3GPP TSG RAN Meeting #26 RP-040472
Vouliagmeni Athens, Greece, 8 - 10 December, 2004

3GPP TSG RAN Working Group 4 (Radio) meeting #33 R4-040735
Yokohama, Japan, 15th-19th November 2004

Title: LS on compatibility studies of terrestrial and satellite UMTS/IMT2000

Response to: LS on Satellite component of UMTS/IMT-2000 regarding recent developments on a W-CDMA Radio Interface and proposal for compatibility studies from ETSI SES/S-UMTS

Source: 3GPP TSG-RAN WG4

To: ETSI SES/S-UMTS

Cc: 3GPP TSG RAN

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Attachments:

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1. Overall Description:

3GPP TSG RAN WG4 would like to thank ETSI SES/S-UMTS for the LS on Satellite component of UMTS/IMT-2000 regarding recent developments on a W-CDMA Radio Interface and proposal for compatibility studies. RAN WG4 has reviewed the LS and the provided technical reports.

ETSI SES/S-UMTS asked RAN WG4:

1) to review ETSI TR 102 277 and ETSI TR 102 058,
2) to start liaison and co-operation between ETSI SES/S-UMTS and RAN-WG4 for RF inter-working between the terrestrial and satellite components.

RAN WG4 would like to provide the following answers:

Compatibility studies are out of the Terms of Reference of RAN WG4, however, RAN WG4 will review and comment the assumptions and results of such compatibility studies, but will not perform any compatibility studies on this area itself. RAN WG4 doesn't specify requirements for the bands adjacent to the FDD and TDD bands used in terrestrial UMTS, but on the opposite, RAN WG4 adopts the requirements developed by other bodies, regulatory organizations normally, and drafts 3GPP specifications in a way that those requirements are fulfilled. Furthermore RAN WG4 would like to clarify that equipment according to the 3GPP minimum performance requirements may be deployed in the market, thus any means necessary for co-existence has to be adopted on the S-UMTS band by defining appropriate requirements.

Due to the frequency allocations of S-UMTS and T-UMTS, the following adjacent channel interference scenarios should be considered for studies of co-existence of S-UMTS and T-UMTS:

T-UMTS as victim:
- S-UMTS Downlink above 2170 MHz interferes T-UMTS (FDD) UE
- S-UMTS Uplink above 1980 MHz interferes T-UMTS (FDD) BS
- S-UMTS Uplink below 2010 MHz interferes T-UMTS (TDD) UE
- S-UMTS Uplink below 2010 MHz interferes T-UMTS (TDD) BS

S-UMTS victim:
- T-UMTS (FDD) UE below 1980 MHz interferes S-UMTS uplink
- T-UMTS (TDD) UE above 2010 MHz interferes S-UMTS uplink

- T-UMTS (TDD) BS above 2010 MHz interferes S-UMTS uplink
- T-UMTS (FDD) BS below 2170 MHz interferes S-UMTS downlink

RAN WG 4 would like to inform ETSI SES/S-UMTS that the characteristics of terrestrial IMT-2000 systems for frequency sharing/interference analysis are captured in ITU-R report M.2039. This report considers 3GPP BS and UE specifications of December 2003 (Release 5) as reference for FDD and TDD. In addition, 3GPP TSG RAN has approved a new work item to standardize a third TDD option with 7.68MHz chip rate to be operated in the TDD bands with 10 MHz carrier bandwidth which will be included in the 3GPP specifications in the future.

RAN WG4 has recognized that S-UMTS has specified UE power classes with higher maximum transmit power than 3GPP for T-UMTS. In combination with the antenna gain assumptions this results in significant higher EIRP figures. Adjacent channel interference studies in 3GPP to derive ACS and ACLR figures assumed a maximum UE output power of 24dBm and isotropic UE antennas hence ACLR and ACS are not specified for higher power class UE in 3GPP. Therefore it is recommended to take special care on the interference impact of higher S-UMTS UE output powers (and/or EIRP due to higher UE antenna gains). This should involve beside the scenarios with statistical distributed UE also “static” cases e.g. a high power S-UMTS UE transmitting at maximum power in close vicinity to a T-UMTS base station operating on adjacent channel.

S-UMTS “On-channel” IMR will transmit in the S-UMTS uplink adjacent to T-UMTS uplink. As it is intended to co-locate S-UMTS IMR to T-UMTS it is important to study the impact on the T-UMTS uplink and derive IMR specific requirements. It may be also necessary to specify additional requirements comparable to those for T-UMTS repeaters.

RAN WG4 would like to provide comments to ETSI TR 102 277 and ETSI TR 102 058 given in the following, limited to issues affecting co-existence of terrestrial and satellite UMTS. RAN WG4 would highlight the following points:

- Frequency band 2010-2025MHz is allocated to T-UMTS for TDD operation in Europe. This frequency band adjacent to the uplink frequency band of S-UMTS in not mentioned in TR 102 058.
- Requirements for spurious emissions are not specified. It is noted that 3GPP specifies for node B and UE more stringent limits than ITU-R SM.329 category B for specific frequency ranges to protect other systems (e.g. GSM) in the same geographic area. There are also additional requirements applicable to node B in case of co-location with other systems. As S-UMTS IMR RF requirements are mainly adopted from the corresponding T-UMTS node B, and intended to be co-located with them, these additional requirements should be also considered.
- Requirements for receiver blocking are not specified. Even if this affects the performance of S-UMTS only it may be beneficial to specify corresponding requirements for typical scenarios.
- “On-channel” IMR will transmit in the S-UMTS uplink band. Neither RF characteristics nor antenna decoupling requirements to FDD node b for the feeder link to satellite are specified.

RAN WG4 would further inform ETSI SES/S-UMTS that inter-working aspects should be addressed at TSG SA.

2. Actions:

To ETSI SES/S-UMTS:

RAN WG4 would kindly ask ETSI SES/S-UMTS to consider the given information and to inform RAN WG4 about the progress of work on the coexistence studies.

3. Date of Next TSG-RAN WG4 Meetings:

TSG RAN4 Meeting #34	14 - 18 Feb 2005	Phoenix, US
TSG RAN4 Meeting #35	9 - 13 May 2005	Europe