TSGS#24(04)0270

Source: **SA5 (Telecom Management)**

Title: **Rel-6 CR 32.403 (PM Performance measurements - UMTS and combined UMTS/GSM)**

Document for: **Decision**

Agenda Item: **7.5.3**

Doc-1st-	Spec	CR	R	Phase	Subject	Ca	Ver	Doc-2nd-	Workitem
SP-040270	32.403	039	-	Rel-6	Addition of the measurements about RAB modification and RAB release by CN	B	6.3.0	S5-048477	OAM-PM

CR-Form-v7

CHANGE REQUEST

⌘ 32.403 CR 039 ⌘rev - ⌘ Current version: 6.3.0 ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Addition of the measurements about RAB modification and RAB release by CN
Source:	⌘	**SA5** (llrui@bupt.edu.cn, liyewen@chinamobile.com)
Work item code:	⌘	OAM-PM
Date:	⌘	14/05/2004
Category:	⌘	**B**
Release:	⌘	Rel-6

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)
Rel-6 (Release 6)

Reason for change:	⌘	Currently, the clause 4.1 “RAB management” in 32.403 contains the measurements about RAB establishment and RAB release request by UTRAN, but the measurements about RAB modification and RAB release by CN are missing. The missing measurements benefit operators to analyze RAB management procedures.
Summary of change:	⌘	Add the measurements about RAB modification and RAB release by CN.
Consequences if not approved:	⌘	The operators cannot analyze the RAB management procedures completely.

Clauses affected:	⌘	4.1

	Y	N		
Other specs affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘

Change in Clause 4.1

4.1 RAB management

4.1.1 Overview

4.1.1.1 Measurements are based on the success and failure of procedures

The proposed measurements are not merely based on the counting of a given type of message since a same message may be repeated by an implementation dependent process. The aim here is to provide implementation independent specification.

Proposed measurements are based on the success/failure of procedures identified in the reference documents. The end of a procedure implies a stable state of the communication between the two involved parties. This stable state is normally the object of a common understanding from the two parties. As a consequence, proposed measurements are attached either to the successful or the unsuccessful issue of a procedure.

4.1.1.2 Combination of Traffic Class and Core Network domains

A Radio Access Bearer (RAB) is characterized by several QOS parameters among them is the Traffic Class. Currently there are not any 3GPP specifications including TS 23.107 [8] in which may be found restrictions related to the possible combinations between Traffic Class and Core Network domain.

Consequently, as a conservative position, this specification should leave open every possible combination between Traffic Class and Core Network domain as specification TS 23.107 [8] does.

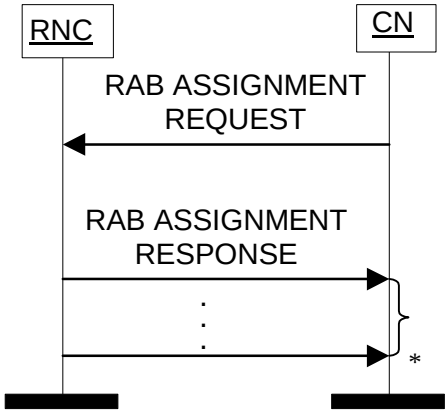
4.1.1.3 Considered Radio Access Bearer management procedures

Performance Measurement definitions in this subclause are based on TS 25.413 "UTRAN Iu Interface RANAP Signalling" [5].

The following paragraphs are of interest for this purpose:

- RAB Assignment;
- RAB Release Request;
- RAB ASSIGNMENT REQUEST;
- RAB ASSIGNMENT RESPONSE;
- RAB RELEASE REQUEST.

These paragraphs show in particular the following diagrams:



* it can be several responses

Figure: RAB Assignment procedure. Successful operation

Figure: RAB Release Request procedure

4.1.1.4 Measurements relate to RAB establishment, modification and release

RAB management procedure includes RAB Assignment procedure and RAB Release Request procedure. The purpose of RAB Assignment procedure is to establish new RABs and/or to enable modifications and/or releases of already established RABs for a given UE. If RABs are failed to be established or modified, the involved services may fail. RAB release request can be initiated by CN or RNC when the services terminate normally or abnormally.

During daily maintenance of network, measurements regarding RAB establishment, modification and release are useful for operators to evaluate RAB management procedures, to analyze failure reasons of RAB establishment and RAB modification, and to analyze the causes of RAB release, especially in case RAB release abnormally.

4.1.2 RAB establishment ~~assignment~~ for CS domain

The five measurement types defined in the clause 4.1.2 for CS domain are subject to the "4 out of 5 approach".

4.1.2.1 Attempted RAB establishments for CS domain

a) This measurement provides the number of requested RAB in establishment ~~assignment~~ attempts for CS domain. The measurement is split into subcounters per traffic class.

b) CC.

c) On receipt by the RNC of a RANAP RAB ASSIGNMENT REQUEST message for CS domain, each requested RAB in establishment attempts~~assignment request~~ is added to the relevant measurement according to the traffic class requested. See TS 25.413 [5] and TS 23.107 [8].

NOTE: The addition is performed with the condition that the RAB has not been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Four integer values.

e) RAB.AttEstabCS.Conv
RAB.AttEstabCS.Strm
RAB.AttEstabCS.Intact
RAB.AttEstabCS.Bgrd

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.2.2 Successful RAB establishments without queuing for CS domain

a) This measurement provides the number of successfully established RABs for CS domain in which a queuing process has not been involved. The measurement is split into subcounters per traffic class.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for CS domain, each successfully established RAB is added to the relevant measurement according to the traffic class requested in the RAB ASSIGNMENT REQUEST message. See TS 25.413 [5] and TS 23.107 [8].

NOTE: The addition is performed with the condition the RAB has not been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE and the RAB has not been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Four integer values.

e) RAB.SuccEstabCSNoQueuing.Conv
RAB.SuccEstabCSNoQueuing.Strm
RAB.SuccEstabCSNoQueuing.Intact
RAB.SuccEstabCSNoQueuing.Bgrd

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.2.3 Failed RAB establishments without queuing for CS domain

a) This measurement provides the number of RABs failed to establish ~~establishment failures~~ for CS domain in which a queuing process has not been involved. The measurement is split into subcounters per failure cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for CS domain, each RAB failed to establish is added to the relevant measurement according to the failure cause. Possible causes are included in TS 25.413 [5]. The sum of all supported per cause measurements shall equal the total number of RAB Establishment Failures. In case only a subset of per cause measurements is supported, a sum subcounter will be provided first.

NOTE: The addition is performed with the condition the RAB has not been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE and the RAB has not been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes supported plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.FailEstabCSNoQueuing.*Cause*
where *Cause* identifies the failure cause.

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.2.4 Successful RAB establishments with queuing for CS domain

a) This measurement provides the number of successfully established RABs for CS domain in which a queuing process has been involved. The measurement is split into subcounters per traffic class.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for CS domain, each successfully established RAB is added to the relevant measurement according to the traffic class. See TS 25.413 [5] and TS 23.107 [8].

NOTE: The addition is performed with the condition the RAB has been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE and the RAB has not been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Four integer values.

e) RAB.SuccEstabCSQueuing.Conv
RAB.SuccEstabCSQueuing.Strm
RAB.SuccEstabCSQueuing.Intact
RAB.SuccEstabCSQueuing.Bgrd

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.2.5 Failed RAB establishments with queuing for CS domain

a) This measurement provides the number of RABs failed to establish ~~establishment failures~~ for CS domain in which a queuing process has been involved. The measurement is split into subcounters per failure cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for CS domain, each RAB failed to establish is added to the relevant measurement according to the cause. Possible causes are included in TS 25.413 [5]. The sum of all supported per cause measurements shall equal the total number of RAB Establishment Failures. In case only a subset of per cause measurements is supported, a sum subcounter will be provided first.

NOTE: The addition is performed with the condition the RAB has been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE and the RAB has not been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.FailEstabCSQueuing.*Cause*
where *Cause* identifies the failure cause.

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.3 RAB establishment~~assignment~~ for PS domain

The five measurement types defined in the clause 4.1.3 for PS domain are subject to the "4 out of 5 approach".

4.1.3.1 Attempted RAB establishments for PS domain

a) This measurement provides the number of requested RABs in establishment ~~assignment~~ attempts for PS domain. The measurement is split into subcounters per traffic class.

b) CC.

c) On receipt by the RNC of a RANAP RAB ASSIGNMENT REQUEST message for PS domain, each requested RAB in establishment attempts~~assignment request~~ is added to the relevant measurement according to the traffic class requested. See TS 25.413 [5] and TS 23.107 [8].

NOTE: The addition is performed with the condition that the RAB has not been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Four integer values.

e) RAB.AttEstabPS.Conv
RAB.AttEstabPS.Strm
RAB.AttEstabPS.Intact
RAB.AttEstabPS.Bgrd

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.3.2 Successful RAB establishments without queuing for PS domain

a) This measurement provides the number of successfully established RABs for PS domain in which a queuing process has not been involved. The measurement is split into subcounters per traffic class.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for PS domain, each successfully established RAB is added to the relevant measurement according to the traffic class. See TS 25.413 [5] and TS 23.107 [8].

NOTE: The addition is performed with the condition the RAB has not been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE and the RAB has not been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Four integer values.

e) RAB.SuccEstabPSNoQueuing.Conv
RAB.SuccEstabPSNoQueuing.Strm
RAB.SuccEstabPSNoQueuing.Intact
RAB.SuccEstabPSNoQueuing.Bgrd

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.3.3 Failed RAB establishments without queuing for PS domain

a) This measurement provides the number of RABs failed to establish ~~establishment failures~~ for PS in which a queuing process has not been involved. The measurement is split into subcounters per failure cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for PS domain, each RAB failed to establish is added to the relevant measurement according to the failure cause. Possible causes are

included in TS 25.413 [5]. The sum of all supported per cause measurements shall equal the total number of RAB Establishment Failures. In case only a subset of per cause measurements is supported, a sum subcounter will be provided first.

NOTE: The addition is performed with the condition the RAB has not been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE and the RAB has not been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.FailEstabPSNoQueuing.*Cause*
where *Cause* identifies the failure cause.

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.3.4 Successful RAB establishments with queuing for PS domain

a) This measurement provides the number of successfully established RABs for PS domain in which a queuing process has been involved. The measurement is split into subcounters per traffic class.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for PS domain, each successfully established RAB is added to the relevant measurement according to the traffic class. See TS 25.413 [5] and TS 23.107 [8].

NOTE: The addition is performed with the condition the RAB has been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE and the RAB has not been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Four integer values.

e) RAB.SuccEstabPSQueuing.Conv
RAB.SuccEstabPSQueuing.Strm
RAB.SuccEstabPSQueuing.Intact
RAB.SuccEstabPSQueuing.Bgrd

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.3.5 Failed RAB establishments with queuing for PS domain

a) This measurement provides the number of RABs failed to establish ~~establishment failures~~ for PS domain in which a queuing process has been involved. The measurement is split into subcounters per failure cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for PS domain, each RAB failed to establish is added to the relevant measurement according to the cause. Possible causes are included in TS 25.413 [5]. The sum of all supported per cause measurements shall equal the total number of RAB Establishment Failures. In case only a subset of per cause measurements is supported, a sum subcounter will be provided first.

NOTE: The addition is performed with the condition that the RAB has been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE and the RAB has not been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the .*sum* suffix.

e) The measurement name has the form RAB.FailEstabPSQueuing.*Cause*
where *Cause* identifies the failure cause.

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.4 RAB modification for CS domain

The five measurement types defined in the clause 4.1.4 for CS domain are subject to the "4 out of 5 approach".

4.1.4.1 Attempted RAB modifications for CS domain

a) This measurement provides the number of requested RABs in modification attempts for CS domain. The measurement is split into subcounters per traffic class.

b) CC.

c) On receipt by the RNC of a RANAP RAB ASSIGNMENT REQUEST message for CS domain, each requested RAB in modification attempts is added to the relevant measurement according to the traffic class requested. See TS 25.413 and TS 23.107.

NOTE: The addition is performed with the condition that the RAB has been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Four integer values.

e) RAB.AttModCS.Conv
RAB.AttModCS.Strm
RAB.AttModCS.Intact
RAB.AttModCS.Bgrd

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.4.2 Successful RAB modifications without queuing for CS domain

a) This measurement provides the number of successfully modified RABs for CS domain in which a queuing process has not been involved. The measurement is split into subcounters per traffic class.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for CS domain, each successfully modified RAB is added to the relevant measurement according to the traffic class requested in the RAB ASSIGNMENT REQUEST message. See TS 25.413 and TS 23.107.

NOTE: The addition is performed with the condition that the RAB has not been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE and the RAB has been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Four integer values.

e) RAB.SuccModCSNoQueuing.Conv
RAB.SuccModCSNoQueuing.Strm

RAB.SuccModCSNoQueuing.Intact
RAB.SuccModCSNoQueuing.Bgrd

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.4.3 Failed RAB modifications without queuing for CS domain

a) This measurement provides the number of RABs failed to modify for CS domain in which a queuing process has not been involved. The measurement is split into subcounters per failure cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for CS domain, each RAB failed to modify is added to the relevant measurement according to the failure cause. Possible causes are included in TS 25.413. The sum of all supported per cause measurements shall equal the total number of RAB Modification Failures. In case only a subset of per cause measurements is supported, a sum measurement subtype will be provided first.

NOTE: The addition is performed with the condition that the RAB has not been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE and the RAB has been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes supported plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.FailModCSNoQueuing.*Cause*
where *Cause* identifies the failure cause.

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.4.4 Successful RAB modifications with queuing for CS domain

a) This measurement provides the number of successfully modified RABs for CS domain in which a queuing process has been involved. The measurement is split into subcounters per traffic class.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for CS domain, each successfully modified RAB is added to the relevant measurement according to the traffic class. See TS 25.413 and TS 23.107.

NOTE: The addition is performed with the condition that the RAB has been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE and the RAB has been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Four integer values.

e) RAB.SuccModCSQueuing.Conv
RAB.SuccModCSQueuing.Strm
RAB.SuccModCSQueuing.Intact
RAB.SuccModCSQueuing.Bgrd

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.4.5 Failed RAB modifications with queuing for CS domain

a) This measurement provides the number of RABs failed to modify for CS domain in which a queuing process has been involved. The measurement is split into subcounters per failure cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for CS domain, each RAB failed to modify is added to the relevant measurement according to the cause. Possible causes are included in TS 25.413. The sum of all supported per cause measurements shall equal the total number of RAB Modification Failures. In case only a subset of per cause measurements is supported, a sum measurement subtype will be provided first.

NOTE: The addition is performed with the condition that the RAB has been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE and the RAB has been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.FailModCSQueuing.*Cause*
where *Cause* identifies the failure cause.

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.5 RAB modification for PS domain

The five measurement types defined in the clause 4.1.5 for PS domain are subject to the "4 out of 5 approach".

4.1.5.1 Attempted RAB modifications for PS domain

a) This measurement provides the number of requested RABs in modification attempts for PS domain. The measurement is split into subcounters per traffic class.

b) CC.

c) On receipt by the RNC of a RANAP RAB ASSIGNMENT REQUEST message for PS domain, each requested RAB in modification attempts is added to the relevant measurement according to the traffic class requested. See TS 25.413 and TS 23.107.

NOTE: The addition is performed with the condition that the RAB has been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Four integer values.

e) RAB.AttModPS.Conv
RAB.AttModPS.Strm
RAB.AttModPS.Intact
RAB.AttModPS.Bgrd

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.5.2 Successful RAB modifications without queuing for PS domain

a) This measurement provides the number of successfully modified RABs for PS domain in which a queuing process has not been involved. The measurement is split into subcounters per traffic class.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for PS domain, each successfully modified RAB is added to the relevant measurement according to the traffic class. See TS 25.413 and TS 23.107.

NOTE: The addition is performed with the condition that the RAB has not been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE and the RAB has been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Four integer values.

e) RAB.SuccModPSNoQueuing.Conv
RAB.SuccModPSNoQueuing.Strm
RAB.SuccModPSNoQueuing.Intact
RAB.SuccModPSNoQueuing.Bgrd

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.5.3 Failed RAB modifications without queuing for PS domain

a) This measurement provides the number of RABs failed to modify for PS in which a queuing process has not been involved. The measurement is split into subcounters per failure cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for PS domain, each RAB failed to modify is added to the relevant measurement according to the failure cause. Possible causes are included in TS 25.413. The sum of all supported per cause measurements shall equal the total number of RAB Modification Failures. In case only a subset of per cause measurements is supported, a sum measurement subtype will be provided first.

NOTE: The addition is performed with the condition that the RAB has not been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE and the RAB has been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.FailModPSNoQueuing.*Cause*
where *Cause* identifies the failure cause.

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.5.4 Successful RAB modifications with queuing for PS domain

a) This measurement provides the number of successfully modified RABs for PS domain in which a queuing process has been involved. The measurement is split into subcounters per traffic class.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for PS domain, each successfully modified RAB is added to the relevant measurement according to the traffic class. See TS 25.413 and TS 23.107.

NOTE: The addition is performed with the condition that the RAB has been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE and the RAB has been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Four integer values.

e) RAB.SuccModPSQueuing.Conv
RAB.SuccModPSQueuing.Strm
RAB.SuccModPSQueuing.Intact
RAB.SuccModPSQueuing.Bgrd

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.5.5 Failed RAB modifications with queuing for PS domain

a) This measurement provides the number of RABs failed to modify for PS domain in which a queuing process has been involved. The measurement is split into subcounters per failure cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for PS domain, each RAB failed to modify is added to the relevant measurement according to the cause. Possible causes are included in TS 25.413. The sum of all supported per cause measurements shall equal the total number of RAB Modification Failures. In case only a subset of per cause measurements is supported, a sum measurement subtype will be provided first.

NOTE: The addition is performed with the condition that the RAB has been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE and the RAB has been setup or modified successfully in a previous RANAP RAB ASSIGNMENT RESPONSE or RELOCATION REQUEST ACKNOWLEDGE.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.FailModPSQueuing.*Cause*
where *Cause* identifies the failure cause.

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.6 RAB release request by CN for CS domain

The five measurement types defined in the clause 4.1.2 for CS domain are subject to the "4 out of 5 approach".

4.1.6.1 Attempted RAB releases for CS domain

a) This measurement provides the number of requested RABs in release attempts for CS domain. The measurement is split into subcounters per release cause.

b) CC.

c) On receipt by the RNC of a RANAP RAB ASSIGNMENT REQUEST message for CS domain, each requested RAB in release attempts is added to the relevant measurement according to the release cause requested. Possible causes are included in TS 25.413. The sum of all supported per cause measurements shall equal the total number

of RAB Release Attempts. In case only a subset of per cause measurements is supported, a sum measurement subtype will be provided first. See TS 25.413 and TS 23.107.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.AttRelCS.*Cause*
where *Cause* identifies the release cause.

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.6.2 Successful RAB releases without queuing for CS domain

a) This measurement provides the number of successfully released RABs for CS domain in which a queuing process has not been involved. The measurement is split into subcounters per release cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for CS domain, each successfully released RAB is added to the relevant measurement according to the release cause requested in the RAB ASSIGNMENT REQUEST message. Possible causes are included in TS 25.413. The sum of all supported per cause measurements shall equal the total number of RAB Release Successes. In case only a subset of per cause measurements is supported, a sum measurement subtype will be provided first. See TS 25.413 and TS 23.107.

NOTE: The addition is performed with the condition that the RAB has not been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.SuccRelCSNoQueuing.*Cause*
where *Cause* identifies the release cause.

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.6.3 Failed RAB releases without queuing for CS domain

a) This measurement provides the number of RABs failed to release for CS domain in which a queuing process has not been involved. The measurement is split into subcounters per failure cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for CS domain, each RAB failed to release is added to the relevant measurement according to the failure cause. Possible causes are included in TS 25.413. The sum of all supported per cause measurements shall equal the total number of RAB Release Failures. In case only a subset of per cause measurements is supported, a sum measurement subtype will be provided first.

NOTE: The addition is performed with the condition that the RAB has not been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes supported plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.FailRelCSNoQueuing.*Cause*
where *Cause* identifies the failure cause.

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.6.4 Successful RAB releases with queuing for CS domain

a) This measurement provides the number of successfully released RABs for CS domain in which a queuing process has been involved. The measurement is split into subcounters per release cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for CS domain, each successfully released RAB is added to the relevant measurement according to the release cause. Possible causes are included in TS 25.413. The sum of all supported per cause measurements shall equal the total number of RAB Release Successes. In case only a subset of per cause measurements is supported, a sum measurement subtype will be provided first. See TS 25.413 and TS 23.107. See TS 25.413 and TS 23.107.

NOTE: The addition is performed with the condition that the RAB has been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.SuccRelCSQueuing.*Cause*
where *Cause* identifies the release cause.

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.6.5 Failed RAB releases with queuing for CS domain

a) This measurement provides the number of RABs failed to release for CS domain in which a queuing process has been involved. The measurement is split into subcounters per failure cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for CS domain, each RAB failed to release is added to the relevant measurement according to the cause. Possible causes are included in TS 25.413. The sum of all supported per cause measurements shall equal the total number of RAB Release Failures. In case only a subset of per cause measurements is supported, a sum measurement subtype will be provided first.

NOTE: The addition is performed with the condition that the RAB has been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.FailRelCSQueuing.*Cause*
where *Cause* identifies the failure cause.

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.7 RAB release request by CN for PS domain

The five measurement types defined in the clause 4.1.3 for PS domain are subject to the "4 out of 5 approach".

4.1.7.1 Attempted RAB releases for PS domain

a) This measurement provides the number of requested RABs in release attempts for PS domain. The measurement is split into subcounters per release cause.

b) CC.

c) On receipt by the RNC of a RANAP RAB ASSIGNMENT REQUEST message for PS domain, each requested RAB in release attempts is added to the relevant measurement according to the release cause. Possible causes are included in TS 25.413. The sum of all supported per cause measurements shall equal the total number of RAB Release Attempts. In case only a subset of per cause measurements is supported, a sum measurement subtype will be provided first. See TS 25.413 and TS 23.107.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.AttRelPS.*Cause*
where *Cause* identifies the release cause.

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.7.2 Successful RAB releases without queuing for PS domain

a) This measurement provides the number of successfully released RABs for PS domain in which a queuing process has not been involved. The measurement is split into subcounters per release cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for PS domain, each successfully released RAB is added to the relevant measurement according to the release cause. Possible causes are included in TS 25.413. The sum of all supported per cause measurements shall equal the total number of RAB Release Successes. In case only a subset of per cause measurements is supported, a sum measurement subtype will be provided first. See TS 25.413 and TS 23.107.

NOTE: The addition is performed with the condition that the RAB has not been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.AttRelPSNoQueuing.*Cause*
where *Cause* identifies the release cause.

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.7.3 Failed RAB releases without queuing for PS domain

a) This measurement provides the number of RABs failed to release for PS in which a queuing process has not been involved. The measurement is split into subcounters per failure cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for PS domain, each RAB failed to release is added to the relevant measurement according to the failure cause. Possible causes are included in TS 25.413. The sum of all supported per cause measurements shall equal the total number of RAB Release Failures. In case only a subset of per cause measurements is supported, a sum measurement subtype will be provided first.

NOTE: The addition is performed with the condition that the RAB has not been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.FailRelPSNoQueuing.*Cause*
where *Cause* identifies the failure cause.

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.7.4 Successful RAB releases with queuing for PS domain

a) This measurement provides the number of successfully released RABs for PS domain in which a queuing process has been involved. The measurement is split into subcounters per release cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for PS domain, each successfully released RAB is added to the relevant measurement according to the release cause. Possible causes are included in TS 25.413. The sum of all supported per cause measurements shall equal the total number of RAB Release Successes. In case only a subset of per cause measurements is supported, a sum measurement subtype will be provided first. See TS 25.413 and TS 23.107. See TS 25.413 and TS 23.107.

NOTE: The addition is performed with the condition that the RAB has been mentioned as queued in a previous RANAP RAB ASSIGNMENT RESPONSE.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.SuccRelPSQueuing.*Cause*
where *Cause* identifies the release cause.

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.7.5 Failed RAB releases with queuing for PS domain

a) This measurement provides the number of RABs failed to release for PS domain in which a queuing process has been involved. The measurement is split into subcounters per failure cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB ASSIGNMENT RESPONSE message for PS domain, each RAB failed to release is added to the relevant measurement according to the cause. Possible causes are included in TS 25.413. The sum of all supported per cause measurements shall equal the total number of RAB Release Failures. In case only a subset of per cause measurements is supported, a sum measurement subtype will be provided first.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.FailRelPSQueuing.*Cause*
where *Cause* identifies the failure cause.

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.48 RAB setup time

4.1.48.1 RAB CS connection set-up time (Mean)

a) This measurement provides the mean time during each granularity period for a RNC to establish a RAB CS connection.

b) DER (n=1).

c) This measurement is obtained by accumulating the time intervals for each successful RAB establishment between the receipt by the RNC of a RANAP "RAB ASSIGNMENT REQUEST" message to establish a RAB for CS domain, and the first corresponding (based on RAB ID) transmission by the RNC of a RANAP "RAB ASSIGNMENT RESPONSE" message for successfully established RABs over a granularity period using DER, see TS 25.413 [5]. This end value of the time will then be divided by the number of successfully established RABs observed in the granularity period to give the arithmetic mean, the accumulator shall be reinitialised at the beginning of each granularity period.

d) Each measurement is an integer value.(in milliseconds).

e) RAB.SuccEstabCSSetupTimeMean

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.48.2 RAB CS connection set-up time (Maximum)

a) This measurement provides the maximum time during each granularity period for a RNC to establish a RAB CS connection.

b) GAUGE.

c) This measurement is obtained by monitoring the time intervals for each successful RAB establishment between the receipt by the RNC of a RANAP "RAB ASSIGNMENT REQUEST" message to establish a RAB for CS domain, and the first corresponding (based on RAB ID) transmission by the RNC of a RANAP "RAB ASSIGNMENT RESPONSE" message for successfully established RABs see TS 25.413 [5]. The high tide mark of this time will be stored in a gauge, the gauge shall be reinitialised at the beginning of each granularity period.

d) Each measurement is an integer value.(in milliseconds).

e) RAB.SuccEstabCSSetupTimeMax

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.48.3 RAB PS connection set-up time (Mean)

a) This measurement provides the mean time during each granularity period for a RNC to establish a RAB PS connection.

b) DER (n=1).

c) This measurement is obtained by accumulating the time intervals for each successful RAB establishment between the receipt by the RNC of a RANAP "RAB ASSIGNMENT REQUEST" message to establish a RAB for PS domain, and the first corresponding (based on RAB ID) transmission by the RNC of a RANAP "RAB ASSIGNMENT RESPONSE" message for successfully established RABs over a granularity period using DER, see TS 25.413 [5]. This end value of the time will then be divided by the number of successfully established

RABs observed in the granularity period to give the arithmetic mean, the accumulator shall be reinitialised at the beginning of each granularity period.

d) Each measurement is an integer value.(in milliseconds).

e) RAB.SuccEstabPSSetupTimeMean

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.~~4~~8.4 RAB PS connection set-up time (Maximum)

a) This measurement provides the maximum time during each granularity period for a RNC to establish a RAB PS connection.

b) GAUGE.

c) This measurement is obtained by monitoring the time intervals for each successful RAB establishment between the receipt by the RNC of a RANAP "RAB ASSIGNMENT REQUEST" message to establish a RAB for PS domain, and the first corresponding (based on RAB ID) transmission by the RNC of a RANAP "RAB ASSIGNMENT RESPONSE" message for successfully established RABs see TS 25.413 [5]. The high tide mark of this time will be stored in a gauge, the gauge shall be reinitialised at the beginning of each granularity period.

d) Each measurement is an integer value.(in milliseconds).

e) RAB.SuccEstabPSSetupTimeMax

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

4.1.~~5~~9 RAB release request by UTRAN

4.1.~~5~~9.1 RAB release~~s~~ requests for CS domain

a) This measurement provides the number of RABs requested to release~~s~~ by UTRAN for CS domain split into subcounters per cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB RELEASE REQUEST message for CS domain, each RAB requested to be released is added to the relevant per cause measurement. Possible causes are included in TS 25.413 [5]. The sum of all supported per cause measurements shall equal the total number of RAB Release~~s~~ Requests for the CS domain. In case only a subset of per cause measurements is supported, a sum subcounter will be provided first.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the *.sum* suffix.

e) The measurement name has the form RAB.RelReqCS.*Cause*
where *Cause* identifies the release cause.

f) RncFunction.

g) Valid for circuit switched traffic.

h) UMTS.

4.1.~~5~~9.2 RAB release~~s~~ requests for PS domain

a) This measurement provides the number of RAB~~s requested to~~ release~~s~~ ~~by UTRAN~~ for PS domain split into subcounters per cause.

b) CC.

c) On transmission by the RNC of a RANAP RAB RELEASE REQUEST message for PS domain, each RAB requested to be released is added to the relevant per cause measurement. Possible causes are included in TS 25.413 [5]. The sum of all supported per cause measurements shall equal the total number of RAB Release~~s~~ ~~Requests~~ for the PS domain. In case only a subset of per cause measurements is supported, a sum subcounter will be provided first.

d) Each measurement is an integer value. The number of measurements is equal to the number of causes plus a possible sum value identified by the .*sum* suffix.

e) The measurement name has the form RAB.Rel~~Req~~PS.*Cause*
where *Cause* identifies the release cause.

f) RncFunction.

g) Valid for packet switched traffic.

h) UMTS.

End of Change in Clause 4.1
End of Document

Annex C (informative):
Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
Jun 2001	S_12	SP-010237	--	--	Submitted to TSG SA #12 for Approval.	1.0.2	4.0.0
Sep 2001	S_13	SP-010468	001	--	Corrections on UMTS and combined UMTS/GSM measurements: Addition of family name for CN measurements, addition of the list of families, addition of Annex A: "(n-1) out of n" examples, application of the "(n-1) out of n" approach to all relevant measurements, enhancement of per cause measurements	4.0.0	4.1.0
Mar 2002	S_15	SP-020026	002	--	Correction of the measured object class for some SGSN MM measurement definitions	4.1.0	4.2.0
Mai 2002	--	--	--	--	MCC clean-up (Cosmetics based on EditHelp)	4.2.0	4.2.1
Jun 2002	S_16	SP-020291	003	2	Introduction of "Performance Measurements Definition Process" describing the repeatable, top-down process to define measurements for inclusion in future 3GPP Releases	4.2.0	5.0.0
Jun 2002	S_16	SP-020291	004	--	Adding performance measurement definitions related to GGSN	4.2.0	5.0.0
Jun 2002	S_16	SP-020291	005	--	Introduction of an optional "Purpose" clause in the measurement template	4.2.0	5.0.0
Jun 2002	S_16	SP-020291	006	--	Addition of explanatory text for Radio Access Bearer (RAB) measurements	4.2.0	5.0.0
Sep 2002	S_17	SP-020609	009	--	Introduction of Service Based Performance Measurement Definitions	5.0.0	5.1.0
Sep 2002	S_17	SP-020609	010	--	Add flexibility in the measurement template for the Measured Object Class (MOC)	5.0.0	5.1.0
Mar 2003	S_19	SP-030146	012	--	Correction of the subscriber number measurement definitions	5.1.0	5.2.0
Jun 2003	S_20	SP-030292	014	--	Correction of the definition of the successful GPRS attach counters	5.2.0	5.3.0
Jun 2003	S_20	SP-030292	015	--	Deletion of dual clause 4.1.2	5.2.0	5.3.0
Jun 2003	S_20	SP-030293	016	--	Addition of GPRS per cause measurement definitions	5.3.0	6.0.0
Jun 2003	S_20	SP-030293	017	--	Introduction of MMS Service Based Performance Measurement	5.3.0	6.0.0
Sep 2003	S_21	SP-030431	020	--	Correction of collection method for SGSN measurements	6.0.0	6.1.0
Sep 2003	S_21	SP-030431	023	--	Correction of “outgoing intra-cell hard handovers measurements”	6.0.0	6.1.0
Dec 2003	S_22	SP-030645	025	--	Correction of terms used for subcounter definitions	6.1.0	6.2.0
Mar 2004	S_23	SP-040134	028	--	Correction of "Radio link addition" measurements	6.2.0	6.3.0
Mar 2004	S_23	SP-040135	029	--	Add the measurements about Iu connection release	6.2.0	6.3.0