpi_link_fail_timer, and rx_lpi_fail variable serve no useful purpose in the in the LPI Receive state diagram (Figure 49-17).

1. When Auto-Negotiation is enabled, setting block_lock = FALSE in the RX_LINK_FAIL state will cause hi_ber = TRUE and, in turn, cause Auto-Negotiation to re-start. There is no point in dwelling in the RX_LINK_FAIL state for any period of time. Even when Auto-Negotiation is disabled, there is no obvious reason to dwell in this state after setting block_lock = FALSE.

2. The value of rx_lpi_fail is set to TRUE in the RX_LINK_FAIL state and FALSE upon entry into the RX_ACTIVE state, but it is used nowhere else and has no obvious purpose.

3. It is not desirable to break the link in the event of a failure to achieve rx_block_lock within rx_tw_timer. Expiration of rx_tw_timer should correspond to the increment of a "wake error counter" in the same manner as currently defined for 1000BASE-T. Expiration of an lpi_link_fail_timer should be used to break the link if the PHY fails to achieve lock after a prolonged period.

Suggested Remedy
1. Delete the definition of the lpi_fail_timer and its associated uses in the LPI Receive state diagram.
2. Delete the definition of the variable rx_lpi_fail and the associated assignments in the LPI Receive state diagram.
3. Delete the RX_LINK_FAIL state.
4. Replace the transition from RX_QUIET to RX_LINK_FAIL with a transition from RX_QUIET to RX_ACTIVE with the transition condition (!signal_ok * rx_tq_timer_done). This will cause block_lock to be assigned the value of rx_block_lock, which presumably false since !signal_ok is TRUE, and hence has the same effect as entering the old RX_LINK_FAIL state.
5. Remove rx_tw_timer_done from the transition conditions from RX_WAKE to RX_ACTIVE and RX_SLEEP. Stop rx_tw_timer upon entry in RX_ACTIVE and RX_WAKE.
6. Define lpi_link_fail_timer to have a duration of 250 microseconds +/- 10%. Start lpi_link_fail_timer in the RX_WAKE state. Add the condition "+ lpi_link_fail_timer_done" to the transition from RX_WAKE to RX_ACTIVE.

Proposed Response
- Response Status: O

Suggested Remedy
- Per comment.
Update text to be consistent with the currently defined operation of the PHY.

Proposed Response

Replace paragraph with the following:

A 10GBASE-KR PHY may optionally enter a low power state to conserve energy during periods of low link utilization. This capability is more commonly known as Energy Efficient Ethernet. The presence of "Assert low power idle" at the XGMII is encoded in the transmitted symbols. Detection of low power idle encoding in the received symbols is indicated as "Assert low power idle" at the XGMII. Upon the detection of "Assert low power idle" at the XGMII, an Energy Efficient 10GBASE-KR PHY sends sleep symbols for a defined period, then ceases transmission and deactivates transmit functions to conserve energy. The PHY periodically transmits during this quiet period to allow the remote PHY to refresh its receiver state (e.g. timing recovery, adaptive filter coefficients) and thereby track any long term variation in the timing of the link or the underlying channel characteristics. If normal inter-frame is asserted at the XGMII while the PHY is in low power mode, the PHY re-activates transmit functions and initiates transmission. This transmission will be detected by the remote PHY receiver, causing it to also exit the low power mode.

Proposed Response

Delete 72.3b.

Proposed Response

The Refresh bit appears to be transmitted and received by the PMD, but not used by any PMD function or the basis of any variable passed to another sublayer.

SuggestedRemedy

Remove the Refresh bit or specify its use by other PMD functions or sublayers. The latter would required the definition of new service interface primitive(s) to convey the information.

Proposed Response

The Wake bit appears to be transmitted and received by the PMD, but not used by any PMD function or the basis of any variable passed to another sublayer.

SuggestedRemedy

Remove the Wake bit or specify its use by other PMD functions or sublayers. The latter would required the definition of new service interface primitive(s) to convey the information.

Proposed Response

The Last Training Frame bit appears to be transmitted and received by the PMD, but not used by any PMD function or the basis of any variable passed to another sublayer.

SuggestedRemedy

Remove the Last Training Frame bit or specify its use by other PMD functions or sublayers. The latter would required the definition of new service interface primitive(s) to convey the information.
Cl 72 SC 72.6.11.4.2 P 225 L 4 # 71
Healey, Adam LSI Corporation

Comment Type T Comment Status X
Per the current LPI Receive state diagram (Figure 72-7), a 10GBASE-KR PHY can never wake from low power mode.

1. Entry into RX_SLEEP causes signal_detect to be set to FALSE
2. signal_detect = FALSE corresponds to !signal_ok at the PCS (incorrectly shown as signal_detect = FALSE in the current draft) which results in rx_quiet being set to TRUE.
3. The transition to RX_WAKE requires rx_quiet to be set to FALSE, which cannot occur so long as signal_detect = FALSE.

Hence the state diagram deadlocks in RX_SLEEP. However, it is also odd that signal_detect is never reset to TRUE. This issue that, in low power mode, signal_detect should represent a function comparable to sense_signal as defined in 72.6.4b.

Suggested Remedy
Modify state diagram, defining or re-defining variables as appropriate, to ensure signal_detect is set according the sense_signal criteria of 72.6.4b.

Proposed Response Response Status O

Cl 72 SC 72.6.11.4.2 P 225 L 6 # 72
Healey, Adam LSI Corporation

Comment Type T Comment Status X
In the LPI Receive state diagram (Figure 72-7), saved coefficient are never restored (e.g. rx_coeff are never set to rx_saved). However, this level of detail could be considered implementation specific and should be beyond the scope of the standard.

Suggested Remedy
Remove rx_saved assignment from the state diagram and delete the definition of the rx_saved and rx_coeff variables.

Proposed Response Response Status O

Cl 72 SC 72.6.11.3.1 P 223 L 7 # 73
Healey, Adam LSI Corporation

Comment Type T Comment Status X
The definition of tx_quiet is inconsistent with its use in the LPI Transmit state diagram (Figure 72-6). For consistency, it should be an enumerated variable with the values of FALSE, REFRESH, TRUE, and WAKE.

Suggested Remedy
Update variable definition accordingly.

Proposed Response Response Status O

Cl 72 SC 72.6.11.3.1 P 222 L 52 # 74
Healey, Adam LSI Corporation

Comment Type T Comment Status X
Per the current LPI transmit state diagram (Figure 72-6), synchronization of 10GBASE-R FEC via the assignment of a variable is not likely to be a complete solution or consistent with the layering model. Modifications to Clause 74 are required, as well as inter-sublayer communications required by such modifications. Recall that there is no direct communication path from the PMD to the FEC (the PMA is in between).

Suggested Remedy
Delete that tx_fec variable and the "Start tx_fec" option from LPI transmit state diagram. Instead, add appropriate amendments to the Clause 74 and update the inter-sublayer interfaces accordingly.

Proposed Response Response Status O

Cl 72 SC 72.6.4a P 218 L 39 # 75
Healey, Adam LSI Corporation

Comment Type T Comment Status X
The text in this subclause is stale as the references to features in the LPI Receive state diagram (Figure 72-7) no longer exist. The desired behavior of signal_detect in low power mode is correctly summarized in terms of the sense_signal function defined in 72.6.4b.

Suggested Remedy
Re-arrange to correctly describe the desired behavior.

Proposed Response Response Status O
IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments

Comments on IEEE P802.

**Cl 72 SC 72.6.11.2 P 221 L 43 # 76**
Healey, Adam LSI Corporation

Comment Type **T** Comment Status **X**

It is redundant to have a table (Table 72-5a) with "Min." and "Max" columns in addition to specifying a +/-10% tolerance.

Suggested Remedy

Remove the phrase "shall be within +/- 10%" and include both minimum and maximum values in Table 72-5a.

Proposed Response

Response Status **O**

**Cl 72 SC 72.6.10.1 P 219 L 35 # 77**
Healey, Adam LSI Corporation

Comment Type **E** Comment Status **X**

This subclause implies that the low power idle is part of the PMD Control function so all low power idle functions should also be part of this subclause.

Suggested Remedy

Integrate the content of 72.6.11 with 72.6.10, including state diagrams and associated variable definitions.

Proposed Response

Response Status **O**

**Cl 49 SC 49.2.13.3 P 150 L 51 # 79**
Healey, Adam LSI Corporation

Comment Type **T** Comment Status **X**

This editor's note appears to be out of date. Changes to the Lock state diagram (Figure 49-12) have already been made. Are changes to the BER monitor state diagram required?

Suggested Remedy

Update or remove editor's note. Note that it also appears to be anchored in the wrong place.

Proposed Response

Response Status **O**

**Cl 49 SC 49.2.13.2.1 P 149 L 16 # 80**
Healey, Adam LSI Corporation

Comment Type **T** Comment Status **X**

Constant ||LPIDLE|| is never used.

Suggested Remedy

Delete definition of ||LPIDLE||.

Proposed Response

Response Status **O**

**Cl 49 SC 49.2.13.2.2 P 149 L 30 # 81**
Healey, Adam LSI Corporation

Comment Type **T** Comment Status **X**

The variable rx_lpi_mode appears to be assigned values of TRUE and FALSE in the Receive state diagram (Figure 49-15) and used for nothing else.

Suggested Remedy

Define how this information is to be used by other functions or delete the variable definition and the variable assignments in Figure 49-15.

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 17 of 41 2/27/2009 1:31:36 PM
The variable tx_lpi_mode appears to be assigned values of TRUE and FALSE in the Transmit state diagram (Figure 49-14) and used for nothing else.

**Suggested Remedy**
Define how this information is to be used by other functions or delete the variable definition and the variable assignments in Figure 49-14.

**Comment Status:** X

**Response Status:** O

Healey, Adam
LSI Corporation

---

The state diagram will not transition out of the TX_T state so long as T_TYPE(tx_raw) = LI.

**Suggested Remedy**
Add state transition from TX_T to TX_LI with the transition condition T_TYPE(tx_raw) = LI.

**Comment Status:** X

**Response Status:** O

Healey, Adam
LSI Corporation

---

The messages PMD_RXQUIET.request and PMD_TXQUIET.request imply that they are PMD service interface primitives. It seems that, to be consistent with the layer model, this information should be delivered to the sublayer below the PCS which may be either the Clause 51 PMA sublayer or the optional Clause 74 10GBASE-R FEC sublayer. In addition this information is more closely associated with the text in 49.1.5 and Figure 49-4 should be relocated accordingly.

**Suggested Remedy**
Per comment.

**Comment Status:** X

**Response Status:** O

Healey, Adam
LSI Corporation

---

In Figure 49-16, replace "=" with the appropriate symbol. Check arrowheads for the consistent use of the correct size.

**Suggested Remedy**
Per comment.

**Comment Status:** X

**Response Status:** O

Healey, Adam
LSI Corporation

---

In Figure 49-17, replace "=" with the appropriate symbol. Check arrowheads for the consistent use of the correct size.

**Suggested Remedy**
Per comment.

**Comment Status:** X

**Response Status:** O

Healey, Adam
LSI Corporation

---

The state diagram will not transition out of the RX_T state so long as R_TYPE(rx_coded) = LI.

**Suggested Remedy**
Add state transition from RX_T to RX_LI with the transition condition R_TYPE(rx_coded) = LI.

**Comment Status:** X

**Response Status:** O

Healey, Adam
LSI Corporation

---

The messages PMD_RXQUIET.request and PMD_TXQUIET.request imply that they are PMD service interface primitives. It seems that, to be consistent with the layer model, this information should be delivered to the sublayer below the PCS which may be either the Clause 51 PMA sublayer or the optional Clause 74 10GBASE-R FEC sublayer. In addition this information is more closely associated with the text in 49.1.5 and Figure 49-4 should be relocated accordingly.

Finally, the precedent set by Clause 49 is that the detailed service interface primitives are defined in the Clauses 51 and 74. Hence, the new service interface primitives used by Clause 49 Energy Efficient Ethernet should be defined in both Clauses 51 and 74 respectively.

**Suggested Remedy**
Per comment.

**Comment Status:** X

**Response Status:** O

Healey, Adam
LSI Corporation

---
### Comments on IEEE P802

#### Proposed Response

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<td>P 154</td>
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<td>The variable signal_detect is not defined. It should be signal_ok.</td>
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<td>SuggestedRemedy: Consistent with its usage in other Clause 49 state diagrams, replace &quot;signal_detect = TRUE&quot; with &quot;signal_ok&quot; and &quot;signal_detect = FALSE&quot; with &quot;!signal_ok&quot;.</td>
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<td>P 154</td>
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<td>Is it really necessary to &quot;de-bounce&quot; signal_detect = FAIL (which should be !signal_ok)? The value of signal_ok is a) communicated from the PMA sublayer to indicate that the PMD detects the presence of a signal AND that the PMA is able to synchronize to that signal or b) from the optional FEC sublayer to indicate, in addition to the PMA criteria, that FEC block lock has been achieved. Neither of these criteria seems likely to be tricked by the power-down transient of the link partner transmitter.</td>
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<td>SuggestedRemedy: Remove RX_DEACT state and delete the definition of rx_deact_timer.</td>
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### Comments on IEEE P802.

#### IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments

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**Comment 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

---

All Energy Efficient Ethernet PHYs operating over the twisted pair medium (xBASE-T) have settled on a single value for the wake time. All Backplane Ethernet PHYs offer a selection of four wake times. For consistency across all of the PHYs, it is encouraged that T_WR in Table 49-3 be reduced to a single value.

**Suggested Remedy:**
- Per comment.

---

Draft 1.0 comment #48, even though accepted, was never implemented in the draft.

The comment was...

"I'm not sure where to anchor this comment, but Annex 28D should also be amended to outline extensions of Clause 28 for Energy Efficient Ethernet and I propose that Clause 28 extensions for EEE include:
1. Auto-Negotiation is mandatory for a EEE PHY (this is currently not the case for 100BASE-TX).
2. The exchange of additional next pages for EEE capability and mode negotiation extends the time required to complete Auto-Negotiation. To reduce this time, a EEE PHY may use the extended next page mechanism introduced by IEEE 802.3an-2006 (it is not currently an option for 100BASE-TX)."

The suggested remedy was...

"Add amendment to Annex 28D per comment."

...and the adopted response was "ACCEPT".

**Suggested Remedy:**
- Add amendment to Annex 28D per comment.

---

All Energy Efficient Ethernet PHYs operating over the twisted pair medium (xBASE-T) have settled on a single value for the wake time. All Backplane Ethernet PHYs offer a selection of four wake times. For consistency across all of the PHYs, it is encouraged that T_WR in Table 48-10 be reduced to a single value.

**Suggested Remedy:**
- Per comment.

---

40.5.1.1, Table 40-3, defines register 3.22 to be the "1000BASE-T wake error counter". This is not reflected in Clause 45.

**Suggested Remedy:**
- Define the counter in Clause 45 per the Clause 40 definition, or define a generic counter to be used by all PHYs that Clause 40 may, in turn, reference.

**Proposed Response:**
- Add amendment to Annex 28D per comment.

---

**Comment ID:** 96

**Page:** 20 of 41

**Date:** 2/27/2009 1:31:36 PM
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<td>In Figure 49-14, the transition condition from TX_D to TX_E should include LI since it is not included in C.</td>
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<td>Change transition condition from TX_D to TX_E to be: T_TYPE(tx_raw) = (E + C + S + LI)</td>
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</table>
It would be valuable if a LPI-capable PHY were able to request that the system transition from the low power mode (e.g. if the SNR is dropping).

I believe that a mechanism for this already exists but it is not stated explicitly in the draft. I think we should add text pointing out this mechanism.

Using 10GBASE-T as an example: If a PHY detects dropping SNR and therefore wants to exit LPI, then it should assert local fault. The MAC will detect this and transmit LF to the link partner. Then the MAC at the link partner will detect the remote fault and start transmitting idles, bringing the LPI period to an end.

This works whether the LPI state is symmetric or asymmetric (in the symmetric case the local MAC needs to send alert/wake to the link partner before it can transmit LF).

If the SNR degradation occurs relatively slowly this could preserve the link without a restart.

It may be desirable to add counters or some other mechanism to monitor this exit condition.

**Suggested Remedy**

Add some informative text stating the above within Clause 78.

e.g.

A mechanism exists that allows PHYs to force a link to exit the lower power mode. If a PHY detects that the SNR on a link is rapidly degrading, it informs the local MAC that a local fault exists. This triggers the MAC to send local fault characters to the link partner. The reception of these characters by the remote MAC causes the remote MAC to transmit IDLEs, which brings the lower power mode to an end and gives the local PHY the opportunity to retrain in the normal operational mode.

**Proposed Response**

Add text to state that infofields are not used during refresh signaling.

**Suggested Remedy**

Add text:

"After the PHY Control state diagram reaches the PCS_Data state infofields are not transmitted."

**Proposed Response**

Define tx_lpi_full_refresh in the state diagram variable list.
Cl 55 SC 55.3.5.4 P 178 L # 106
Parnaby, Gavin Solarflare Communica

Comment Type TR Comment Status X
For the state timing shown on page 178 to work correctly we need a requirement that the alert is signalled by the PMA after the full alert signal has been detected (so that the lpi_rx_wake_timer encompasses the true wake signal).

Any other alert detection timing does not give the PHY wake_time frames to recover the signal.

SuggestedRemedy
Add text to say 'The PMA asserts alert detect after the entire alert signal (3.5 LDPC frames of alert, and 0.5 frames of silence) has been detected.'

Proposed Response Response Status O

Cl 55 SC 55.4.4 P 182 L # 108
Parnaby, Gavin Solarflare Communica

Comment Type TR Comment Status X
Add some text stating requirements for MDI/MDIX configuration during LPI

SuggestedRemedy
Add text 'EEE capable PHYs shall ensure that MDI/MDIX configuration applies to refresh signaling.' to the end of 55.4.4

Proposed Response Response Status O

Cl 55 SC 55.3.5.2.4 P 97 L # 109
Parnaby, Gavin Solarflare Communica

Comment Type TR Comment Status X
R_BLOCK_TYPE and T_BLOCK_TYPE /I/ and /LI/ need to be defined.

SuggestedRemedy
Add definitions for /I/ and /LI/.

Also look at state machine transitions involved /C/, since I believe this currently includes /I/ and /LI/.

Proposed Response Response Status O

Cl 01 SC Editors Note P 15 L 24 # 110
Zimmerman, George Solarflare Communica

Comment Type E Comment Status X
Please update the revision history or delete it

SuggestedRemedy
update revision history with each reissue

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 D1.2.1 Energy Efficient Ethernet comments

**Cl 14 SC 14.8 P25 L51 #111**

**Comment Type:** T  **Comment Status:** X

Marking 10BASE-T or 10BASE-Te support precludes devices that support both.

**Suggested Remedy:**
- Change to 10BASE-T and/or 10BASE-Te support

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

---

**Cl 25 SC 25.2.11.2.1 P60 L51 #112**

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

TP-TMD typo, should be TP-PMD

**Suggested Remedy:**
- Replace with TP-PMD (2 instances)

**Proposed Response:**  **Response Status:** W

**PROPOSED ACCEPT.**

---

**Cl 78 SC 78.1.1 P233 L11 #114**

**Comment Type:** ER  **Comment Status:** X

Is "low power idle mode" supposed to be a subset of "Energy Efficient Ethernet mode"? If so, what else does "energy efficient ethernet mode" contain?

**Suggested Remedy:**
- Clarify the difference or converge the terminology

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

---

**Cl 78 SC 78.1.3 P235 L24 #115**

**Comment Type:** TR  **Comment Status:** X

On reflection, it seems that our protocol lacks a fail-safe. If a receiver, for some reason, senses a faster environmental change in the link than can be adapted for using the refreshes (or rather, senses it's SNR is degrading), it has no way to reach out for help and re-establish the steady stream of idles. This gives it no choice but to proceed down a path to bringing the link down - something that is probably preventable.

**Suggested Remedy:**
- Task force to discuss - add a new code (to be substituted for idle in the stream) and state transitions to allow receiver (for each PHY type that might have this issue) to force a WAKE transition.

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

---

**Cl 78 SC 78.1.4 P236 L10 #116**

**Comment Type:** TR  **Comment Status:** X

The list of affected IEEE standards is incomplete

**Suggested Remedy:**
- Add 10GBASE-R, 10GBASE-X, XGMII, 100BASE-X, 1000BASE-X, GMII and MIL

**Proposed Response:**  **Response Status:** O
Comments on IEEE P802.

IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments

Mar 2009

**Cl 78 SC 78.3**

Zimmerman, George
Solarflare Communications

**Comment Type:** ER
**Comment Status:** X
No need to revisit the technical mechanisms for autoneg. It creates synchronous maintenance issues later

**Suggested Remedy:**
delete descriptions of how autoneg is done for the various clauses

**Proposed Response:** Response Status: O

---

**Cl 78 SC 78.3**

Zimmerman, George
Solarflare Communications

**Comment Type:** TR
**Comment Status:** X
Autonegotiation is referenced, but the clauses aren't in the draft

**Suggested Remedy:**
Need to define and add autonegotiation clauses

**Proposed Response:** Response Status: O

---

**Cl 49 SC 49.2.13.3**

Barrass, Hugh
Cisco

**Comment Type:** E
**Comment Status:** X
Only 1 state is added - singular

**Suggested Remedy:**
Change "are" to "is"

**Proposed Response:** Response Status: O

---

**Cl 49 SC 49.2.9**

Barrass, Hugh
Cisco

**Comment Type:** E
**Comment Status:** X
The LPI paragraph needs to be underlined (it's an insertion).

**Suggested Remedy:**
Underline the paragraph starting "If the optional Low Power Idle..."

**Proposed Response:** Response Status: O

---

**Cl 49 SC 49.2.13.2.6**

Barrass, Hugh
Cisco

**Comment Type:** E
**Comment Status:** X
Remove editor's note at beginning of clause regarding BER & block lock

**Suggested Remedy:**
Remove editor's note at beginning of clause regarding BER & block lock

**Proposed Response:** Response Status: O

---

**Cl 72 SC 72.3a**

Barrass, Hugh
Cisco

**Comment Type:** E
**Comment Status:** X
Typo RTXQUIET

**Suggested Remedy:**
Change to TXQUIET

**Proposed Response:** Response Status: O

---

**Cl 72 SC 72.3a**

Barrass, Hugh
Cisco

**Comment Type:** E
**Comment Status:** X
edit instruction says 70.3

**Suggested Remedy:**
Change to 72.3

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

**BP training**
Without training frames, there is no need to signal REFRESH/WAKE. Change tx_quiet definition to match other clauses.

Suggested Remedy
Replace:

set to REFRESH when the transmitter is to send refresh signaling, set to WAKE when the transmitter is to send wake signaling and set to FALSE otherwise. When set to TRUE, the PMD will disable the transmitter as described in 71.6.6. When set to REFRESH or WAKE the PMD will send training signals as described in 71.6.12.

with:

and is set to FALSE otherwise. When set to TRUE, the PMD will disable the transmitter as described in 71.6.6.

Proposed Response
To support wake time fault, there needs to be another state - after RX_WAKE, the PHY must detect a situation where the PHY does not reach a state where data service can be established with an acceptable BER.

**Suggested Remedy**

Add a term "training_done" for the two transitions out of RX_WAKE (not the one with rx_tw_timer_done).

Add a new state ASSERT_WTF

Make a transition from RX_WAKE to ASSERT_WTF:
rx_tw_timer_done * rx_block_lock = OK

Make a transition from ASSERT_WTF to RX_ACTIVE
R_TYPE(rx_raw) != LI

Make a transition from ASSERT_WTF to RX_SLEEP
R_TYPE(rx_raw) = LI

In state ASSERT_WTF, add action "assert_WTF"

In 49.2.13.2.3 Functions, add

assert_WTF

An unexpected event has caused the PHY to complete the wake process without reaching a state where data service can be established with an acceptable BER (add link to clause 45 counter)

In 49.2.13.2.6 Messages, add

PCS_TRAINING_DONE.indication(training_done)

A signal sent by the PMD that, when TRUE, indicate that the receiver is operating normally and should support a data service with an acceptable BER. When FALSE indicates that some form of training is in process following an interruption to normal link operation such as low power idle. PHY devices that do not support optional functions requiring this signal shall set the value as TRUE.

**BP training**

A more effective means of rapidly synchronizing 66b block boundaries may be achieved by forcing a reset of the scrambler on a TRUE to FALSE transition of tx_quiet.

**Suggested Remedy**

Edit subclause 49.2.6

Add paragraph at the end of subclause:
To aid block synchronization in the receiver, the scrambler shall be reset prior to the first bit of the first 66b block following a transition of tx_quiet from TRUE to FALSE.
**BP training**

The receiver will be required to rapidly synchronize the 66b block boundaries following LPI. The precise details do not need to be specified but an informative description would be useful.

**Suggested Remedy**

Append after "LPI receive state diagram."

Following the a period of quiet transmission, the receiver is expected to achieve block synchronization within the wakeup time specified. The receiver may use the knowledge that the link partner's transmitter has reset the scrambler at the beginning of the first 66b block following the transition from TRUE to FALSE for tx_quiet. The idle sequence following this event will form a fixed pattern for the duration of the wake period.

**Proposed Response**

Response Status O

---

**BD training**

The messages PMD_RXQUIET & PMD_TXQUIET are mis-named. They need to go through the PMA.

**Suggested Remedy**

Change the names to PMA_RXQUIET & PMA_TXQUIET

Change PCS/PMA to PCS (2 instances) and PMD to PMA/PMD (2 instances).

**Proposed Response**

Response Status O

---

**BP training**

The FEC clause needs editing to support LPI.

Messages must pass through and block lock must be edited.

**Suggested Remedy**

Make changes to clause based on presentation submitted for BP training.

**Proposed Response**

Response Status O

---

**BP training**

The FEC block is synchronized by using the known sequence following deassertion of tx_quiet.

**Suggested Remedy**

Delete the paragraph starting "to synchronize..."

**Proposed Response**

Response Status O
<table>
<thead>
<tr>
<th>ID</th>
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<th>Comment Status</th>
<th>Proposed Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>136</td>
<td><strong>BP training</strong></td>
<td>X</td>
<td>Delete LPI status indication row in Table 72-3</td>
</tr>
<tr>
<td>137</td>
<td><strong>BP training</strong></td>
<td>X</td>
<td>Replace current text in 72.6.4a &amp; 72.6.4b with the following:</td>
</tr>
<tr>
<td>138</td>
<td><strong>BP training</strong></td>
<td>X</td>
<td>Delete all text under 72.6.10 (i.e. no change to the base standard).</td>
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<tr>
<td>139</td>
<td><strong>BP training</strong></td>
<td>X</td>
<td>Replace the section with:</td>
</tr>
</tbody>
</table>

**Comment:**

There is no register in the PMD space for LPI status.

**Proposed Remedy:**

Delete LPI status indication row in Table 72-3.

**Comment Type:**

T

**Comment Status:**

X

**Proposed Response:**

Response Status: O

---

**Comment:**

There is no register in the PMD space for LPI status.

**Proposed Remedy:**

Delete LPI status indication row in Table 72-3.

**Comment Type:**

T

**Comment Status:**

X

**Proposed Response:**

Response Status: O

---

**Comment:**

The signal detect function needs to act like a classic signal detect to support operation in the PMA & PCS during LPI.

**Proposed Remedy:**

Replace current text in 72.6.4a & 72.6.4b with the following:

72.6.4a PMD signal detect function during low power operation

If Energy Efficient Ethernet is supported, the PMD needs to revert to a classic operation for SIGNAL_DETECT. This indicates when the electrical signal level at the input of the receiver is within certain threshold voltages. The PMD shall provide SIGNAL_DETECT function which sets SIGNAL_DETECT to a value of TRUE within TSA after a step increase in the differential peak-to-peak voltage exceeding the Signal Detect Assertion threshold of VSA as specified in Table 72-6.

The SIGNAL_DETECT parameter shall be set to FAIL within a maximum of TSD after a step decrease in the differential peak-to-peak input voltage from a value greater than the Signal Detect Assertion Threshold to a differential signal level less than the Signal Detect Deassertion Threshold of VSD as specified in Table 72-9.

**Proposed Response**

Response Status: O
Comments on IEEE P802.

**Comment ID # 141**

**Cl 72 SC 72.6.11.2 P 221 L 41 # 141**

Barrass, Hugh Cisco

**Comment Type** T **Comment Status** X

**BP training**

There is no timing in the PMD, so this section is not required.

**Suggested Remedy**

Delete 72.6.11.2, including the table 72-5a.

**Proposed Response**

Response Status O

---

**Comment ID # 142**

**Cl 72 SC 72.6.11.3 P 221 L 48 # 142**

Barrass, Hugh Cisco

**Comment Type** T **Comment Status** X

**BP training**

There is no timing in the PMD, so this section is not required.

**Suggested Remedy**

Delete 72.6.11.3 and 72.6.11.4

**Proposed Response**

Response Status O

---

**Comment ID # 143**

**Cl 71 SC 71.6.4a P 200 L 8 # 143**

Barrass, Hugh Cisco

**Comment Type** T **Comment Status** X

There is no register in the PMD space for LPI status

**Suggested Remedy**

Delete LPI status indication row in Table 71-3

**Proposed Response**

Response Status O

---

**Comment ID # 144**

**Cl 70 SC 70.5 P 200 L 40 # 144**

Barrass, Hugh Cisco

**Comment Type** T **Comment Status** X

**BP training**

There is no register in the PMD space for LPI status

**Suggested Remedy**

Delete LPI status indication row in Table 70-3

**Proposed Response**

Response Status O

---

**Comment ID # 145**

**Cl 48 SC 48.2.6.2.5 P 143 L 17 # 145**

Barrass, Hugh Cisco

**Comment Type** T **Comment Status** X

All of the PHYs defined are defined to work with fixed wake times - except backplane. Even though the backplane PHYs are the simplest of the PHYs being defined.

All backplane PHYs should use fixed wake times based only on PHY type.

**Suggested Remedy**

Change TABLE 48-10, middle row, from 8 - 18 to 8 - 9. Delete the footnote.

**Proposed Response**

Response Status O

---

**Comment ID # 146**

**Cl 36 SC 36.2.5.2.8 P 86 L 17 # 146**

Barrass, Hugh Cisco

**Comment Type** T **Comment Status** X

All of the PHYs defined are defined to work with fixed wake times - except backplane. Even though the backplane PHYs are the simplest of the PHYs being defined.

All backplane PHYs should use fixed wake times based only on PHY type.

**Suggested Remedy**

Change TABLE 36-3b, middle row, from 10 - 20 to 10 - 11. Delete the footnote.

**Proposed Response**

Response Status O

---
The use of training frames during refresh & wake for backplane PHYs is unnecessary and adds too much complexity.

Scrambled idle codes are sufficient to retrain receivers and the resynchronization of FEC or 66b block boundaries can be achieved by using a reset of the scrambler.

Suggested Remedy
Delete sections that control training frames and replace with descriptions that use scrambled idles and scrambler reset - see presentation for more description.

This comment is an umbrella comment, detailed comments marked **BP training** cover specific changes required.

---

Comment ID: 148

Cl 72 SC 72 P 216 L 29 # 148
Barrass, Hugh Cisco

Comment Type: TR
Comment Status: X

The use of training frames during refresh & wake for backplane PHYs is unnecessary and adds too much complexity.

Scrambled idle codes are sufficient to retrain receivers and the resynchronization of FEC or 66b block boundaries can be achieved by using a reset of the scrambler.

Suggested Remedy
Delete sections that control training frames and replace with descriptions that use scrambled idles and scrambler reset - see presentation for more description.

This comment is an umbrella comment, detailed comments marked **BP training** cover specific changes required.

---

Comment ID: 150

Cl 22 SC 22.2.1.3.3 P 29 L 33 # 150
Bennett, Michael LBNL

Comment Type: E
Comment Status: X

The paragraph would be easier to read if the first sentence terminated after CARRIER_STATUS.

Suggested Remedy
Replace the comma with a period and change the case of the beginning of the next sentence as shown below:

For LPI operation, in full duplex mode RX_DV and CRS have no influence on CARRIER_STATUS. A transition ...

---

Comment ID: 149

Cl 78 SC 78.4.1.4 P 240 L 3 # 149
Barrass, Hugh Cisco

Comment Type: TR
Comment Status: X

System Tw can be resolved using one simple and static equation. This would simplify the standard, the implementation and testing.

Careful examination of the proposed equation and rule shown below will show that this covers every corner case.

Suggested Remedy
The attached presentation describes the details of the proposal.

In summary, the four parameters defined in the TLV can be combined in the following equation:

Resolved system Tw = min(remote Rx Tw, max(local Tx Tw, remote echo Tx Tw) )

The only additional rule required is that the system shall not change a parameter unless the current local value matches the remote echoed value.

---

Comment ID: 147

Cl 49 SC 49 P 145 L 38 # 147
Barrass, Hugh Cisco

Comment Type: TR
Comment Status: X

The use of training frames during refresh & wake for backplane PHYs is unnecessary and adds too much complexity.

Scrambled idle codes are sufficient to retrain receivers and the resynchronization of FEC or 66b block boundaries can be achieved by using a reset of the scrambler.

Suggested Remedy
Delete sections that control training frames and replace with descriptions that use scrambled idles and scrambler reset - see presentation for more description.

This comment is an umbrella comment, detailed comments marked **BP training** cover specific changes required.
The definition of low power idle (LPI) ...

The EEE operational mode supports ...

use something less ambiguous, such as "non-eee operation"

replace "baseline" with "non-eee"

... governed by Resolved Transmit Tw defined in 78.4.2.3

But the Resolved Transmit definition is in clause 78.4.1.4

Change reference to the correct subclause:
### Comment on IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments

<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Page</th>
<th>Line</th>
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<th>Response Status</th>
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<td>A timer that counts, in microseconds, the time expired since the deassertion of LPI. The terminal count of the timer is the value of the Resolved Transmit Tw as defined in 78.4.2.3.</td>
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<td>D1.2.1 changed the requirement for layer 2 from mandatory to optional. For 100M and some low end systems, the rationale is that LLDP engines may not always be present, hence the broadmarket is best served with an optional feature. While more and more 100M and triple speed systems are implementing LLDP for a variety of reasons including AVB, PoEP, Link Agg etc. it seems reasonable to keep LLDP optional. 10G systems, however, are very sophisticated systems that implement a stack of protocols including LLDP. There seems to be little reason to make the LLDP optional on such systems.</td>
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<td>&quot;The Data Link Layer capabilities are optional for all devices.&quot;</td>
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<td>&quot;The Data Link Layer capabilities shall be implemented for devices that are 10 Gbps or high. The Data Link Layer capabilities are optional for all devices and may be implemented.&quot;</td>
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<td>Typo in 1st paragraph &quot;used to by&quot;</td>
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<td>rx_ and tx_ timer definitions reference the PMD entering or exiting state. Shouldn't this be the PCS entering this state?</td>
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<td>Suggested Remedy</td>
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<td>Change rx_ and tx_ timer on this page from PMD to PCS.</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  
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<td>169</td>
<td>72</td>
<td>72.1</td>
<td>217</td>
</tr>
</tbody>
</table>

**Comment 164**

**Type:** T

**Comment Status:** X

The draft is missing a description of how and when the 10GBase-KR FEC will synchronize and lock during wake sequence.

**Suggested Remedy:**

Add description in Clause 49 and/or 74 of how and when FEC will synchronize and lock during 10GBase-R PCS Wake from LPI.

**Proposed Response**

**Response Status:** O

---

**Comment 165**

**Type:** T

**Comment Status:** X

rx_lpi_mode and tx_lpi_mode not used anywhere to set or control any feature or function.

**Suggested Remedy:**

Tie this into a power saving suggestion (should statement) in the PCS or delete it.

**Proposed Response**

**Response Status:** O

---

**Comment 166**

**Type:** T

**Comment Status:** X

rx_lpi_mode and tx_lpi_mode are not used to set or control any feature or function.

**Suggested Remedy:**

Either add a suggestion statement (should) to trigger power savings in the PCS or delete them from variables and state diagrams.

**Proposed Response**

**Response Status:** O

---

**Comment 167**

**Type:** T

**Comment Status:** X

rx_lpi_mode and tx_lpi_mode are not used to set or control any feature or function.

**Suggested Remedy:**

Fix or delete reference to 71.6.x and make more generic to include Optical PMDs.

**Proposed Response**

**Response Status:** O

---

**Comment 168**

**Type:** T

**Comment Status:** X

The definition for tx_quiet should be stated more generically for support of both KR and legacy Optical PMDs. References to 71.6.6 and 71.6.12 are to -KX4 not -KR and should be deleted or corrected.

**Suggested Remedy:**

Fix or delete reference to 71.6.x and make more generic to include Optical PMDs.

**Proposed Response**

**Response Status:** O

---

**Comment 169**

**Type:** T

**Comment Status:** X

KR-PHY will not generate sleep training symbols.

**Suggested Remedy:**

Change "10GBase-KR PHY sends sleep symbols" to "10GBase-KR PHY forwards sleep symbols"

**Proposed Response**

**Response Status:** O
The tx_quiet now has 3 enumerated values and the use of assert/de-assert is not appropriate anymore.

**Suggested Remedy**

Change: If Energy Efficient Ethernet is supported, the PCS transmit function tells this PMDÆs transmit function when to enter in low power mode by asserting the tx_quiet primitive via the PMD_RTXQUIET.request. The PCS tell the PMD to exit low power idle mode by deasserting tx_quiet. While tx_quiet is asserted the PCS, PMA and PMD should deactivate all or part of its functional blocks to conserve energy.

**Proposed Response**

If Energy Efficient Ethernet is supported, the PCS transmit function tells this PMDÆs transmit function when to enter low power mode by setting the tx_quiet primitive to TRUE via the PMD_RTXQUIET.request. The PCS tells the PMD to exit low power idle mode by setting tx_quiet to REFRESH or WAKE. While tx_quiet is TRUE the PCS, PMA and PMD should deactivate all or part of its functional blocks to conserve energy.

#### Comment Type TR

- **Comment Status X**
  - **Delete tx_lpi_mode in this state machine.**
  - Modify state diagram to remove training and just enable/disable transmitter where appropriately directed by tx_quiet.

**Proposed Response**

Delete tx_lpi_mode in this state machine.

**Proposed Remedy**

- Modify state diagram to take direction from signal_detect, PCS/PMA and rx_quiet to enter/exit quiet states.

**Proposed Response**

Delete tx_lpi_mode.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Document Page</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Proposed Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>176</td>
<td>48</td>
<td>TR</td>
<td>X</td>
<td>Signal_detect will not be generated by a LPI state machine but by receiver voltage levels. Also Sense Signal is not needed anymore as Signal Detect will suffice. SuggestedRemedy: Delete the paragraph under 72.6.4a. Move the paragraph under 72.6.4b to 72.6.4a and change to sense signal to signal_detect where appropriate.</td>
</tr>
<tr>
<td>177</td>
<td>53</td>
<td>TR</td>
<td>X</td>
<td>The training frames need not indicate Wake, Refresh and Last Frame. Refresh and wake can be accomplished by forwarding /LI/ symbols. SuggestedRemedy: Delete the Wake, refresh, and Last Frame settings in this paragraph and in Table 72-5.</td>
</tr>
<tr>
<td>178</td>
<td>48</td>
<td>TR</td>
<td>X</td>
<td>Refresh, Wake and Last Frame not needed. /LI/ can be forwarded instead. SuggestedRemedy: Remove definitions from 72.6.10.2.4.4 - 72.6.10.2.4.5</td>
</tr>
<tr>
<td>179</td>
<td>18</td>
<td>TR</td>
<td>X</td>
<td>According to pillai_02_0109 (Motion #4), remove the references to VSA, VSD, TSD and TSA in Table 70.6, 70.7.2. SuggestedRemedy: Remove definitions from 72.6.10.2.4.4 - 72.6.10.2.4.5</td>
</tr>
<tr>
<td>180</td>
<td>12</td>
<td>E</td>
<td>X</td>
<td>signalled</td>
</tr>
<tr>
<td>181</td>
<td>12</td>
<td>E</td>
<td>X</td>
<td>Then the PHY enters Active_st and .. Nothing wrong with it, but to be consistent with the rest of text, it should be Then the PHY enters Active_st state and.. SuggestedRemedy: Remove definitions from 72.6.10.2.4.4 - 72.6.10.2.4.5</td>
</tr>
</tbody>
</table>
Comments on IEEE P802.

IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments

Mar 2009

**Cl 78 SC 78.1.3 P 235 L 23 # 182**

**Pillai, Velu Broadcom**

**Comment Type** E **Comment Status** X

After a a system specified recovery

**SuggestedRemedy**

After a system specified recovery

**Proposed Response**

Response Status O

---

**Cl 78 SC 78.2.3 P 237 L 11 # 183**

**Pillai, Velu Broadcom**

**Comment Type** E **Comment Status** X

Description for Tw_phy and Tw_sys looks very similar, except for Tw_sys > Tw_phy. Should we put more text to it?

**SuggestedRemedy**

**Proposed Response**

Response Status O

---

**Cl 78 SC 78.3 P 237 L 27 # 184**

**Pillai, Velu Broadcom**

**Comment Type** E **Comment Status** X

Is there a reason for mentioning Clause 37 Auto Negotiation in 802.3az standard?

**SuggestedRemedy**

**Proposed Response**

Response Status O

---

**Cl 78 SC 78.2.2 P 236 L 48 # 185**

**Pillai, Velu Broadcom**

**Comment Type** E **Comment Status** X

Please fix the tab for the text.

**SuggestedRemedy**

**Proposed Response**

Response Status O

---

**Cl 45 SC 45.2.3.2 P 118 L 26 # 186**

**Pillai, Velu Broadcom**

**Comment Type** E **Comment Status** X

1 = Tx PCS is currently receiving LP idle

**SuggestedRemedy**

1 = Tx PCS is currently receiving LP idle

**Proposed Response**

Response Status O

---

**Cl 78 SC 78.2.3 P 237 L 12 # 187**

**Pillai, Velu Broadcom**

**Comment Type** ER **Comment Status** X

when first codewords are permitted on the xxMII interface

**SuggestedRemedy**

when first data codewords are permitted on the xxMII interface

**Proposed Response**

Response Status O

---

**Cl 78 SC 78.3 P 237 L 32 # 188**

**Pillai, Velu Broadcom**

**Comment Type** ER **Comment Status** X

1000-KX needs to be 1000BASE-KX.

Line numbers 32 and 35.

**SuggestedRemedy**

**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 37 of 41 2/27/2009 1:31:36 PM
Table 70-3, Table 71-3 and Table 72-3 are all MDIO/PMD status variable mapping. But LP Idle state indication is coming from the PCS register space (Reg 3.1). So should we take it from this table and put it in a different MDIO/PCS status table?

**Suggested Remedy**

Proposed Response

Response Status O

---

LAST_WAKE: 0 1 1
LAST_REF: 1 0 1
WAKE: 0 1 0
REFRESH: 1 0 0

Does not handle a bit error. Which might put the state machine in a stuck state.

**Suggested Remedy**

No solution right now. Will provide it during the meeting.

Proposed Response

Response Status O

---

In order to handle a Wake request right during the "last refresh".

**Suggested Remedy**

An arc from TX_LAST_REF to TX_WAKE, if tx_quiet = WAKE.

Proposed Response

Response Status O

---

EEE wake timer requirement [48:1] = \{32'b0, NP, 3'b0, 7.64.11:0\}
lp EEE wake timer requirement [48:1] = \{32'b0, NP, 3'b0, 7.65.11:0\}

**Suggested Remedy**

Unformatted next page:
EEE wake timer requirement [48:1] = \{20'b0, 7.64.11:0, NP, Ack, MP, Ack2, T, 11'b0\}
lp EEE wake timer requirement [48:1] = \{20'b0, 7.65.11:0, NP, Ack, MP, Ack2, T, 11'b0\}

Proposed Response

Response Status O

---

Register/bit number: 1.1.3

But it should be 3.1

**Suggested Remedy**

Proposed Response

Response Status O

---

LP Idle state indication Status register 1 1.1.3 PMD_LPI_active

**Suggested Remedy**

LP Idle state indication Status register 1 3.1 PCS_LPI_active

Proposed Response

Response Status O
Cl 73  SC 73.1  P  L  # 195
Pillai, Velu  Broadcom

Comment Type  TR  Comment Status  X
Right now in Clause 73.1 the use of AN is optional. But not in EEE mode. Hence 73.1 should change from

73.1 Auto-Negotiation introduction
While implementation of Auto-Negotiation is mandatory for Backplane Ethernet PHYs, the use of Auto-Negotiation is optional. Parallel detection shall be provided for legacy devices that do not support Auto-Negotiation.

SuggestedRemedy
While implementation of Auto-Negotiation is mandatory for Backplane Ethernet PHYs, the use of Auto-Negotiation is optional, but mandatory for the support of Energy Efficient Ethernet. Parallel detection shall be provided for legacy devices that do not support Auto-Negotiation.

Proposed Response  Response Status  O

Cl 70  SC 70.7.1  P 203  L 18  # 196
Pillai, Velu  Broadcom

Comment Type  TR  Comment Status  X
Table 70-4 should have the values from pillai_02_0109 (Motion #4).

SuggestedRemedy

Proposed Response  Response Status  O

Cl 72  SC Table 72-3  P 218  L 10  # 197
Pillai, Velu  Broadcom

Comment Type  TR  Comment Status  X
LP Idle state indication Status register 1  1.1.3  PMD_LPI_active

SuggestedRemedy
LP Idle state indication Status register 1  3.1  PMD_LPI_active

Proposed Response  Response Status  O

Cl 71  SC 71.6.4a  P 209  L 24  # 198
Pillai, Velu  Broadcom

Comment Type  TR  Comment Status  X
According to pillai_02_0109 (Motion #4), remove the references to VSA, VSD, TSD and TSA in 71.6.4a Table 71.6

SuggestedRemedy

Proposed Response  Response Status  O

Cl 00  SC  P  L  # 199
Pillai, Velu  Broadcom

Comment Type  TR  Comment Status  X
According to pillai_02_0109 (Motion #4), remove the references to VSA, VSD, TSD and TSA in Table 72.9

SuggestedRemedy

Proposed Response  Response Status  O

Cl 72  SC 72.6.11.3.1  P 223  L 1  # 200
Pillai, Velu  Broadcom

Comment Type  TR  Comment Status  X
Tx_quiet has only two values: TRUE or FALSE. But the state machine assigns TRUE, FALSE, REFRESH and WAKE.

SuggestedRemedy

Proposed Response  Response Status  O
**Comment ID # 201**

**Comment**  
For T_BLOCK_TYPE

change:

C; The vector contains one of the following:
- a) eight valid control characters other than /O/, /S/, /T/, /E/ and /LI/ (note that /LI/ is only excluded if the optional Low Power Idle function is supported);

**Suggested Remedy**

To:

C; The vector contains one of the following:
- a) eight valid control characters other than /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);

**Proposed Response**

**Response Status** O

---

**Comment ID # 202**

**Comment**

**Proposed Response**

**Response Status** O

---

**Comment ID # 203**

**Comment**

**Suggested Remedy**

The transition to and from RX_LI can be conditional to a valid R_TYPE, but staying in that state needs to be qualified with rx_lpi_mode.

**Proposed Response**

**Response Status** O

---

**Comment ID # 204**

**Comment**

**Suggested Remedy**

The transition to and from RX_LI can be conditional to a valid R_TYPE, but staying in that state needs to be qualified with rx_lpi_mode.

**Proposed Response**

**Response Status** O

---

**Comment ID # 205**

**Comment**

**Suggested Remedy**

Need signals from the CL72 LPI Receive State machine

**Proposed Response**

**Response Status** O
IEEE P802.3az D1.2.1 Energy Efficient Ethernet comments
Mar 2009

**Comment ID # 206**

**Cl 72 SC Fig 72-7 P 225 L 1 # 206**
Pillai, Velu Broadcom
Comment Type TR
Comment Status X

CL49 LPI RX State diagram (Fig 49-17):
This state machine will receive LI to take it from Active to LPI mode. But for a KR PHY it will not receive any valid R_TYPE during refresh or wake. Hence this state machine will not work as it is.

**Suggested Remedy**
I think we should go back to the Draft 1.1 version and then correct it for missing items.

**Proposed Response**
Response Status O

**Comment ID # 207**

**Cl 36 SC Fig 36-7a P 80 L 1 # 207**
Pillai, Velu Broadcom
Comment Type TR
Comment Status X

LP_IDLE and LPI_K needs to see continuous detect_lpidle

**Suggested Remedy**
Staying in these state needs to be qualified with \texttt{rx_lpi_mode}.

**Proposed Response**
Response Status O

**Comment ID # 208**

**Cl 48 SC Fig 48-9 P 137 L 25 # 208**
Pillai, Velu Broadcom
Comment Type TR
Comment Status X

Transition from RECEIVE to LPIDLE_MODE with [LPIDLE], but in order to stay in LPIDLE.MODE and RECEIVE LPI the state machine is expecting continuous [LPIDLE] at the PCS service interface.

**Suggested Remedy**
Staying in that state needs to be qualified with \texttt{rx_lpi_mode}.

**Proposed Response**
Response Status O

**Comment ID # 209**

**Cl 55 SC 55.1.3.3 P 161 L 48 # 209**
Bennett, Michael LBNL
Comment Type T
Comment Status X

The following sentence suggests the data rate is changing:

This quiet-refresh cycle continues until the link partner transmits the alert signal, initiating a transition back to the full data rate.

The same is true on line 50:

local receiver time to prepare for the full 10G data-rate.

Referring to changes in data rate rather than changes in power consumption may confuse the reader regarding the concept of low power idle

**Suggested Remedy**
On line 48, replace "full data rate" with "full power operation"

On line 50, replace "the full 10G data-rate" with "full power operation"

**Proposed Response**
Response Status O