TSG-RAN Meeting #15
Cheju, Korea, 5 - 8 March 2002

TSGRP#15(02) 0183

Title: **Agreed CRs to TS 25.935**

Source: **TSG-RAN WG3**

Agenda item: **7.3.3/7.3.4**

RP_Num	Tdoc_Num	Specification	CR_Num	Revision_Num	3G_Release	CR_Subject	CR_Category	Cur_Ver_Num	Workitem
RP-020183	R3-020672	25.935	002		Rel-4	Description of causes of DRNS congestion	F	4.0.0	RRM-Opt

3GPP TSG-RAN Working Group 3 Meeting #27 **R3-020672**
Orlando, FL; USA, 18th to 22nd February 2002

CR-Form-v5

CHANGE REQUEST

⌘ **25.935** **CR** **2** ⌘ **rev** **-** ⌘ Current version: **4.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☐

Title:	⌘	Description of causes of DRNS congestion
Source:	⌘	R-WG3
Work item code:	⌘	RRM-Opt
Date:	⌘	Feb 2002
Category:	⌘	**F**
Release:	⌘	REL-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	In RAN3#25, a Congestion Cause IE was included in the RADIO LINK CONGESTION INDICATION message to indicate the SRNC the type of congestion at the DRNC. There is a need to clarify the meaning of the congestion cause.
Summary of change:	⌘	A new section 4.3.1A is included; it explains the types of resources affected by the different congestion situations (dynamic, static). It also outlines the main scope of the causes and the envisaged solution that is expected to reduce each type of congestion situation.
Consequences if not approved:	⌘	The Congestion Cause definition (IE currently included in the RNSAP R4 specification) would remain incomplete and thus different interpretations could be taken resulting in a performance degradation of the feature in inter-vendor scenarios. Impact Analysis: This CR has no impact on the previous version of the specification (same release) because 25.935 has purely informative character.

Clauses affected:	⌘	4.3.1A
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4 RRM Opt 1: Congestion handling of DCH

4.1 Introduction

Currently a DRNC accepting a dedicated RL, in principle needs to reserve resources for the maximum bitrate which could possibly be required for the DCH's on this RL. This because the DRNC has a very limited view on the load statistics of the DCH's (source descriptor) and has no possibility to control the DL-rate of the DCH's in congestion situations.

4.2 Requirements

The following requirements are identified:

1) It shall be possible for the DRNS to request the SRNC to decrease the resource usage for one or more DCH's due to local congestion conditions in the DRNS.

2) Primary focus should be on UL interference and DL power congestion conditions, allthough congestion for other types of resources may also be considered;

3) Any chosen solution shall support interworking to Iu rate control for real-time services;

4) It shall be possible to have the requested decrease indicated with a granularity sufficiently small to enable an efficient usage of any remaining DRNS resources;

4.3 Study areas

4.3.1 General

Any new functionality introduced in Release 4 should be introduced with the least possible impact to the existing R99 specifications.

4.3.1A Type of congestion (congestion cause)

The congestion in a RL is associated with Resources that could change dynamically during the lifetime of the Radio Link or that are static during the lifetime of the Radio Link or until the RL is reconfigured. Then, the congestion cause can be divided in two types referred to the resources experimenting the congestion. These types of congestion may be related to both UL and/or DL resources:

- Dynamic Resources: This type of congestion is associated with resources that change dynamically during the lifetime of the Radio Link. The main resources associated to this type are the DL Power and the UL Interference (although the Interference is not itself a resource, it is a parameter that can be modelled as a resource). It is expected that reducing the UL/DL Rate is enough to reduce congestion of this type, however the reaction of the SRNC when receiving a congestion indication of this type is open to the vendor implementation.

- Semi-Static resources: This type of congestion is associated with resources that does not change during the lifetime of the Radio Link or until the Radio Link is reconfigured. The main resources associated to this type are the channelisation codes and other Node B semi-static resources (e.g. Max. DL power, transport resources, etc). It is expected that a Radio Link Reconfiguration for reducing the rate and thus not reserving resources for the highest data rates is enough to reduce congestion of this type, however the reaction of the SRNC when receiving a congestion indication of this type is open to the vendor implementation.

4.3.2 Rate Reduction vs. RL Reconfiguration

4.3.2.1 DL Power

To solve congestion on the average DL power there is no need for a reconfiguration. A reduction of the utilised rate will reduce the average DL power.

To solve congestion on the peak DL power there would be a need to reconfigure. However, congestion on the peak DL power is a problem that has to be dealt with fast, i.e. on a frame by frame basis. The current solution is to use the Frame Handling Priority to prioritise between different frames/users in case of a peak DL power congestion.

Consequently, reducing the maximum rate of a DCH is sufficient to reduce the average DL power..

4.3.2.2 UL Interference

For the UL Interference a reduction of the utilised rate may reduce the UL interference as long as the rate reduction leads to a higher spreading factor, i.e. there is an interaction between the rate matching for the Uu and the DCH rate reduction.

Consequently, reducing the maximum rate of a DCH is sufficient to reduce the UL interference.