

**TSG RAN Meeting #20**  
**Hämeenlinna, Finland, 3 - 6 June, 2003**

**RP-030314**

**Title** CRs (R99 and Rel-4/Rel-5 Category A) to TS 25.413 on Essential Correction of  
lu Release Issue  
**Source** TSG RAN WG3  
**Agenda Item** 7.3.3

RAN3 Tdoc	Spec	curr. Vers.	new Vers.	REL	CR	Rev	Cat	Title	Work item
R3-030835	25.413	3.12.0	3.13.0	R99	568	2	F	Essential Correction of lu Release Issue	TEI
R3-030836	25.413	4.8.0	4.9.0	REL-4	569	2	A	Essential Correction of lu Release Issue	TEI
R3-030837	25.413	5.4.0	5.5.0	REL-5	570	2	A	Essential Correction of lu Release Issue	TEI

3GPP TSG-RAN3 Meeting #36  
Paris, France, 19<sup>th</sup>-23th May 2003

Tdoc #R3-030835

CR-Form-v7

## CHANGE REQUEST

⌘ 25.413 CR 568 ⌘ rev 2 ⌘ Current version: 3.12.0 ⌘

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

<b>Title:</b>	⌘ Essential Correction of Iu Release Issue		
<b>Source:</b>	⌘ RAN WG3		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 19/05/2003
<b>Category:</b>	⌘ F	<b>Release:</b>	⌘ R99
Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:	
F (correction)		2 (GSM Phase 2)	
A (corresponds to a correction in an earlier release)		R96 (Release 1996)	
B (addition of feature),		R97 (Release 1997)	
C (functional modification of feature)		R98 (Release 1998)	
D (editorial modification)		R99 (Release 1999)	
Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Rel-4 (Release 4)	
		Rel-5 (Release 5)	
		Rel-6 (Release 6)	

**Reason for change:** ⌘ The current cause "user inactivity" is only supported by the RNC-triggered Iu release. It is not known what kind of inactivity this is measuring (RAB inactivity or Iu signalling inactivity). It is not said who is responsible to check user inactivity for Iu signalling only when there is no existing RAB and control the Iu Release. RANAP is also ambiguous as to RAB Release Request upon RAB inactivity.

**Summary of change:** ⌘ The CN node is identified in charge of managing the Iu release upon Iu signalling only inactivity. Use of cause value "user inactivity" is also clarified.

Impact assessment towards the previous version of the specification (same release):

This CR has isolated impact towards the previous version of the specification (same release).

This CR has an impact under functional point of view.

The impact can be considered isolated because it only affects the Iu Release Request and Iu Release system functions.

**Consequences if not approved:** ⌘ Major IOT issue when SGSN and RNC expect each other to control the lu release upon lu signalling inactivity. Awful system performance if SGSN relies on RNC and system potentially blocked if all UEs remain in connected mode.

**Clauses affected:** ⌘ 8.5, 9.2.1.4

<b>Other specs</b>	⌘	<b>Y</b>	<b>N</b>	Other core specifications	⌘ TS 25.413 REL-4 CR569r2 TS25.413 REL-5 CR570r2
		X			
<b>affected:</b>			X	Test specifications	
			X	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/specs/CR.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.

## 8.5 Iu Release

### 8.5.1 General

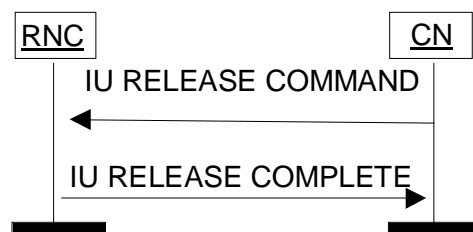
The purpose of the Iu Release procedure is to enable the CN to release the Iu connection and all UTRAN resources related only to that Iu connection to be released. The procedure uses connection oriented signalling.

The Iu Release procedure can be initiated for at least the following reasons:

- Completion of transaction between UE and CN.
- UTRAN generated reasons, e.g. reception of IU RELEASE REQUEST message.
- Completion of successful relocation of SRNS.
- Cancellation of relocation after successful completion of the Relocation Resource Allocation procedure.

The Iu release procedure should also be initiated when there is a period of Iu signalling inactivity with no existing RAB.

### 8.5.2 Successful Operation



**Figure 4: Iu Release procedure. Successful operation.**

The procedure is initiated by the CN by sending an IU RELEASE COMMAND message to the UTRAN.

After the IU RELEASE COMMAND message has been sent, the CN shall not send further RANAP connection oriented messages on this particular connection.

The IU RELEASE COMMAND message shall include a *Cause* IE, indicating the reason for the release (e.g. "Successful Relocation", "Normal Release", "Release due to UTRAN Generated Reason", "Relocation Cancelled", "No Remaining RAB").

When the RNC receives the IU RELEASE COMMAND message:

1. Clearing of the related UTRAN resources is initiated. However, the UTRAN shall not clear resources related to other Iu signalling connections the UE might have. The Iu transport bearers for RABs subject to data forwarding and other UTRAN resources used for the GTP-PDU forwarding process, are released by the RNC only when the timer  $T_{DATAfwd}$  expires.
2. The RNC returns any assigned Iu user plane resources to idle i.e. neither uplink user data nor downlink user data can be transferred over the Iu interface anymore. Then the RNC sends an IU RELEASE COMPLETE message to the CN. (The RNC does not need to wait for the release of UTRAN radio resources or for the transport network layer signalling to be completed before returning the IU RELEASE COMPLETE message.) When an IU RELEASE COMPLETE message is sent, the procedure is terminated in the UTRAN.

The IU RELEASE COMPLETE message shall include a *RABs Data Volume Report* IE for RABs towards the PS domain for which data volume reporting was requested during RAB establishment.

If the release was initiated by UTRAN, for each RAB towards the PS domain, for which the *DL GTP-PDU Sequence Number* IE and/or the *UL GTP-PDU Sequence Number* IE are (is) available, the RNC shall include the available

sequence number(s) in the *RABs Released Item* IE (within the *RAB Released List* IE) in the IU RELEASE COMPLETE message.

The *RAB Release Item* IE shall not be present if there is no sequence number to be reported for that RAB.

Reception of an IU RELEASE COMPLETE message terminates the procedure in the CN.

### 8.5.3 Abnormal Conditions

If the Iu Release procedure is not initiated towards the source RNC from the CN before the expiry of timer  $T_{RELOCoverall}$ , the source RNC should initiate the Iu Release Request procedure towards the CN with a cause value " $T_{RELOCoverall}$  expiry".

#### 9.2.1.4 Cause

The purpose of the *Cause* IE is to indicate the reason for a particular event for the RANAP protocol.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice <b>Cause</b>				
>Radio Network Layer Cause			INTEGER (RAB pre-empted(1), Trelocoverall Expiry(2), Trelocprep Expiry(3), Treloccomplete Expiry(4), Tqueing Expiry(5), Relocation Triggered(6), Unable to Establish During Relocation(8), Unknown Target RNC(9), Relocation Cancelled(10), Successful Relocation(11), Requested Ciphering and/or Integrity Protection Algorithms not Supported(12), Conflict with already existing Integrity protection and/or Ciphering information (13), Failure in the Radio Interface Procedure(14), Release due to UTRAN Generated Reason(15), User Inactivity(16), Time Critical Relocation(17), Requested Traffic Class not Available(18), Invalid RAB	Value range is 1 – 64.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause			Parameters Value(19), Requested Maximum Bit Rate not Available(20), Requested Maximum Bit Rate for DL not Available(33), Requested Maximum Bit Rate for UL not Available(34), Requested Guaranteed Bit Rate not Available(21), Requested Guaranteed Bit Rate for DL not Available(35), Requested Guaranteed Bit Rate for UL not Available(36), Requested Transfer Delay not Achievable(22), Invalid RAB Parameters Combination(23), Condition Violation for SDU Parameters(24), Condition Violation for Traffic Handling Priority(25), Condition Violation for Guaranteed Bit Rate(26), User Plane Versions not Supported(27), lu UP Failure(28), TRELOAlloc Expiry (7), Relocation Failure	



IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			<p>in Target CN/RNC or Target System (29),</p> <p>Invalid RAB ID(30),</p> <p>No remaining RAB(31),</p> <p>Interaction with other procedure(32),</p> <p>Repeated Integrity Checking Failure(37),</p> <p>Requested Request Type not supported(38),</p> <p>Request superseded(39),</p> <p>Release due to UE generated signalling connection release(40),</p> <p>Resource Optimisation Relocation(41),</p> <p>Requested Information Not Available(42),</p> <p>Relocation desirable for radio reasons (43),</p> <p>Relocation not supported in Target RNC or Target system(44),</p> <p>Directed Retry (45),</p> <p>Radio Connection With UE Lost(46)</p> <p>...)</p>	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
<b>Choice Cause</b>				
>Transport Layer Cause			INTEGER ( Signalling Transport Resource Failure(65),  lu Transport Connection Failed to Establish(66),  ...)	Value range is 65 – 80.
>NAS Cause			INTEGER (User Restriction Start Indication(81),  User Restriction End Indication(82),  Normal Release(83),  ...)	Value range is 81 – 96.
>Protocol Cause			INTEGER (Transfer Syntax Error(97),  Semantic Error (98),  Message not compatible with receiver state (99),  Abstract Syntax Error (Reject) (100),  Abstract Syntax Error (Ignore and Notify) (101),  Abstract Syntax Error (Falsely Constructed Message) (102),  ...)	Value range is 97 – 112.
>Miscellaneous Cause			INTEGER (O&M Intervention(113),  No Resource Available(114),  Unspecified Failure(115),  Network Optimisation(116) ,	Value range is 113 – 128.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			...)	
>Non-standard Cause			INTEGER (...)	Value range is 129 – 256. Cause value 256 shall not be used.

The meaning of the different cause values is described in the following table. In general, "not supported" cause values indicate that the concerning capability is missing. On the other hand, "not available" cause values indicate that the concerning capability is present, but insufficient resources were available to perform the requested action.

<b>Radio Network Layer cause</b>	<b>Meaning</b>
Conflict with already existing Integrity protection and/or Ciphering information	The action was not performed due to that the requested security mode configuration was in conflict with the already existing security mode configuration.
Condition Violation For Guaranteed Bit Rate	The action was not performed due to condition violation for guaranteed bit rate.
Condition Violation For SDU Parameters	The action was not performed due to condition violation for SDU parameters.
Condition Violation For Traffic Handling Priority	The action was not performed due to condition violation for traffic handling priority.
Directed Retry	The reason for action is Directed Retry
Failure In The Radio Interface Procedure	Radio interface procedure has failed.
Interaction With Other Procedure	Relocation was cancelled due to interaction with other procedure.
Invalid RAB ID	The action failed because the RAB ID is unknown in the RNC.
Invalid RAB Parameters Combination	The action failed due to invalid RAB parameters combination.
Invalid RAB Parameters Value	The action failed due to invalid RAB parameters value.
Iu UP Failure	The action failed due to Iu UP failure.
No remaining RAB	The reason for the action is no remaining RAB.
RAB Pre-empted	The reason for the action is that RAB is pre-empted.
Radio Connection With UE Lost	The action is requested due to losing radio connection to the UE
Release Due To UE Generated Signalling Connection Release	Release requested due to UE generated signalling connection release.
Release Due To UTRAN Generated Reason	Release is initiated due to UTRAN generated reason.
Relocation Cancelled	The reason for the action is relocation cancellation.
Relocation Desirable for Radio Reasons	The reason for requesting relocation is radio related.
Relocation Failure In Target CN/RNC Or Target System	Relocation failed due to a failure in target CN/RNC or target system.
Relocation Not Supported In Target RNC Or Target System	Relocation failed because relocation was not supported in target RNC or target system.
Relocation Triggered	The action failed due to relocation.
Repeated Integrity Checking Failure	The action is requested due to repeated failure in integrity checking.
Request Superseded	The action failed because there was a second request on the same RAB.
Requested Ciphering And/Or Integrity Protection Algorithms Not Supported	The UTRAN or the UE is unable to support the requested ciphering and/or integrity protection algorithms.
Requested Guaranteed Bit Rate For DL Not Available	The action failed because requested guaranteed bit rate for DL is not available.
Requested Guaranteed Bit Rate For UL Not Available	The action failed because requested guaranteed bit rate for UL is not available.
Requested Guaranteed Bit Rate Not Available	The action failed because requested guaranteed bit rate is not available.
Requested Information Not Available	The action failed because requested information is not available.
Requested Maximum Bit Rate For DL Not Available	The action failed because requested maximum bit rate for DL is not available.
Requested Maximum Bit Rate For UL Not Available	The action failed because requested maximum bit rate for UL is not available.
Requested Maximum Bit Rate Not Available	The action failed because requested maximum bit rate is not available.
Requested Request Type Not Supported	The RNC is not supporting the requested location request type either because it doesn't support the requested event or it doesn't support the requested report area.
Requested Traffic Class Not Available	The action failed because requested traffic class is not available.
Requested Transfer Delay Not Achievable	The action failed because requested transfer delay is not achievable.

Resource Optimisation Relocation	The reason for requesting relocation is resource optimisation.
Successful Relocation	The reason for the action is completion of successful relocation.
Time Critical Relocation	Relocation is requested for time critical reason.
T <sub>QUEUEING</sub> Expiry	The action failed due to expiry of the timer T <sub>QUEUEING</sub> .
T <sub>RELOCalloc</sub> Expiry	Relocation Resource Allocation procedure failed due to expiry of the timer T <sub>RELOCalloc</sub> .
T <sub>RELOCcomplete</sub> Expiry	The reason for the action is expiry of timer T <sub>RELOCcomplete</sub> .
T <sub>RELOCoverall</sub> Expiry	The reason for the action is expiry of timer T <sub>RELOCoverall</sub> .
T <sub>RELOCprep</sub> Expiry	Relocation Preparation procedure is cancelled when timer T <sub>RELOCprep</sub> expires.
Unable To Establish During Relocation	RAB failed to establish during relocation because it cannot be supported in the target RNC.
Unknown Target RNC	Relocation rejected because the target RNC is not known to the CN.
User Inactivity	The action is requested due to user inactivity- <a href="#">on one or several non real time RABs e.g. in order to optimise radio resource.</a>
User Plane Versions Not Supported	The action failed because requested user plane versions were not supported.

Transport Layer cause	Meaning
Iu Transport Connection Failed to Establish	The action failed because the Iu Transport Network Layer connection could not be established.
Signalling Transport Resource Failure	Signalling transport resources have failed (e.g. processor reset).

NAS cause	Meaning
Normal Release	The release is normal.
User Restriction Start Indication	A location report is generated due to entering a classified area set by O&M.
User Restriction End Indication	A location report is generated due to leaving a classified area set by O&M.

Protocol cause	Meaning
Abstract Syntax Error (Reject)	The received message included an abstract syntax error and the concerning criticality indicated "reject".
Abstract Syntax Error (Ignore And Notify)	The received message included an abstract syntax error and the concerning criticality indicated "ignore and notify".
Abstract Syntax Error (Falsely Constructed Message)	The received message contained IEs or IE groups in wrong order or with too many occurrences.
Message Not Compatible With Receiver State	The received message was not compatible with the receiver state.
Semantic Error	The received message included a semantic error.
Transfer Syntax Error	The received message included a transfer syntax error.

Miscellaneous cause	Meaning
Network Optimisation	The action is performed for network optimisation.
No Resource Available	No requested resource is available.
O&M Intervention	The action is due to O&M intervention.
Unspecified Failure	Sent when none of the specified cause values applies.



3GPP TSG-RAN3 Meeting #36  
Paris, France, 19<sup>th</sup>-23th May 2003

Tdoc #R3-030836

CR-Form-v7

## CHANGE REQUEST

⌘ 25.413 CR 569 ⌘ rev 2 ⌘ Current version: 4.8.0 ⌘

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

<b>Title:</b>	⌘ Essential Correction of Iu Release Issue		
<b>Source:</b>	⌘ RAN WG3		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 19/05/2003
<b>Category:</b>	⌘ A	<b>Release:</b>	⌘ REL-4
Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <u>one</u> 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:** ⌘ The current cause "user inactivity" is only supported by the RNC-triggered Iu release. It is not known what kind of inactivity this is measuring (RAB inactivity or Iu signalling inactivity). It is not said who is responsible to check user inactivity for Iu signalling only when there is no existing RAB and control the Iu Release. RANAP is also ambiguous as to RAB Release Request use upon RAB inactivity.

**Summary of change:** ⌘ The CN node is identified in charge of managing the Iu release upon Iu signalling only inactivity. Use of cause value "user inactivity" is also clarified.

Impact assessment towards the previous version of the specification (same release):

This CR has isolated impact towards the previous version of the specification (same release).

This CR has an impact under functional point of view.

The impact can be considered isolated because it only affects the Iu Release Request and Iu Release system functions.

**Consequences if not approved:** ⌘ Major IOT issue when SGSN and RNC expect each other to control the lu release upon iu signalling inactivity. Awful system performance if SGSN relies on RNC and system potentially blocked if all UEs remain in connected mode.

**Clauses affected:** ⌘ 8.5, 9.2.1.4

<b>Other specs affected:</b>	<table border="1"> <tr> <td>Y</td> <td>N</td> </tr> <tr> <td>X</td> <td></td> </tr> </table>	Y	N	X		Other core specifications	⌘ TS 25.413 R99 CR568r2 TS25.413 REL-5 CR570r2
	Y	N					
	X						
	X	Test specifications					
	X	O&M Specifications					
<b>Other comments:</b> ⌘							

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## 8.5 Iu Release

### 8.5.1 General

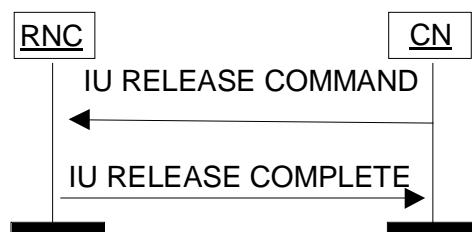
The purpose of the Iu Release procedure is to enable the CN to release the Iu connection and all UTRAN resources related only to that Iu connection to be released. The procedure uses connection oriented signalling.

The Iu Release procedure can be initiated for at least the following reasons:

- Completion of transaction between UE and CN.
- UTRAN generated reasons, e.g. reception of IU RELEASE REQUEST message.
- Completion of successful relocation of SRNS.
- Cancellation of relocation after successful completion of the Relocation Resource Allocation procedure.

The Iu release procedure should also be initiated when there is a period of Iu signalling inactivity with no existing RAB.

### 8.5.2 Successful Operation



**Figure 4: Iu Release procedure. Successful operation.**

The procedure is initiated by the CN by sending an IU RELEASE COMMAND message to the UTRAN.

After the IU RELEASE COMMAND message has been sent, the CN shall not send further RANAP connection oriented messages on this particular connection.

The IU RELEASE COMMAND message shall include a *Cause* IE, indicating the reason for the release (e.g. "Successful Relocation", "Normal Release", "Release due to UTRAN Generated Reason", "Relocation Cancelled", "No Remaining RAB").

When the RNC receives the IU RELEASE COMMAND message:

1. Clearing of the related UTRAN resources is initiated. However, the UTRAN shall not clear resources related to other Iu signalling connections the UE might have. The Iu transport bearers for RABs subject to data forwarding and other UTRAN resources used for the GTP-PDU forwarding process, are released by the RNC only when the timer  $T_{DATAfwd}$  expires.
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The IU RELEASE COMPLETE message shall include a *RABs Data Volume Report* IE for RABs towards the PS domain for which data volume reporting was requested during RAB establishment.

If the release was initiated by UTRAN, for each RAB towards the PS domain, for which the *DL GTP-PDU Sequence Number* IE and/or the *UL GTP-PDU Sequence Number* IE are (is) available, the RNC shall include the available

sequence number(s) in the *RABs Released Item* IE (within the *RAB Released List* IE) in the IU RELEASE COMPLETE message.

The *RAB Release Item* IE shall not be present if there is no sequence number to be reported for that RAB.

Reception of an IU RELEASE COMPLETE message terminates the procedure in the CN.

### 8.5.3 Abnormal Conditions

If the Iu Release procedure is not initiated towards the source RNC from the CN before the expiry of timer  $T_{RELOCoverall}$ , the source RNC should initiate the Iu Release Request procedure towards the CN with a cause value " $T_{RELOCoverall}$  expiry".

#### 9.2.1.4 Cause

The purpose of the *Cause* IE is to indicate the reason for a particular event for the RANAP protocol.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice <b>Cause</b>				
>Radio Network Layer Cause			INTEGER (RAB pre-empted(1), Trelocoverall Expiry(2), Trelocprep Expiry(3), Treloccomplete Expiry(4), Tqueing Expiry(5), Relocation Triggered(6), Unable to Establish During Relocation(8), Unknown Target RNC(9), Relocation Cancelled(10), Successful Relocation(11), Requested Ciphering and/or Integrity Protection Algorithms not Supported(12), Conflict with already existing Integrity protection and/or Ciphering information (13), Failure in the Radio Interface Procedure(14), Release due to UTRAN Generated Reason(15), User Inactivity(16), Time Critical Relocation(17), Requested Traffic Class not Available(18), Invalid RAB	Value range is 1 – 64.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			Parameters Value(19),  Requested Maximum Bit Rate not Available(20),  Requested Maximum Bit Rate for DL not Available(33),  Requested Maximum Bit Rate for UL not Available(34),  Requested Guaranteed Bit Rate not Available(21),  Requested Guaranteed Bit Rate for DL not Available(35),  Requested Guaranteed Bit Rate for UL not Available(36),  Requested Transfer Delay not Achievable(22),  Invalid RAB Parameters Combination(23),  Condition Violation for SDU Parameters(24),  Condition Violation for Traffic Handling Priority(25),  Condition Violation for Guaranteed Bit Rate(26),  User Plane Versions not Supported(27),  lu UP Failure(28),  TRELOAlloc Expiry (7),  Relocation Failure	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause			<p>in Target CN/RNC or Target System (29),</p> <p>Invalid RAB ID(30),</p> <p>No remaining RAB(31),</p> <p>Interaction with other procedure(32),</p> <p>Repeated Integrity Checking Failure(37),</p> <p>Requested Request Type not supported(38),</p> <p>Request superseded(39),</p> <p>Release due to UE generated signalling connection release(40),</p> <p>Resource Optimisation Relocation(41),</p> <p>Requested Information Not Available(42),</p> <p>Relocation desirable for radio reasons (43),</p> <p>Relocation not supported in Target RNC or Target system(44),</p> <p>Directed Retry (45),</p> <p>Radio Connection With UE Lost(46),</p> <p>RNC unable to establish all RFCs (47),</p> <p>Deciphering Keys Not Available(48),</p> <p>Dedicated Assistance data Not Available(49),</p>	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			Relocation Target not allowed(50), Location Reporting Congestion(51)	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
<b>Choice Cause</b>				
>Transport Layer Cause			INTEGER ( Signalling Transport Resource Failure(65),  lu Transport Connection Failed to Establish(66))	Value range is 65 – 80.
>NAS Cause			INTEGER (User Restriction Start Indication(81),  User Restriction End Indication(82),  Normal Release(83))	Value range is 81 – 96.
>Protocol Cause			INTEGER (Transfer Syntax Error(97),  Semantic Error (98),  Message not compatible with receiver state (99),  Abstract Syntax Error (Reject) (100),  Abstract Syntax Error (Ignore and Notify) (101),  Abstract Syntax Error (Falsely Constructed Message) (102))	Value range is 97 – 112.
>Miscellaneous Cause			INTEGER (O&M Intervention(113),  No Resource Available(114),  Unspecified Failure(115),  Network Optimisation(116) )	Value range is 113 – 128.
>Non-standard Cause			INTEGER ( )	Value range is 129 – 256. Cause value 256 shall not be used.



The meaning of the different cause values is described in the following table. In general, "not supported" cause values indicate that the concerning capability is missing. On the other hand, "not available" cause values indicate that the concerning capability is present, but insufficient resources were available to perform the requested action.

<b>Radio Network Layer cause</b>	<b>Meaning</b>
Deciphering Keys Not Available	The action failed because RNC is not able to provide requested deciphering keys.
Conflict with already existing Integrity protection and/or Ciphering information	The action was not performed due to that the requested security mode configuration was in conflict with the already existing security mode configuration.
Condition Violation For Guaranteed Bit Rate	The action was not performed due to condition violation for guaranteed bit rate.
Condition Violation For SDU Parameters	The action was not performed due to condition violation for SDU parameters.
Condition Violation For Traffic Handling Priority	The action was not performed due to condition violation for traffic handling priority.
Dedicated Assistance data Not Available	The action failed because RNC is not able to successfully deliver the requested dedicated assistance data to the UE.
Directed Retry	The reason for action is Directed Retry
Failure In The Radio Interface Procedure	Radio interface procedure has failed.
Interaction With Other Procedure	Relocation was cancelled due to interaction with other procedure.
Invalid RAB ID	The action failed because the RAB ID is unknown in the RNC.
Invalid RAB Parameters Combination	The action failed due to invalid RAB parameters combination.
Invalid RAB Parameters Value	The action failed due to invalid RAB parameters value.
Iu UP Failure	The action failed due to Iu UP failure.
No remaining RAB	The reason for the action is no remaining RAB.
RAB Pre-empted	The reason for the action is that RAB is pre-empted.
Radio Connection With UE Lost	The action is requested due to losing radio connection to the UE
Release Due To UE Generated Signalling Connection Release	Release requested due to UE generated signalling connection release.
Release Due To UTRAN Generated Reason	Release is initiated due to UTRAN generated reason.
Relocation Cancelled	The reason for the action is relocation cancellation.
Relocation Desirable for Radio Reasons	The reason for requesting relocation is radio related.
Relocation Failure In Target CN/RNC Or Target System	Relocation failed due to a failure in target CN/RNC or target system.
Relocation Not Supported In Target RNC Or Target System	Relocation failed because relocation was not supported in target RNC or target system.
Relocation Target not allowed	Relocation to the indicated target cell is not allowed for the UE in question.
Relocation Triggered	The action failed due to relocation.
Repeated Integrity Checking Failure	The action is requested due to repeated failure in integrity checking.
Request Superseded	The action failed because there was a second request on the same RAB.
Requested Ciphering And/Or Integrity Protection Algorithms Not Supported	The UTRAN or the UE is unable to support the requested ciphering and/or integrity protection algorithms.
Requested Guaranteed Bit Rate For DL Not Available	The action failed because requested guaranteed bit rate for DL is not available.
Requested Guaranteed Bit Rate For UL Not Available	The action failed because requested guaranteed bit rate for UL is not available.
Requested Guaranteed Bit Rate Not Available	The action failed because requested guaranteed bit rate is not available.
Requested Information Not Available	The action failed because requested information is not available.
Requested Maximum Bit Rate For DL Not Available	The action failed because requested maximum bit rate for DL is not available.
Requested Maximum Bit Rate For UL Not Available	The action failed because requested maximum bit rate for UL is not available.
Requested Maximum Bit Rate Not Available	The action failed because requested maximum bit rate is not available.
Requested Request Type Not	The RNC is not supporting the requested location request

Supported	type either because it doesn't support the requested event or it doesn't support the requested report area.
Location Reporting Congestion	The action was not performed due to an inability to support location reporting caused by overload.
Requested Traffic Class Not Available	The action failed because requested traffic class is not available.
Requested Transfer Delay Not Achievable	The action failed because requested transfer delay is not achievable.
Resource Optimisation Relocation	The reason for requesting relocation is resource optimisation.
Successful Relocation	The reason for the action is completion of successful relocation.
Time Critical Relocation	Relocation is requested for time critical reason.
T <sub>QUEUEING</sub> Expiry	The action failed due to expiry of the timer T <sub>QUEUEING</sub> .
T <sub>RELOCalloc</sub> Expiry	Relocation Resource Allocation procedure failed due to expiry of the timer T <sub>RELOCalloc</sub> .
T <sub>RELOCcomplete</sub> Expiry	The reason for the action is expiry of timer T <sub>RELOCcomplete</sub> .
T <sub>RELOCoverall</sub> Expiry	The reason for the action is expiry of timer T <sub>RELOCoverall</sub> .
T <sub>RELOCprep</sub> Expiry	Relocation Preparation procedure is cancelled when timer T <sub>RELOCprep</sub> expires.
Unable To Establish During Relocation	RAB failed to establish during relocation because it cannot be supported in the target RNC.
Unknown Target RNC	Relocation rejected because the target RNC is not known to the CN.
User Inactivity	The action is requested due to user inactivity <a href="#">on one or several non real time RABs e.g. in order to optimise radio resource.</a>
User Plane Versions Not Supported	The action failed because requested user plane versions were not supported.
RNC unable to establish all RFCs	RNC couldn't establish all RAB subflow combinations indicated within the <i>RAB Parameters</i> IE.

Transport Layer cause	Meaning
Iu Transport Connection Failed to Establish	The action failed because the Iu Transport Network Layer connection could not be established.
Signalling Transport Resource Failure	Signalling transport resources have failed (e.g. <i>processor reset</i> ).

NAS cause	Meaning
Normal Release	The release is normal.
User Restriction Start Indication	A location report is generated due to entering a classified area set by O&M.
User Restriction End Indication	A location report is generated due to leaving a classified area set by O&M.

Protocol cause	Meaning
Abstract Syntax Error (Reject)	The received message included an abstract syntax error and the concerning criticality indicated "reject".
Abstract Syntax Error (Ignore And Notify)	The received message included an abstract syntax error and the concerning criticality indicated "ignore and notify".
Abstract Syntax Error (Falsely Constructed Message)	The received message contained IEs or IE groups in wrong order or with too many occurrences.
Message Not Compatible With Receiver State	The received message was not compatible with the receiver state.
Semantic Error	The received message included a semantic error.
Transfer Syntax Error	The received message included a transfer syntax error.

<b>Miscellaneous cause</b>	<b>Meaning</b>
Network Optimisation	The action is performed for network optimisation.
No Resource Available	No requested resource is available.
O&M Intervention	The action is due to O&M intervention.
Unspecified Failure	Sent when none of the specified cause values applies.

3GPP TSG-RAN3 Meeting #36  
 Paris, France, 19<sup>th</sup>-23th May 2003

Tdoc #R3-030837

CR-Form-v7

# CHANGE REQUEST

⌘ **25.413 CR 570** ⌘ rev **2** ⌘ Current version: **5.4.0** ⌘

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

<b>Title:</b>	⌘ Essential Correction of Iu Release Issue		
<b>Source:</b>	⌘ RAN WG3		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 19/05/2003
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ REL-5
Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <u>one</u> 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:** ⌘ The current cause “user inactivity” is only supported by the RNC-triggered Iu release. It is not known what kind of inactivity this is measuring (RAB inactivity or Iu signalling inactivity). It is not said who is responsible to check user inactivity for Iu signalling only when there is no existing RAB and control the Iu Release. RANAP is also ambiguous as to RAB Release Request use upon RAB inactivity.

**Summary of change:** ⌘ The CN node is identified in charge of managing the Iu release upon Iu signalling only inactivity. Use of cause value “user inactivity” is also clarified.

Impact assessment towards the previous version of the specification (same release):

This CR has isolated impact towards the previous version of the specification (same release).

This CR has an impact under functional point of view.

The impact can be considered isolated because it only affects the Iu Release Request and Iu Release system functions.

**Consequences if not approved:** ⌘ Major IOT issue when SGSN and RNC expect each other to control the lu release upon iu signalling inactivity. Awful system performance if SGSN relies on RNC and system potentially blocked if all UEs remain in connected mode.

**Clauses affected:** ⌘ 8.5, 9.2.1.4

	Y	N		
<b>Other specs</b>	X		Other core specifications	⌘ TS 25.413 R99 CR568r2 TS25.413 REL-4 CR569r2
<b>affected:</b>		X	Test specifications	
		X	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/specs/CR.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.

## 8.5 Iu Release

### 8.5.1 General

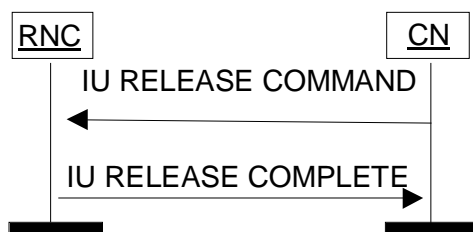
The purpose of the Iu Release procedure is to enable the CN to release the Iu connection and all UTRAN resources related only to that Iu connection to be released. The procedure uses connection oriented signalling.

The Iu Release procedure can be initiated for at least the following reasons:

- Completion of transaction between UE and CN.
- UTRAN generated reasons, e.g. reception of IU RELEASE REQUEST message.
- Completion of successful relocation of SRNS.
- Cancellation of relocation after successful completion of the Relocation Resource Allocation procedure.

The Iu release procedure should also be initiated when there is a period of Iu signalling inactivity with no existing RAB.

### 8.5.2 Successful Operation



**Figure 4: Iu Release procedure. Successful operation.**

The procedure is initiated by the CN by sending an IU RELEASE COMMAND message to the UTRAN.

After the IU RELEASE COMMAND message has been sent, the CN shall not send further RANAP connection oriented messages on this particular connection.

The IU RELEASE COMMAND message shall include a *Cause* IE, indicating the reason for the release (e.g. "Successful Relocation", "Normal Release", "Release due to UTRAN Generated Reason", "Relocation Cancelled", "No Remaining RAB").

When the RNC receives the IU RELEASE COMMAND message:

1. Clearing of the related UTRAN resources is initiated. However, the UTRAN shall not clear resources related to other Iu signalling connections the UE might have. The Iu transport bearers for RABs subject to data forwarding and other UTRAN resources used for the GTP-PDU forwarding process, are released by the RNC only when the timer  $T_{DATAfwd}$  expires.
2. The RNC returns any assigned Iu user plane resources to idle i.e. neither uplink user data nor downlink user data can be transferred over the Iu interface anymore. Then the RNC sends an IU RELEASE COMPLETE message to the CN. (The RNC does not need to wait for the release of UTRAN radio resources or for the transport network layer signalling to be completed before returning the IU RELEASE COMPLETE message.) When an IU RELEASE COMPLETE message is sent, the procedure is terminated in the UTRAN.

The IU RELEASE COMPLETE message shall include a *RABs Data Volume Report* IE for RABs towards the PS domain for which data volume reporting was requested during RAB establishment.

If the release was initiated by UTRAN, for each RAB towards the PS domain, for which the *DL GTP-PDU Sequence Number* IE and/or the *UL GTP-PDU Sequence Number* IE are (is) available, the RNC shall include the available

sequence number(s) in the *RABs Released Item* IE (within the *RAB Released List* IE) in the IU RELEASE COMPLETE message.

The *RAB Release Item* IE shall not be present if there is no sequence number to be reported for that RAB.

Reception of an IU RELEASE COMPLETE message terminates the procedure in the CN.

### 8.5.3 Abnormal Conditions

If the Iu Release procedure is not initiated towards the source RNC from the CN before the expiry of timer  $T_{RELOCoverall}$ , the source RNC should initiate the Iu Release Request procedure towards the CN with a cause value "T<sub>RELOCoverall</sub> expiry".



#### 9.2.1.4 Cause

The purpose of the *Cause* IE is to indicate the reason for a particular event for the RANAP protocol.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice <b>Cause</b>				
>Radio Network Layer Cause			INTEGER (RAB pre-empted(1), Trelocoverall Expiry(2), Trelocprep Expiry(3), Treloccomplete Expiry(4), Tqueing Expiry(5), Relocation Triggered(6), Unable to Establish During Relocation(8), Unknown Target RNC(9), Relocation Cancelled(10), Successful Relocation(11), Requested Ciphering and/or Integrity Protection Algorithms not Supported(12), Conflict with already existing Integrity protection and/or Ciphering information (13), Failure in the Radio Interface Procedure(14), Release due to UTRAN Generated Reason(15), User Inactivity(16), Time Critical Relocation(17), Requested Traffic Class not Available(18), Invalid RAB	Value range is 1 – 64.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause				
			Parameters Value(19), Requested Maximum Bit Rate not Available(20), Requested Maximum Bit Rate for DL not Available(33), Requested Maximum Bit Rate for UL not Available(34), Requested Guaranteed Bit Rate not Available(21), Requested Guaranteed Bit Rate for DL not Available(35), Requested Guaranteed Bit Rate for UL not Available(36), Requested Transfer Delay not Achievable(22), Invalid RAB Parameters Combination(23), Condition Violation for SDU Parameters(24), Condition Violation for Traffic Handling Priority(25), Condition Violation for Guaranteed Bit Rate(26), User Plane Versions not Supported(27), lu UP Failure(28), TRELOAlloc Expiry (7), Relocation Failure	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause			<p>in Target CN/RNC or Target System (29),</p> <p>Invalid RAB ID(30),</p> <p>No remaining RAB(31),</p> <p>Interaction with other procedure(32),</p> <p>Repeated Integrity Checking Failure(37),</p> <p>Requested Request Type not supported(38),</p> <p>Request superseded(39),</p> <p>Release due to UE generated signalling connection release(40),</p> <p>Resource Optimisation Relocation(41),</p> <p>Requested Information Not Available(42),</p> <p>Relocation desirable for radio reasons (43),</p> <p>Relocation not supported in Target RNC or Target system(44),</p> <p>Directed Retry (45),</p> <p>Radio Connection With UE Lost(46),</p> <p>RNC unable to establish all RFCs (47),</p> <p>Deciphering Keys Not Available(48),</p> <p>Dedicated Assistance data Not Available(49),</p>	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice Cause			Relocation Target not allowed(50), Location Reporting Congestion(51), Reduce Load in Serving Cell (52), No Radio Resources Available in Target cell (53), GERAN Iu-mode failure (54), Access Restricted Due to Shared Networks(55)	

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice <b>Cause</b>				
>Transport Layer Cause			INTEGER ( Signalling Transport Resource Failure(65),  lu Transport Connection Failed to Establish(66))	Value range is 65 – 80.
>NAS Cause			INTEGER (User Restriction Start Indication(81),  User Restriction End Indication(82),  Normal Release(83))	Value range is 81 – 96.
>Protocol Cause			INTEGER (Transfer Syntax Error(97),  Semantic Error (98),  Message not compatible with receiver state (99),  Abstract Syntax Error (Reject) (100),  Abstract Syntax Error (Ignore and Notify) (101),  Abstract Syntax Error (Falsely Constructed Message) (102))	Value range is 97 – 112.
>Miscellaneous Cause			INTEGER (O&M Intervention(113),  No Resource Available(114),  Unspecified Failure(115),  Network Optimisation(116) )	Value range is 113 – 128.
>Non-standard Cause			INTEGER ( )	Value range is 129 – 256. Cause value 256 shall not be used.

The meaning of the different cause values is described in the following table. In general, "not supported" cause values indicate that the concerning capability is missing. On the other hand, "not available" cause values indicate that the concerning capability is present, but insufficient resources were available to perform the requested action.

<b>Radio Network Layer cause</b>	<b>Meaning</b>
Deciphering Keys Not Available	The action failed because RNC is not able to provide requested deciphering keys.
Conflict with already existing Integrity protection and/or Ciphering information	The action was not performed due to that the requested security mode configuration was in conflict with the already existing security mode configuration.
Condition Violation For Guaranteed Bit Rate	The action was not performed due to condition violation for guaranteed bit rate.
Condition Violation For SDU Parameters	The action was not performed due to condition violation for SDU parameters.
Condition Violation For Traffic Handling Priority	The action was not performed due to condition violation for traffic handling priority.
Dedicated Assistance data Not Available	The action failed because RNC is not able to successfully deliver the requested dedicated assistance data to the UE.
Directed Retry	The reason for action is Directed Retry
Failure In The Radio Interface Procedure	Radio interface procedure has failed.
Interaction With Other Procedure	Relocation was cancelled due to interaction with other procedure.
Invalid RAB ID	The action failed because the RAB ID is unknown in the RNC.
Invalid RAB Parameters Combination	The action failed due to invalid RAB parameters combination.
Invalid RAB Parameters Value	The action failed due to invalid RAB parameters value.
Iu UP Failure	The action failed due to Iu UP failure.
No remaining RAB	The reason for the action is no remaining RAB.
RAB Pre-empted	The reason for the action is that RAB is pre-empted.
Radio Connection With UE Lost	The action is requested due to losing radio connection to the UE
Release Due To UE Generated Signalling Connection Release	Release requested due to UE generated signalling connection release.
Release Due To UTRAN Generated Reason	Release is initiated due to UTRAN generated reason.
Relocation Cancelled	The reason for the action is relocation cancellation.
Relocation Desirable for Radio Reasons	The reason for requesting relocation is radio related.
Relocation Failure In Target CN/RNC Or Target System	Relocation failed due to a failure in target CN/RNC or target system.
Relocation Not Supported In Target RNC Or Target System	Relocation failed because relocation was not supported in target RNC or target system.
Relocation Target not allowed	Relocation to the indicated target cell is not allowed for the UE in question.
Relocation Triggered	The action failed due to relocation.
Repeated Integrity Checking Failure	The action is requested due to repeated failure in integrity checking.
Request Superseded	The action failed because there was a second request on the same RAB.
Requested Ciphering And/Or Integrity Protection Algorithms Not Supported	The UTRAN or the UE is unable to support the requested ciphering and/or integrity protection algorithms.
Requested Guaranteed Bit Rate For DL Not Available	The action failed because requested guaranteed bit rate for DL is not available.
Requested Guaranteed Bit Rate For UL Not Available	The action failed because requested guaranteed bit rate for UL is not available.
Requested Guaranteed Bit Rate Not Available	The action failed because requested guaranteed bit rate is not available.
Requested Information Not Available	The action failed because requested information is not available.
Requested Maximum Bit Rate For DL Not Available	The action failed because requested maximum bit rate for DL is not available.
Requested Maximum Bit Rate For UL Not Available	The action failed because requested maximum bit rate for UL is not available.
Requested Maximum Bit Rate Not Available	The action failed because requested maximum bit rate is not available.
Requested Request Type Not	The RNC is not supporting the requested location request



Supported	type either because it doesn't support the requested event or it doesn't support the requested report area.
Location Reporting Congestion	The action was not performed due to an inability to support location reporting caused by overload.
Requested Traffic Class Not Available	The action failed because requested traffic class is not available.
Requested Transfer Delay Not Achievable	The action failed because requested transfer delay is not achievable.
Resource Optimisation Relocation	The reason for requesting relocation is resource optimisation.
Successful Relocation	The reason for the action is completion of successful relocation.
Time Critical Relocation	Relocation is requested for time critical reason.
T <sub>QUEUEING</sub> Expiry	The action failed due to expiry of the timer T <sub>QUEUEING</sub> .
T <sub>RELOCalloc</sub> Expiry	Relocation Resource Allocation procedure failed due to expiry of the timer T <sub>RELOCalloc</sub> .
T <sub>RELOCcomplete</sub> Expiry	The reason for the action is expiry of timer T <sub>RELOCcomplete</sub> .
T <sub>RELOCoverall</sub> Expiry	The reason for the action is expiry of timer T <sub>RELOCoverall</sub> .
T <sub>RELOCprep</sub> Expiry	Relocation Preparation procedure is cancelled when timer T <sub>RELOCprep</sub> expires.
Unable To Establish During Relocation	RAB failed to establish during relocation because it cannot be supported in the target RNC.
Unknown Target RNC	Relocation rejected because the target RNC is not known to the CN.
User Inactivity	The action is requested due to user inactivity <a href="#">on one or several non real time RABs e.g. in order to optimise radio resource.</a>
User Plane Versions Not Supported	The action failed because requested user plane versions were not supported.
RNC unable to establish all RFCs	RNC couldn't establish all RAB subflow combinations indicated within the <i>RAB Parameters</i> IE.
Reduce Load in Serving Cell	Load on serving cell needs to be reduced.
No Radio Resources Available in Target Cell	Load on target cell is too high.
GERAN Iu-mode failure	The RAB establishment/modification/relocation failed because the GERAN BSC cannot provide an appropriate RAB due to limited capabilities within GERAN.
Access Restricted Due to Shared Networks	Access is not permitted in the cell due to Shared Networks.

Transport Layer cause	Meaning
Iu Transport Connection Failed to Establish	The action failed because the Iu Transport Network Layer connection could not be established.
Signalling Transport Resource Failure	Signalling transport resources have failed ( <i>e.g. processor reset</i> ).

NAS cause	Meaning
Normal Release	The release is normal.
User Restriction Start Indication	A location report is generated due to entering a classified area set by O&M.
User Restriction End Indication	A location report is generated due to leaving a classified area set by O&M.

<b>Protocol cause</b>	<b>Meaning</b>
Abstract Syntax Error (Reject)	The received message included an abstract syntax error and the concerning criticality indicated "reject".
Abstract Syntax Error (Ignore And Notify)	The received message included an abstract syntax error and the concerning criticality indicated "ignore and notify".
Abstract Syntax Error (Falsely Constructed Message)	The received message contained IEs or IE groups in wrong order or with too many occurrences.
Message Not Compatible With Receiver State	The received message was not compatible with the receiver state.
Semantic Error	The received message included a semantic error.
Transfer Syntax Error	The received message included a transfer syntax error.

<b>Miscellaneous cause</b>	<b>Meaning</b>
Network Optimisation	The action is performed for network optimisation.
No Resource Available	No requested resource is available.
O&M Intervention	The action is due to O&M intervention.
Unspecified Failure	Sent when none of the specified cause values applies.