TSG-RAN Meeting #14 Kyoto, Japan, 11 - 14, December, 2001

TSGRP#14(01) 0847

Title: Agreed CRs to TS 25.410

Source: TSG-RAN WG3

Agenda item: 8.3.3/8.3.4/9.4.3

RP Tdoc	R3 Tdoc	Spec	CR_Num	Rev	Release	CR_Subject	Cat	Cur_Ver	New_Ver	Workitem
RP-010847	R3-013618	25.410	030	1	R99	Addition of "Specification Notations" Section	F	3.5.0	3.6.0	TEI
RP-010847	R3-013619	25.410	031	1	Rel-4	Addition of "Specification Notations" Section	A	4.2.0	4.3.0	TEI
RP-010847	R3-013229	25.410	028		Rel-4	SCCP Connection Release Initiated by RNC in Abnormal case	A	4.2.0	4.3.0	TEI
RP-010847	R3-013228	25.410	027		R99	SCCP Connection Release Initiated by RNC in Abnormal case	F	3.5.0	3.6.0	TEI
RP-010847	R3-013510	25.410	026	1	Rel-4	Iu-BC Connectivity	A	4.2.0	4.3.0	TEI
RP-010847	R3-013509	25.410	025	1	R99	Iu-BC Connectivity CRx on TS 25.410 v3.5.0	F	3.5.0	3.6.0	TEI
RP-010847	R3-013092	25.410	024		Rel-4	SS7 point codes over lu-cs	A	4.2.0	4.3.0	TEI
RP-010847	R3-013526	25.410	023	1	R99	SS7 point codes over lu-cs	F	3.5.0	3.6.0	TEI

R3-013526

			CHANG	ER	EQU	ES1	Γ				CR-Form-v4
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For R4 and further releases, as the MSC can be split into an MSC Service or more MGWs, it is proposed to mandate the RNC to support difference codes to RANAP and ALCAP. However, it is proposed to use the same for both RANAP and ALCAP at RNC side.								C Server fferent po e same po	and one bint bint code		
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Other specs affected:	 X Other core specifications Test specifications O&M Specifications 	ж	25.410 v4.2.0 CR024	
Other comments:	ж			

4.5.1 Use of Transport Network User Plane as Signalling Bearer

4.5.1.1 Use of SCCP

This section is unchanged

4.5.1.2 Use of MTP3b

- For a given MSC, the RNC shall be able to access RANAP and ALCAP either under the same MTP3b destination point code, or under different point codes;
- For a given RNC, the MSC shall be able to access RANAP and ALCAP either under the same MTP3b destination point code, or under different point codes;

R3-013092

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Reason for change:	In TS 25.410 RANAP and two different point codes f This could lead	o, for the lu-cs int ALCAP is unclea MTP3b protocol for RANAP and A to interoperability	erface, the nur ar for MSC side stacks that co ALCAP. between vendo	mber of MTP3b e and RNC side uld be interprete ors over the Iu-cs	point codes for The figure 6.1 shows ed as two different interface.		
Summary of change	e: # Rev1						
	Full flexibility i Rev0	is agreed for bot	n R99 and R4,	and the text is o	changed to reflect it.		
	For R99, it is p and ALCAP fo	proposed to resti or both sides, i.e.	ict the number MSC and RN	r of point codes C.	to one for RANAP		
For R4 and further releases, as the MSC can be split into an MSC Server a or more MGWs, it is proposed to mandate the RNC to support different poin codes to RANAP and ALCAP. However, it is proposed to use the same poin for both RANAP and ALCAP at RNC side.							
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Other specs affected:	 Conter core specifications Test specifications O&M Specifications 	Ħ	25.410 v3.5.0 CR023
Other comments:	¥		

4.5.1 Use of Transport Network User Plane as Signalling Bearer

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This section is unchanged

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3GPP TSG-RAN WG3 Meeting #25 Makuhari, Japan, November 26th - 30th 2001

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Proposed change affects: # (U)SIM ME/UE Radio Access Network X Core Network X										
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Category: ⊮	Release: %R99se one of the following categories:Use one of the following releases:F (correction)2A (corresponds to a correction in an earlier release)R96B (addition of feature),R97C (functional modification of feature)R98D (editorial modification)R99e found in 3GPP TR 21.900.REL-5									
Reason for change:	# An RNC may not be connected to more than one CBC.									
Summary of change	 According to 23.041: 'The BSC/RNC shall interface to only one CBC'. At present in 25.410 it is stated that 'There may be more than one lu interface (lu-BC) from an RNC towards the Broadcast domain.' Following instructions from S2 (see S2- 012450.doc for details), 25.410 should be aligned to 23.041 (Clause 6). 									
Consequences if not approved:	 It will remain ambiguous as to how many CBCs an RNC may connect to. Impact Analysis Impact assessment towards the previous version of the specification (same release): This CR has isolated impact with the previous version of the specification (same release) as the connectivity of the Iu BC interface was not aligned with 23.041. 									
Clauses affected.	% 411 and 412									
Other specs	# X Other core specifications # Mirror CR to R4-25.410 v4.2.0 CR 26									
affected:	Test specifications O&M Specifications									

Other comments:

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How to create CRs using this form: Comprehensive information and tips about how to create CRs can be found at: <u>http://www.3gpp.org/3G_Specs/CRs.htm</u>. 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 <u>ftp://ftp.3gpp.org/specs/</u> 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

4 General Aspects

4.1 UTRAN Architecture

4.1.1 Iu Interface Architecture

The overall UMTS architecture and UTRAN architectures are described in [1]. This subclause specifies only the architecture of the Iu interface, and shall not constrain the network architecture of either Core or Radio Access Networks.

The I_u interface is specified at the boundary between the Core Network and UTRAN. Figure 4.1 depicts the logical division of the I_u interface. From the Iu perspective, the UTRAN access point is an RNC.



Iu Interface



The Iu interface towards the PS-domain of the core network is called Iu-PS, and the Iu interface towards the CS-domain is called Iu-CS. The differences between Iu-CS and Iu-PS are treated elsewhere in this specification. The Iu interface to the Broadcast domain is called Iu-BC.

There shall not be more than one Iu interface (Iu-CS) towards the CS domain and one Iu interface (Iu-PS) towards the PS-domain from any one RNC. There <u>shall not be more than one may be multiple</u>. Iu interfaces (Iu-BC) from an RNC towards the Broadcast domain.

In the separated core network architecture, this means that there shall be separate signalling and user data connections towards the PS and CS domains – this applies in both transport and radio network layers.

In the combined architecture, there shall be separate connections in the user plane towards the PS and CS domains (in both transport and radio network layers). In the control plane, there shall be separate SCCP connections to the two logical domains.

In either architecture, there can be several RNCs within UTRAN and so UTRAN may have several I_u access points towards the Core Network. As a minimum, each Iu access point (in UTRAN or CN) shall independently fulfil the requirements of the relevant Iu specifications (25.41x series – see clause 7).

4.1.2 I_u connection principles

The Iu interface has a hierarchical architecture where one higher layer entity controls several lower layer entities. The hierarchy for the CN - UTRAN signalling connection end points is described below:

- Each CN Access Point may be connected to one or more UTRAN Access Points.
- For the PS and CS domains, each UTRAN Access Point shall not be connected to more than one CN Access Point per CN domain.
- For the BC domain, each UTRAN Access Point may be connected to one or more CN Access Point onlys.

3GPP TSG-RAN WG3 Meeting #25 Makuhari, Japan, November 26th–30th 2001

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- For the PS domain, each UTRAN Access Point shall not be connected to more than one CN Access Point per CN domain.
- -____For the CS and BC domains, each UTRAN Access Point may be connected to one or more CN Access Points.
- For the BC domain, each UTRAN Access Point shallmay not be connected to onemore than one CN Access Point only.

END OF CHANGES

3GPP TSG-RAN3 Meeting #25 Makuhari, Japan, 26th – 30th November, 2001

	С	HANGE	REQU	EST			CR-Form-v
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Reason for change: ೫	The current 25. procedure. How expiry of inacti it should be spe procedure in no procedure in an	rrent 25.410 specifies that it is always the CN initiates the SCCP connection release lure. However, according to the ITU-T specification Q.714, e.g. due to the timer of inactivity test, the SCCP will initiate the connection release message. Therefore, ald be specified that it is always the CN initiates the SCCP connection release lure in normal case but the RNC can also initiate the SCCP connection release lure in any abnormal case.					
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- 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.

12

4.5.1.1.2.2 Establishment procedure in case ii

The SCCP signalling connection establishment is initiated, by the Core Network, in connection with performing a Relocation.

Initiation

The Core Network initiates the connection establishment by sending an SCCP connection request message to the RNC. Optionally, a RANAP message may be included in the user data field of the SCCP connection request message.

Termination

- successful outcome
 - The SCCP connection confirm message, which may optionally contain a connection oriented RANAP message in the user data field, is returned to the Core Network.

- unsuccessful outcome

- If the SCCP signalling connection establishment fails, an SCCP connection refusal message will be sent back to the Core Network. This message may contain a RANAP message in the user data field.

Figure 4.3: Setting-up of CN Initiated SCCP Signalling Connection

4.5.1.1.3 SCCP connection release

This procedure is always initiated at the Core Network side in normal release case.

An SCCP connection is released when the CN realises that a given signalling connection is no longer required.

The CN sends a SCCP Released message.

The procedure may be initiated at the Core Network side and the RNC side in any abnormal release case

3GPP TSG-RAN3 Meeting #25 Makuhari, Japan, 26th – 30th November, 2001

	С	HANGE	REQU	EST			CR-Form-v3
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Source: ೫ R-	WG3						
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Category: ೫ A					Release: ೫	Rel4	
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Reason for change: अ	The current 25.410 specifies that it is always the CN initiates the SCCP connection release procedure. However, according to the ITU-T specification Q.714, e.g. due to the timer expiry of inactivity test, the SCCP will initiate the connection release message. Therefore, it should be specified that it is always the CN initiates the SCCP connection release procedure in normal case but the RNC can also initiate the SCCP connection release procedure in any abnormal case.						
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How to create CRs using this form:

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- 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.

4.5.1.1.2.2 Establishment procedure in case ii

The SCCP signalling connection establishment is initiated, by the Core Network, in connection with performing a Relocation.

Initiation

The Core Network initiates the connection establishment by sending an SCCP connection request message to the RNC. Optionally, a RANAP message may be included in the user data field of the SCCP connection request message.

Termination

- successful outcome
 - The SCCP connection confirm message, which may optionally contain a connection oriented RANAP message in the user data field, is returned to the Core Network.

- unsuccessful outcome

- If the SCCP signalling connection establishment fails, an SCCP connection refusal message will be sent back to the Core Network. This message may contain a RANAP message in the user data field.

RNC CN CR {SSN=RANAP, al=y,RANAP message or no user data} CC {al=x, a2=y, RANAP message or no user data} Or CREF{a2=y, RANAP message or no user data} al = source local reference, a2 = destination local reference, x = SCCP connection reference at the RNC, y = SCCP connection reference at the CN.

Figure 4.3: Setting-up of CN Initiated SCCP Signalling Connection

4.5.1.1.3 SCCP connection release

This procedure is always initiated at the Core Network side in normal release case.

An SCCP connection is released when the CN realises that a given signalling connection is no longer required.

The CN sends a SCCP Released message.

The procedure may be initiated at the Core Network side and the RNC side in any abnormal release case

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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.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in [1] apply.

6

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

3G-MSC	3 rd Generation Mobile Switching Centre
3G-SGSN	3 rd Generation Serving GPRS Support Node
AAL	ATM Adaptation Laver
ATM	Asynchronous Transfer Mode
BC	Broadcast
BSSMAP	Base Station Subsystem Management Application Part
CBS	Cell Broadcast Service
CC	Connection Confirm
CN	Core Network
CR	Connection Release
CREF	Connection Refusal
CS	Circuit Switched
GT	Global Title
GTP-U	GPRS Tunnelling Protocol
IMSI	International Mobile Subscriber Identity
INISI	Internat Protocol
ISDN	Integrated Services Digital Network
	Location Area
	Non Access Stratum
NAS OBM	Non Access Stratum
DC	Desket Switched
rð Dettn	Packet Switched Talashana Natural
PSIN	Public Switched Telephone Network
PVC	Permanent virtual Circuit
QoS	Quality of Service
KA	Routing Area
RAB	Radio Access Bearer
RANAP	Radio Access Network Application Part
RLP	Radio Link Protocol
RNC	Radio Network Controller
RNL	Radio Network Layer
RRC	Radio Resource Control
SA	Service Area
SABP	Service Area Broadcast Protocol
SAP	Service Access Point
SCCP	Signalling Connection Control Part
SPC	Signalling Point Code
SRNS	Serving Radio Network Subsystem
SSN	Sub-System Number
SVC	Switched Virtual Circuit
TCP	Transmission Control Protocol
UE	User Equipment
UDP	User Datagram Protocol
UP	User Plane
URA	UTRAN Registration Area
UTRAN	UMTS Terrestrial Radio Access Network
VC	Virtual Circuit

3.3 Specification Notations

For the purposes of the present document, the following notations apply:

Procedure	When referring to a procedure in the specification the Procedure Name is written with the first letters in each word in upper case characters followed by the word "procedure", e.g. Radio Network Layer procedures.
<u>Message</u>	When referring to a message in the specification the MESSAGE NAME is written with all letters in upper case characters followed by the word "message", e.g. RADIO LINK SETUP REQUEST message.
Frame	When referring to a control or data frame in the specification the CONTROL/DATA FRAME NAME is written with all letters in upper case characters followed by the words "control/data frame", e.g. DCH transport frame.

4.5 I_u Interface Characteristics

4.5.1 Use of Transport Network User Plane as Signalling Bearer

4.5.1.1 Use of SCCP

4.5.1.1.1 General

The SCCP is used to support signalling messages between the CNs and the RNC. One user function of the SCCP, called Radio Access Network Application Part (RANAP), is defined. The RANAP uses one signalling connection per active UE and CN for the transfer of layer 3 messages.

Both connectionless and connection-oriented procedures are used to support the RANAP. TS 25.413 explains whether connection oriented or connectionless services should be used for each layer 3 procedure.

RANAP may use SSN, SPC and/or GT and any combination of them as addressing schemes for the SCCP. Which of the available addressing scheme to use for the SCCP is an operator matter.

When GT addressing is utilised, the following settings shall be used:

- SSN Indicator = 1 (RANAP SSN as defined in [13] shall always be included).
- Global Title Indicator = 0100 (GT includes translation type, numbering plan, encoding scheme and nature of address indicator).
- Translation Type = 0000 0000 (not used).
- Numbering Plan = 0001 (E.163/4).
- Nature of Address Indicator = 000 0100 (International Significant Number).
- Encoding Scheme = 0001 or 0010 (BCD, odd or even).
- Routing indicator = 0 or 1 (route on GT or PC/SSN).

When used, the GT shall be the E.164 address of the relevant node.

The following subclauses describe the use of SCCP connections for RANAP transactions. Subclause 4.5.1.2 describes the connection establishment procedures. Subclause 4.5.1.3 describes the connection release procedures. Subclause 4.5.1.4 describes abnormal conditions.

4.5.1.1.2 SCCP <u>C</u>eonnection <u>E</u>establishment <u>procedure</u>

A new SCCP connection is established when information related to the communication between a UE and the network has to be exchanged between RNC and CN, and no SCCP connection exists between the CN and the RNC involved, for the concerned UE.

Various SCCP connection establishment cases have to be distinguished:

- i) RNC Initiated SCCP Signalling Connection;
- ii) CN Initiated SCCP Signalling Connection.

The above cases are the only cases currently identified for SCCP connection establishment. Others may emerge in the future.

4.5.1.1.2.1 Establishment procedure in case i

The SCCP signalling connection establishment is initiated, by the RNC, at the reception of the first layer 3 non access stratum message from the UE.

Initiation

10

The RNC sends SCCP connection request <u>CONNECTION REQUEST</u> message to the Core Network. A RANAP message is included in the user data field of the SCCP-connection request <u>CONNECTION REQUEST</u> message.

Termination

- successful outcome
 - The SCCP-connection confirm <u>CONNECTION CONFIRM</u> message, which may optionally contain a connection oriented RANAP message in the user data field, is returned to the RNC.
- unsuccessful outcome
 - If the SCCP signalling connection establishment fails, an SCCP connection refusal <u>CONNECTION</u> <u>REFUSAL</u> message will be sent back to the RNC. This message may contain a RANAP message in the user data field.

For more information on how the RANAP procedure Initial UE <u>M</u>message is handled, please see the elementary procedure Initial UE <u>M</u>message in TS 25.413 [6].

RNC CN CR {SSN=RANAP, al=x, RANAP message} CC {al=y,a2=x, RANAP message or no user data} CREF{a2=x, RANAP message or no user data} al = source local reference, a2 = destination local reference, x = SCCP connection reference at the RNC, y = SCCP connection reference at the CN.

Figure 4.2: Setting-up of RNC Initiated SCCP Signalling Connection

4.5.1.1.2.2 Establishment procedure in case ii

The SCCP signalling connection establishment is initiated, by the Core Network, in connection with performing a Relocation.

Initiation

The Core Network initiates the connection establishment by sending an SCCP-connection request <u>CONNECTION</u> <u>REQUEST</u> message to the RNC. Optionally, a RANAP message may be included in the user data field of the SCCP connection request <u>CONNECTION REQUEST</u> message.

Termination

- successful outcome
 - The SCCP connection confirm <u>CONNECTION CONFIRM</u> message, which may optionally contain a connection oriented RANAP message in the user data field, is returned to the Core Network.
- unsuccessful outcome
 - If the SCCP signalling connection establishment fails, an SCCP connection refusal <u>CONNECTION</u> <u>REFUSAL</u> message will be sent back to the Core Network. This message may contain a RANAP message in the user data field.

12

Figure 4.3: Setting-up of CN Initiated SCCP Signalling Connection

4.5.1.1.3 SCCP <u>C</u>eonnection <u>R</u>release <u>procedure</u>

This procedure is always initiated at the Core Network side.

An SCCP connection is released when the CN realises that a given signalling connection is no longer required.

The CN sends a SCCP Released <u>RELEASED</u> message.

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Other comments:	ж		

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CR	Connection Release
CREF	Connection Refusal
CS	Circuit Switched
GT	Global Title
GTP-U	GPRS Tunnelling Protocol
IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
ISDN	Integrated Services Digital Network
LA	Location Area
NAS	Non Access Stratum
O&M	Operation and Maintenance
PS	Packet Switched
PSTN	Public Switched Telephone Network
PVC	Permanent Virtual Circuit
QoS	Quality of Service
RA	Routing Area
RAB	Radio Access Bearer
RANAP	Radio Access Network Application Part
RLP	Radio Link Protocol
RNC	Radio Network Controller
RNL	Radio Network Layer
RRC	Radio Resource Control
SA	Service Area
SABP	Service Area Broadcast Protocol
SAP	Service Access Point
SCCP	Signalling Connection Control Part
SPC	Signalling Point Code
SRNS	Serving Radio Network Subsystem
SSN	Sub-System Number
SVC	Switched Virtual Circuit
ТСР	Transmission Control Protocol
UE	User Equipment
UDP	User Datagram Protocol
UP	User Plane
URA	UTRAN Registration Area
UTRAN	UMTS Terrestrial Radio Access Network
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Frame	When referring to a control or data frame in the specification the CONTROL/DATA FRAME NAME is written with all letters in upper case characters followed by the words "control/data frame", e.g. DCH transport frame.

I_u Interface Characteristics 4.5

4.5.1 Use of Transport Network User Plane as Signalling Bearer

4.5.1.1 Use of SCCP

4.5.1.1.1 General

The SCCP is used to support signalling messages between the CNs and the RNC. One user function of the SCCP, called Radio Access Network Application Part (RANAP), is defined. The RANAP uses one signalling connection per active UE and CN for the transfer of layer 3 messages.

Both connectionless and connection-oriented procedures are used to support the RANAP. TS 25.413 explains whether connection oriented or connectionless services should be used for each layer 3 procedure.

RANAP may use SSN, SPC and/or GT and any combination of them as addressing schemes for the SCCP. Which of the available addressing scheme to use for the SCCP is an operator matter.

When GT addressing is utilised, the following settings shall be used:

- SSN Indicator = 1 (RANAP SSN as defined in [13] shall always be included).
- Global Title Indicator = 0100 (GT includes translation type, numbering plan, encoding scheme and nature of address indicator).
- Translation Type = $0000\ 0000$ (not used).
- Numbering Plan = 0001 (E.163/4).
- Nature of Address Indicator = 000 0100 (International Significant Number).
- Encoding Scheme = 0001 or 0010 (BCD, odd or even).
- Routing indicator = 0 or 1 (route on GT or PC/SSN).

When used, the GT shall be the E.164 address of the relevant node.

The following subclauses describe the use of SCCP connections for RANAP transactions. Subclause 4.5.1.2 describes the connection establishment procedures. Subclause 4.5.1.3 describes the connection release procedures. Subclause 4.5.1.4 describes abnormal conditions.

4.5.1.1.2 SCCP Ceonnection Eestablishment procedure

A new SCCP connection is established when information related to the communication between a UE and the network has to be exchanged between RNC and CN, and no SCCP connection exists between the CN and the RNC involved, for the concerned UE.

Various SCCP connection establishment cases have to be distinguished:

- i) RNC Initiated SCCP Signalling Connection;
- ii) CN Initiated SCCP Signalling Connection.

The above cases are the only cases currently identified for SCCP connection establishment. Others may emerge in the future.

4.5.1.1.2.1 Establishment procedure in case i

The SCCP signalling connection establishment is initiated, by the RNC, at the reception of the first layer 3 non access stratum message from the UE.

Initiation

10

The RNC sends SCCP <u>CONNECTION REQUEST connection request</u> message to the Core Network. A RANAP message is included in the user data field of the SCCP <u>CONNECTION REQUEST connection request</u> message.

Termination

- successful outcome
 - The SCCP <u>CONNECTION CONFIRM</u> connection confirm message, which may optionally contain a connection oriented RANAP message in the user data field, is returned to the RNC.
- unsuccessful outcome
 - If the SCCP signalling connection establishment fails, an SCCP <u>CONNECTION REFUSAL</u> connection refusal message will be sent back to the RNC. This message may contain a RANAP message in the user data field.

For more information on how the RANAP procedure Initial UE <u>M</u>message is handled, please see the elementary procedure Initial UE <u>M</u>message in TS 25.413 [6].

Figure 4.2: Setting-up of RNC Initiated SCCP Signalling Connection

4.5.1.1.2.2 Establishment procedure in case ii

The SCCP signalling connection establishment is initiated, by the Core Network, in connection with performing a Relocation.

Initiation

The Core Network initiates the connection establishment by sending an SCCP <u>CONNECTION REQUEST</u> connection request message to the RNC. Optionally, a RANAP message may be included in the user data field of the SCCP <u>CONNECTION REQUEST</u> connection request message.

Termination

- successful outcome

- The SCCP <u>CONNECTION CONFIRM</u> connection confirm message, which may optionally contain a connection oriented RANAP message in the user data field, is returned to the Core Network.
- unsuccessful outcome
 - If the SCCP signalling connection establishment fails, an SCCP <u>CONNECTION REFUSAL</u> eonnection refusal message will be sent back to the Core Network. This message may contain a RANAP message in the user data field.

12

Figure 4.3: Setting-up of CN Initiated SCCP Signalling Connection

4.5.1.1.3 SCCP <u>Ceonnection Rrelease procedure</u>

This procedure is always initiated at the Core Network side.

An SCCP connection is released when the CN realises that a given signalling connection is no longer required.

The CN sends a SCCP Released <u>RELEASED</u> message.