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| Title                        | <b>Comments to Draft Standard IEEE 802.16 – Part 4: Protocol Implementation Conformance Statement (PICS) Proforma for Frequencies below 11 GHz</b>  |   |
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| Re:                          | Supporting document for call for contribution for IEEE 802.16C  |   |
| Abstract                     | Comments on the structure, organization, and technical content of IEEE P802.16/Conformance04/D1, April 2005 draft standard for conformance to IEEE Standard 802.16 – Part 4: Protocol Implementation Conformance Statement (PICS) Proforma for Frequencies below 11 GHz.  |   |
| Purpose                      | Adoption of P802.16/Conformance04/D1  |   |
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1 **Comments to Draft Standard IEEE 802.16 - Part 4:**  
 2 **Protocol Implementation Conformance Statement**  
 3 **(PICS) Proforma for Frequencies below 11 GHz**  
 4 **(DRAFT)**

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## 1 Overview

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3 The purpose of this contribution is to provide comments on the structure, organization, and technical content of  
4 draft standard for conformance to IEEE Standard 802.16 — Part 4: Protocol Implementation Conformance  
5 Statement (PICS) Proforma for Frequencies below 11 GHz.  
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## 8 2 Comments

### 9 2.1 High-level partition

10 High level partitioning of IEEE PICS according to PHY, MAC/PHY, and MAC layer, which is appropriate for  
11 RCT and TSS/TP development (based on discussion with test equipment vendor).  
12  
13

14 Rationale: Using this method of partitioning, the document will be user friendly, in a sense that TSS/TP and RCT  
15 development tasks can utilize the relevant sections (MAC and MAC/PHY for TSS/TP and PHY for RCT) more  
16 effectively and conveniently.  
17  
18

### 19 2.2 Partition based on Functions

20 Partition of the various test cases such that the specific PICS correlated by function and not by specific sections is  
21 desired. See Annex A for an example on partitioning of MAC section.  
22

23 Rationale: The main reason for this recommendation is to make the document more friendly to the end user tasks,  
24 i.e. TSS/TP and RCT developments. As an example, it turns out that there is quite a bit of redundancy in the current  
25 OFDM PICS document (This applies to the MAC section of the current PICS), and there are quite a few items that  
26 are addressed in more than one table. This creates additional burden to all users of the PICS. The proposal for  
27 structuring the document based on functionality greatly helps with this regards.  
28

### 29 2.3 Comprehensiveness

30 PICS document comprehensiveness should be targeted by including all the PICS requirements and conditions  
31 independent on the profiles. This means that the PICS document should be complete even if we do not consider  
32 any specific profile. The current base line document does not address this issue.  
33

### 34 2.4 Organization and Structure of the IEEE PICS Document to Support Testability

35  
36 Rationale: Since the Test Suite Structures and Test Plan (TSS/TP) are usually derived from the PICS document, it  
37 would be highly beneficial if the organization and structure of the PICS is aligned with the organization of the  
38 TSS/TP (e.g., if sections and sub-sections of the PICS are aligned with the sections and sub-sections of the Test  
39 Plan).  
40

- 41 ■ The use of the status term "Conditional" tends to cause confusion because there could be two kinds of  
42 "Conditional items" as follows: a) Conditional items that are derived from purely optional items b)  
43 Conditional items that are derived from "Qualified Optional" items (where the vendor must select to  
44 implement at least one of the items out of a selection list). It is important to maintain a distinction between  
45 these two kinds since, the former case ends up being optional, whereas in the latter case it is still mandatory  
46 to support one of the options (and all its associated derivations). So, it would be useful to define a new  
47 Status Type called "Qualified Conditional" to account for the latter type.
- 48 ■ The set of optional and conditional PICS should be comprehensive in order to support a complete testing of  
49 all the mandatory, optional, and conditional PICS.  
50

**2.5 Alignment of IEEE PICS statement format according to ISO/IEC 9646-7 guidelines (1995)**

**For example:**

Notation for conditional requirements:

Conditional requirements, utilizing predicates if desired, may be specified in one of the following ways:

- a) Separate status and predicate columns;
- b) Merged status and predicate columns;
- c) Conditional expressions referenced from the status column;
- d) Conditions implied by nested item numbers;
- e) Predicates applying to a whole table.

The use of Separate status and predicate columns

A “c” is placed in the status column followed by a colon followed by one or more unconditional status indications on separate lines, each with a predicate, or the negation of a predicate in the predicate column.

**Table 1. Use of status and predicate columns**

| Item # | Item Description | Reference | Status     | Predicate | Support |
|--------|------------------|-----------|------------|-----------|---------|
| 1      | Item A           | [x]       | C: m<br>:o | P1<br>-P1 |         |
| 2      | Item B           | [x]       | C: m       | P2        |         |

Table 1 shows two examples of the use of separate status and predicate columns, with the following meaning:

- a) Item A is mandatory if p1 is true, but optional if p1 is false.
- b) Item B is mandatory if p2 is true but, by convention, not-applicable if p2 is false: there shall be a statement elsewhere in the ICS Proforma clarifying this convention, if it is used.

For example:

**Table A.1 – Roles**

| Item # | Item Description        | Reference | Status         | Predicate | Support |
|--------|-------------------------|-----------|----------------|-----------|---------|
| 1      | Subscriber Station (SS) | [1]       | C1-01: m<br>:o | P1<br>-P1 |         |
| 2      | Base Station (BS)       | [1]       | C1-02: m<br>:o | P1<br>-P1 |         |

**C1-01: IF Table A.1/2 is not supported THEN m ELSE o**

**C1-02: IF Table A.1/1 is not supported THEN m ELSE o**

**Table A.12 – Major Receiving CS Functions (SS in PMP)**

| Item # | Item Description   | Reference                | Status    | Predicate | Support |
|--------|--|--------------------------|-----------|-----------|---------|
| 1      | Receipt of the CS PDU  | [1] 5.2                  | m         |           |         |
| 2      | Rebuilding of the suppressed payload header information (PHS function) | [1] 5.1.2.3<br>[1] 5.2.4 | C12-01: m | P2        |         |

**C12-01: IF Table A.10/1 THEN m ELSE i**

### 3 Annex A: Example of PICS Document Partitioning Based on Functions

#### SS PICS Prioritization – MAC Layer

| Test Group   | Feature Sets Tested                 |
|--|-------------------------------------|
| Network entry and Initialization<br><br>(One BS and one SS, no contention resolution needed) | SS addressing and MPU construction  |
|  | SS Network entry and Initialization |
|  | SS Downlink channel acquisition     |
|  | SS Uplink channel acquisition       |
|  | SS Initial Ranging                  |
|  | SS negotiate basic capabilities     |
|  | SS Authentication and Authorization |
|  | SS Registration                     |
|  | SS headers and subheaders           |
|  | SS global parameters                |
|  | SS configuration file               |
| Service flow test (MAC CPS)  | SS Uplink Scheduling Service        |
|  | SS dynamic service flow control     |
| SS miscellaneous MAC test  | SS MAC PDU construction             |
|  | SS CRC                              |
|  | SS Map relevance                    |
|  | SS contention resolution            |
|  | SS periodic ranging                 |
|  | SS                                  |
| SS convergence sub-layer test  | SS convergence sublayer             |

### 4 References

The following documents contain provisions, which, through reference in this text, constitute provisions of the present document. References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific. For a specific reference, subsequent revisions do not apply. For a nonspecific reference, the latest version applies.

[1] IEEE Standard 802.16-2004: “Local and Metropolitan Area Networks – Part 16: Air Interface for Fixed Broadband Wireless Access Systems”

[2] ISO/IEC 9646-1: “Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts” 2004-10-08 IEEE 802.16Conf04-04/04

[3] ISO/IEC 9646-7: “Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 7: Implementation Conformance Statements.”