Agenda Item: 8.2

Source: Ericsson

Title: Proposed BS Spectrum Emission Mask

Document for: Discussion

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1   Introduction

The definition of a spectrum emission mask for the BS has been an item for further study in WG4 until this point. One input on the issue is presented in Tdoc TSG R4#5 (99)283, which proposes an emission mask based on the ACLR requirements using a measurement bandwidth equal to the chip rate.

The spectrum emission mask does however have implication beyond that of adjacent channel performance between WCDMA based systems. Such examples are co-existence with other (non-WCDMA) systems in frequency bands adjacent to the UMTS bands or co-existence with other systems in the PCS bands. The mask should also be determined based on the need for co-existence considerations, implying that a measurement bandwidth narrower that the chip rate is needed close to the carrier. A measurement bandwidth of 30 kHz is proposed here, since it is in line with the most narrowband PCS systems as well as satellite systems considered. Further away from the carrier, wider measurement bandwidths should be used.

A spectrum mask is outlined below based on the above considerations. The basis for the values used in defining the masks are taken from the present ACLR requirements as well as FCC part 24.

2   Proposed Spectrum Emission Mask

Based on the discussion in the introduction, the mask in Table 1 is proposed. The rationale for each specification point is outlined in the table together with the proposed mask and the corresponding mask values, measured in 30 kHz (the smallest measurement bandwidth used):

Table 1. Proposed spectrum emission mask values and rationale.

Frequency offset Δf	Minimum requirement	Measurement bandwidth	Comments for rationale	Corresponding value in 30 kHz
2.5 MHz	-15 dBm	30 kHz	Based on FCC part 24: -13 dBm/45 kHz	-15 dBm
2.5-3.5 MHz	-15-13(Δf-2.5) dBm	30 kHz	Dropping linearly from 2.5 to 3.5 MHz	
3.5 MHz	-28 dBm	30 kHz	Based on FCC part 24: -13 dBm/1 MHz	-28 dBm
3.5-7.5 MHz	-23 dBm	100 kHz	Based on FCC part 24: -13 dBm/1 MHz (Tighter than ACLR @5 MHz)	-28 dBm
7.5-12.5 MHz	-23 dBm	300 kHz	Based on ACLR @10 MHz: -55 dBc/4.096 MHz for 43 dBm BS	-33 dBm

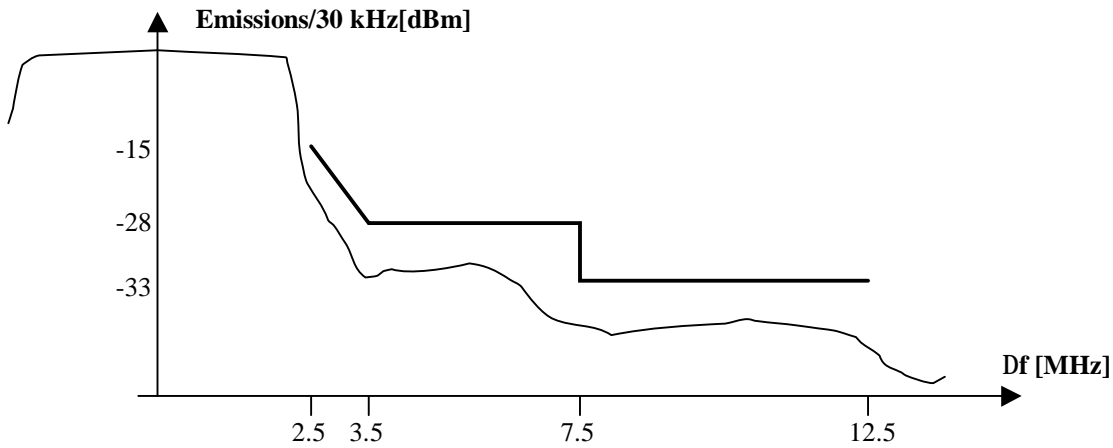The mask is also illustrated in Figure 1.

Figure 1. Proposed spectrum emission mask measured in 30 kHz bandwidth.

3 Proposed text for "Spectrum emission mask"

6.6.2.1 Spectrum emission mask

The emission mask of the base station is a requirement that applies for frequencies which are between 2.5 and 12.5 MHz from a carrier frequency. For a base station with multiple carriers, the requirement applies for frequencies between 2.5 and 12.5 MHz below the first carrier frequency and 2.5 and 12.5 MHz above the last carrier frequency.

The power of any emission shall not exceed

Table 2. Spectrum emission mask requirement

Frequency offset from carrier Δf	Minimum requirement	Measurement Bandwidth
2.5 – 3.5 MHz	- 15 - 13(Δf - 2.5) dBm	30 kHz
3.5 – 7.5 MHz	- 23 dBm	100 kHz
7.5 – 12.5 MHz	- 23 dBm	300 kHz

4 Open item

The spectrum mask for other BS powers than 43 dBm is an open item.