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Title	**CQICH channel clarification**
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Re:	Call for comments, 802.16maint task group
Abstract	The contribution clarifies CQICH operation.
Purpose	Adoption of suggested changes into P802.16/Cor1/D4
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CQICH Channel Clarification

1   Problem Statement

The current draft specifies a mechanism for adaptive coding and modulation (MCS) based on average CINR which may be fed backed through CQICH channel by SS. In CQICH Allocation IE, it indicates that SS will report channel quality indicator through fast feedback channel, where it defines CINR as the channel quality indicator. However, it is difficult to find a unique mapping between CINR and MCS due to the various receiver implementations, different deployment environment and mobile speed.

In addition, it is not clear in the standard where SS should measure the CINR. For a system with mixed zones, especially with mixed frequency reuse factor, adaptive coding and modulation may not work well.

In this contribution, we propose to clarify the channel quality indicator (CQI) feedback. Instead of using CINR as channel quality, we propose to allow CS to report an effective CINR. The effective CINR shall be a function of CINR, implementation aspect, channel type and Doppler. The actual measurement of CQI should be up to the implementation. However, a reference mapping between effective CQI and MCS should be clearly established and used by both BS and SS. This reference mapping can be specified in the standard or in the conformance document. By default, we can use the Table 338 as the reference for packet error rate 10-2. The conformance spec can override the reference table for different class of SSs, for example, it may define multiple tables for various FEC types.

2   Detailed Text Changes

Insert the following text in section 8.4.5.4.10.1 at line 35.
SS shall measure channel quality based on the same frequency reuse factor as its latest assigned traffic zone. If there is no traffic zone assigned to the SS, then SS shall measure channel quality on preamble based on reuse factor 3. The channel quality measurement shall reflect the power strength on non-boosting data carriers. Channel quality shall be an effective CINR (or post processing S/N), which is a function of CINR, channel condition, mobile speed and implementation margin. The exact measurement method is implementation specific. By default, SS shall follow Table xxx to channel quality to CQI, for example, CQI 0b0110 indicates that the effective CINR is between -2dB to 0dB, MS is capable of receiving data with QPSK modulation and coding rate ½ less than 10-2 packer error rate. BS may assign higher modulation or coding rate by power boosting or repetition. SS may also assign lower modulation or coding rate. The conformance spec may override this table or define multiple tables for various FEC coders.

Table XXX: Reference mapping of CQI to effective CINR and burst type at target packer error rate 10-2

CQI	Effective CINR (dB)	Burst Type
0b0000	< -2	QPSK, 1/2, repetition 6
0b0001	0	QPSK, 1/2, repetition 4
0b0010	2	QPSK, 1/2, repetition 4
0b0011	4	QPSK, 1/2, repetition 2
0b0100	6	QPSK, 1/2, repetition 2

0b0101	8	QPSK, ½, repetition 2
0b0110	10	QPSK, 1/2
0b0111	12	QPSK, 3/4
0b1000	14	QPSK, 3/4
0b1001	16	16QAM, 1/2
0b1010	18	16QAM, 3/4
0b1011	20	16QAM, 3/4
0b1100	22	64 QAM, 2/3
0b1101	24	64 QAM, 3/4
0b1110	26	64 QAM, 3/4
0b1111	> 26	64 QAM, 3/4