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Correction to Power Control for OFDMA PHY

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1 Introduction

Section 8.4.10.3 discuses specific cases in which the SS should calculate on its own the transmit power to use. It is not clear what happens in the other cases. Moreover a clear definition of SS response to Tx power modification commands needs to be defined.

2 Power control mechanism

To maintain at the BS a power density consistent with the modulation and FEC rate used by each SS, the BS may change the SS TX power as well as the SS assigned modulation and FEC rate. The BS should do this by sending the SS an offset to be added to the power calculated by the SS.

The base station continuously monitors the uplink and measures the link quality. If the link quality starts to diminish, then the base station commands the SS to power up. If the link quality is too good, then there is excess power on the uplink. In this case, the base station commands the SS to power down. The base station should send the power-control adjustment commands using one of the following options:

- Fast Power Control (FPC) message (6.3.2.3.34).
- OFDMA Power Control IE (8.4.5.4.5) message.
- Ranging response (RNG-RSP) message (6.3.2.3.6) Power Adjust Information - Power Level Adjust TLV (11.6 type 2).

3 Detailed Text Changes

1. ***[change section 8.4.10.3, page 149 line 20 to page 150 line 5]***

-------- BEGIN --------

[Change the text describing Equation 138 as indicated:]

To maintain at the BS a power density consistent with the modulation and FEC rate used by each SS, the BS may change the SS TX power through power correction messages, as well as the SS assigned modulation and FEC rate. There are, however, situations where the SS should automatically update its TX power, without being explicitly instructed by the BS. This happens when the SS transmits in region marked by UIUC = 0, UIUC = 12, or UIUC = 14. In all these situations, the SS shall use a temporary TX power value set according to Equation (138) (in dB),

$$Pnew = \min\left(Plast + (C/Nnew - C/Nlast) - (10log10(Rnew) - 10log10(Rlast)) + Offset, Pmax\right) \quad (138)$$

Where,

Pnew	is the temporary TX Power
Plast	is the last used TX Power.
C/Nnew	is the normalized C/N of new modulation/FEC rate instructed by the UIUC.
C/Nlast	is the normalized C/N of the last used modulation/FEC rate.
Rnew	is the number of repetitions for the new modulation/FEC rate instructed by the UIUC.
Rlast	Is the number of repetitions on the last used modulation/FEC rate.
Offset	is an accumulation of power correction terms sent by the BS since the last transmission.
Pmax	is the maximum power that the SS can transmit

In all other situations, the SS shall use TX power value set according to Equation (138a) (in dB),

$$Pnew = \min\left(Plast + Offset, Pmax\right) \quad (138a)$$

The default normalized C/N values per modulation are given by Table 334. These values may be overridden by the BS by using a dedicated UCD message TLV.

2. ***[add the following line to table 64, before the 'Number of Stations' parameter]***

Syntax - Power measurement frame
Size - 8 bits

3. ***[below table 64, add the following text]***

Power measurement frame - The 8 LSB of the frame number in which the BS measured the power corrections referred to in the message.

4. ***[add the following line to table 292, after the 'Power control' parameter]***

Syntax - Power measurement frame
Size - 8 bits

5. ***[below table 292, add the following text]***

Power measurement frame - The 8 LSB of the frame number in which the BS measured the power corrections referred to in the message.

-------- END --------

4 References

[1] IEEE P802.16-2004.
[2] IEEE P802.16-2004/Cor1/D2