IEEE 802.16 Working Group on Broadband Wireless Access

http://WirelessMAN.org

Dr. Roger B. Marks, Chair
325 Broadway, MC 818.00
Boulder, CO 80305 USA
Tel: +1 303 497 3037
mailto:r.b.marks@ieee.org
12 May 2004

Dear IEEE-SA RevCom:

This submittal is an application for approval of P802.16-REVd/D5 ("Draft IEEE Standard for Local and metropolitan area networks - Part 16: Air Interface for Fixed Broadband Wireless Access Systems").

Attached to this letter, please find the following:

The draft itself will be included separately in PDF format and supplied to the IEEE Staff Project Editor in FrameMaker format.

As of this time, the second 15-day recirculation has not yet opened. However, we expect it open before 14 May. Until that recirculation is complete, I cannot completely confirm the approval ratio. However, As a result of comment resolution, 8 of the 10 recirculation Disapprove voters (Naftali Chayat, Mariana Goldhamer, David Johnston, Tal Kaitz, Vladimir Yanover, Yossi Segal, Shawn Taylor, and Cor van de Water) indicated satisfaction with the resolutions and a change in their vote to Approve. At this point, the tally is 58 Approve, 2 Disapprove, and 2 Abstain. Of the two remaining Disapprove voters, Neil Shipp is satisfied with the resolutions of his comments but has not yet indicated an intent to vote Approve. Nico van Waes has not responded to the comment resolutions yet. By virtue of the voting numbers, the ballot is considered to have passed, pending recirculation.

Please feel free to contact me with any questions or concerns.

Sincerely,

Roger B. Marks
Chair, IEEE 802.16 Working Group on Broadband Wireless Access

IEEE-SA STANDARDS BOARD
FORM FOR SUBMITTAL OF PROPOSED STANDARDS

1. PROJECT NUMBER: P802.16-REVd/D5 **2. DATE:** 12 May 2004

3. TITLE: Draft IEEE Standard for Local and metropolitan area networks - Part 16: Air Interface for Fixed Broadband Wireless Access Systems

4. SPONSOR (Full name of society/committee): Computer Society/LMSC + Microwave Theory & Techniques Society

5. BALLOTING COMMITTEE: IEEE 802.16 Working Group + Microwave Theory and Techniques Society

6. NAME OF WORKING GROUP: IEEE 802.16 Working Group on Broadband Wireless Access

7. NAME AND ADDRESS OF SUBMITTER

Roger B. Marks
NIST
325 Broadway, MC 818.00
Boulder, CO 80305
USA

Telephone: +1 303 497 3037 Fax: +1 303 497 7828 E-Mail: r.b.marks@ieee.org

8. DESCRIPTION OF DOCUMENT (Check one from each column.)

□ New	☒ Standard	☒ Full Use (5-year life cycle)
☒ Revision	□ Recommended Practice	□ Trial Use (2-year life cycle)
□ Reaffirmation	□ Guide	
□ Withdrawal	□ Amendment/Corrigenda to an existing standard (Indicate number and year) _____	

8A. REAFFIRMATION ONLY: The Sponsor confirms that the balloting group agrees that this standard continues to be useful in its current form and contains no significant obsolete or erroneous information.

□ Yes □ No

9. BALLOT INFORMATION

List the interest categories of **eligible** balloters only. Refer to the IEEE-SA Standards Board Operations Manual and the Working Guide for Submittal of Proposed Standards for the rules of balloting committee classification.

User	18	Producer	25	General Interest	30	Government	5
Interest Category	No.	Interest Category	No.	Interest Category	No.	Interest Category	No.

SUMMARY OF ELIGIBLE BALLOTS

	INITIAL BALLOT		RECIRCULATION BALLOT (if applicable)	
	Draft D3	Date Closed: 2004-03-13	Draft D4	Date Closed: 2004-04-15
	Number	Percentage	Number	Percentage
Ballots Mailed	80	100%	78	100%
Ballots Returned	62	77	62	77
Affirmatives	50	81	50	83
Negatives	11	N/A	10	N/A
Abstentions	01	01	02	03

Reasons for abstentions: Lack of time = 2 Lack of expertise = 0 Other = 0

10. RESOLUTION OF COMMENTS AND NEGATIVE VOTES

All balloting group members, observers, and coordinating groups have been advised of substantive changes made with respect to the balloted draft standard (in response to comments, in resolving negative votes, or for other reasons) and have received copies of all unresolved negative votes with reasons from the negative voter and the rebuttal, and have been advised that they have an opportunity to change their votes.

A. Have unresolved comments accompanying negative votes been circulated? *Include unresolved negative comments and rebuttal.* ☒ Yes ☐ No ☐ No unresolved comments

B. Have substantive document changes been circulated? ☒ Yes ☐ No ☐ No substantive changes

11. COORDINATION ACTIVITY (Not required for reaffirmation)

Using the abbreviations listed below, indicate the response received from each committee/organization required for coordination and include a copy of the response. Include documentation authorizing coordination by common membership, if applicable.

R = Received R/C = Received with comment NR = Not received

Committee/Organization	Response	Committee/Organization	Response
SCC10 (IEEE Dictionary)	NR		
SCC14 (Quantities, Units, & Letter Symbols)	R/C		
IEEE Standards Editorial Staff	R/C		

Indicate below any unresolved problems from coordination activities.

Comments from editorial staff and SCC14 were reviewed and substantially implemented.

.br

12. PATENT/COPYRIGHT and REGISTRATION ISSUES

A. Is there any patented material in the proposed standard? ☒ Yes ☐ No ☐ Originally indicated on the PAR, but not included in the final document
If yes, include letters(s) of assurance from the patent holder.

B. Is there any copyrighted material in the proposed standard? ☒ Yes ☐ No
If yes, include copyright release(s).

C. Is the registration of objects and/or numbers a provision of the proposed standard? If yes, include a proposal for review by the IEEE-SA Registration Authority Committee (RAC). ☐ Yes ☒ No ☐ Already approved by RAC

13. INTERNATIONAL STANDARDS ACTIVITIES (Not required for reaffirmation)

Is this document intended to be the basis of or included in an international standard? ☒ Yes (Explain) ☐ No
Under review in ITU-R Study Group 9B and ITU-T Study Group 9.

14. UNIT OF MEASUREMENT (check one)

☒ International System of Units (SI) - Metric ☐ Inch/Pound ☐ Both ☐ Not measurement sensitive

☐ Other _____

15. Source Materials Submitted to IEEE Standards Department

A. Have electronic versions of the source documents (text and figures) been provided? ☐ Yes ☒ No Format: FrameMaker

B. Will a diskette or other online material be required to accompany the published standard? ☐ Yes ☒ No

16. Submission checklist (X = included in submittal package N/A = Not applicable)

	Submission Package Item	**List URL if online**
X	This submittal form	http://ieee802.org/16/docs/04/80216-04_26.pdf
X	Ballot summary form(s) (1 per ballot cycle)	http://ieee802.org/16/docs/04/80216-04_26.pdf
X	Copies of unresolved negatives & rebuttals	http://ieee802.org/16/docs/04/80216-04_26.pdf
X	PAR and PAR approval letter	http://ieee802.org/16/docs/04/80216-04_26.pdf
X	Coordination comments and responses	http://ieee802.org/16/docs/04/80216-04_26.pdf
X	.pdf of final balloted draft #D5	http://ieee802.org/16/private/drafts/tgd/P80216-REVd_D5.zip
X	Permissions & copyright releases	http://ieee802.org/16/docs/04/80216-04_26.pdf
N/A	Delegation of balloting authority	

PROJECT NUMBER: P802.16-REVd **DATE:** 12 May 2004

This draft standard has been developed in accordance with the policies and procedures of the Sponsor and I am authorized by those policies and procedures to make this submittal.	
	Chair, IEEE 802.16 WG on Broadband Wireless Access
Signature of Submitter	**Title (role in Sponsor)**

==========

FOR STANDARDS DEPARTMENT USE ONLY

	IEEE-SA Standards Board Chair	
Signature of IEEE-SA Officer	**Title**	**Date**

Return to:

IEEE Standards Department
RevCom Secretary
445 Hoes Lane
PO Box 1331
Piscataway, NJ 08855-1331

Email This Letter

12 September 2003

Paul Nikolich
18 Bishops Lane
Lynnfield, MA 01940
paul.nikolich@att.net

Re: P802.16-REVd - Standard for Local and metropolitan area networks - Part 16: Air Interface for Fixed Broadband Wireless Access Systems

Dear Paul:

I am pleased to inform you that on 11 September 2003 the IEEE-SA Standards Board approved the above referenced project until 31 December 2006. A copy of the file can be found on our website at http://standards.ieee.org/board/nes/projects/802-16-REVd.pdf.

Now that your project has been approved, please forward a roster of participants involved in the development of this project. This request is in accordance with the IEEE-SA Operations Manual, Clause 5.1.2f under Duties of the Sponsor which states:

"Submit annually to the IEEE Standards Department an electronic roster of individuals participating on standards projects"

For your convenience, an Excel spreadsheet for your use has been posted on our website at http://standards.ieee.org/guides/par/roster.xls. Please forward this list to me via e-mail at j.haasz@ieee.org no later than 9 December 2003.

Please visit our website, IEEE Standards Development Online (http://standards.ieee.org/resources/development/index.html), for tools, forms and training to assist you in the standards development process. Also, we strongly recommend that a copy of your draft be sent to this office for review prior to the final vote by the working group to allow for a quick review by editorial staff before sponsor balloting begins.

If you should have any further questions, please contact me at 732-562-6367 or by email at j.haasz@ieee.org.

Sincerely,

Jodi Haasz
Program Manager
International Stds Programs and Governance
Standards Activities
Phone +1 732 562 6367
FAX +1 208 460 5300
Email: j.haasz@ieee.org

cc: r.b.marks@ieee.org

PAR FORM

PAR Status: Revision of Revision PAR
PAR Approval Date: 2003-09-11
PAR Signature Page on File: Yes
Review of Standards Development Process: No

1. Assigned Project Number: 802.16-REVd

2. Sponsor Date of Request: 2003-06-20

3. Type of Document: Standard for

4. Title of Document:
Draft: Standard for Local and metropolitan area networks - Part 16: Air Interface for Fixed Broadband Wireless Access Systems

5. Life Cycle: Full Use

6. Type of Project:
6a. Is this an update to an existing PAR? Yes
If Yes: Indicated PAR number/approval date: P802.16d-12/11/2002
If Yes: Is this Project in Ballot now? No
6b. The Project is a: Revision of Std 802.16-2001

7. Contact Information of Working Group:
Name of Working Group: IEEE 802.16 Working Group on Broadband Wireless Access
Name of Working Group Chair: Roger B Marks
Telephone: 303-497-3037 **FAX:** 509-756-2642
Email: r.b.marks@ieee.org

8. Contact Information of Official Reporter (If different than Working Group Chair)
Name of Official Reporter: (if different than WG contact)
Telephone: FAX:
Email:

9. Contact Information of Sponsoring Society or Standards Coordinating Committee:
Name of Sponsoring Society and Committee: Computer Society Local and Metropolitan Area Networks
Name of Sponsoring Committee Chair: Paul Nikolich
Telephone: 857-205-0050 **FAX:** 781-334-2255
Email: paul.nikolich@att.net
Name of Liaison Rep. (If different than Sponsor Chair):
Telephone: FAX:
Email:

10. The Type of ballot is: Individual Sponsor Ballot
Expected Date of Submission for Initial Sponsor Ballot: 2003-11-21

11. Fill in Projected Completion Date for Submittal to RevCom: 2004-03-19
Explanation for Revised PAR that Completion date is being extended past the original four-year life of the PAR:

12. Scope of Proposed Project:

This revised standard specifies the air interface, including the medium access control layer and multiple physical layer specifications, of fixed broadband wireless access systems supporting multiple services. It consolidates IEEE Standards 802.16, 802.16a, and 802.16c, retaining all modes and major features without adding modes. Content is added or revised to improve performance, ease deployment, or replace incorrect, ambiguous, or incomplete material, including system profiles.

13. Purpose of Proposed Project:

This standard enables rapid worldwide deployment of innovative, cost-effective, and interoperable multivendor broadband wireless access products, facilitates competition in broadband access by providing alternatives to wireline broadband access, ecnourages consistent worldwide spectrum allocations, and accelerates the commercialization of broadband wireless access systems.

14. Intellectual Property:

Sponsor has reviewed the IEEE patent policy with the working group? Yes
Sponsor is aware of copyrights relevant to this project? Yes
Sponsor is aware of trademarks relevant to this project? No
Sponsor is aware of possible registration of objects or numbers due to this project? No

15. Are there other documents or projects with a similar scope? No

Similar Scope Project Information:

16. Is there potential for this document (in part or in whole) to be submitted to an international organization for review/adoption? Do not Know

If yes, please answer the following questions:

Which International Organization/Committee?

International Contact Information?

17. If the project will result in any health, safety, or environmental guidance that affects or applies to human health or safety, please explain, in five sentences or less. No

18. Additional Explanatory Notes: (Item Number and Explanation)

February 25, 2000

Dr. Roger B. Marks
IEEE 802.16 Working Group on Broadband Wireless Access Standards
325 Broadway MC 813.00
Boulder, CO 80303
mailto: r.b.marks@ieee.org

Dear Dr. Marks:

I hereby grant permission to the Institute of Electrical and Electronics Engineers, Inc., to modify the below listed source material and to include the modified or unmodified material in the specified standards project:

802.16.1 Air Interface for Fixed Broadband Wireless Access Systems

Source material:

1. Radio Frequency Interface Specification (version 1.1), part of Data-Over-Cable Service Interface Specifications, © Copyright 1999, Cable Television Laboratories
   Sections 4, 5, 6, 7, 8, 9 and Appendices A through Q.

2. Baseline Privacy Plus Interface Specification, © Copyright 1999, Cable Television Laboratories.
   Entire document.

The permission to use this material is granted for world rights for distribution and applies to all future revisions and editions in all media known or hereinafter known. No other intellectual property rights in the Specifications are granted.

_____ _____

Dorothy Gill Raymond
Cable Television Laboratories, Inc.
Senior Vice President and General Counsel

Date

Credit Line and Placement Requested:

"Reprinted with permission from Cable Television Laboratories, Inc.", wherever CableLabs material appears.

Ballot Summary

P802.16-REVd
Closing date: 2004-03-13

1. This ballot has met the 75% returned ballot requirement.

```
    80 eligible people in this ballot group.


    50 affirmative votes
    11 negative votes with comments
     0 negative votes without comments
     1 abstention votes
=====
    62 votes received =  77% returned
                          1% abstention
```

2. The 75% affirmation requirement is being met.

```
    50 affirmative votes
    11 negative votes with comments
=====
    61 votes =  81% affirmative
```

Ballot Details

Coordination Responses Only

IEEE/Coord Number	Name	Role	Phone / E-mail	Coordination Ballot Received	Coordination Comment(s) Received
	Bruce Barrow		SCC14	yes	yes
	Editorial Coordinator	Editorial		yes	yes
	SCC10 Coordinator		SCC10	-	-

IEEE 802.16 Working Group on Broadband Wireless Access

http://WirelessMAN.org

Dr. Roger B. Marks
325 Broadway, MC 813.00
Boulder, CO 80305 USA
Tel: +1 303 497 3037
mailto:r.b.marks@ieee.org
29 March 2004

Dear P802.16-REVd Balloting Group:

Thank you for your participation in the Sponsor Ballot of P802.16-REVd, which ran from 12 February to 13 March 2004.

A number of comments were submitted. Resolutions were developed by the IEEE 802.16 Working Group on Broadband Wireless Access, acting as the Ballot Resolution Committee, during the Working Group's regularly scheduled session of 15-18 March 2004. 220 people, including 82 of the Working Group's 90 members, attended the session.

As a result of comment resolution, 10 of the 11 original Disapprove voters (Naftali Chayat, Marianna Goldhammer, David Johnston, Tal Kaitz, Jonathan Labs, Yossi Segal, Neil Shipp, Shawn Taylor, Vladimir Yanover, and Cor van de Water) indicated satisfaction with the resolutions and indicated a change in their vote to Approve. At this point, the tally is 60 Approve, 1 Disapprove, 1 Abstain, and 18 not voting. By virtue of these numbers, the ballot is considered to have passed, pending recirculation.

We are requesting that the IEEE Balloting Center initiate a fifteen-day recirculation of the new draft P802.16-REVd/D4 (file **P80216-REVd_D4delta.pdf**), with all changes indicated, along with the sole outstanding Disapprove comment and its resolution. That comment is detailed on the following page of this letter.

Please take this opportunity to review the material. You are not obligated to reply; if you do not, your current vote will stand. Based on the changes to the draft or on the Disapprove comment and responses, you may change your vote and/or submit additional comments. If you wish to re-vote or comment, please keep the deadline in mind. Instructions have been provided by the IEEE Balloting Center.

If you were one of the voters agreeing to switch from Disapprove to Approve based on comment resolution, I request that you confirm your decision by submitting a ballot.

Sincerely,

Roger Marks
Chair, IEEE 802.16 Working Group on Broadband Wireless Access

Ballot Group Member: *Nico van Waes*
Comment Type: *Technical, Binding*
Starting Page #: *437*

Comment:
It seems that the reader is left to guess what the PHY mod IE is meant for, especially since it's applied so sweepingly even though it's only useful for AAS in certain cases. There is absolutely no use for it in non-AAS cases, except to needlessly increase complexity.

Suggested remedy:
Make the PHYsical modifier IE mandatory with the implemenation of AAS only.
Allow usage only during the AAS portion of the frame.
State clearly what its purpose it. State for example that the BS should set each shift to substantially exceed the duration of the major multipath components to allow seperate detection of simultaneously received (synchronous) transmissions.

Reason for group's decision/resolution:
Vote to accept the proposed resolution
In favor:16
Against: 13
Fails (By Sponsor rules, 75% approval required for change)

Reason for rejection:
The functionality provided by the physical modifier IE is instrumental in reducing co-channel interference effects in aggresive frequency reuse situations and allows simultanious reception from more than one subscriber station at a time. These advantages are gained with relatively minor complexity increase in the subscriber station. It is therefore justified to retain this capability as mandatory.

Ballot Summary

P802.16-REVd Recirculation/D4
Closing date: 2004-04-15

This is a recirculation ballot. The report collates the results from the following groups: 0000640 0000755.

1. This ballot has met the 75% returned ballot requirement.

```
    80 eligible people in this ballot group.


    50 affirmative votes
    10 negative votes with comments
     0 negative votes without comments
     2 abstention votes
=====
    62 votes received =  77% returned
                          3% abstention
```

2. The 75% affirmation requirement is being met.

```
    50 affirmative votes
    10 negative votes with comments
=====
    60 votes =  83% affirmative
```

Ballot Details

Coordination Responses Only

IEEE/Coord Number	Name	Role	Phone / E-mail	Coordination Ballot Received	Coordination Comment(s) Received
	Bruce Barrow	SCC14		yes	yes
	Editorial Coordinator	Editorial		yes*	yes
	SCC10 Coordinator				

IEEE 802.16 Working Group on Broadband Wireless Access

http://WirelessMAN.org

Dr. Roger B. Marks
325 Broadway, MC 813.00
Boulder, CO 80305 USA
Tel: +1 303 497 3037
mailto:r.b.marks@ieee.org
12 May 2004

Dear P802.16-REVd Balloting Group:

Thank you for your participation in the Sponsor Ballot of P802.16-REVd. The first recirculation of this ballot ran from 1-15 April 2004. A number of comments were submitted. Resolutions were developed by a Ballot Resolution Committee comprised of the 90 members of the IEEE 802.16 Working Group on Broadband Wireless Access.

As a result of comment resolution, 8 of the 10 recirculation Disapprove voters (Naftali Chayat, Marianna Goldhammer, David Johnston, Tal Kaitz, Vladimir Yanover, Yossi Segal, Shawn Taylor, and Cor van de Water) indicated satisfaction with the resolutions and indicated a change in their vote to Approve. At this point, the tally is 58 Approve, 2 Disapprove, and 2 Abstain. Of the two remaining Disapprove voters, Neil Shipp is satisfied with the resolutions of his comments but has not yet indicated an intent to vote Approve. Nico van Waes has not responded to the comment resolutions yet. By virtue of the voting numbers, the ballot is considered to have passed, pending recirculation.

We are requesting that the IEEE Balloting Center initiate a fifteen-day recirculation of the new draft P802.16-REVd/D5, along with the four outstanding Disapprove comments (all from Nico van Waes) and their resolution. Those comment are detailed on the following pages.

Please take this opportunity to review the material. You are not obligated to reply; if you do not, your current vote will stand. Based on the *changes* to the draft or on the Disapprove comments and responses, you may change your vote and/or submit additional comments. If you wish to re-vote or comment, please keep the deadline in mind. Instructions have been provided by the IEEE Balloting Center.

If you were one of the voters agreeing to switch from Disapprove to Approve based on comment resolution, I request that you confirm your decision by submiting a ballot.

Sincerely,

Roger Marks
Chair, IEEE 802.16 Working Group on Broadband Wireless Access

Document under Review: P802.16-REVd/D4 **Ballot Number:** 0000755 **Comment Date**

Comment # 004 **Comment submitted by:** Nico van Waes Member 2004/04/15

Comment Type Technical, Binding **Starting Page #** 1 **Starting Line #** **Fig/Table#** **Section**

The removal of the lower limit on applicable frequencies violates the 16-REVd PAR.

The scope of the 16-REVd PAR reads:
This revised standard specifies the air interface, including the medium access control layer and multiple physical layer specifications, of fixed broadband wireless access systems supporting multiple services. It consolidates IEEE Standards 802.16, 802.16a, and 802.16c, retaining all modes and major features without adding modes. Content is added or revised to improve performance, ease deployment, or replace incorrect, ambiguous, or incomplete material, including system profiles.

The scope of the 16a PAR reads:
This standard specifies the physical layer and medium access control layer of the air interface of interoperable fixed point-to-multipoint (and, in license-exempt bands, optional mesh topology) broadband wireless access systems (e.g., those supporting data rates of DS1/E1 or greater). The specification enables access to data, video, and voice services with a specified quality of service in licensed bands designated for public network access and license-exempt bands. It applies to systems operating between 2 and 11 GHz, where such services are permitted. This Amendment expands the scope of the IEEE Standard 802.16 by extending it to bands between 2-11 GHz, whereas the scope of the original project was limited to 10-66 GHz.

From the 16a PAR, it is clear that the scope is limited to 2-11 GHz whereas the scope of the original project was 10-66 GHz. The total scope of the revision is hence 2-66 GHz, with permitted modifications as per the 16-REVd PAR. The 16-REVd PAR allows modifications which are not deletions of modes or features or additions of modes, but which fall into the category of performance improvements, deployment easements, or replacement of ambiguous, incorrect or incomplete material.

The removal of the lower frequency limit is not a performance improvement. It also is not related to easing deployment. The language in the standard limiting the frequency band was neither ambiguous, incorrect (as it adhered to the 16a PAR) or incomplete. The removal of this language therefore violates the 16-REVd PAR.

The notion that this limit could be deleted because it is not explicitly called out is nonsense. The requirement that a scope statement be limited to 5 lines of text makes it per definition impossible to crunch all components of the scopes of multiple PARs (the original standard and the various amendments) into a single scope. The notion is also not relevant, because the 16-REVd PAR states explicitly what is open for revision. The frequency limit removal falls in none of those categories.

As a matter of principle, it is important for scopes of Revisions (or any project for that matter) to be interpreted narrowly , as the precedent of an open-ended interpretation makes the undertaking of a Revision too risky for the members of most WGs to consider. The result will be a standards-process in which WGs produce increasingly unreadable amendments with occassional affirmation ballots and refuse to produce regular revisions for fear of leaving legal loopholes to be exploited (something already somewhat evident in certain 802 WGs).

Suggested Remedy

Undo changes implemented per comments:
004
005
015
016
017
020
021
022
023
024
025
026
030
031
184
236
239
240
261
333
437
438
448
449
450

Proposed Resolution Recommendation: **Accepted** Recommendation by Nico van Waes

Undo changes implemented per comments:
004
005
015
016
017
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026
030
031
184
236
239
240
261
333
437
438
448
449
450

Reason for Recommendation

The notion that the majority view is in favor of this is irrelevant, because the majority also was in favor of the PARs when those were established. A PAR is a document that binds and limits the WG, and can only be adjusted for the changing view of the WG (which is evident) by changing the language of the PAR itself.

The notion that it is an informative item is nonsense. One could in the same fashion claim that this standard is applicable to WLANs, PANs, satellite communications etc, since applicability is supposedly informative anyway. With varying effectiveness, a communication system can after all be used for just about any application.

As noted before, the 2 GHz limit does not need to be in the REVd PAR, because the REVd PAR limits the changes that can be made to the standard as based on previous PARs. The notion that it eases deployment is a transparent excuse. There is not a single country that does have frequency bands for broadband fixed access available below 2 GHz but not between 2 and 11 GHz (though the contrary is true in various nations). That premise hence already falls apart on first inspection. Naturally, one cannot logically claim ease of deployment for instances that were strictly outside the scope of the standard as originally written.

Decision of Group **Rejected**

Resolution of Group

BRC Vote - Accept: 0 / Reject: 51 / Abstain: 1
Approval Ratio: 0

Rationale (by the Working Group Chair; not reviewed by Ballot Resolution Committee):
This comment was rejected by unanimous vote of the Ballot Resolution Committee (0 Accept, 51 Reject).

The P802.16-REVd PAR Scope does not limit the standard to frequencies above 2 GHz, so lower frequencies are within the Scope. Also, the Scope says that content may be added to "ease deployment." Operation below 2 GHz could certainly ease deployment in some cases, such as when only such frequencies are available."

Document under Review: P802.16-REVd/D4 **Ballot Number:** 0000755 **Comment Date**

Comment # 135 **Comment submitted by:** Nico van Waes Member 2004/04/15

Comment Type Technical, Binding **Starting Page #** 433 **Starting Line #** **Fig/Table#** **Section**

In comment 314, I proposed making the PHY_MOD_IE applicable only to AAS, where its use is obvious.

The response was that it might be used to reduce co-channel interference and provision simultaneous reception.

I do agree that it would lead to an improved channel estimate in the case of simultaneous reception. Since the reception in the co-channel interference case is non-synchronous due to different propagation durations from other cells (even if the BSs in the cells are synchronized), I don't see the gain in the co-channel case.
In the case of simultaneous reception, the channel estimate will be improved, but the signal to interference ratio of the data pieces of the bursts will be 0 dB.
I could envision a system with multiple co-located sectors, where you created AAS like spatial gain to get a better SIR on the data part, but the need to synchronize all uplink bursts (to get this minor preamble diversity) seems an usually high price to pay.

In other words, I don't believe the response to be accurate for co-channel interference, and impractical for simultaneous reception.

Suggested Remedy

Please reconsider comment 314

Proposed Resolution Recommendation: **Accepted-Modified** Recommendation by Nico van Waes

Change to
The PHYMOD_IE can appear anywhere in the UL map after the AAS UL IE, and it shall remain in effect until another PHYMOD_IE is encountered, or until the end of the UL map.

Establish the DL PHY mod IE as an optional capability: Indicate in bit#4 of 11.8.3.6.2 OFDM SS demodulator.
State that it shall have value 1 if bit#3 is set to 1.

Reason for Recommendation

Motivation for retaining the UL PHY mod IE for non-AAS devices has not been convincingly established in terms of advantages and has not been convincingly been countered in terms of noted substantial disadvantages.

Retaining the DL PHY mod IE is not so much of an issue, because it's a BS scheduling choice whether to use it. The training data will inherently be nicely synchronized, which creates no problems. An SS only has to understand that if it obtains DL-MAP_IE's after a concurrent_IE, that the list of IE's can be terminated by either a NULL IE (DIUC 14) or another concurrent_IE, and that the duration of the last burst before termination is either determined by the start time of the NULL IE or by the duration of the immediately preceeding concurrent_IE (which we'll assume not to conflict for the last burst in the entire DL-MAP). Since for some implementations, it's a nuisance, it is trivial to make it optional without additional overhead, such that the BS can schedule this for devices that support it and schedule non-concurrent bursts for devices that don't.

Decision of Group **Rejected**

Resolution of Group

BRC Vote - Accept: 32 / Reject: 32 / Abstain: 0
Approval Ratio: .5

Rationale (by the Working Group Chair; not reviewed by Ballot Resolution Committee):
Members of the Ballot Resolution Committee responded to this comment in written form. Some of the responses addressed the added complexity this change would require. The commentor replied with a revised version of the comment, to address the concerns. Acceptance of the comment was voted upon by the Ballot Resolution Committee, failing by a margin of 21 Accept/ 27 Reject. The commentor was offered another opportunity to revise the comment but did not do so. Approval of the comment was then put to a second vote of the Ballot Resolution Committee, with the vote 32 Accept/32 Reject. The comment was therefore rejected for lack of a 75% approval ratio.

Based on initial voting by the BRC, revision of the comment was invited for reconsideration. No revision was provided, so the version of the comment first voted upon was identical to the one reconsidered. The results of the first vote were:

BRC Vote - Accept: 21 / Reject: 27 / Abstain: 0
Approval Ratio: .438

Document under Review: P802.16-REVd/D4 **Ballot Number:** 0000755 **Comment Date**

Comment # 154 **Comment submitted by:** Nico van Waes Member 2004/04/15

Comment Type Technical, Binding **Starting Page #** 453 **Starting Line #** **Fig/Table#** **Section**

In comment 321, I noted that an inconsistency exists between the language in 8.3.6, the language in 11.8.2.2, and the actual parameters in 11.8.2.2.
The description talks about power levels, while the parameters are backoff values.
When backoff values are reported, the peak value (P1dB or so) against which these backoff values are applied is missing as well.

The group response is a rejection because of lack of text. The WG can however not reject the observation of an inconsistency by a sponsor ballot member on that basis, because it cannot publish a standard with known and observed errors.

In my view, one can either report max. power values for each modulation, or backoffs with a value to backoff from, but in either case, the text in the referenced places must be consistent.

Suggested Remedy
Fix error.

Proposed Resolution Recommendation: **Accepted-Modified** Recommendation by Nico van Waes
Change the table in 11.8.3.2 to
Byte 0: Maximum transmitted power for BPSK.
Byte 1: Maximum transmitted power for QPSK.
Byte 2: Maximum transmitted power for QAM16.
Byte 3: Maximum transmitted power for QAM64. SSs that do not support 64-QAM shall report the value 0x00.

Decision of Group **Accepted**

Resolution of Group

BRC Vote - Accept: 24 / Reject: 0 / Abstain: 10
Approval Ratio: 1

Rationale (by the Working Group Chair; not reviewed by Ballot Resolution Committee):
Members of the Ballot Resolution Committee responded to this comment in written form. The commentor responded with a modified version of the comment, detailing the specific change request. Comment was voted upon by Ballot Resolution Committee and approved unanimously (24 Accept/ 0 Reject). Ballot Resolution Committee considers the comment closed but has not received formal notification by commentor.

Document under Review: P802.16-REVd/D4 **Ballot Number:** 0000755 **Comment Date**

Comment # 368 **Comment submitted by:** Nico van Waes Member 2004/04/15

Comment Type Technical, Binding **Starting Page #** 737 **Starting Line #** **Fig/Table#** **Section**

In Table B.28, Tb for 10 MHz OFDM is listed as 22.4 us.
In Table 364, Tb for 10 MHz OFDM is listed as 22 146/357
In 8.3.2.2, Tb for 10 MHz OFDM is defined as 256/ (floor(1.44/1.25*10/0.008)*0.008) = 22 2/9

As a sidenote, I'm thinking that it's not going to be easy to design clocking trees for the awkward clock rates resulting from "n" in Table 208.

Suggested Remedy

Ensure that for the OFDM PHY, Tb and related numbers are consistent throughout standard with whatever equation is provided in 8.3.2.2.

Proposed Resolution Recommendation:**Superceded** Recommendation by Nico van Waes

Superceded by the acceptance of 96

Decision of Group **Accepted**

Resolution of Group

BRC Vote - Accept: 10 / Reject: 2 / Abstain: 9
Approval Ratio: .833

Rationale (by the Working Group Chair; not reviewed by Ballot Resolution Committee):
Members of the Ballot Resolution Committee responded to this comment in written form. The commentor responded by requesting that his comment be marked Superceded because another comment (Comment 096) had taken precedence. The implication was this comment would become irrelevant due to the acceptence of Comment 096, which was indeed accepted. Ballot Resolution Committee considers the comment closed, but has not received formal notification by commentor.

Document under Review: P802.16-REVd **Ballot Number:** 0000640 **Comment Date**

Comment # 007 **Comment submitted by:** Michelle Turner Other 2204-03-02

Comment Type Editorial **Starting Page #** iv **Starting Line #** **Fig/Table#** **Section**

Upon editorial review of IEEE P802.16-REVd/D3.1, I have the following comments.

1) In the introduction the sentence should appear as follows

(This introduction is not part of IEEE P802.16-REVd, title.)

2) If figures and tables were derived or obtained from sources other than the Working Group, please obtain and supply permission from the appropriate sources. Please see Clause 7 of the IEEE Style Manual for text required when trademarks or patents exists.

3) At the time of RevCom submittal please remember to supply a separate electronic file for each graphic in TIFF, GIF, EPS, or WMF formats.

Suggested Remedy

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** **Accepted**

The implementation of this comment will be done following the implementation of comment #3

Reason for Group's Decision/Resolution

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions** I) none needed

Editor's Questions and Concerns

Editor's Action Items

Document under Review: P802.16-REVd **Ballot Number:** 0000640 **Comment Date**

Comment # 002 **Comment submitted by:** James Frysinger Other 2004-03-13

Comment Type Editorial/Coordination **Starting Page #** Gen **Starting Line #** **Fig/Table#** **Section**

SCC14 comments on P802.16-REVd/D3-2004

Throughout: Signal levels are to be specified in dB, according to various clauses. I could not readily find in this 811 page document the base level to which those log ratios would be calculated. I suggest that due to the massive nature of the document, the basis for such levels be given with the requirements.

Suggested Remedy

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** **Accepted-Modified**

Make the following changes:
Page 45, line 26:
change :
"Transmit power (dBm)"

Page 756, line 1:
change:
"In Table B.23, the thermal noise level has been assumed –204 dBW/Hz whereas the Rx noise factor is assumed to be 5 dB."

Reason for Group's Decision/Resolution

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions** k) done

Editor's Questions and Concerns

Editor's Action Items

Document under Review: P802.16-REVd **Ballot Number:** 0000640 **Comment Date**

Comment # 070 **Comment submitted by:** James Frysinger Other 2004-03-13

Comment Type Editorial/Coordination **Starting Page #** 43 **Starting Line #** **Fig/Table#** **Section** 6.3.2.1.1.2

SCC14 comments on P802.16-REVd/D3-2004

6.3.2.1.1.2, et al., p. 43 et seq: The symbol Mbps is used for megabits per second. The correct symbol is Mb/s if the intent is to symbolize 1 000 000 bits per second. If, however, 10242 bits per second are intended, the symbol would be Mib/s, for mebibits per second. The context suggests that the latter may be the case; error rates are calculated on a basis of 256 bits. Note that in table 143 (in clause 8.1.6) the symbol Mbit/s is used. [ref: SI 10-2002 clause 3.5.3.2, IEEE Std 1541]

Suggested Remedy

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** **Accepted-Modified**

Use the term Mbps for mega bits per second thoughout the document

Reason for Group's Decision/Resolution

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions** k) done

also added definitions
Mbps megabit per second
MBdps megabaud per second

Changed MSymbol/s to MBdps

Editor's Questions and Concerns

Editor's Action Items

Document under Review: P802.16-REVd **Ballot Number:** 0000640 **Comment Date**

Comment # 230 **Comment submitted by:** James Frysinger Other 2004-03-13

Comment Type Editorial/Coordination **Starting Page #** 331 **Starting Line #** **Fig/Table#** 147 **Section** 8.1.8.1.1

SCC14 comments on P802.16-REVd/D3-2004

In table 147 and in this clause, B is used for the symbol for channel symbol rate in MBd. Note that this is the symbol for byte. So, the entries 400/B and 800/B in the table seem at first glance to be awry. Could a different symbol be used for channel symbol rate? It would help, of course, if the practice of putting quantity symbols in slanted type to distinguish them from unit symbols (in upright type) were followed. In 8.2.3.2, the quantity symbol SR is apparently used to mean the same thing. Or is this somehow a different quantity?

Suggested Remedy

SCC14 comments on P802.16-REVd/D3-2004

In table 147 and in this clause, B is used for the symbol for channel symbol rate in MBd. Note that this is the symbol for byte. So, the entries 400/B and 800/B in the table seem at first glance to be awry.
Could a different symbol be used for channel symbol rate? It would help, of course, if the practice of putting quantity symbols in slanted type to distinguish them from unit symbols (in upright type) were followed.
In 8.2.3.2, the quantity symbol SR is apparently used to mean the same thing.
Or is this somehow a different quantity?

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** **Accepted-Modified**

Section 8.1.8.1.1

Change every instace of "B" with "*R*"

Reason for Group's Decision/Resolution

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions** k) done

Editor's Questions and Concerns

Editor's Action Items

Document under Review: P802.16-REVd **Ballot Number:** 0000640

Comment #	Comment submitted by:			Comment Date
250	James	Frysinger	Other	2004-03-13

Comment Type Editorial/Coordination **Starting Page #** 399 **Starting Line #** **Fig/Table#** **Section** 8.2.3.2

SCC14 comments on P802.16-REVd/D3-2004

The unit symbol Msymb/s is used. How does this differ from Mbd?

Suggested Remedy

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** **Accepted-Modified**

Throughout the document replace "Msymb" with "MBd" where appropriate

Reason for Group's Decision/Resolution

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions** k) done

Editor's Questions and Concerns

Editor's Action Items

Document under Review: P802.16-REVd **Ballot Number:** 0000640 **Comment Date**

Comment # 373 **Comment submitted by:** James Frysinger Other 2004-03-13

Comment Type Editorial/Coordination **Starting Page #** 581 **Starting Line #** **Fig/Table#** **Section** 8.4.13.3

SCC14 comments on P802.16-REVd/D3-2004

The symbol dBm is used. The proper unit symbol is dB. If there is a need to distinguish the quantity, it should be done with the quantity name and symbol, not the unit name and symbol. [ref: SI 10-2002 clause 3.5.5]

Suggested Remedy

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** Accepted

Reason for Group's Decision/Resolution

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions** e) editor disagrees

This comment was entered by mistake under the editorial block.
I don't agree with the comment and think that dBm is more appropriate in the specific context since it refered an absolute value and not a relative value.

Editor's Questions and Concerns

Editor's Action Items

Document under Review: P802.16-REVd Ballot Number: 0000640

Comment #	Comment submitted by:			Comment Date
374	James	Frysinger	Other	2004-03-13

Comment Type	Starting Page #	Starting Line #	Fig/Table#	Section
Editorial/Coordination	581			8.4.14.1

SCC14 comments on P802.16-REVd/D3-2004

The symbol ppm is used. This should be avoided. [ref: SI 10-2002 clause 3.4.8]

Suggested Remedy

SCC14 comments on P802.16-REVd/D3-2004

The symbol ppm is used. This should be avoided. [ref: SI 10-2002 clause 3.4.8]

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** **Accepted**

Reason for Group's Decision/Resolution

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions** e) editor disagrees

This comment was entered by mistake under the editorial block.
This is not the only place which ppm is used. No appropriate substitute symbol is suggested.

Editor's Questions and Concerns

Editor's Action Items

Document under Review: P802.16-REVd **Ballot Number:** 0000640 **Comment Date**

Comment # 431 **Comment submitted by:** James Frysinger Other 2004-03-13

Comment Type Editorial/Coordination **Starting Page #** 650 **Starting Line #** **Fig/Table#** **Section** 11.13.9

SCC14 comments on P802.16-REVd/D3-2004

In the display table, the value shown is “B (bytes)”. Is that B meant to be the accepted symbol for byte? If so, there should be no need to indicate its meaning. On the other hand, if this is the “B” referred to in 8.1.8.1.1, then the units for the channel symbol rate, *B*, should be in bauds. (No slanted type was used in the standard; that was done here for clarity.)

Suggested Remedy

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** **Accepted-Modified**

Page 650, line 39, change :
"Burst size (bytes)"

Reason for Group's Decision/Resolution

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions** k) done

Editor's Questions and Concerns

Editor's Action Items

Document under Review: P802.16-REVd **Ballot Number:** 0000640 **Comment Date**

Comment # 432 **Comment submitted by:** James Frysinger Other 2004-03-13

Comment Type Editorial/Coordination **Starting Page #** 651 **Starting Line #** **Fig/Table#** **Section** 11.13.10

SCC14 comments on P802.16-REVd/D3-2004

Various unit symbol usages here are not in accordance with standards. The symbol for second is s, not sec; the latter is an abbreviation and not a symbol. This clause mixes a name and a abbreviation with a solidus (bits/sec). The proper form would be b/s or bits per second. [ref: SI 10-2002 clause 3.5.3.2, table A.1; IEEE Std 1541]

Suggested Remedy

SCC14 comments on P802.16-REVd/D3-2004

Various unit symbol usages here are not in accordance with standards. The symbol for second is s, not sec; the latter is an abbreviation and not a symbol. This clause mixes a name and a abbreviation with a solidus (bits/sec). The proper form would be b/s or bits per second. [ref: SI 10-2002 clause 3.5.3.2, table A.1; IEEE Std 1541]

Proposed Resolution **Recommendation:** **Recommendation by**

Reason for Recommendation

Resolution of Group **Decision of Group:** Accepted

Reason for Group's Decision/Resolution

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions** I) none needed

Editor's Questions and Concerns

Editor's Action Items

Document under Review: P802.16-REVd/D4 **Ballot Number:** 0000755 **Comment Date**

Comment # 370 **Comment submitted by:** James R. Frysinger Other 2004-04-07

Comment Type Coordination **Starting Page #** 999 **Starting Line #** **Fig/Table#** **Section**

SCC14 Coordination Comments on P802.16-REVd/D4
Part 16: Air Interface for Fixed Broadband Wireless Access Systems
2004 April 07

Two forms of expression for bits per second are used, both of which are not in accordance with the standards for forming the quotient of two units. One is Mbps (as in clause 1.3.1 and elsewhere) and one is bits/s (as in equation 7 of clause 6.4.2.4.38 and elsewhere). The solidus should be used in lieu of “p” to indicate division of units in symbolic form and “per” should be used when unit names are spelled out, and then all unit names should be spelled out. Thus, we would have Mb/s and b/s (or bits per second).

Throughout the document, dBm is used. Units are not modified to indicate the nature of the quantity. Nor are logarithmic units modified to indicate reference level. In each case, the quantity name or symbol is modified. (See IEEE Std 260.1-2003, in press, for examples of the latter matter.)

Throughout the document, ppm is used. This has an ambiguous meaning since “million” has ambiguous meaning. It would be better to use a quotient. For example, in Table 155, one could use ms/s (microsecond per second) for the units of the time value.

In equation 124 of clause 8.4.11.2, the unit mWatt appears. The proper form would be either mW or milliwatt.

Possibly due to an artifact of the PDF making process, there appears to be an extraneous space in the expression 200 ms in table 347. It seems to be written as 200 m s.

James R. Frysinger
Vice Chair, SCC14
j.frysinger@ieee.org

Suggested Remedy

Proposed Resolution **Recommendation:** Accepted-Modified **Recommendation by** Roger Marks

* Throughout the draft, replace all instances of "Mbps" with "Mb/s" and "bps" with "b/s".

* Throughout the draft, replace all instances of "mWatt" with "mW"

* Change "5GHz" to "5 GHz" at Page 319 Line 26 and Page 557 Line 21

* Address "ppm" comment by making the following changes:

- Page 318 Line 61 - change:
"shall have an absolute accuracy better than ±10 ppm" to:
"shall have an accuracy better than ±10*10-6"

- Page 318 Line 64 - change:
"absolute carrier frequency accuracy for the BS shall be better than ±8 ppm" to:
"carrier frequency accuracy for the BS shall be better than ±8*10-6"

- Page 319 Line 1 - change:
"carrier frequency accuracy for the BS shall be ±8 ppm." to:
"carrier frequency accuracy for the BS shall be better than ±8*10-6."

- Page 319 Line 4 - change:
"The relative accuracy of the SS shall be better than ±1 ppm with respect to the BS." to:
"The carrier frequency of the SS shall be within ±1*10-6 of that of the BS."

- Page 319 Line 53 - change:
"The Tx symbol timing accuracy shall be within ± 8 ppm of its nominal value" to:
"The Tx symbol timing shall be accurate to within ±8*10-6"

- Page 319 Line 56 - change:
"± 8 ppm" to:
"±8*10-6"

- Page 396 Line 40 - change:
"RF channel frequency accuracy for an SS shall be within ± 15 ppm of the selected RF carrier" to:
"RF channel frequency accuracy for an SS shall be within ±15*10-6 of the selected RF carrier"

- Page 396 Line 42 - change:
"The frequency accuracy for a BS shall be within ± 8 ppm of the selected RF carrier" to:
"The frequency accuracy for a BS shall be within ±8*10-6 of the selected RF carrier"

- Page 462 Line 55 - change:
"all devices shall have a ± 20 ppm maximum frequency tolerance" to:
"all device frequencies shall be accurate to within ±20*10-6"

- Page 555 Line 55 - change:
"At the BS the reference frequency tolerance shall be ± 2ppm. " to:
"At the BS, the reference frequency accuracy shall be better than ±2*10-6."

- Page 555 Line 52 - change:
"all devices shall have a ± 20 ppm maximum frequency tolerance" to:
"all device frequencies shall be accurate to within ±20*10-6"

- Page 661 Line 48 - change:
"Tx RF frequency accuracy ± 10 ppm" to:
"Tx RF frequency accuracy ±10*10-6"

- Page 667 Line 5 - change:
"Tx RF frequency accuracy ± 10 ppm" to:

"Tx RF frequency accuracy ±10*10-6"

- Page 672 Line 20 - change:
"RF frequency accuracy ± 15 ppm of RF frequency" to:
"RF frequency accuracy ±15*10-6"

- Page 673 Line 54 - change:
"Reference frequency tolerance, BS +/- 8 ppm" to:
"Reference frequency accuracy, BS ±8*10-6"

- Page 686 Line 22 - change:
"Reference frequency tolerance, BS +/- 8 ppm" to:
"Reference frequency accuracy, BS ±8*10-6"

- Page 686 Line 23 - change:
"Reference frequency tolerance, Mesh system +/- 20 ppm" to:
"Reference frequency accuracy, Mesh system ±20*10-6"

- Page 698 Line 29 - change:
"Reference frequency tolerance, BS +/- 1 ppm" to:
"Reference frequency accuracy, BS ± 1*10-6"

- Page 699 Line 61 - change:
"Reference frequency tolerance, BS +/- 4 ppm" to:
"Reference frequency accuracy, BS ± 4*10-6"

- Page 700 Line 34 - change:
"Reference frequency tolerance, BS +/- 4 ppm" to:
"Reference frequency accuracy, BS ± 4*10-6"

- Page 701 Line 35 - change:
"Reference frequency tolerance, BS +/- 4 ppm" to:

- Page 701 Line 35 - change:
"Reference frequency tolerance, BS +/- 4 ppm" to:
"Reference frequency accuracy, BS ± 4*10-6"

- Page 702 Line 35 - change:
"Reference frequency tolerance, BS +/- 4 ppm" to:
"Reference frequency accuracy, BS ± 4*10-6"

- Page 703 Line 35 - change:
"Reference frequency tolerance, BS +/- 4 ppm" to:
"Reference frequency accuracy, BS ± 4*10-6"

- Page 704 Line 35 - change:
"Reference frequency tolerance, BS +/- 4 ppm" to:
"Reference frequency accuracy, BS ± 4*10-6" to:

Reason for Recommendation

We accept the important advisory role of SCC14 in reviewing IEEE-SA drafts and appreciate the careful scruntiny. We recognize the importance of following guidance on proper usage of units and symbols.

We agree with the remarks regarding "b/s", "ppm", and "mW" and will implement them.

Regarding the comment about "200 m s" in table 347, there is nothing like this in that table. Perhaps Table 247 was intended? There, no space exists between the "m" and "s". In fact, a search of "200 m s" turns up nothing in the draft.

Regarding dBm, we have considered the comment and the reference to IEEE Std 260.1. However, we are declining to implement this suggestion. The use of "dBm" is consistent with common industry practice when expressing power levels in dB referenced to 1 mW. This usage is readily understood by anyone of ordinary skill in the art. "dBm" is accurately and consistently used in countless pages of standards, datasheets, articles, and textbooks in the industry. It is also extensively used in instruments, components, and software tools for these industries. "dBm" is also defined (as

"Decibels relative to 1 milliwatt") in The IEEE Standard Dictionary of Electrical and Electronics Terms Sixth Edition (IEEE Std 100-1996).

See also Comment 002.

Resolution of Group **Decision of Group:** **Accepted**

Reason for Group's Decision/Resolution

BRC Vote - Accept: 21 / Reject: 0 / Abstain: 7
Approval Ratio: 1

Group's Notes

Group's Action Items

Editor's Notes **Editor's Actions**

Editor's Questions and Concerns

Editor's Action Items