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Re:	In response to Sponsor Ballot on P802.16n	
Abstract	Comments on power control for direct communication in GRIDMAN Draft Standard	
Purpose	To discuss and adopt the proposed text in the draft amendment document on GRIDMAN	
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Clarification on power control for HR-MS to HR-MS direct communication in IEEE 802.16n

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1. Introduction

This document provides clarification on the power control under HR-MS to HR-MS direct communication over IEEE 802.16n, focusing on the removing unnecessary sentence and fixing typos.

2. References

- [1] IEEE 802.16-12-0132-00, GRIDMAN System Requirement Document including SARM annex, January 2012.
- [2] IEEE P802.16nTM/D5, Air Interface for Broadband Wireless Access Systems - Draft Amendment: Higher Reliability Networks, June 2012.
- [3] IEEE P802.16.1aTM/D5, WirelessMAN-Advanced Air Interface for Broadband Access Systems - Draft Amendment: Higher Reliability Networks, June 2012.
- [4] IEEE P802.16TM-2012, IEEE Standard for Air Interface for Broadband Wireless Access Systems,” August 2012.
- [5] IEEE P802.16.1TM-2012, IEEE Standard for WirelessMAN-Advanced Air Interface for Broadband Wireless Access Systems, September 2012.

3. Proposed Text on the IEEE 802.16n Amendment Draft Standard

[-----Start of Text Proposal-----]

[Remedy: change section 16.2.2.2.2 (line#34, page 85 to line#14, page 87) in P802.16n/D5 as follows:]

16.2.2.2.2 Power control for mobile to mobile communication

16.2.2.2.2.1 Power control for at least one HR-MS associated with an HR-BS

The transmission power of a forwarding HR-MS transmitting data or control channels to another HR-MS is controlled by ~~messages from the receiving HR-MS that are derived from~~ HR-BS controls.

~~The HR-BS signals power control parameters to all HR-MS with active links. HR-MS may be instructed by the HR-BS to estimate path loss between HR-MSs. The receiver of data generates offset controls that are based on constraints~~

~~or parameters, signaled from HR-BS.~~

~~Cross link interference is handled by augmenting the PC to include SIR measured on crosslink resources. The same procedure is applied for BS-controlled FTN and BS-controlled direct communication.~~

Power control parameters that are generated by ~~the~~an HR-BS are sent directly to both ~~HR-MS~~HR-MSs provided both have a link to the HR-BS. When one of the ~~HR-MS~~HR-MSs does not have a link to the HR-BS, then ~~its~~ power control parameters are transmitted by an HR-MS associating the HR-BS directly to the HR-MS having no link to the HR-BS, signaled to the one that does. The associated HR-MS signals them to the forwarded HR-MS.

The operation of power control requires that measurements be performed by the forwarding and forwarded HR-MS.

16.2.2.2.1.1 Closed loop power control

Power control is performed as in 8.4.10.3 except as detailed in this section.

~~Equation 131 (repeated here) is used:~~

$$P_{\text{new}} = P_{\text{last}} + (C/N_{\text{new}} - C/N_{\text{last}}) - (10\log_{10}(R_{\text{new}}) - 10\log_{10}(R_{\text{last}})) + \text{Offset}$$

$$\text{---wxy}$$

~~Where~~

~~P_{new} = the power of the new UL burst in the current UL frame~~

~~C/N_{new} = normalized C/N for the new UL burst in the current UL frame~~

~~R_{new} = repetition factor R for the new UL burst in the current UL frame~~

~~P_{last} = the power of the burst with the maximum value of $(C/N - 10\log_{10}(R))$ in the most recently transmitted UL frame~~

~~C/N_{last} = normalized C/N associated with P_{last} (thus referring to the burst with the maximum value of $(C/N - 10\log_{10}(R))$ in the most recently transmitted UL frame)~~

~~R_{last} = repetition factor R associated with P_{last} (thus referring to the burst with the maximum value of $(C/N - 10\log_{10}(R))$ in the most recently transmitted UL frame)~~

~~Offset = an accumulation of power correction terms sent by the BS since the last transmission~~

~~Power control of channels transmitted between HR-MS~~

~~Offset_{C} for control channel is derived from correction terms included in HR-PCC message described in 6.3.2.3.99.31 sent by the receiving HR-MS based on $\text{Offset}_{\text{MIN_FWD_D}}$, $\text{Offset}_{\text{MIN_FWD_C}}$, and~~

~~$\text{Offset}_{\text{MAX_FWD_D}}$, $\text{Offset}_{\text{MAX_FWD_C}}$ constraints, which are included in UCD message, signaled by the HR-BS such that $\text{Offset}_{\text{MIN_FWD_D}} \leq \text{Offset} \leq \text{Offset}_{\text{MAX_FWD_D}}$~~

~~$\text{Offset}_{\text{MIN_FWD_C}} \leq \text{Offset}_{\text{C}} \leq \text{Offset}_{\text{MAX_FWD_C}}$~~

A receiving ~~HR-BS~~HR-MS that is directly associated with the HR-BS receives $\text{Offset}_{\text{MIN_FWD_C}}$ and $\text{Offset}_{\text{MAX_FWD_C}}$ from it. A receiving ~~HR-BS~~HR-MS that is not directly associated with the HR-BS receives ~~$\text{Offset}_{\text{MIN_FWD_C}}$ and $\text{Offset}_{\text{MAX_FWD_C}}$~~ from the ~~one~~one HR-MS that is which in turn receives ~~$\text{Offset}_{\text{MIN_FWD_C}}$ and $\text{Offset}_{\text{MAX_FWD_C}}$~~ from the HR-BS.

~~Signaling of offset constraints from the HR-BS is done per UCD (UL channel descriptor) message~~

~~Signaling of Offset between the HR-MS is done through HR-PCC.~~

~~16.2.2.2.2 Power control for no HR-MS associated with an HR-BS~~

1 ~~If a coordinator is used then it controls transmission power for the pair in the same way as a baseline HR-BS would.~~
 2 ~~The HR-BS signals power control parameters to all HR-MS with active links.~~
 3 ~~HR-MS may be instructed by the HR-BS to estimate path loss between HR-MSs.~~
 4 ~~The receiver of data generate offset controls that are based on constraints or parameters, signaled from HR-BS.~~
 5 ~~The same procedure is applied for BS-controlled FTN and BS-controlled direct communication.~~
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 7

9 ~~16.2.2.2.2.3~~ 16.2.2.2.2.2 Forwarding of MAC messages to and from the HR-BS

10
 11 A forwarding HR-MS shall forward power and measurement control and related messages from the HR-BS to the
 12 forwarded HR-MS and measurement results from the forwarded HR-MS to the HR-BS.
 13

14 ~~16.2.2.2.2.4~~ 16.2.2.2.2.3 Measurements used for HR-MS power control

15
 16
 17 The HR-BS may request HR-MS that have a direct link to other HR-MS to perform the ~~following~~ measurements and
 18 report their results. ~~In addition the HR-BS may define conditions for event based reporting. The allowed conditions~~
 19 ~~for event based reporting are the same as for the corresponding measurements performed on HR-BS signals.~~
 20

21 ~~Average CINR_C mean is the average CINR of an HR-MS with which the reporting HR-MS has a direct~~
 22 ~~communication link;~~

23 ~~RSSI_C mean is the received signal strength from the HR-MS~~

24 ~~BLER_C is the average BLER of a channel received from the HR-MS.~~

25
 26 These measurements are requested and reported as described in 8.4.10.3 ~~according to OFDMA. When needed to be~~
 27 ~~forwarded between HR-MS, the HR-PCC is used.~~
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32 [-----End of Text Proposal-----]
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