TSG-RAN Meeting #9 **_RP-000366_**
Oahu, HI, USA, 20 – 22 September 2000

Title: **Agreed CRs to TR 25.922**

Source: **TSG-RAN WG2**

Agenda item: **5.2.3**

Doc-1st-	Status-	Spec	CR	Rev	Subject	Cat	Version	Versio
R2-001807	agreed	25.922	004	2	Clarification on RRC security and capability information transfer during handover to UTRAN	F	3.2.0	3.3.0
R2-001612	agreed	25.922	006		Variable Rate Transmission	F	3.2.0	3.3.0

3GPP TSG RAN WG2#15
Sophia Ant., France, August 21st- 25th, 2000

***Document* R2-001807**
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or for SMG, use the format P-99-xxx

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25.922	**CR**	**004r2**	Current Version:	3.2.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑   *↑ CR number as allocated by MCC support team*

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

Source: TSG-RAN WG2   **Date:** 2000-08-29

Subject: Clarification on RRC security and capability information transfer during handover to UTRAN

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change:

This CR includes the following change proposals:

- "Transfer of security and UE capability information during handover to UTRAN": further clarification is added regarding the need for transferring this information prior thandover.

Clauses affected: 2, 5.1.5.2, 5.1.5.2.1, 5.1.5.2.1a (NEW), 5.1.5.2.1b (NEW), 5.1.5.2.1.c (NEW)

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments: R2-1516 was reserved for the original revision of this CR. However, R2-1516 was withdrawn.

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2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] 3GPP Homepage: www.3GPP.org.

[2] 3G TS 25.212: "Multiplexing and channel coding".

[3] 3G TS 25.215: "Physical layer – Measurements (FDD)".

[4] 3G TS 25.301: "Radio Interface Protocol Architecture".

[5] 3G TS 25.302: "Services provided by the Physical Layer".

[6] 3G TS 25.303: "Interlayer Procedures in Connected Mode".

[7] 3G TS 25.304: "UE procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode".

[8] 3G TS 25.322: "RLC Protocol Specification".

[9] 3G TS 25.331: "RRC Protocol Specification".

[10] 3G TS 25.921: "Guidelines and Principles for protocol description and error handling".

[11] 3G TR 21.905: "Vocabulary for 3GPP Specifications".

[12] 3G TS 26.010: "Mandatory Speech Codec speech processing functions AMR Speech Codec General Description".

[13] 3G TS 23.022: "Functions related to Mobile Station (MS) in idle mode".

[14] 3G TS 33.102: "3G Security; Security Architecture".

5.1.5.2 Handover 2G to 3G

In the following clauses, first the general concept and requirements are introduced. Next the typical flow of information is described.

5.1.5.2.1 Introduction

The description provided in the following mainly deals with the use of predefined radio configuration during handover from 2G to 3G. However, the description of the handover information flows also includes details of other RRC information transferred during handover e.g. UE radio capability and security information.

5.1.5.2.1a Predefined radio configuration information

In order to reduce the size of certain size critical messages in UMTS, a network may download/ pre-define one or more radio configurations in a mobile. A predefined radio configuration mainly consists of radio bearer and transport channel parameters. A network knowing that the UE has suitable predefined configurations stored can then refer to the stored configuration requiring only additional parameters to be transferred.

Predefined configurations may be applied when performing handover from another RAT to UTRAN. In the case of handover from GSM to UTRAN, the performance of handover to UTRAN is improved when it is possible to transfer the handover to UTRAN command within a non-segmented GSM air interface message.

Furthermore, it is important to note that it is a network option whether or not to use pre-configuration; the handover to UTRAN procedures also support transfer of a handover to UTRAN command including all parameters.

NOTE: In case segmentation is used, subsequent segments can only be transferred after acknowledgement of earlier transmitted segments. In case of handover however, the quality of the UL may be quite poor resulting in a failure to transfer acknowledgements. This implies that it may be impossible to quickly transfer a segmented handover message. Segmentation over more than two GSM air interface messages will have a significantly detrimental, and unacceptable, impact on handover performance.

The UE shall be able to store upto 16 different predefined configurations, each of which is identified with a separate pre-configuration identity. The UE need not defer accessing the network until it has obtained all predefined configurations. The network may use different configurations for different services e.g. speech, circuit switched data. Moreover, different configurations may be needed because different UTRAN implementations may require service configurations to be customised e.g. different for micro and macro cells.

The predefined configurations stored within the UE are valid within the scope of a PLMN; the UE shall consider these configurations to be invalid upon PLMN re-selection. Furthermore, a value tag is associated with each individual pre-defined configuration. This value tag, that can have 16 values, is used by the UE and the network to ensure the stored pre-defined configuration(s) is the latest/required version.

The current facilities in 25.331 have focused on the use of predefined configurations during handover from GSM to UTRAN. The same principles may also be applied for the handover procedures used within UTRAN e.g. handover including SRNC relocation. Use of predefined configurations in these cases may require extension of the currently defined RRC procedures.

5.1.5.2.1b Security and UE capability information

The security requirements concerning handover to UTRAN are specified in [14].

The initialisation parameters for ciphering are required to be transferred to the target RNC prior to the actual handover to UTRAN to ensure the immediate start of ciphering. For UEs involved in CS & PS domain services, R99 specifications support handover for the CS domain services while the PS domain services are re-established later. Consequently, in R99 only the START for the CS domain service needs to be transferred prior to handover. The START for the PS domain may be transferred at the end of the handover procedure, within the HANDOVER TO UTRAN COMPLETE message.

It should be noted that inter RAT handover normally involves a change of ciphering algorithm, in which case the new algorithm is included within the HANDOVER TO UTRAN COMMAND message.

Activation of integrity protection requires additional information transfer e.g. FRESH. Since the size of the HANDOVER TO UTRAN COMMAND message is critical, the required integrity protection information can not be included in this message. Instead, integrity protection is started immediately after handover by means of the security mode control procedure. Therefore, the HANDOVER TO UTRAN COMMAND and the HANDOVER TO UTRAN COMPLETE messages are not integrity protected.

5.1.5.2.1.c UE capability information

When selecting the RRC radio configuration parameters to be included in the HANDOVER TO UTRAN COMMAND message, UTRAN should take into account the capabilities of the UE. Therefore, the UE radio capability information should be transferred to the target RNC prior to handover to UTRAN.

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Sophia Antipolis, 21 - 25 August 2000

Document R2-001612
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25.922 CR 006 Current Version: 3.2.0

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	X	strategic	
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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 [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-RAN WG2 **Date:** 09/08/00

Subject: Variable Rate Transmission

Work item:

Category:
(only one category shall be marked with an X)

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change:

Corrections have been made to align this section with modification in other specifications.

- discard function is usable for all RLC modes now (25.322). Therefore this procedure is not limited anymore to non-real time services.

- RLC/MAC interaction has been clarified in 25.322

- transport format combination selection in 25.321 has been modified

- maximum UE transmitter power now defined in 25.331

- alignment with WG4 specification 25.133

Clauses affected: 9.1, 9.1.1, 9.1.2

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

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9 Power Management

9.1 Variable Rate ~~Packet~~ Transmission

9.1.1 Examples of Downlink Power Management

When ~~the~~ an RB connection ~~for e.g. packet~~with variable rate transmission ~~services~~ is established, the RRC considers the down-link traffic conditions, then assigns the TFCS to MAC and allowable transmission power to L1. The allowable transmission power can be determined according to the service requirements and the traffic conditions, and is updated for each user when the traffic conditions change. RRC also assigns a measurement to Node B that sets the allowable transmission power to the transmitted code power.

During a call, the physical layer averages the transmission power for that UE over one or several frames. If the averaged transmission power for the UE becomes higher than the allowable transmission power, that is, the channel conditions are bad, L1 indicates to MAC that the "Allowable transmission power has been reached". The MAC in response reduces the data rate within TFCS, and the power control procedure then reduces the total transmission power for that UE and excess interference to other UEs is avoided. The PDUs that can not be transmitted in a TTI shall be buffered according to the discard function set by RRC.

When channel conditions improve and the averaged transmission power falls [margin~~x~~] dB below than the allowable transmission power the physical layer indicates to MAC that the "Average transmission power is below allowable transmission power by margin ~~x~~dB" (the values for [~~x~~margin] are chosen to match the power requirements of different increments for the transport channels within the TFCS). If there is enough data to be sent~~d~~ ~~T~~the MAC in response increases the data rate by increasing the number of transport blocks delivered to L1 and the physical layer increases the total transmission power to the UE by the predefined amount. This allows data that was buffered during bad channel conditions to be delivered to the UE.

Simulation results on down-link variable rate packet transmission are provided in Appendix E.

9.1.2 Examples of Uplink Power Management

When ~~the~~ an RB connection ~~for e.g. packet services~~ with variable rate transmission is established, the RRC assigns the TFCS ~~to the UE~~ and the allowable transmission power to the UE. ~~For the allowable transmission power the UE capability class should be taken into account.~~The maximum allowed UE transmitter power is defined in [25.331].

During a call, the physical layer averages the transmission power over one or several frames. ~~If the averaged transmission power becomes higher than the allowable transmission power~~If the UE output power measured over at least [t1] ms is [margin1] dB within the maximum, the UE shall adapt the transport format combination corresponding to the next lower bit-rate. ~~reduces the data rate within TFCS, and the power control procedure then reduces the total transmission power.~~ The PDUs that can not be transmitted in a TTI shall be buffered according to the discard function set by RRC.

When channel conditions improve and the averaged transmission power falls [margin~~x~~] dB below than the allowable transmission power (the values for [margin~~x~~] are chosen to match the power requirements of different increments in the number of transport channels within the TFCS) and there is enough data to be sent~~d~~, the UE shall continuously estimate whether the output power needed for a switch to the transport format combination corresponding to the next higher bit-rate does not exceed [margin] dB below the maximum. If the UE has enough power to support that up-switch for at least [t2] ms the UE shall increase~~s~~ the data rate by increasing the number of transport blocks delivered to L1 and the physical layer increases the total transmission power by the predefined amount. This allows data that was buffered during bad channel conditions to be transmitted to Node B.

UE transport format selection shall be done according to [25.321] considering logical channel priorities. If the bit rate of a logical channel carrying data from a codec supporting variable rate operation is impacted by the transport format combination selection, the codec data rate shall be adopted accordingly.

Minimum requirements for t1, t2 (multiple of 10ms) and margin as well as maximum delay requirements for a transport format combination switch are defined in [25.133].