3GPP TSG RAN Meeting #21 **RP-030475**
Frankfurt, Germany, 16 - 19 September 2003

TSG-RAN Working Group 4 (Radio) meeting #28 **R4-030851**
Sophia Antipolis, France, 18th – 22nd August 2003

Title: Reply LS on "Proposed guidance to RAN4 on the LS on ITU-R draft new Report on mitigating techniques to address coexistence between IMT-2000 TDD and FDD radio interface technologies within the frequency range 2 500-2 690 MHZ operating in adjacent bands and in the same geographical area"

Source: RAN WG4
To: RAN

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RAN4 thanks ITU-R ad hoc group for the LS where ITU-R WP 8F welcomed the input from 3GPP on the working document towards the preliminary draft of the new Report on mitigating techniques.

RAN4 has already given inputs to this report during TSG RAN WG4#25 in R4-030272 [2]. RAN4 found that several comments and error corrections reported in R4-030272 are not reflected in the updated report on mitigation techniques. In addition more comments are included here as well.

Comments:

In this section specific comments related to [1] are reported, highlighting the affected sections in [1] and, if applicable, referring to specific sentences herein reported in cursive between inverted commas:

- **Section 2 Introduction and summary** (3rd bullet in introduction of R4-030272)

"…whether they be co-located on in close proximity…"
"Proximity" has no meaning from 3GPP point of view. Therefore the proximity scenarios in the TDD specification were re-named as "Same Geographic Area" scenarios in RAN4.
The term proximity is in the report used both in the meaning of "Same Geographical Area" (in clauses 2, 5.1.2 and Annex B) and in the meaning of "small distance" (in clauses 4.3 and Annex B). When referring to a scenario where two systems have overlapping coverage and BS and MS thereby may

at times be close to each other, it should be called “Same geographical area”. To avoid confusion, “proximity” should not be used at all.

- **Section 3.1 Reference scenarios**

“In this report, case 1 [FDD BS <-> TDD BS] *is further analyzed through statistical methods for interference level calculations for base stations using adaptive antennas.…”*

RAN4 BS-BS requirements are based on deterministic scenarios only and in RAN4’s opinion BS-BS interference scenario cannot in general be analysed by statistical approach as BS-BS interference the situation is more or less static, while the MS interference can be analysed with statistical methods since this is a time-variant interference situation due to e.g. mobility.

- **Section 3.1.2** (Point 1 in R4-030272)
  Table 1 Summary of parameters for the problematic coexistence cases

The table is still incorrect. TDD BS ACLR has a fixed requirement of -36dBm for WA TDD BS and -23dBm for LA TDD BS in case of co-existence with FDD, a relative ACLR of 45 and 70 dB cannot be used in co-existence calculations. A note (4) has been added to the table to point out that the values are consistent with [IMT.COEX], but on the other hand they are not consistent with Table 4 in clause 5.3.1, M.1457-1 or with any 3GPP Release. To avoid this confusion, the correct values should be derived from TS 25.105 v.5.4.0 or greater.

Section 4.1.1: *“Co-location of TDD/FDD was not specified in 3GPP - only co-existence in the same geographical area is specified [7]”:*

RAN4 concluded in [3] that co-location of UTRA-FDD and UTRA-TDD with 30dB BS-BS coupling loss is even with cryogenic technology not possible due to the adjacent FDD and TDD channels without sufficient guard bands.
The corresponding site engineering scenario is given in TR 25.942 [3]

- **Section 4.1.1.1 Non-collocated antennas** (Point 3 in R4-030272)

“Thus the effective gain that determines the coupling between the two is less than the algebraic sum of the gains.”

This scenario cannot be general, depending whether the assumptions are in line with real deployment.

- **Section 4.1.1.2 Collocated antennas**

“Careful installation techniques allow two antennas that are mounted on the same pole to achieve higher coupling loss of [72] dB.”

This section refers to site engineering techniques and not to “co-location”.30 dB is commonly agreed value for co-location (see [3], [4], [5]).
This section gives the impression that there is full control in the field when deploying systems, which is not the case; real-life limitations of the site may exist and then have to be taken into account.

- **Section 5.1.1.1 Site engineering and antenna collocation** (Point 7 in R4-030272)

“While it is not always possible to coordinate the collocation process between competing operators, doing so could yield, on the average, 60 dB of isolation”

It is not possible to prove that 60 dB can be achieved on “average”, as outlined in R4-030272.
The 3GPP contribution referred as [4] in Document 8F/TEMP/376 is a measurement report. The paper does not conclude that an average of 60 dB isolation can be achieved. It shows that more than the agreed minimum of 30 dB can be achieved in many cases through separation of antennas.

- **Section 5.1.1.2.2 Macro, downtown BS and outdoor micro BS** (Point 8 in R4-030272)

“The isolation is obtained for >90% of the deployments between in outdoor micro BSs located in a regular rectangular grid and a macro,…”

Conclusions cannot be based on what isolation can be achieved in 90% of the cases in a scenario where aggressor and victims are fixed. One needs to exceed the isolation for a “vast majority” of all micro BS not to have a severe degradation.

- **Section 5.3.1.1 Table 4 out of band emission requirements:**

It should be underlined that RAN4 has derived requirements for band I only.

- **Section 5.3.1.1 Table 4 out of band emission requirements** (Point 10 in R4-030272)

It seems that point 10 in R4-030272 has been taken into account, but with a mistake in the implementation for 10 MHz spacing. The LA adjacent channel power should be –33 dBm while the WA one –36 dBm for 10 MHz spacing. In table 6.8AA in Appendix A in the report [1] the numbers are correct. According to the current RAN4 specification, the correct table is:

TABLE 4

Summary of the 3GPP-RAN TDD spurious emission limits for BS geographic coverage area of UTRA-FDD requirements

TDD BS class	Adjacent Carrier spacing of 5 MHz	Alternate Carrier spacing of 10 MHz	Other Carrier spacing of ≥15 MHz
Local Area (LA)	–23 dBm	–33 dBm	Spurious, –40 dBm
Wide Area (WA)	–36 dBm	–36 dBm	Spurious, –43 dBm

It is to be noted that also the definition of “out of band emission requirements” has to be changed in “TDD spurious emission limits for BS geographic coverage area of UTRA-FDD requirements”, as evident from the proposed revision of table 4 herein reported.
All the tables derived from table 4 and their conclusion need to be updated accordingly to the changes in table 4.

- **Section 5.3.1.3 Effects of FDD receiver filtering on allowed TDD base station TX power deployed in the same geographical area**

“Based on the specified FDD ACS and blocking performance of 25.105 the allowable interference levels for interference equal to Iext has been calculated ”: the FDD BS requirements are contained in TS 25.104 not 25.105.

- **Section 5.3.1.3 Effects of FDD receiver filtering on allowed TDD base station TX power deployed in the same geographical area**

“The FDD ACS and blocking performance will dictate the allowed TDD Tx power when operating in same geographic area with MCL of 72dB”: RAN4 derived requirements for TDD BSs with an MCL of 74dB, according to the scenario of 25.942.

- **Section 5.3.1.3 Effects of FDD receiver filtering on allowed TDD base station TX power deployed in the same geographical area, TABLE 7**

Table 7 raises some questions that needs to be clarified and/or corrected in the table and accompanying text:

- Values in table 7 are not specified by RAN4. RAN4 would like to understand how these values are derived.

- The title for the column “WG4 specified FDD Rx” is not correct. WG4 has not specified any receiver, only receiver blocking and ACS parameters. What is the intention of the column? How are the values derived?

- **Section 5.4.1 Effects of using power control**

“*In particular the interference of an FDD MS (UL) to an adjacent TDD MS (DL) can be mitigated using the power control.*”: the power control is not available as a mitigating technique, while it is an in-build technique in FDD.

- **Section 5.1.1.1 Site engineering and antenna collocation,** figure 3 and 4: in figure 3 the victim is FDD (not TDD), while in figure 4 the victim is TDD.

Reference

[1] Document 8F/TEMP/377(Rev.1) ” WORKING DOCUMENT TOWARDS A PRELIMINARY DRAFT NEW REPORT ON MITIGATING TECHNIQUES TO ADDRESS COEXISTENCE BETWEEN IMT-2000 TDD AND FDD RADIO INTERFACE TECHNOLOGIES WITHIN THE FREQUENCY RANGE 2 500-2 690 MHz OPERATING IN ADJACENT BANDS AND IN THE SAME GEOGRAPHICAL AREA” as attached in 3GPP RAN WG4 R4-030646.

[2] 3GPP RAN WG4 R4-030272 “LS on coexistence Between IMT-2000 TDD and FDD Radio Interface Technologies Within the Frequency Range 2 500-2 690 MHZ Operating in Adjacent Bands and in the Same Geographical Area”

[3] 3GPP TR 25.942 6.0.0: " RF System Scenarios ".

[4] 3GPP TAG RAN WG4 Tdoc 631/99: "Antenna-to-Antenna Isolation Measurements".

[5] ETSI/STC SMG2 Tdoc 48/93: "Practical Measurement of Antenna Coupling Loss".

Date of Next Meetings:

RAN WG4 #29 17-21 November 2003 San Diego, USA