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| Project | **IEEE 802.16** **Broadband Wireless Access Working Group <**<http://ieee802.org/16>**>** |
| Title | ***Report to IEEE 802.16 Working Group on ITU-R WP 5D Meeting #14*** |
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| Re: |  |
| Abstract | This document contains a report to the IEEE 802.16 Working Group on ITU-R WP 5D Meeting #14 of October 2012. The report may be of interest to other groups within IEEE 802. |
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*Report to IEEE 802.16 Working Group on ITU-R WP 5D Meeting #14*

Roger B. Marks

Consensii LLC

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# Abstract

This document contains a report to the IEEE 802.16 Working Group on ITU-R WP 5D Meeting #14 of October 2012. The report may be of interest to other groups within IEEE 802.

# Background and Summary

Working Party 5D (WP 5D) held its Meeting #14 in Woodland Hills, CA, USA on 3-11 October 2012. The Chairman’s Report of the meeting is in [ITU-R 5D/196](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=R12-WP5D-C-0196). A useful summary is provided in the “Executive Report from Working Party 5D” ([ITU-R 5/17](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=R12-SG05-C-0017)). The Working Party progressed work on a vast number of topics, much of it related to mobile spectrum decisions for WRC2015 and for future developments of IMT technology. The scope of the activity is far more extensive than the coverage of this report.

IEEE 802.16 Chair Roger Marks was the only IEEE delegate to the meeting.

**IEEE Contributions**

IEEE had submitted three contributions to this meeting, all developed within the 802.16 Working Group:

* [ITU-R 5D/111](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=R12-WP5D-C-0111) *Update of* *WirelessMAN-Advanced RIT of Recommendation ITU-R M.2012 (**Meeting Y+1)*

* [ITU-R 5D/135](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=R12-WP5D-C-0135) *Response to liaison statement: Review of Report ITU-R M.2039*

* [ITU-R 5D/136](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=R12-WP5D-C-0136) *Initial response to liaison statement to 3GPP and IEEE on parameters for LTE-Advanced and WirelessMAN-Advanced for use in sharing studies*

In addition, an earlier IEEE contribution (also from IEEE 802.16) had been carried over from the prior session:

* + [ITU-R 5D/65](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=R12-WP5D-C-0065) *IMT-2000 OFDMA TDD WMAN submission towards revision 11 of Recommendation ITU-R M.1457 (Meeting X+2)*

**Actions on IMT Specifications**

The following summarizes the actions related to IEEE contributions regarding IMT Specifications:

* ITU-R 5D/65 was considered in Sub-Working Group IMT Specifications as the final step in the update of the *IMT-2000 OFDMA TDD WMAN* radio interface specifications (based on the WirelessMAN-OFDMA air interface in IEEE Std 802.16-2012). Input submitted by the Director of the Radiocommunication Bureau (ITU-R 5D/104 and ITU-R 5D/125) documented that IEEE (and its partner, the WiMAX Forum) has submitted the appropriate transpositions and certifications. Accordingly, the update was agreed for incorporation into the draft of Revision 11 of Recommendation ITU-R M.1457. Meeting #14 concluded the draft and submitted it to Study Group 5 for in November 2012.
* ITU-R 5D/111 was considered in Sub-Working Group IMT-Specifications as the second of three primary steps in the update of the *WirelessMAN-Advanced Radio Interface Technology* (updated to IEEE Std 802.16.1-2012) of the IMT-Advanced recommendation (ITU-R M.2012). The proposal was considered to have satisfactorily met the requirements of the “Meeting Y+1” documentation, so the update remains on track for inclusion in the first revision of ITU-R M.2012 in late 2013. The errors in Rec. ITU-R M.2012 raised within ITU-R 5D/111 were noted for preparation of the revision.

In other actions:

* Contribution 5D/174 proposed that future revisions of M.1457 and M.2012 be developed every two years, with M.2012 being updated in odd years and M.1457 in even years. This was not decided, and the contribution was carried over to Meeting #15 for further discussion. However, the immediate implication of the proposal, which is a deferral of the next M.1457 revision until 2014, was agreed. A liaison statement ([IEEE 802.16-12-0628](http://doc.wirelessman.org/16-12-0628)) was developed to inform the External Organizations regarding the IMT-2000 revision process. This statement reflects the decision to schedule the completion of Revision 12 of M.1457 at the end of 2014. The specific schedule will be determined and announced later. It is possible that a development schedule similar to that of the IMT-Advanced process will be adopted. This would imply that the “Meeting X” announcement would be due at the July 2013 meeting.
* Regarding the IMT-Advanced revision, it was confirmed that the following information is required for the Meeting Y+2 contribution:
	+ Revised Annex 2
	+ Compliance templates 4.2.4 from Report ITU-R M.2133 (2008).
	+ Revised GCS
	+ Certification B
	+ transposition references and Certification C provided by the transposing organizations
* A liaison statement to WP 5A (5D/TEMP/70) was developed, suggesting that WP 5A add a new annex to Rec. M.1801 referring to IMT-Advanced per Rec. ITU-R M.2012, specifying LTE-Advanced and WirelessMAN-Advanced. [Note: WP 5A is considering the update of M.1801 as it meets from 5-15 November, while this report is in preparation. Indications are that the proposal has been tentatively agreed; 5A/TEMP/63 includes WirelessMAN-Advanced as the second element of a new Annex 3 on “IMT-Advanced terrestrial radio interfaces.” Amendments proposed by IEEE in regard to IEEE 802.11 are also incorporated. It appears that the intent is to provide the update version to external organizations for review prior to May 2013.]
* A liaison statement to WP 5A (5D/TEMP/71) was developed, suggesting that WP 5A add references to both Recommendations ITU-R M.1457 and ITU-R M.2012 in Section 3 of Recommendation ITU-R M.2009. [Note: As of the date of this report, WP 5A/TEMP/51 has been posted, with a working document toward a preliminary draft revision of Rec.ITU-R M.2009, on public protection and disaster relief (PPDR).]

**Public Protection and Disaster Relief (PPDR)**

A liaison statement to external organizations ([IEEE 802.16-12-0629](http://doc.wirelessman.org/16-12-0629)) asks for input toward a new ITU-R report on the use of IMT for broadband PPDR applications. Input is requested for Meeting #15 (due 23 January 2013).

A US contribution (5D/123R1) provided a ‘case study’ toward IMT in PPDR, related to the case of a Minnesota bridge collapse with IEEE 802.16 technology used for PPDR. The contribution said

*The performance differences between WiMAX and LTE were not a dominant factor in the analysis because both are based on the core IMT Advanced radio family of technologies. WiMAX is based upon the IEEE 802.16 standard for fixed and mobile wireless connectivity. WiMAX is used herein as a surrogate for any of the leading broadband 4G technologies such as LTE, an alternative technology widely supported by the cellular industry.*

However, the WP 5D meeting did not agree to include that case study into the draft report.

**Passive and Active BS Antennas**

A liaison statement to external organizations ([IEEE 802.16-12-0627](http://doc.wirelessman.org/16-12-0627)) asks for input on activities, if any, related to “Technical and operational aspects of passive and active BS antennas for IMT systems” for Meeting #16 (due 3 July 2013). Active antennas include adaptive beamforming and MIMO antennas.

**Vision**

Sub-Working Group Vision addressed the development of a document for which the title “Framework and overall objectives of future development of IMT for 2020 and beyond” was agreed. The group is soliciting input on the scope and content.

**M.2039**

IEEE’s contribution (ITU-R 5D/135) indicated that it expected to have information toward the revision of M.2039 at Meeting #15 and/or Meeting #16. This was a response to a July liaison ([IEEE 802.16-12-0517](http://doc.wirelessman.org/16-12-0517)). The Sharing Studies Sub-Working Group concluded that, based on similar input from other SDOs, the work would be deferred. A workplan was developed (Document 5D/TEMP/68), with inputs at Meeting #15 and Meeting #16, with an intent to finalize the work at Meeting #17.

One significant ambiguity about the M.2039 activity should be noted. Namely, the July liaison from WP 5D ([IEEE 802.16-12-0517](http://doc.wirelessman.org/16-12-0517)) asking for input indicates that the intent is to “modify and add parameters according to the latest specifications of IMT technologies.” The term “IMT” implies IMT-Advanced as well as IMT-2000. However, an October liaison from WP 5D to WP 5A (5D/TEMP/108R1) implies that M.2039 will continue to be limited to IMT-2000 technologies, noting that “WP 5D has started to develop a new ITU-R Report on sharing parameters for IMT Advanced technologies.” Therefore, the 802.16 WG might consider responding at Meeting #15 with corrections to errors in M.2039 prior to any addition of new material and with an inquiry to clarify the ambiguity.

**Sharing**

A liaison statement to 3GPP and IEEE ([IEEE 802.16-12-0630](http://doc.wirelessman.org/16-12-0630)) addresses “Parameters for LTE-Advanced and WirelessMAN Advanced for use in sharing studies.” This is a followup to IEEE’s ITU-R 5D/136 and 3GPP’s ITU-R 5D/116. The liaison requests input per Part 2 of a prior liaison ([IEEE 802.16-12-0516-01](http://doc.wirelessman.org/16-12-0516-01)) by Meeting #15 and/or #16. The inputs will be used to develop a draft new report using the working name “ITU-R M.[IMT.ADV PARAM].”

**Suitable Frequency Ranges**

Extensive work took place in support of WRC-15 Agenda items 1.1 and 1.2 addressing the identification and suitability of frequency ranges for future mobile broadband and IMT. This is expected to eventually be used in a draft new Report using the working name “ITU-R M.[IMT.2020.FREQ RANGE].” However, the focus of this work at Meeting #14 was primarily oriented toward the development of a liaison statement to JTG 4-5-6-7. This was issued as “Liaison statement to Joint Task Group 4-5-6-7 on suitable frequency ranges under WRC-15 Agenda item 1.1” ([ITU-R JTC4567/46](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=R12-JTG4567-C-0046)). Most the focus was on bands below 6 GHz. However, mainly due to a contribution from Korea, a note was including reading “fulfilling its responsibilities under WRC-15 Agenda item 1.1, WP 5D is also considering the suitability of bands above 6 GHz for IMT systems. WP 5D plans to report on the results of its considerations on the suitability of these bands to the 3rd meeting of the JTG 4-5-6-7. System characteristics for use in sharing studies in the bands above 6 GHz are also being developed.” The Korean proposal (5D/143) had suggested certain bands within the ranges 13.25-13.75 and 24-30 GHz.

[ITU-R JTC4567/46](http://www.itu.int/md/meetingdoc.asp?lang=en&parent=R12-JTG4567-C-0046) noted that “When considering additional spectrum to be made available for IMT, it may be helpful for the JTG to consider some developments of the technology,” as listed in Attachment 2. Attachment 2 contained points of interest to the 802.16 WG:

* Asymmetric FDD uplink (traditionally in lower bands) and downlink blocks (with one or more separate downlinks which could also be in different bands).
* FDD or TDD uplink and downlink for very high peak data rates in confined and densely populated indoor areas as well as in confined areas of moving vehicles.
* FDD and TDD backhauling from, e.g., trains, buses and other vehicles or from body area networks to the host IMT network
* In-band or out-of-band backhauling of small cells.

Note in particularly the relevance to the proposed P802.16r PAR on Small Cell Backhaul.

# Low-Power IMT

Several contributions (5D/120 [Russia], 5D/155 [China] and 5D/177[APT], plus Document 5D/1105 [China] as carried forward) promoted low-power use of IMT in the band 3.4-3.6 GHz. An initial working document towards a preliminary draft new Report on the compatibility study between IMT [low power systems]/[systems, including low power systems] and FSS networks in the band 3.4-3.6 GHz was developed (5D/TEMP/66), with an accompanying workplan (5D/TEMP/65) and a draft liaison statement 5D/TEMP/67R1).

[Note: A different view of low-power systems is proposed in a contribution 5A/150 (USA) to the current WP 5A meeting. It is entitled “Spectrum requirements and consideration of 5350-5470 MHz and

5850-5925 MHz bands for RLAN devices.” It asks WP 5A to consider “the feasibility of permitting RLAN devices to operate in the 5350-5470 MHz and 5825-5950 MHz band in the United States” with regard to spectrum requirements related to WRC2015 Agenda Item 1.1.]

# Recommendations

This contribution recommends that the IEEE 802.16 Working ­Group seek to develop contributions to ITU-R WP 5D as follows:

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| WP 5D Meeting | Deadline | Topic | IEEE 802.16 Session Deadline  |
| #15 | 2013-01-23 | Possible response to IEEE 802.16-12-0629 on PPDR | #82 (possibly #83) |
| #15 | 2013-01-23 | Followup to ITU-R 5D/135 on M.2039, with corrections and with request for intent to include to IMT-Advanced technologies | #82 (possibly #83) |
| #15 | 2013-01-23 | Initial response to IEEE 802.16-12-0630 on sharing parameters | #82 (possibly #83) |
| #15 | 2013-01-23 | Initial response to IEEE 802.16-12-0627 on Passive and Active BS Antennas | #82 (possibly #83) |
|  |  |  |  |
| #16 | 2013-07-03 | Second followup to ITU-R 5D/135 on M.2039 | #84 (possibly #85) |
| #16 | 2013-07-03 | M.2012 “Meeting Y+2B” contribution and associated paperwork  | #84 (possibly #85) |
| #16 | 2013-07-03 | M.1457 “Meeting X” contribution (possible­ date, noting IEEE 802.16-12-0628)  | #84 (possibly #85) |
| #16 | 2013-07-03 | Response to IEEE 802.16-12-0627 on Passive and Active BS Antennas | #84 (possibly #85) |
| #16 | 2013-07-03 | Followup to ITU-R 5D/136 (and second response to IEEE 802.16-12-0630) on sharing parameters | #84 (possibly #85) |
| #17 | [2012-10-09]+/- two weeks | M.1457 “Meeting X+1” contribution (possible­ date, noting IEEE 802.16-12-0628) | #86 |