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

RP-010755

Title: **Agreed CRs (Release '99 and Rel-4 category A) to TS 25.303**

Source: **TSG-RAN WG2**

Agenda item: **8.2.3**

Doc-1st-	Status-	Spec	CR	Rev	Phase	Subject	Cat	Version	Versio
R2-012473	agreed	25.303	058		R99	Correction to RNTI in cell-update and URA-update procedures	F	3.9.0	3.10.0
R2-012638	agreed	25.303	059		Rel-4	Correction to RNTI in cell-update and URA-update procedures	A	4.2.0	4.3.0
R2-012485	agreed	25.303	060		R99	HFN transfer between network nodes in SRNS relocation	F	3.9.0	3.10.0
R2-012639	agreed	25.303	061		Rel-4	HFN transfer between network nodes in SRNS relocation	A	4.2.0	4.3.0
R2-012516	agreed	25.303	062		R99	Removal of Tr mode DCCH from R99 only	F	3.9.0	3.10.0
---	---	---	---		---	<no Rel-4 shadow>	---	---	---

3GPP TSG-RAN WG2 Meeting #25 **R2-012473**
Makuhari- Japan, 26-30 November 2001

CR-Form-v5

CHANGE REQUEST

⌘ **25.303** **CR** **058** ⌘ **rev** **-** ⌘ Current version: **3.9.0** ⌘

*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 **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Correction to RNTI in cell-update and URA-update procedures
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	19.Nov.01
Category:	⌘	**F**
Release:	⌘	R99

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:	⌘	Alignment with TS 25.33: correction of using U-RNTI instead of using S-RNTI and SRNC-identity in cell-update and URA-update procedures. Also add missing mandatory clause “Definitions and abbreviations”.
Summary of change:	⌘	1- In 6.4.2 Cell Update, URA update procedures change S-RNTI and the SRNC Identity to U-RNTI and correct S-RNTI to C-RNTI to align it with 25.331, where it is described in Cell-Update, Cell-Update-Confirm, URA-Update and URA-Update-Confirm messages. 2- Figure 26 is changed to correct MAC-B-Data-IND to be sent from UE-MAC to UE-RRC, considering RLC is transparent. 3- Add mandatory clause (Definitions and abbreviations) to the specification. This clause is mandatory in the 3GPP specifications. Refrence to 21.905 is added. **The CR has isolated impact** • Correction to a function (to align with TS 25.331), where the specification was : o ambiguous or not sufficiently explicit. Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.
Consequences if not approved:	⌘	Inconsistency with 25.331.

Clauses affected:	⌘	2, 3, 3.1, 3.2, 6.4.2, 6.4.3		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	25.303 v4.2.0, CR 059

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.

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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.

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.
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[1] 3GPP TS 25.321: "MAC Protocol Specification".

[2] 3GPP TS 25.322: "RLC Protocol Specification".

[3] 3GPP TS 25.331: "RRC Protocol Specification".

[4] 3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode".

[5] 3GPP TS 25.301: "Radio Interface Protocol Architecture".

[6] 3GPP TS 23.060: "General Packet Radio Service (GPRS) Service description; Stage 2"

[7] 3GPP TS 25.323: "PDCP Protocol Specification".

[8] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications"

3 ~~Void~~ Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in [8] apply.

3.2 Abbreviations

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

DC-SAP Dedicated Control SAP

********** Next Change **********

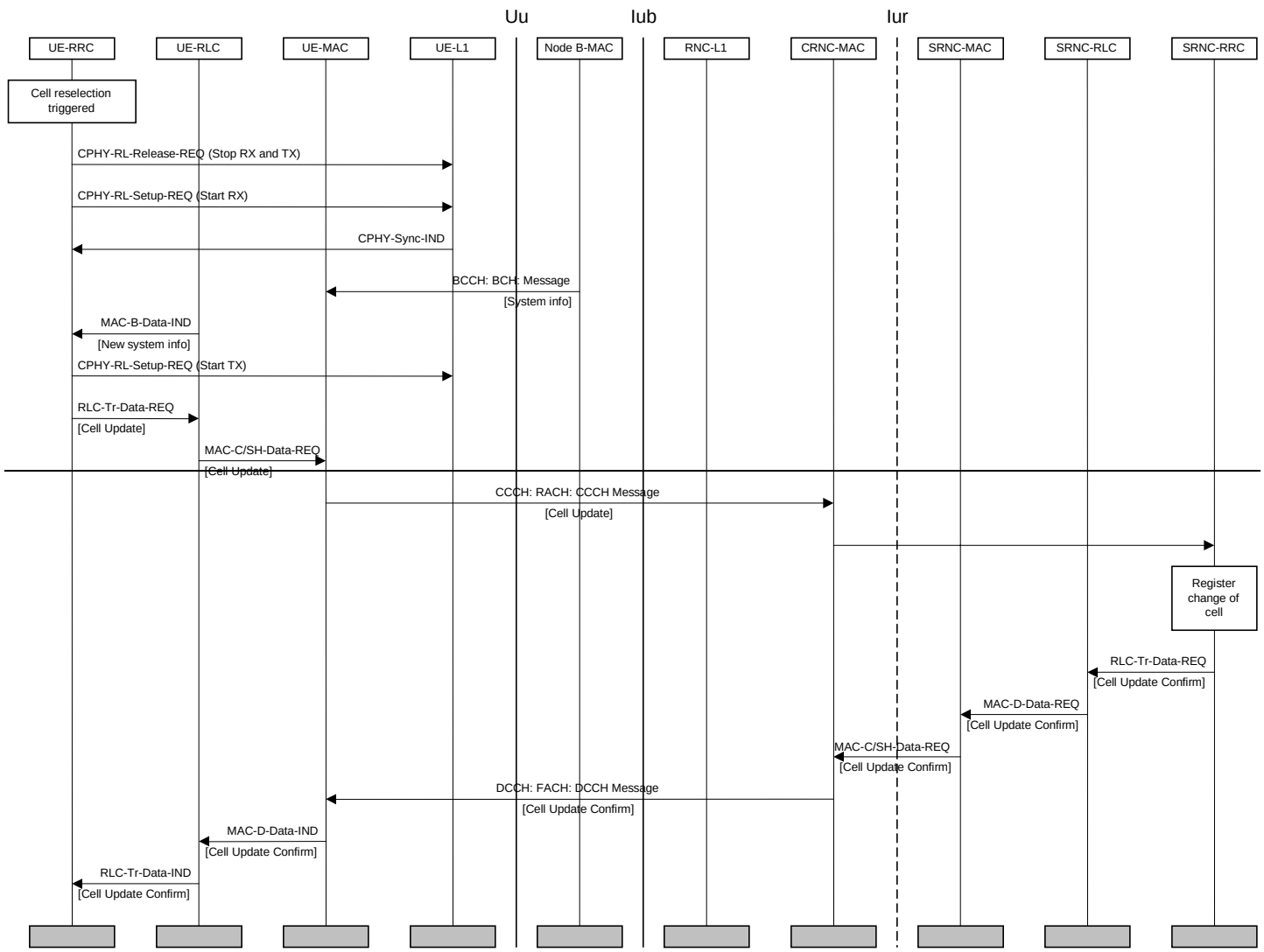
6.4.2 Cell Update

Figure 26 illustrates an example of a cell update procedure.

The cell update procedure is triggered by the cell re-selection function in the UE, which notifies which cell the UE should switch to. The UE reads the broadcast information of the new cell. Subsequently, the UE RRC layer sends a CELL UPDATE message to the UTRAN RRC via the CCCH logical channel and the RACH transport channel. The RACH transmission includes the current U-RNTI (S-RNTI and the SRNC Identity).

Upon reception of the CELL UPDATE, the UTRAN registers the change of cell. If the registration is successful it replies with a CELL UPDATE CONFIRM message transmitted on the DCCH/FACH to the UE. The message includes

the current U-RNTI (S-RNTI and SRNC Identity~~ies~~) and it may also include new C-RNTI~~S-RNTI~~ and / or U-RNTI (S-RNTI + SRNC Identity~~ies~~). By using DCCH for the confirm message the contents of the message can be ciphered.


Uu
Iub
Iur
UE-RRC
UE-RLC
UE-MAC
UE-L1
Node B-MAC
RNC-L1
CRNC-MAC
SRNC-MAC
SRNC-RLC
SRNC-RRC
Cell reselection triggered
CPHY-RL-Release-REQ (Stop RX and TX)
CPHY-RL-Setup-REQ (Start RX)
CPHY-Sync-IND
BCCH: BCH: Message
[System info]
MAC-B-Data-IND
[New system info]
CPHY-RL-Setup-REQ (Start TX)
RLC-Tr-Data-REQ
[Cell Update]
MAC-C/SH-Data-REQ
[Cell Update]
CCCH: RACH: CCCH Message
[Cell Update]
Register change of cell
RLC-Tr-Data-REQ
[Cell Update Confirm]
MAC-D-Data-REQ
[Cell Update Confirm]
MAC-C/SH-Data-REQ
[Cell Update Confirm]
DCCH: FACH: DCCH Message
[Cell Update Confirm]
MAC-D-Data-IND
[Cell Update Confirm]
RLC-Tr-Data-IND
[Cell Update Confirm]

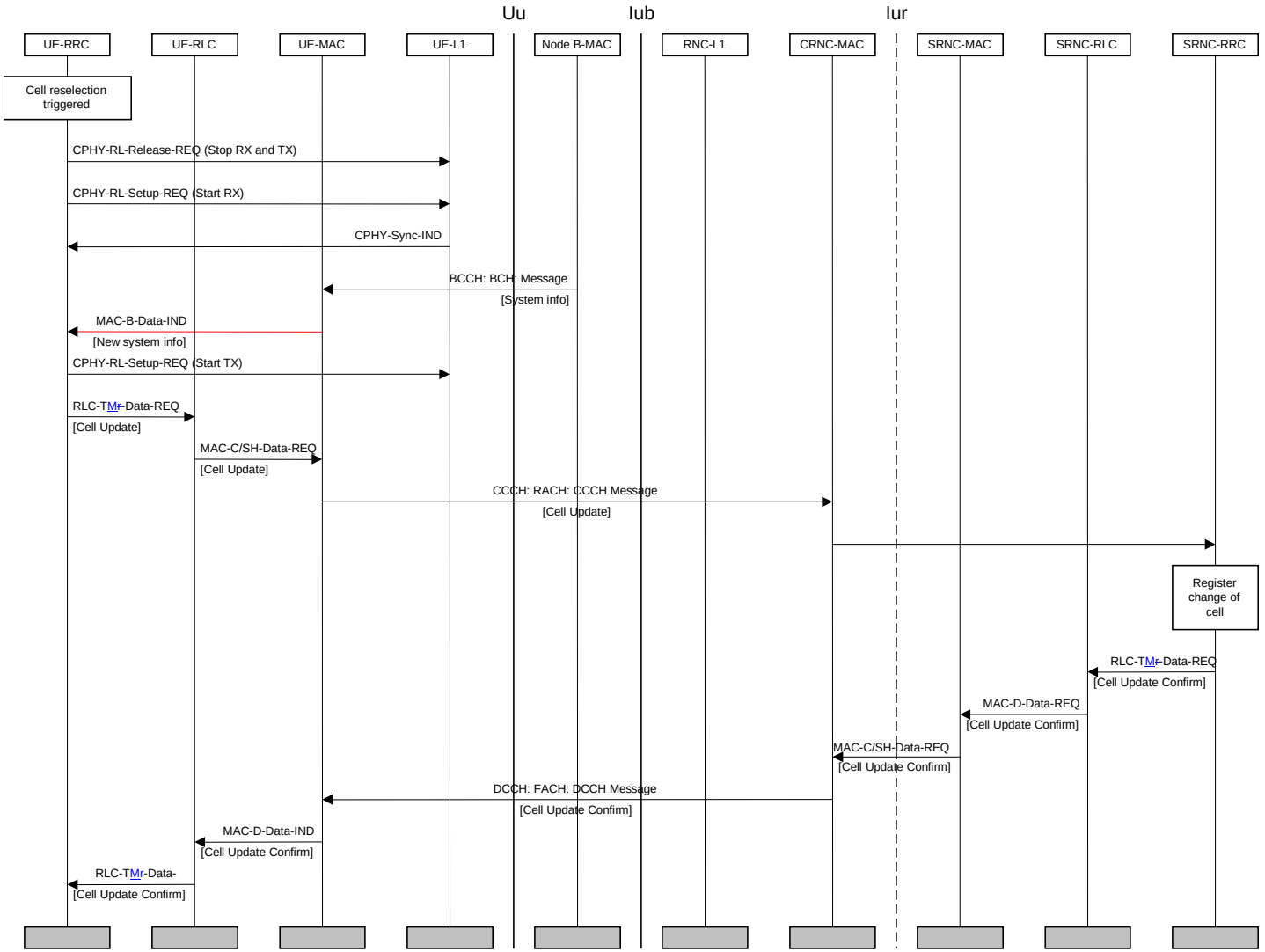


Figure 26: Cell update procedure

6.4.3 URA Update

Figure 27 illustrates an example of a URA Update procedure. For a more detailed figure on the interlayer interaction for CCCH or DCCH transmission please refer to "Cell Update" in the previous subclause.

When cell re-selection is triggered, the UE abandons the radio link in the old cell and establishes a radio link to the new cell. The URA update procedure is triggered when the UE reads the broadcast information of the new cell and recognises that a URA update is required. After that, the UE RRC layer sends a URA UPDATE on the CCCH to the UE MAC layer, which transfers the message on the RACH to UTRAN. The RACH transmission includes the current U-RNTI (S-RNTI and SRNC Identity).

Upon reception of the URA UPDATE, the UTRAN registers the change of URA. Then the CRNC-RRC requests the CRNC-MAC to send a URA UPDATE CONFIRM message on the FACH to the UE. The message includes the current U-RNTI (S-RNTI and SRNC Identity~~ies~~) and may also include new C-RNTI, U-RNTI (S-RNTI and SRNC Identity~~ies~~).

The logical channel used for URA UPDATE CONFIRM depends on the SRNC relocation policy. If SRNC is always relocated before URA UPDATE CONFIRM is sent, a DCCH should be used (to allow ciphering of the message contents). If SRNC is not relocated, the CCCH logical channel should be used to be able to utilize the RNSAP Iur procedures and not being forced to set up user plane on the Iur for this procedure.

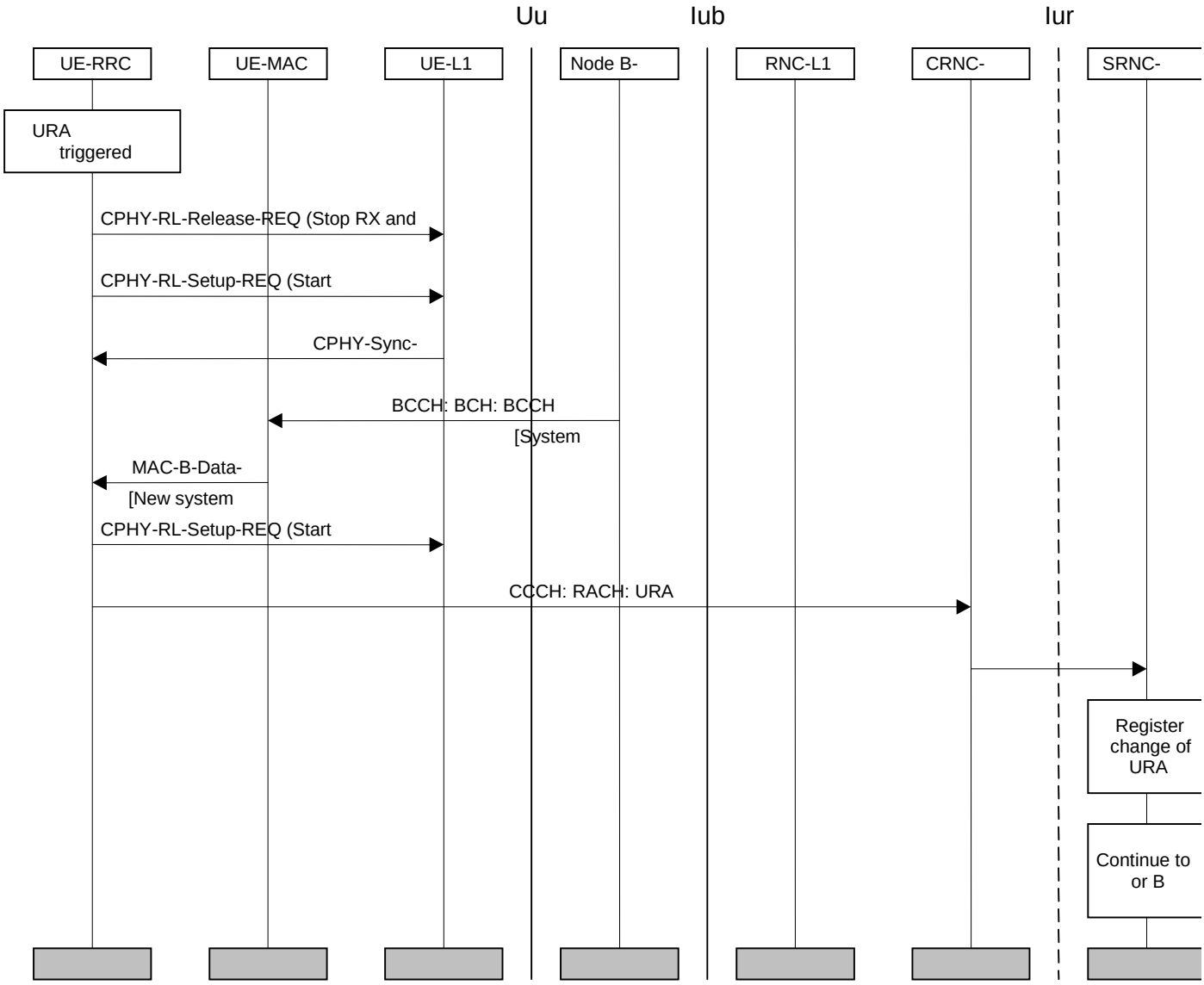


Figure 27: Beginning of the URA update procedure – continue either to case A or case B

Case A: URA UPDATE CONFIRM on DCCH:

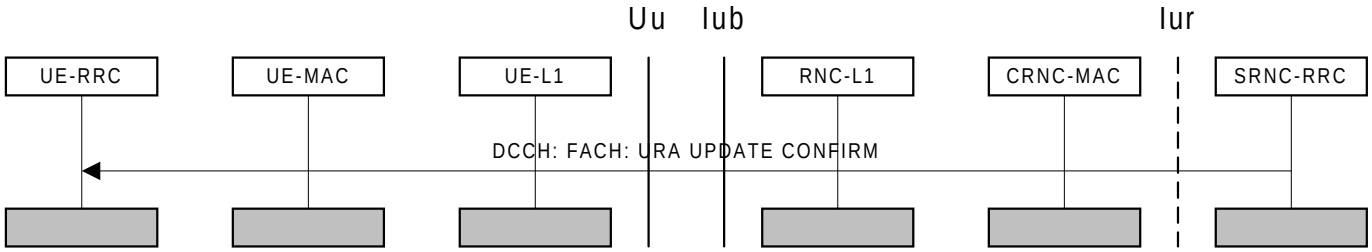


Figure 28: Case A continuation of URA update, CONFIRM message can be ciphered

Case B: URA UPDATE CONFIRM on CCCH:

In this case transmission between SRNC and CRNC takes place on the RNSAP Downlink Signalling Transfer and the CCCH logical channel is used.

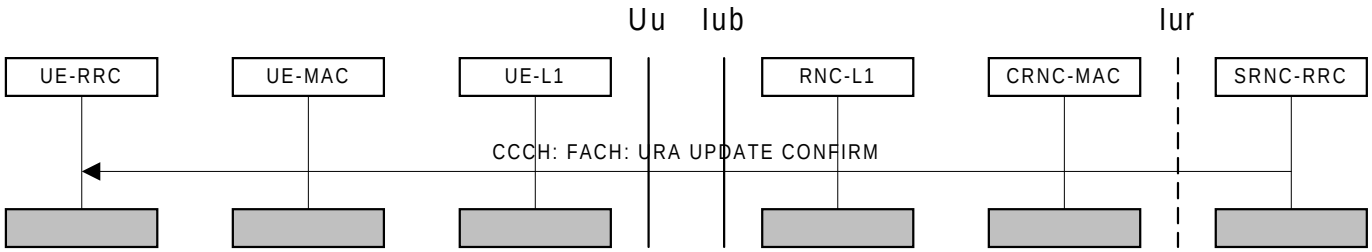


Figure 29: Case B continuation of URA update, CONFIRM message cannot be ciphered

3GPP TSG-RAN WG2 Meeting #25 **R2-012638**
Makuhari- Japan, 26-30 November 2001

CR-Form-v5

CHANGE REQUEST

⌘ **25.303** **CR** **059** ⌘ **rev** **-** ⌘ Current version: **4.2.0** ⌘

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

Title:	⌘	Correction to RNTI in cell-update and URA-update procedures
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	28.Nov.01
Category:	⌘	**A**
Release:	⌘	REL-4

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Consequences if not approved:	⌘	Inconsistency with 25.331.

Clauses affected:	⌘	2, 3, 3.1, 3.2, 6.4.2, 6.4.3		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	25.303 v3.9.0, CR 058

Other comments: ⌘

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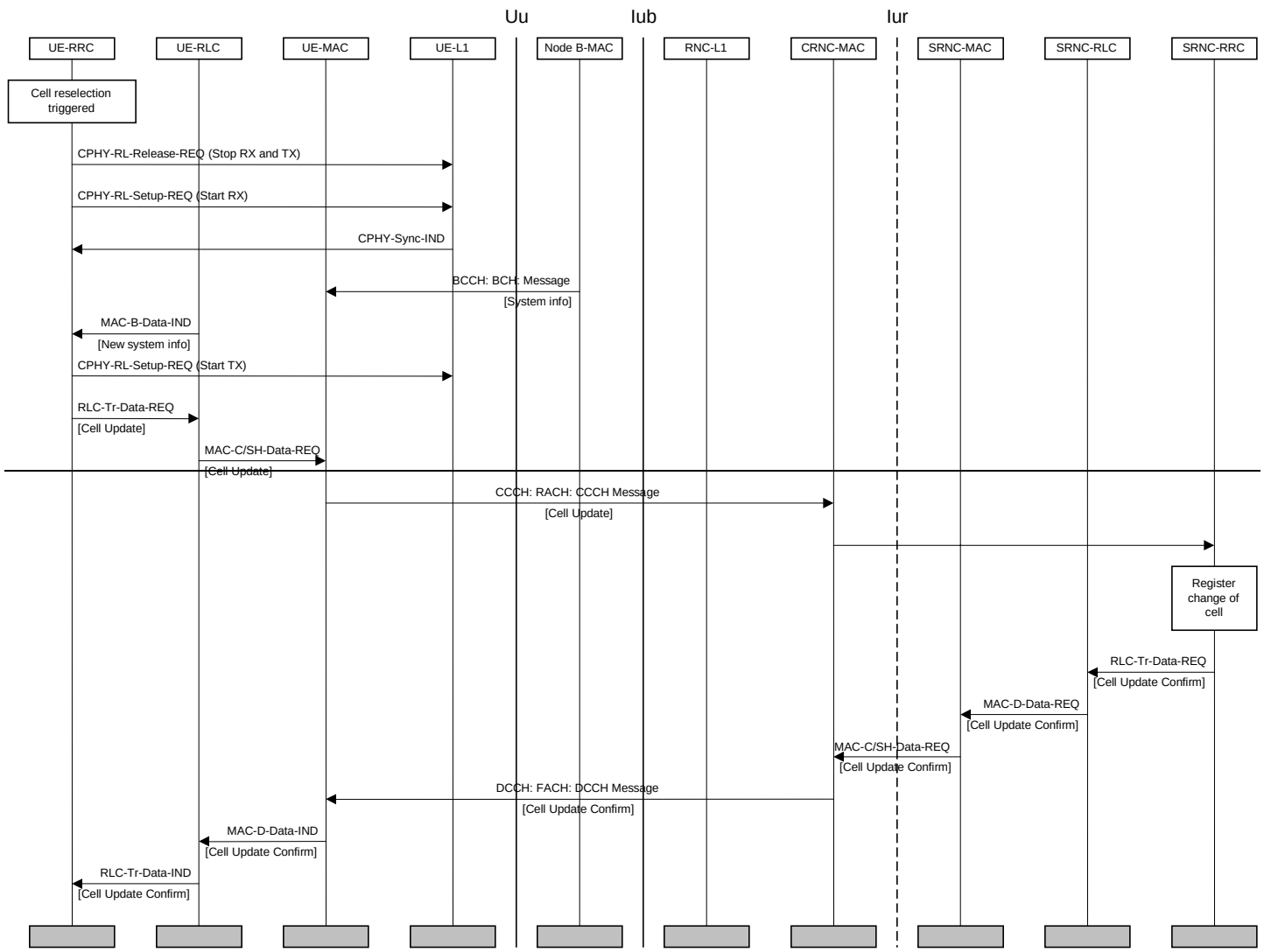
Uu
Iub
Iur
UE-RRC
UE-RLC
UE-MAC
UE-L1
Node B-MAC
RNC-L1
CRNC-MAC
SRNC-MAC
SRNC-RLC
SRNC-RRC
Cell reselection triggered
CPHY-RL-Release-REQ (Stop RX and TX)
CPHY-RL-Setup-REQ (Start RX)
CPHY-Sync-IND
BCCH: BCH: Message
[System info]
MAC-B-Data-IND
[New system info]
CPHY-RL-Setup-REQ (Start TX)
RLC-Tr-Data-REQ
[Cell Update]
MAC-C/SH-Data-REQ
[Cell Update]
CCCH: RACH: CCCH Message
[Cell Update]
Register change of cell
RLC-Tr-Data-REQ
[Cell Update Confirm]
MAC-D-Data-REQ
[Cell Update Confirm]
MAC-C/SH-Data-REQ
[Cell Update Confirm]
DCCH: FACH: DCCH Message
[Cell Update Confirm]
MAC-D-Data-IND
[Cell Update Confirm]
RLC-Tr-Data-IND
[Cell Update Confirm]

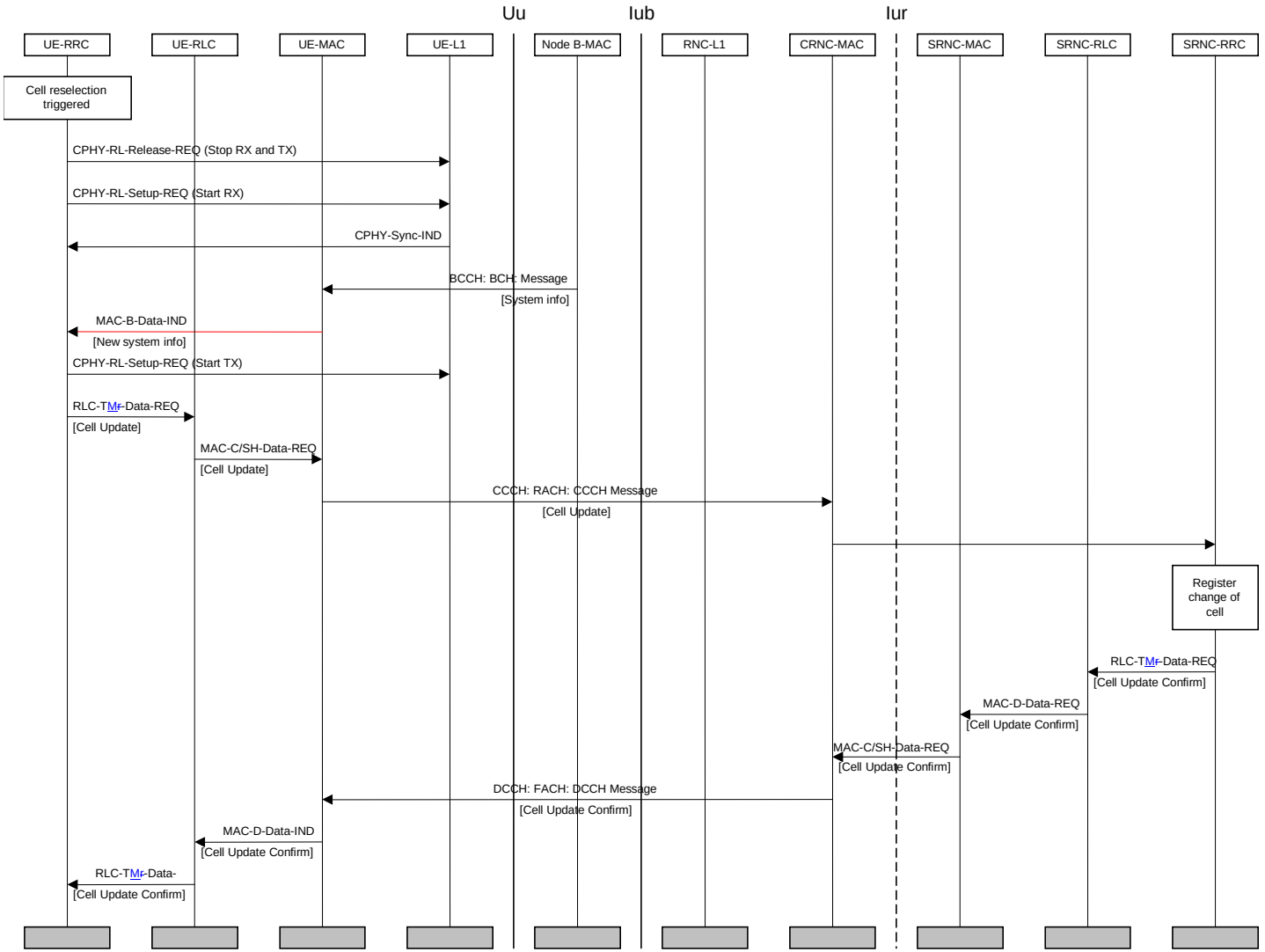

Figure 26: Cell update procedure

6.4.3 URA Update

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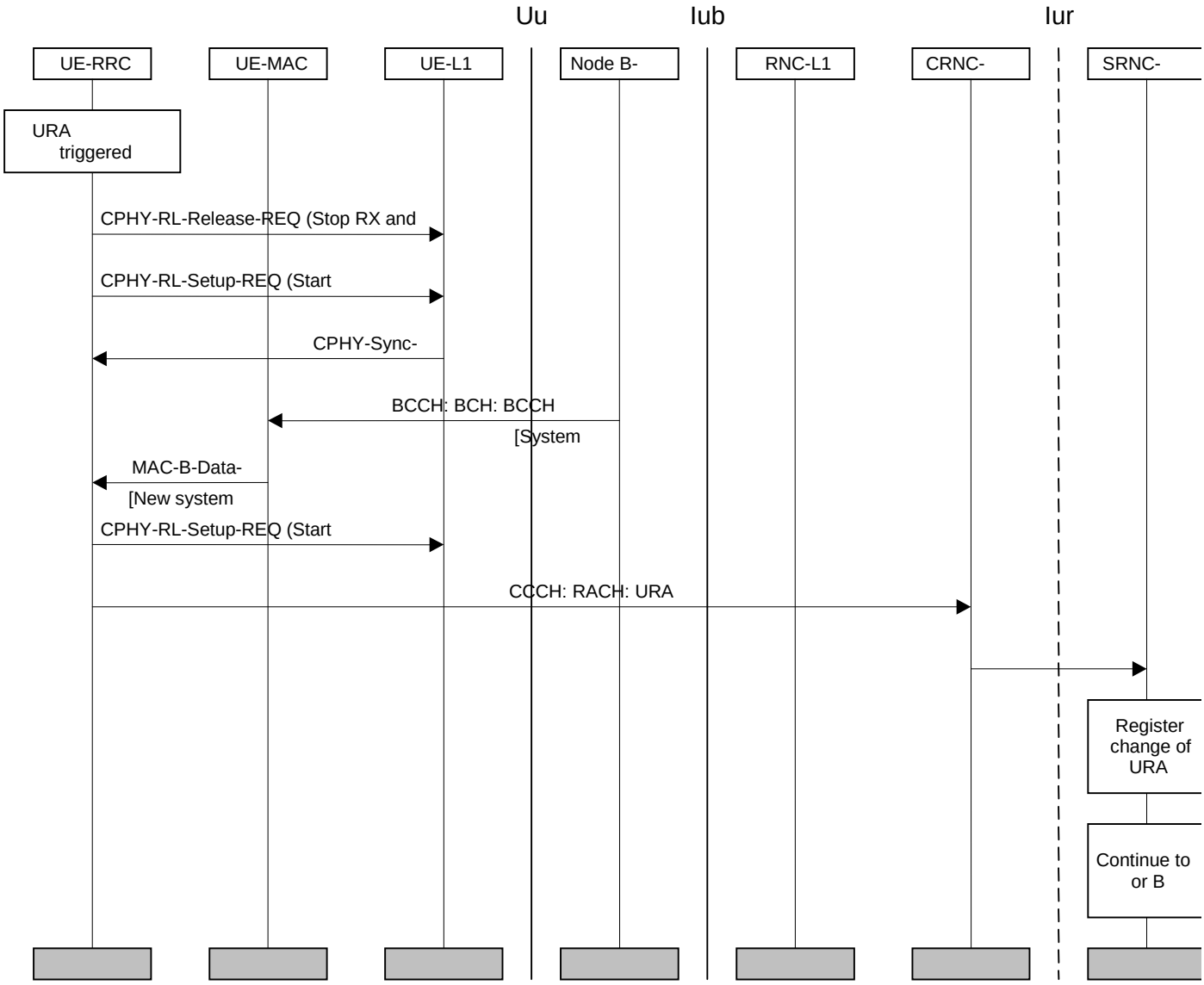

Figure 27: Beginning of the URA update procedure – continue either to case A or case B

Case A: URA UPDATE CONFIRM on DCCH:

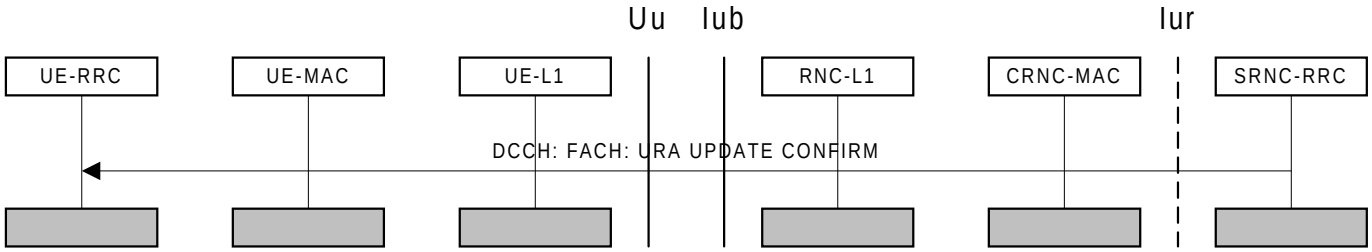

Figure 28: Case A continuation of URA update, CONFIRM message can be ciphered

Case B: URA UPDATE CONFIRM on CCCH:

In this case transmission between SRNC and CRNC takes place on the RNSAP Downlink Signalling Transfer and the CCCH logical channel is used.

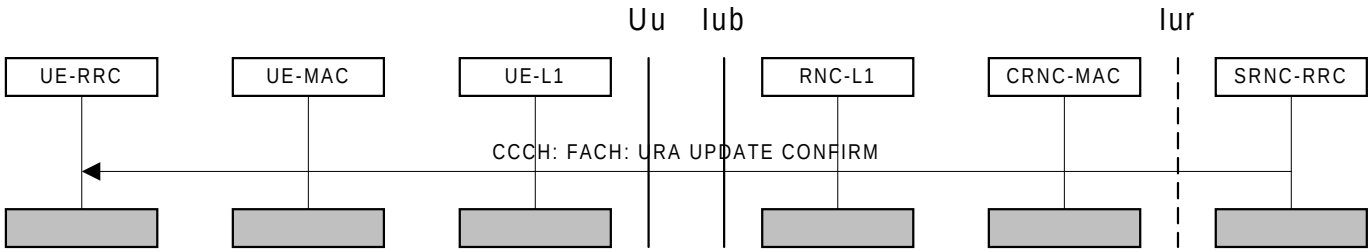

Figure 29: Case B continuation of URA update, CONFIRM message cannot be ciphered

3GPP TSG-RAN WG2 Meeting #25
Makuhari, Japan, 26 - 30 November 2001

Tdoc R2-012485

CR-Form-v4

CHANGE REQUEST

⌘ **25.303** **CR** **060** ⌘ ev **-** ⌘ Current version: **3.9.0** ⌘

*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:	⌘	HFN transfer between network nodes in SRNS relocation
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	20 Nov 2001
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
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R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	It is incorrectly stated in 6.4.8.2 and 6.4.8.4 that UL and DL HFNs would be transferred from source to target RNC during the "forwarding of SRNS contexts via the CN" phase. In fact, HFNs are transferred in "Relocation Preparation" phase (ie. RANAP: RELOCATION REQUIRED, RANAP: RELOCATION REQUEST).
Summary of change:	⌘	The incorrect sentences have been removed.
Consequences if not approved:	⌘	The description of SRNS relocation is incorrect and conflicts with e.g. RANAP specification 25.413. **The CR has isolated impact** • Correction to a function where the specifications were : o containing some contradictions. Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.

Clauses affected:	⌘	6.4.8.2, 6.4.8.4		
Other specs Affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	25.303 v4.2.0, CR 061
Other comments:	⌘			

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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.

6.4.8.2 Combined Hard Handover and SRNS relocation (lossless radio bearers)

Based on measurement results and knowledge of the UTRAN topology, the source SRNC decides to initiate a combined hard handover and SRNS relocation. The UE is still under control of the SRNC but is moving to a location controlled by the target RNC.

A RANAP Relocation Command is received by the source RNC from the CN, indicating the RABs to be released, the Target RNC to Source RNC Transparent Container and the RABs that are subject to data forwarding. Lossless SRNS relocation is always, and only, configured for RABs that are subject to data forwarding. The PDCP layer shall support PDCP sequence numbering when lossless SRNS relocation is supported [7]. The Target RNC to Source RNC Transparent Container includes the RRC message (e.g. PHYSICAL CHANNEL RECONFIGURATION) for hard handover.

Upon reception of the RANAP Relocation Command, the RRC entity in the source RNC stops the RLC entities for the affected radio bearers and retrieves the PDCP sequence numbers. It then triggers the execution of the relocation of SRNS by sending the RRC message to the UE using the acknowledged mode dedicated signalling radio bearer (SRB #2). This message includes the new U-RNTI (from the target RNC) and the uplink receive PDCP sequence number for each radio bearer configured to support lossless SRNS relocation (from the source RNC). The UE reinitialises the PDCP header compression entities of the radio bearers configured to use a header compression protocol [7].

The PDCP send and receive sequence numbers ~~and the current downlink and uplink HFN values~~ are then transferred via the CN during the forwarding of SRNS contexts from source to target RNC. The target RNC becomes the serving RNC when the RANAP Relocation Detect message is sent.

Upon reception and acknowledgment by the UE of the message, the RLC entity for the acknowledged mode dedicated signalling radio bearer (SRB #2) is re-established, both on the UTRAN and UE sides and their HFN values are set to the current downlink and uplink HFN values incremented by one. Care should be taken by UTRAN in timing the SRNS relocation so that there is no risk of a SN rollover on SRB #2 during this procedure.

The UE compares the uplink receive PDCP sequence number with the uplink send PDCP sequence number. If this confirms PDCP SDUs successfully transferred before the start of relocation i.e. already received by the source RNC then these are discarded by the UE.

If the UE has successfully configured itself, it sends a response message, in this case a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message to the target RNC using the acknowledged mode dedicated signalling radio bearer (SRB #2). This message contains the START values and the downlink receive PDCP sequence number for each radio bearer configured to support lossless SRNS relocation.

Upon acknowledgement of the message, the RLC entities for affected radio bearers are re-established both on the UTRAN and UE side. The HFN values for each RB are set to the START value in the message for the corresponding CN domain.

UTRAN compares the downlink receive PDCP sequence number with the downlink send PDCP sequence number. The UTRAN initialises the PDCP header compression entities of the radio bearers configured to use a header compression protocol [7].

The UTRAN and the UE continue the RLC and PDCP entities of the affected RBs and the relocation procedure ends.

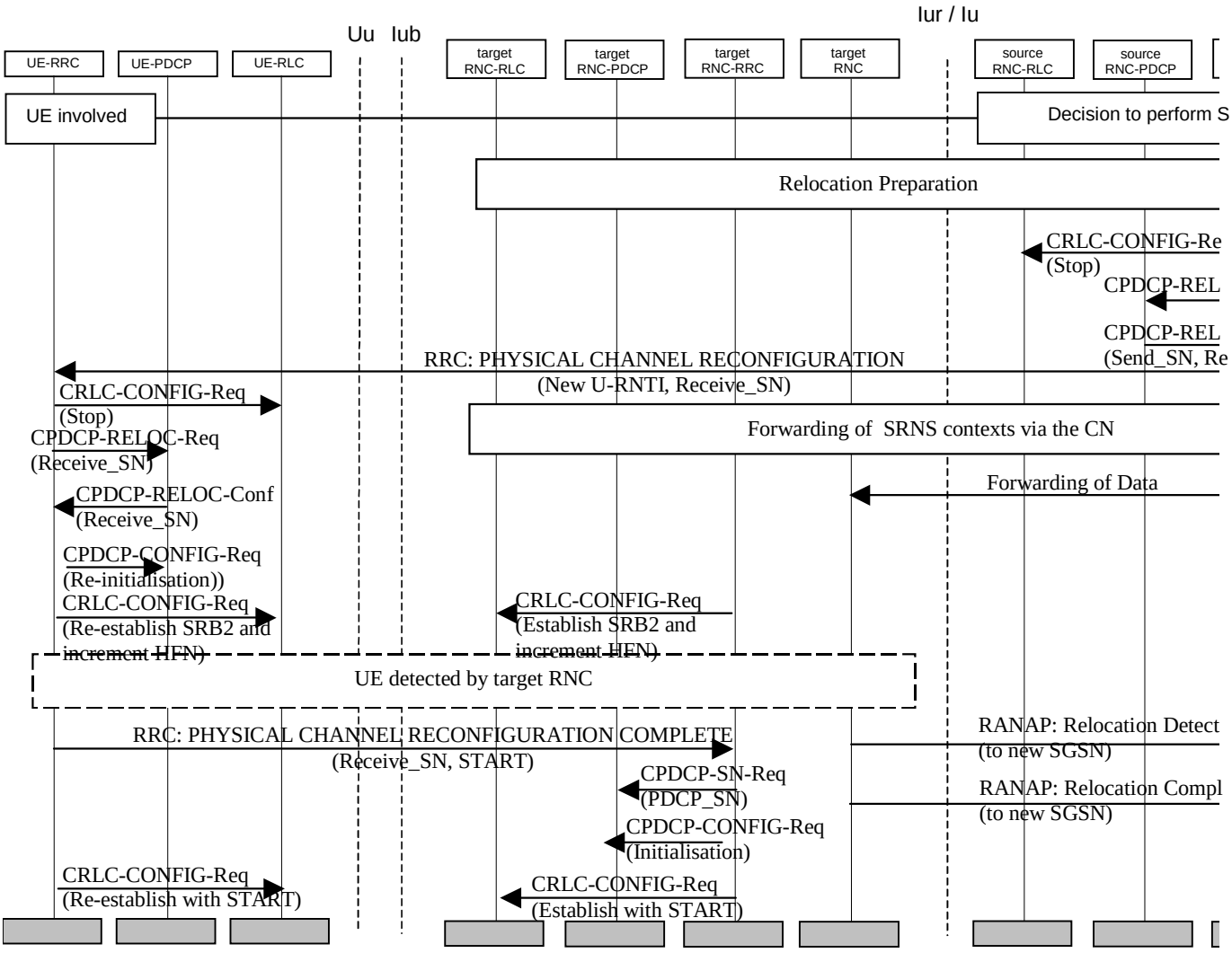


Figure 35: Combined Hard Handover and SRNS relocation (lossless radio bearers)

6.4.8.4 Combined Hard Handover and SRNS relocation (seamless radio bearers)

Based on measurement results and knowledge of the UTRAN topology, the source SRNC decides to initiate a combined hard handover and SRNS relocation. The UE is still under control of the SRNC but is moving to a location controlled by the target RNC.

The source RNC continues the downlink data transmission on radio bearers supporting seamless SRNS relocation until the target RNC becomes the serving RNC. The target RNC becomes the serving RNC when the RANAP Relocation Detect message is sent.

A RANAP Relocation Command is received by the source RNC from the CN, indicating the RABs to be released. The Target RNC to Source RNC Transparent Container includes the RRC message (e.g. PHYSICAL CHANNEL RECONFIGURATION) for hard handover. This message includes the new U-RNTI.

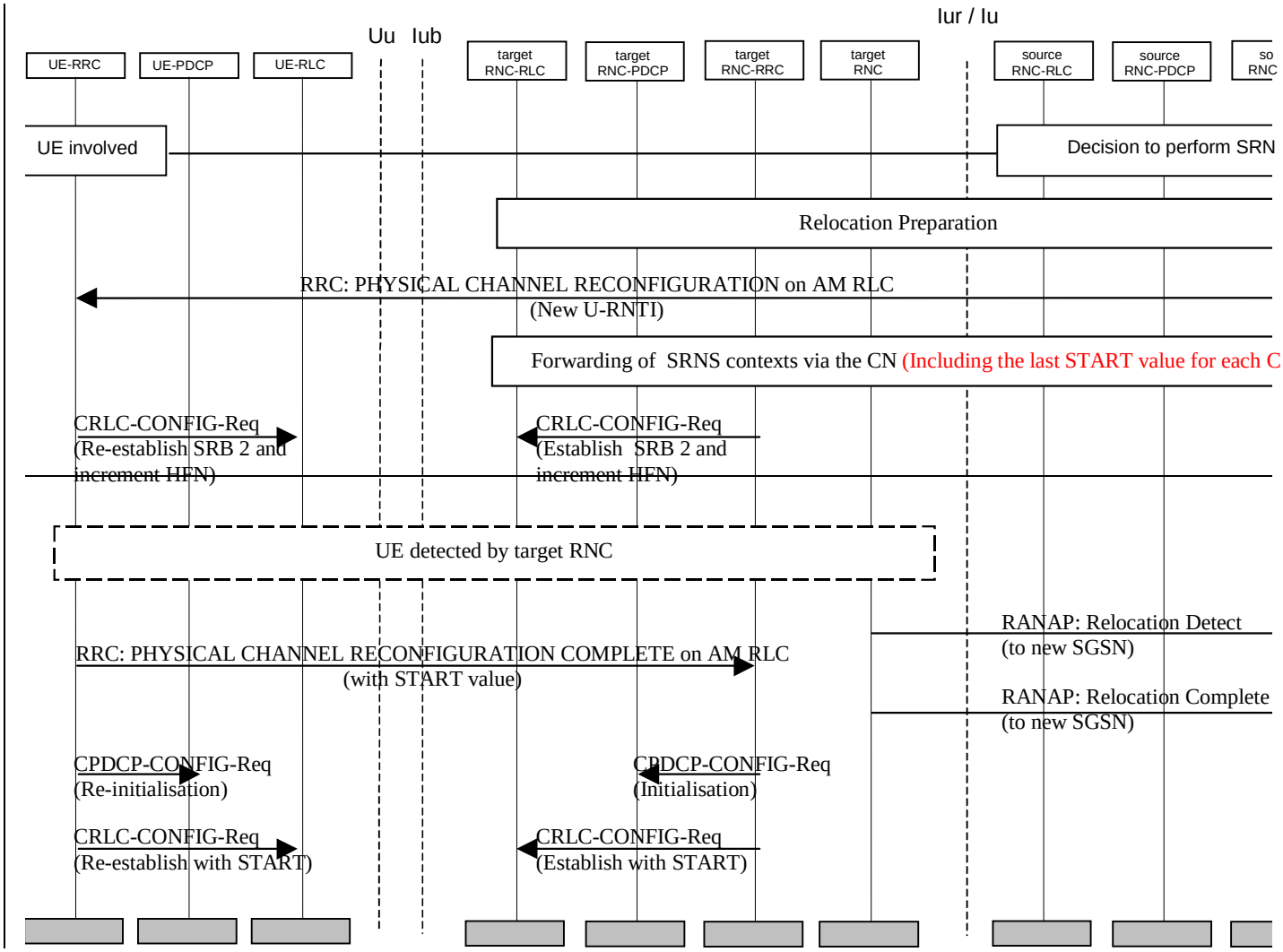
Upon reception of the RANAP Relocation Command, the source RNC triggers the execution of the relocation of SRNS by sending the RRC message to the UE using the acknowledged mode dedicated signalling radio bearer. ~~The current downlink and uplink HFN values for this signalling radio bearer are then transferred from source to target RNC during the "forwarding of SRNS contexts via the CN" phase.~~

Upon reception and acknowledgment by the UE of the PHYSICAL CHANNEL RECONFIGURATION message, the RLC entity for the acknowledged mode dedicated signalling radio bearer (SRB #2) is re-established, both on the UTRAN (target SRNC) and UE sides, and their HFN values are set to the current downlink and uplink HFN values incremented by one. Care should be taken by UTRAN in timing the SRNS relocation so that there is no risk of a SN rollover on SRB #2 during this procedure.

If the UE has successfully configured itself, it sends a response message, in this case PHYSICAL CHANNEL RECONFIGURATION COMPLETE message to the target RNC using the acknowledged mode dedicated signalling radio bearer (SRB #2). This message is transmitted based on the new RLC context and contains the START values (to be used in integrity protection and in ciphering on radio bearers using UM and AM RLC). The UTRAN initialises and the UE reinitialises the PDCP header compression entities of the radio bearers configured to use a header compression protocol [7].

Upon acknowledgement of the message, the RLC entities for the rest of the affected radio bearers are re-established both on the UTRAN and UE side. The HFN values for each RB are set to the START value in the message for the corresponding CN domain. The HFN values for each remaining signalling radio bearer (other than SRB #2) are set to the START value in the message for the last configured CN domain.

The relocation procedure ends.


Uu
Iub
Iur / Iu
UE-RRC
UE-PDCP
UE-RLC
target RNC-RLC
target RNC-PDCP
target RNC-RRC
target RNC
source RNC-RLC
source RNC-PDCP
so RNC
UE involved
Decision to perform SRN
Relocation Preparation
RRC: PHYSICAL CHANNEL RECONFIGURATION on AM RLC
(New U-RNTI)
Forwarding of SRNS contexts via the CN (Including the last START value for each C
CRLC-CONFIG-Req
(Re-establish SRB 2 and increment HFN)
CRLC-CONFIG-Req
(Establish SRB 2 and increment HFN)
UE detected by target RNC
RANAP: Relocation Detect
(to new SGSN)
RRC: PHYSICAL CHANNEL RECONFIGURATION COMPLETE on AM RLC
(with START value)
RANAP: Relocation Complete
(to new SGSN)
CPDCP-CONFIG-Req
(Re-initialisation)
CPDCP-CONFIG-Req
(Initialisation)
CRLC-CONFIG-Req
(Re-establish with START)
CRLC-CONFIG-Req
(Establish with START)

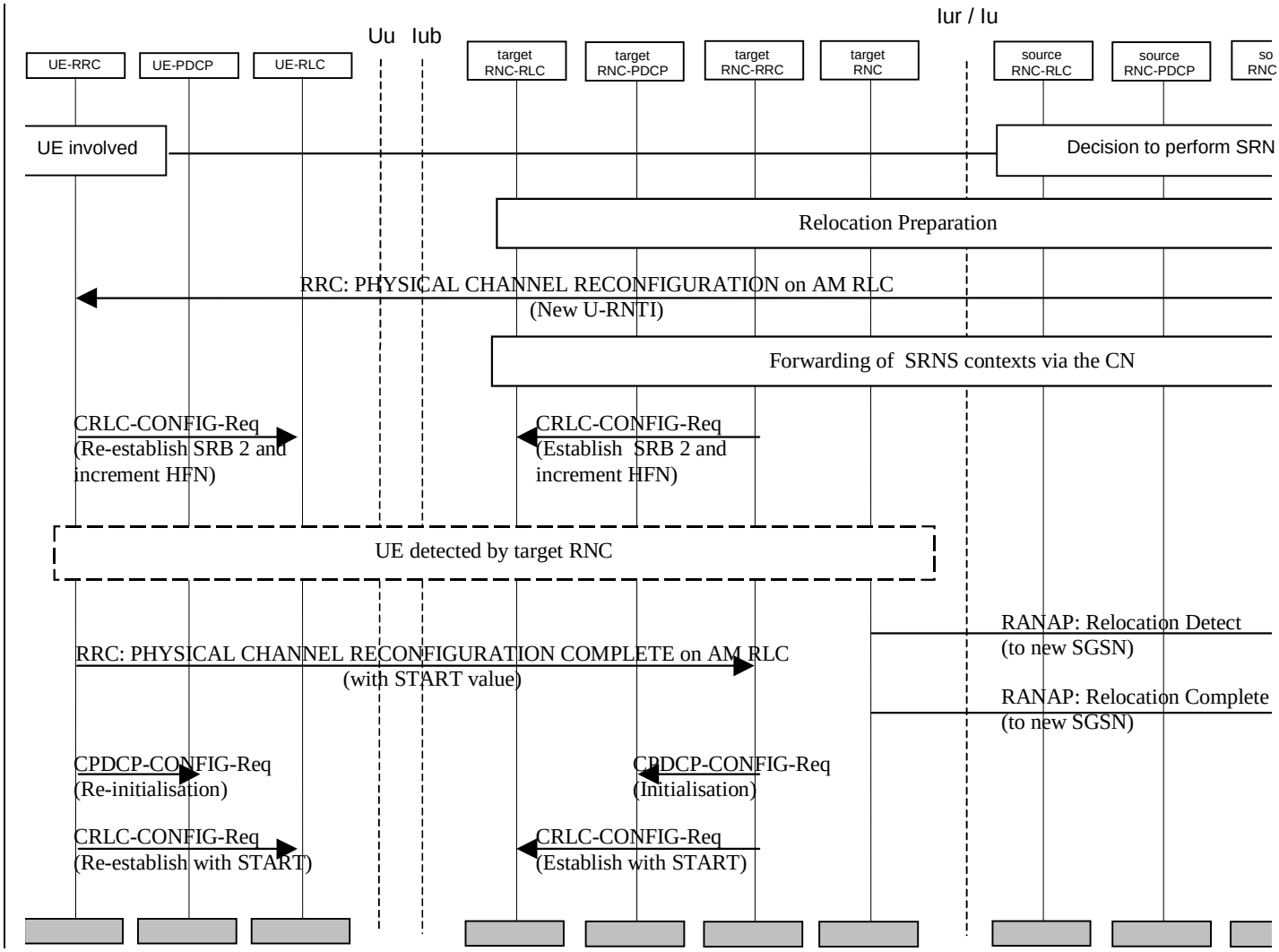


Figure 37: Combined Hard Handover and SRNS relocation (seamless radio bearers)

3GPP TSG-RAN WG2 Meeting #25
Makuhari, Japan, 26 - 30 November 2001

Tdoc R2-012639

CR-Form-v4

CHANGE REQUEST

⌘ **25.303** **CR** **061** ⌘ ev **-** ⌘ Current version: **4.2.0** ⌘

*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 **X** Core Network ☐

Title:	⌘	HFN transfer between network nodes in SRNS relocation
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	27 Nov 2001
Category:	⌘	**A**
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:	⌘	It is incorrectly stated in 6.4.8.2 and 6.4.8.4 that UL and DL HFNs would be transferred from source to target RNC during the "forwarding of SRNS contexts via the CN" phase. In fact, HFNs are transferred in "Relocation Preparation" phase (ie. RANAP: RELOCATION REQUIRED, RANAP: RELOCATION REQUEST).
Summary of change:	⌘	The incorrect sentences have been removed.
Consequences if not approved:	⌘	The description of SRNS relocation is incorrect and conflicts with e.g. RANAP specification 25.413.

Clauses affected:	⌘	6.4.8.2, 6.4.8.4
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.

6.4.8.2 Combined Hard Handover and SRNS relocation (lossless radio bearers)

Based on measurement results and knowledge of the UTRAN topology, the source SRNC decides to initiate a combined hard handover and SRNS relocation. The UE is still under control of the SRNC but is moving to a location controlled by the target RNC.

A RANAP Relocation Command is received by the source RNC from the CN, indicating the RABs to be released, the Target RNC to Source RNC Transparent Container and the RABs that are subject to data forwarding. Lossless SRNS relocation is always, and only, configured for RABs that are subject to data forwarding. The PDCP layer shall support PDCP sequence numbering when lossless SRNS relocation is supported [7]. The Target RNC to Source RNC Transparent Container includes the RRC message (e.g. PHYSICAL CHANNEL RECONFIGURATION) for hard handover.

Upon reception of the RANAP Relocation Command, the RRC entity in the source RNC stops the RLC entities for the affected radio bearers and retrieves the PDCP sequence numbers. It then triggers the execution of the relocation of SRNS by sending the RRC message to the UE using the acknowledged mode dedicated signalling radio bearer (SRB #2). This message includes the new U-RNTI (from the target RNC) and the uplink receive PDCP sequence number for each radio bearer configured to support lossless SRNS relocation (from the source RNC). The UE reinitialises the PDCP header compression entities of the radio bearers configured to use a header compression protocol [7].

The PDCP send and receive sequence numbers ~~and the current downlink and uplink HFN values~~ are then transferred via the CN during the forwarding of SRNS contexts from source to target RNC. The target RNC becomes the serving RNC when the RANAP Relocation Detect message is sent.

Upon reception and acknowledgment by the UE of the message, the RLC entity for the acknowledged mode dedicated signalling radio bearer (SRB #2) is re-established, both on the UTRAN and UE sides and their HFN values are set to the current downlink and uplink HFN values incremented by one. Care should be taken by UTRAN in timing the SRNS relocation so that there is no risk of a SN rollover on SRB #2 during this procedure.

The UE compares the uplink receive PDCP sequence number with the uplink send PDCP sequence number. If this confirms PDCP SDUs successfully transferred before the start of relocation i.e. already received by the source RNC then these are discarded by the UE.

If the UE has successfully configured itself, it sends a response message, in this case a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message to the target RNC using the acknowledged mode dedicated signalling radio bearer (SRB #2). This message contains the START values and the downlink receive PDCP sequence number for each radio bearer configured to support lossless SRNS relocation.

Upon acknowledgement of the message, the RLC entities for affected radio bearers are re-established both on the UTRAN and UE side. The HFN values for each RB are set to the START value in the message for the corresponding CN domain.

UTRAN compares the downlink receive PDCP sequence number with the downlink send PDCP sequence number. The UTRAN initialises the PDCP header compression entities of the radio bearers configured to use a header compression protocol [7].

The UTRAN and the UE continue the RLC and PDCP entities of the affected RBs and the relocation procedure ends.

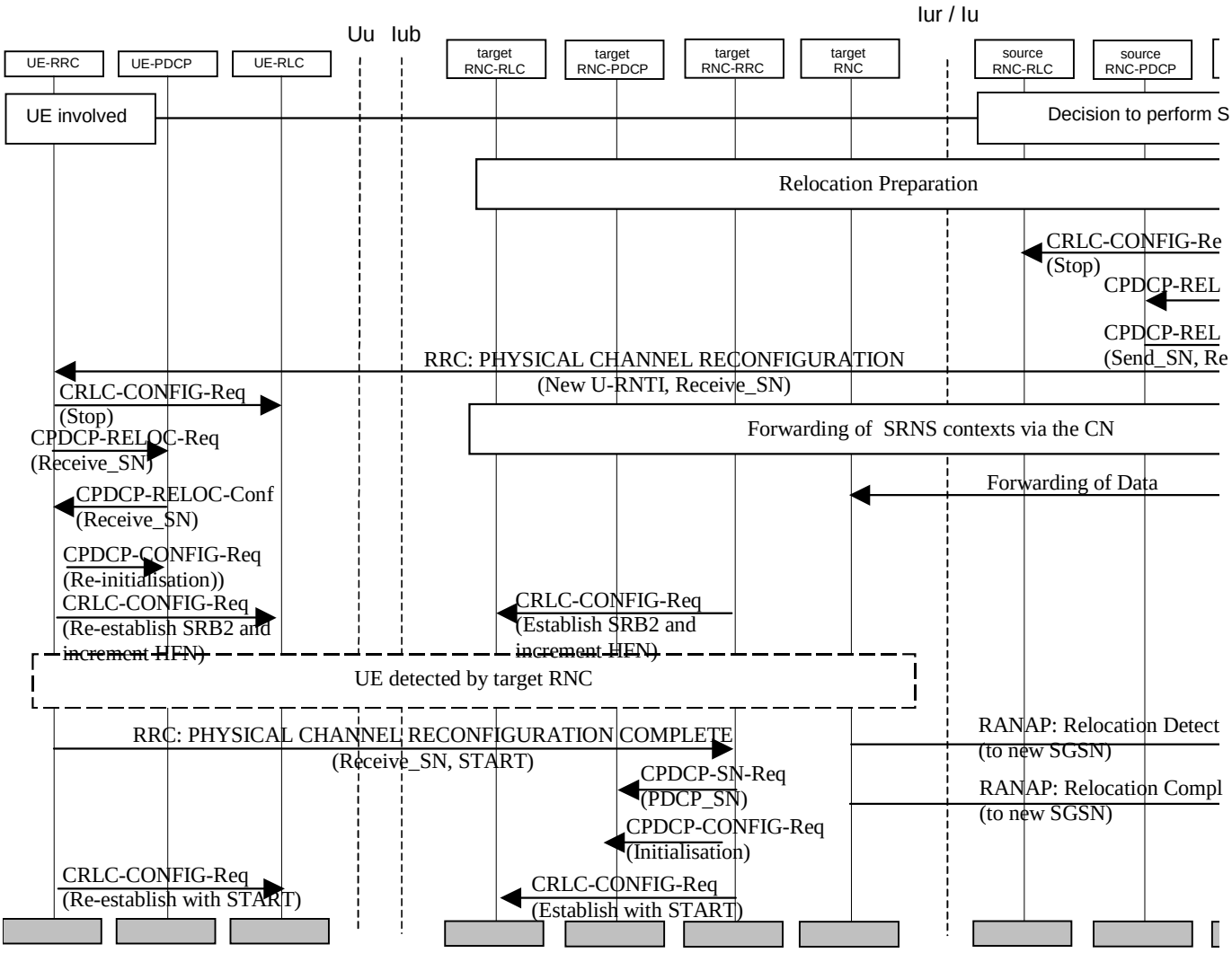


Figure 35: Combined Hard Handover and SRNS relocation (lossless radio bearers)

6.4.8.4 Combined Hard Handover and SRNS relocation (seamless radio bearers)

Based on measurement results and knowledge of the UTRAN topology, the source SRNC decides to initiate a combined hard handover and SRNS relocation. The UE is still under control of the SRNC but is moving to a location controlled by the target RNC.

The source RNC continues the downlink data transmission on radio bearers supporting seamless SRNS relocation until the target RNC becomes the serving RNC. The target RNC becomes the serving RNC when the RANAP Relocation Detect message is sent.

A RANAP Relocation Command is received by the source RNC from the CN, indicating the RABs to be released. The Target RNC to Source RNC Transparent Container includes the RRC message (e.g. PHYSICAL CHANNEL RECONFIGURATION) for hard handover. This message includes the new U-RNTI.

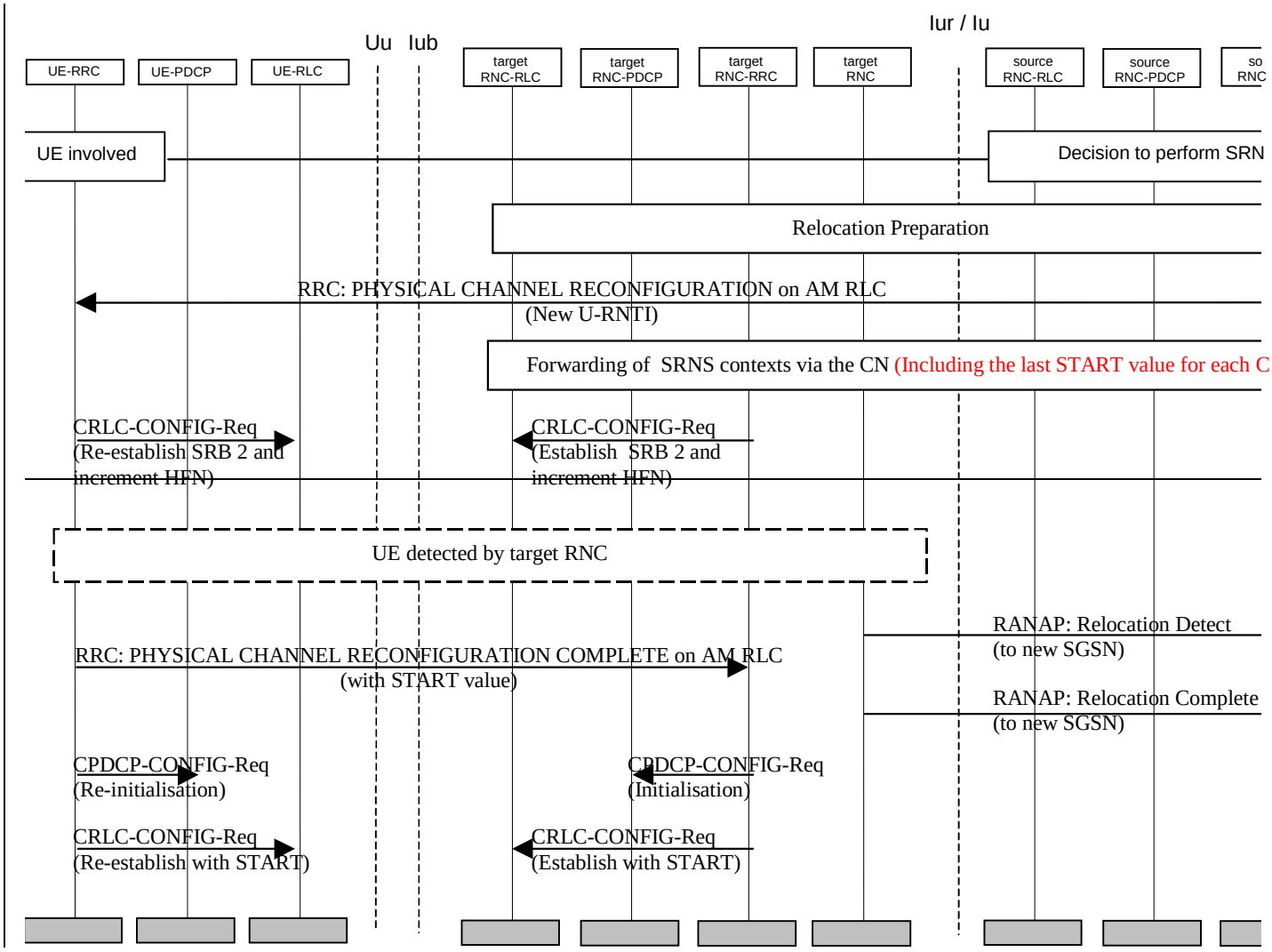
Upon reception of the RANAP Relocation Command, the source RNC triggers the execution of the relocation of SRNS by sending the RRC message to the UE using the acknowledged mode dedicated signalling radio bearer. ~~The current downlink and uplink HFN values for this signalling radio bearer are then transferred from source to target RNC during the "forwarding of SRNS contexts via the CN" phase.~~

Upon reception and acknowledgment by the UE of the PHYSICAL CHANNEL RECONFIGURATION message, the RLC entity for the acknowledged mode dedicated signalling radio bearer (SRB #2) is re-established, both on the UTRAN (target SRNC) and UE sides, and their HFN values are set to the current downlink and uplink HFN values incremented by one. Care should be taken by UTRAN in timing the SRNS relocation so that there is no risk of a SN rollover on SRB #2 during this procedure.

If the UE has successfully configured itself, it sends a response message, in this case PHYSICAL CHANNEL RECONFIGURATION COMPLETE message to the target RNC using the acknowledged mode dedicated signalling radio bearer (SRB #2). This message is transmitted based on the new RLC context and contains the START values (to be used in integrity protection and in ciphering on radio bearers using UM and AM RLC). The UTRAN initialises and the UE reinitialises the PDCP header compression entities of the radio bearers configured to use a header compression protocol [7].

Upon acknowledgement of the message, the RLC entities for the rest of the affected radio bearers are re-established both on the UTRAN and UE side. The HFN values for each RB are set to the START value in the message for the corresponding CN domain. The HFN values for each remaining signalling radio bearer (other than SRB #2) are set to the START value in the message for the last configured CN domain.

The relocation procedure ends.


Iur / Iu
Uu
Iub
UE-RRC
UE-PDCP
UE-RLC
target RNC-RLC
target RNC-PDCP
target RNC-RRC
target RNC
source RNC-RLC
source RNC-PDCP
UE involved
Decision to perform SRN
Relocation Preparation
RRC: PHYSICAL CHANNEL RECONFIGURATION on AM RLC
(New U-RNTI)
Forwarding of SRNS contexts via the CN (Including the last START value for each C
CRLC-CONFIG-Req
(Re-establish SRB 2 and increment HFN)
CRLC-CONFIG-Req
(Establish SRB 2 and increment HFN)
UE detected by target RNC
RANAP: Relocation Detect
(to new SGSN)
RRC: PHYSICAL CHANNEL RECONFIGURATION COMPLETE on AM RLC
(with START value)
RANAP: Relocation Complete
(to new SGSN)
CPDCP-CONFIG-Req
(Re-initialisation)
CPDCP-CONFIG-Req
(Initialisation)
CRLC-CONFIG-Req
(Re-establish with START)
CRLC-CONFIG-Req
(Establish with START)

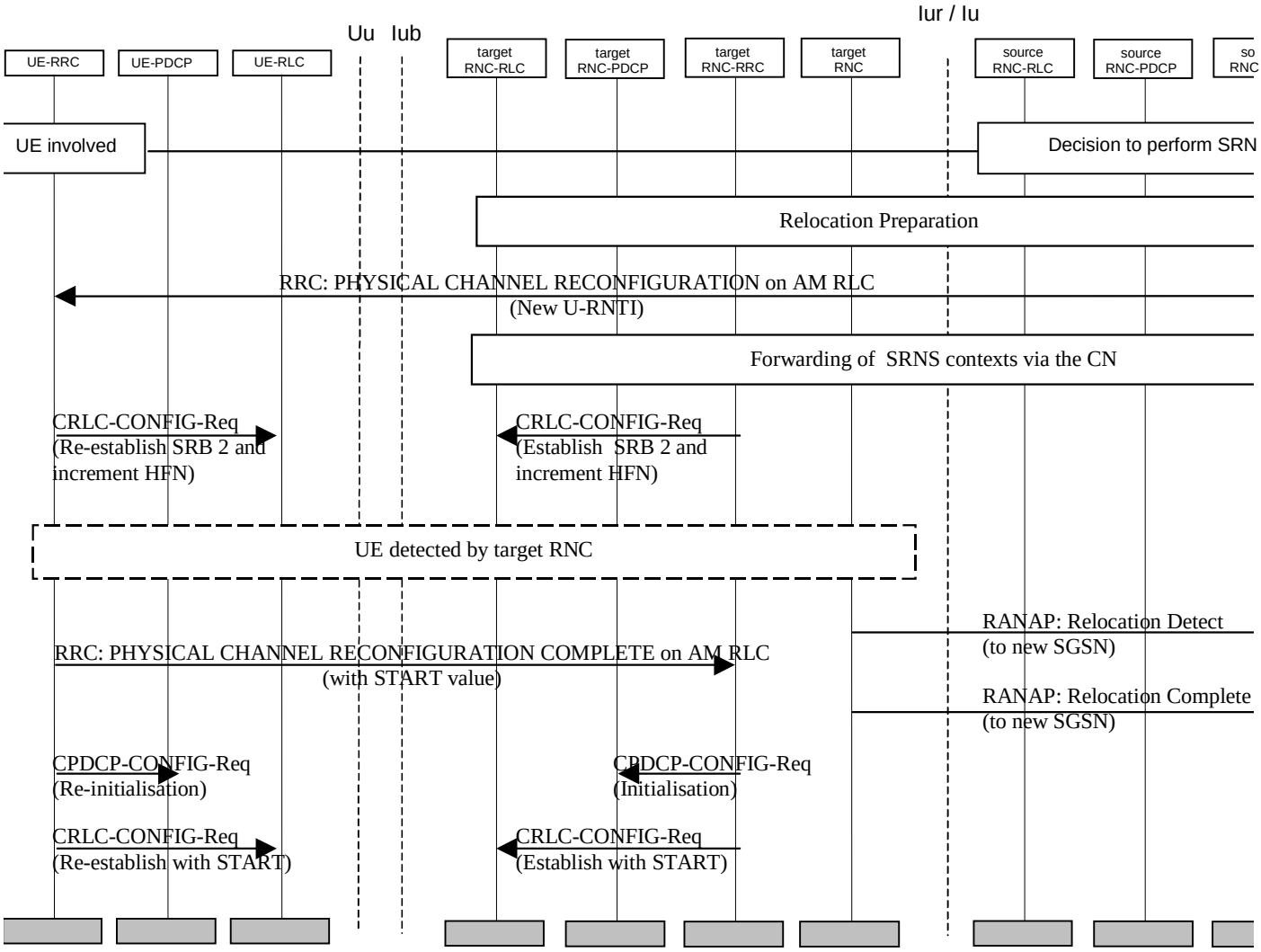


Figure 37: Combined Hard Handover and SRNS relocation (seamless radio bearers)

3GPP TSG-RAN WG2 Meeting #25 ***R2-012516***
Makuhari, Japan, 26- 30 November, 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.303 CR 062** ⌘ ev **-** ⌘ Current version: **3.9.0** ⌘

*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 **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Removal of Tr mode DCCH from R99 only
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	November 26, 2001
Category:	⌘	**F**
Release:	⌘	R99

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: ⌘ Transparent Mode DCCH is intended to support TFO and TrFO with GSM networks. Anyhow, these features will only be fully supported by the standard only from Rel-4 onward. Moreover, the way Transparent Mode DCCM is defined in R99 is extremely inefficient, e.g. 20-60 bits of information are sent almost every 20 ms to convey an information that could be more appropriately be encoded with 3-5 bits. Therefore it seems very unlikely that this R99 feature would ever be deployed in commercial networks. Its removal, on the other hand, would simplify the UE development and it would reduce the amount of testing. Note that none of the configurations so far defined in TS 34.108v3.4.0 includes the Transparent Mode DCCH.

Summary of change: ⌘ Transparent Mode DCCH is removed from R99

Isolated Impact Change Analysis.

This change affects the Tr Mode DCCH.

It would not affect implementations behaving like indicated in the CR, it would affect implementations supporting the corrected functionality otherwise.

Consequences if not approved: ⌘ UE would be unnecessary complex to implement a feature that will almost certainly never be implemented in R99 systems.

Clauses affected: ⌘ 6.2.4.1

Other specs affected: ⌘

X	Other core specifications	CR 1130 to TS 25.331 CR 057 to TS 25.301 CR 167 to TS 25.322 TS 33.102 may also be affected No change to 25.301 v4.1.0!
☐	Test specifications	
☐	O&M Specifications	

Other comments:	⌘	There is no shadow Rel-4 CR, since Transparent Mode DCCH is supported in Rel-4.R2-01???? Is the LS to inform SA3 of the removal of the “TRANSPORT FORMAT COMBINATION CONTROL (TM DCCH only)” from the list of messages for which integrity protection is not performedThe removal of this feature was agreed at RAN2 #24 during the discussion of R2-012344.

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:

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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.

6.2.4 Transport Format Combination Control

6.2.4.1 Transport Format Combination Limitation

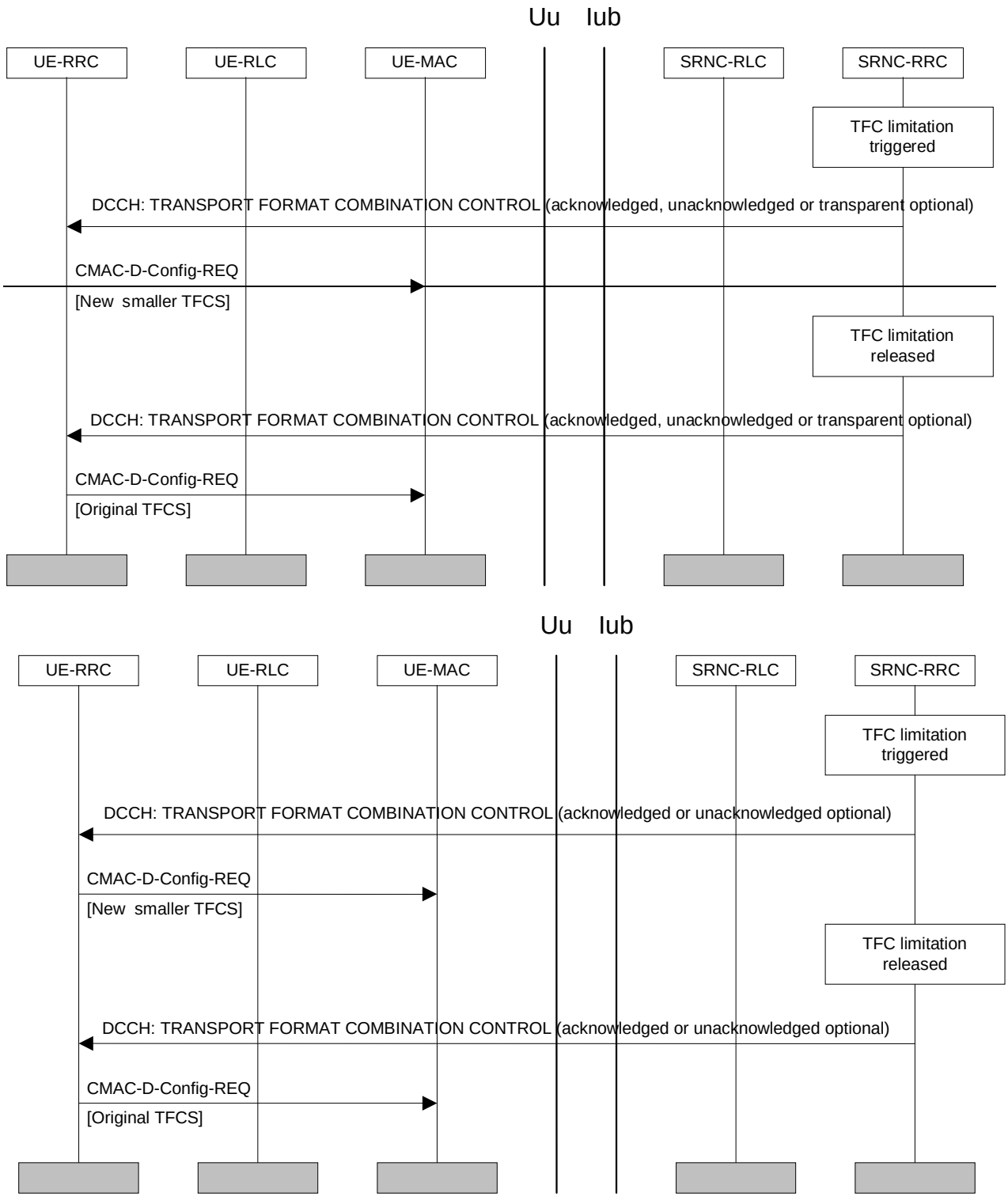

Figure 16: Transport Format Combination Limitation

Figure 16 illustrates an example of a Transport Format Combination Control procedure. A congestion situation occurs and allowed transport format combinations are restricted temporarily. When the congestion is resolved the restriction is removed.

This procedure is initiated with a Transport Format Combination Control message from the network to the UE (acknowledged~~,~~ or unacknowledged ~~or transparent~~ transmission optional to the NW). This message contains a subset of the ordinary Transport Format Combination Set. The UE then continues with a reconfiguration of MAC. MAC sees the TFC subset as a completely new set.

Further, after a while when the congestion is resolved a new Transport Format Combination Control message is sent to the UE from the RRC layer in the network. This message contains a subset that is the entire original set. Again, the UE reconfigures the MAC.

[…]