

Agenda item:

Source: Ericsson

Title: CR 25.215-068: Reporting of UTRAN Transmitted carrier power

Document for: Decision

Reporting of UTRAN Transmitted carrier power

In 25.215 the measurement of the UTRAN Transmitted carrier power is defined to be measured per branch, i.e. in case of Tx diversity 2 values will be measured, otherwise one value will be measured.

Currently 25.433 supports reporting of only one value for the Transmitted carrier power.

In case of no Tx diversity there is no problem, as one value is measured and one value is reported, but the question occurs how to report the transmitted carrier power when Tx diversity is used and one value is measured per branch, i.e. two value is measured, and only one value can be reported.

There are at least 3 options to handle the reporting of the Transmitted carrier power in Tx diversity:

1. Report the sum of the values
2. Report the maximum of the two values
3. Change the reporting over NBAP, so that two values are reported in case of Tx diversity

A typical usage of the transmitted carrier power measurement is to monitor the downlink load in the cell. The RNC configures the total maximum transmitted power that can be used in a cell, independent of the antenna and power amplifier configuration. However it can be assumed that separate power amplifiers are used for each antenna branch in Tx diversity.

When closed loop transmit diversity mode 2 is used, the fluctuation of the power between the antennas will be significant due to the high frequency of the feedback information and the possible highly frequent variations in the propagation conditions of the individual radio links. So the power in each branch is not a semi-static value, but is distributed around an average value. This average value can be different between the two diversity antennas (imbalance situation) due to several reasons:

1. The RNC configures some of the RL to use Tx diversity and some of the RL not to use Tx diversity. The non-Tx diversity RL will all be allocated to the same antenna which probably will end up having a higher load than the other antenna transmitting only the Tx diversity RLs.
2. Using closed loop Tx diversity mode 2, bad deployment of one antenna may cause that antenna to have a higher path loss to the mobiles than the other antenna. This situation may also be caused by a traffic situation where a majority of the traffic is geographically located in such way that the path loss to one of the antennas is lower than to the other antenna.

Due to these reasons the load in one branch may reach the maximum value that can be handled by the power amplifier before the other branch, even if the sum of the load in the two branches still are below the maximum power allowed in the cell. For the admission/congestion control to work in an efficient way this situation needs to be detected.

If reporting option 1 above is used it is clear that the sum of the values can be below the maximum allowed value, but still one of the power amplifiers can have reached the maximum value (congested). Reporting option 3 will solve the

problem with detecting that an imbalance situation exists between the two branches and also the RNC will know about the total load in the cell as both values are reported, but this will require a change in the NBAP signalling. Also this will be in conflict with the WG3-model of Node B where the individual antennas are not included in the model.

By reporting the maximum value from each branch (maximum during the measurement period, see figure 1 below) the RNC will be aware of any overload situation, even if an imbalance situation exists. This will be sufficient for the admission/congestion control and will not require any change in the NBAP signalling.

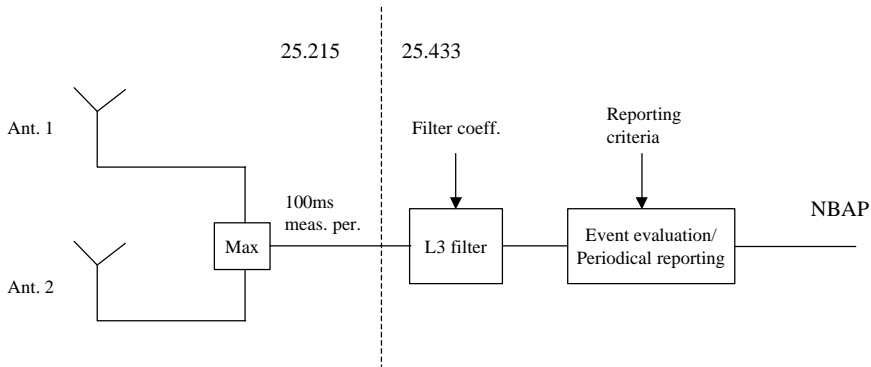


Figure 1 Reporting of the Transmitted carrier power in Tx diversity

Proposal

The attached CR for 25.433 clarifies the reporting of the Transmitted carrier power according to option 2 above.

CHANGE REQUEST				Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.
25.215	CR	068	Current Version: 3.3.0	
GSM (AA.BB) or 3G (AA.BBB) specification number ↑		↑ CR number as allocated by MCC support team		
For submission to: TSG-RAN #9	for approval <input checked="" type="checkbox"/>	strategic <input type="checkbox"/>		(for SMG use only)
list expected approval meeting # here ↑	for information <input type="checkbox"/>	non-strategic <input type="checkbox"/>		

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

Proposed change affects: (U)SIM ME UTRAN / Radio Core Network
(at least one should be marked with an X)

Source: Ericsson **Date:** 2000-07-03

Subject: Reporting of UTRAN Transmitted carrier power

Work item: _____

Category:	F Correction <input checked="" type="checkbox"/>	Release:	Phase 2 <input type="checkbox"/>
(only one category shall be marked with an X)	A Corresponds to a correction in an earlier release <input type="checkbox"/>		Release 96 <input type="checkbox"/>
	B Addition of feature <input type="checkbox"/>		Release 97 <input type="checkbox"/>
	C Functional modification of feature <input type="checkbox"/>		Release 98 <input type="checkbox"/>
	D Editorial modification <input type="checkbox"/>		Release 99 <input checked="" type="checkbox"/>

Reason for change: In 25.215 the measurement of the transmitted carrier power is defined to be measured per branch, e.g. in case of Tx diversity 2 values will be measured, otherwise one value will be measured. Currently only one value is reported over NBAP. This CR clarifies the reporting of Transmitted carrier power in Tx diversity.

Clauses affected: 5.2.3

Other specs affected:	Other 3G core specifications <input type="checkbox"/>	→ List of CRs:	
	Other GSM core specifications <input type="checkbox"/>	→ List of CRs:	
	MS test specifications <input type="checkbox"/>	→ List of CRs:	
	BSS test specifications <input type="checkbox"/>	→ List of CRs:	
	O&M specifications <input type="checkbox"/>	→ List of CRs:	

Other comments: _____



help.doc

<----- double-click here for help and instructions on how to create a CR.

5.2.3 Transmitted carrier power

Definition	Transmitted carrier power, is the ratio between the total transmitted power and the maximum transmission power. Total transmission power is the mean power [W] on one carrier from one UTRAN access point. Maximum transmission power is the mean power [W] on one carrier from one UTRAN access point when transmitting at the configured maximum power for the cell. Measurement shall be possible on any carrier transmitted from the UTRAN access point. The reference point for the transmitted carrier power measurement shall be the antenna connector. In case of Tx diversity the transmitted carrier power for each branch shall be measured and the maximum of the two values shall be reported to higher layers, i.e. only one value will be reported to higher layers.
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