

TSG-RAN WG3 meeting #6
Sophia Antipolis, 23-27 August1999

TSGR3#6 (99)813 |

Agenda Item: 16
Source: WG3
Title: UMTS 25.433: NBAP Specification V1.1.0
Document for: Approval

3GPP

TS RAN 25.433 V~~1.1.01.0.2~~ (1999-067)

Technical Specification

**3rd Generation Partnership Project (3GPP);
Technical Specification Group (TSG) RAN
NBAP Specification**

[UMTS <spec>]

3GPP

Reference

<Workitem> (<Shortfilename>.PDF)

Keywords

<keyword[, keyword]>

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Intellectual Property Rights

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project, Technical Specification Group <TSG name>.

The contents of this TS may be subject to continuing work within the 3GPP and may change following formal TSG approval. Should the TSG modify the contents of this TS, it will be re-released with an identifying change of release date and an increase in version number as follows:

Version m.t.e

where:

- m indicates [major version number]
- x the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- y the third digit is incremented when editorial only changes have been incorporated into the specification.

1 Scope

The present document specifies the standards for NBAP specification to be used over Iub Interface.

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.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] 25.401, UTRAN Overall Description

3 Definitions, symbols and abbreviations

[Editor's note: This chapter is almost stable]

3.1 Definitions

NBAP (Node B Application Part) is defined as Radio Network Layer Protocol applied the interface between Controlling RNC and NodeB, namely Iub Interface.

3.2 Symbols

3.3 Abbreviations

AAL2	ATM Adaptation Layer type 2
ASN.1	Abstract Syntax Notation One
ATM	Asynchronous Transfer Mode
BCCH	Broadcast Control Channel
CCPCH	Common Control Physical Channel
CFN	Connection Frame Number
CRNC	Controlling Radio Network Controller
DCH	Dedicated Channel
DL	Downlink
DPCCCH	Dedicated Physical Control Channel
DPCH	Dedicated Physical Channel
DPDCH	Dedicated Physical Data Channel
DRNC	Drift Radio Network Controller
FDD	Frequency Division Duplex
FP	Frame Protocol
L1	Layer 1
L2	Layer 2
NBAP	Node B Application Part
OFF	Frame Offset
O&M	Operation and Management
QoS	Quality of Service
RL	Radio Link
RNC	Radio Network Controller
RRC	Radio Resource Control
SRNC	Serving Radio Network Controller
TDD	Time Division Duplex
TFC	Transport Format Combination
TFCI	Transport Format Combination Indicator
TFCS	Transport Format Combination Set
TFS	Transport Format Set
UE	User Equipment
UL	Uplink
UTRAN	UMTS Terrestrial Radio Access Network

4 General

[Editor's note: This chapter should describe requirements on protocol capabilities, principles, etc.]

[Editor's note: This chapter is almost stable]

Node B Application Part, NBAP, includes common procedures and dedicated procedures. It covers procedures for paging distribution, broadcast system information, request / complete / release of dedicated resources and management of logical resources (logical O&M [1]).

Note that the issue of transport layer addressing is FFS.

5 NBAP Services

The NBAP offers the following services:

[Editor's note: Contents are missing]

5.1 Parallel Transactions

~~There can only be one NBAP procedure for a specific UE active. Unless explicitly indicated in the procedure description, at any one instance in time, one protocol peer shall have initiated maximum one ongoing dedicated NBAP procedure related to a certain NodeB communication context.~~

6 Services expected from signalling transport

[Editor's note: Contents are missing]

7 Functions of NBAP

[Editor's note: This chapter is almost stable]

The following procedures are included in NBAP:

- Common Transport Channels Management
- Radio Resource Management
- Iub Link Management
- Radio Network Performance Management
- Cell Configuration Management
- Resource Event Management
- System Information Update
- Radio Link Setup
- Radio Link Addition
- Radio Link Reconfiguration (synchronised)
- Radio Link Reconfiguration (unsynchronised)
- Radio Link Deletion
- DL Power Control
- Measurement reporting
- Radio Link failure

~~Physical Channel Reconfiguration *[Editor's note: contributions are to be provided]*~~

[Editor's note: A couple of procedures for Logical O&M are probably missing]

8 Elementary NBAP procedures

NBAP procedures are divided into common procedures and dedicated procedures.

- NBAP common procedures are procedures that request initiation of a UE context for a specific UE in Node B or are not related to a specific UE. NBAP common procedures also incorporate logical O&M [1] procedures.
- NBAP dedicated procedures are procedures that are related to a specific UE context in Node B. This UE context is identified by a UE context identity.

The two types of procedures may be carried on separate signalling links.

8.1 NBAP Common Procedures

{Editor's Note: This section is not stable}

8.1.1 Common Transport Channels Management

This procedure provides the capability to activate common channel resources such as [cell broadcast channels and] random access channels. The ability to control, for example, paging retransmission should also be provided. Information on common channel performance (eg overload) should be provided by node B to the RNC. Any failures impacting on the common channel resources at Node B should be signalled to the RNC via the Resource Event Management procedure (section 8.1.6).

8.1.1.1 Downlink Common Transport Channel Configuration Procedures

The Procedures for Downlink Common Transport Channel Configuration:

- Downlink Common Transport Channel Setup (e.g. FACH, PCCH, BCCH and DSCH)
- Downlink Common Transport Channel Reconfigure
- Downlink Common Transport Channel Delete

8.1.1.1.1 Downlink Common Transport Channel Setup

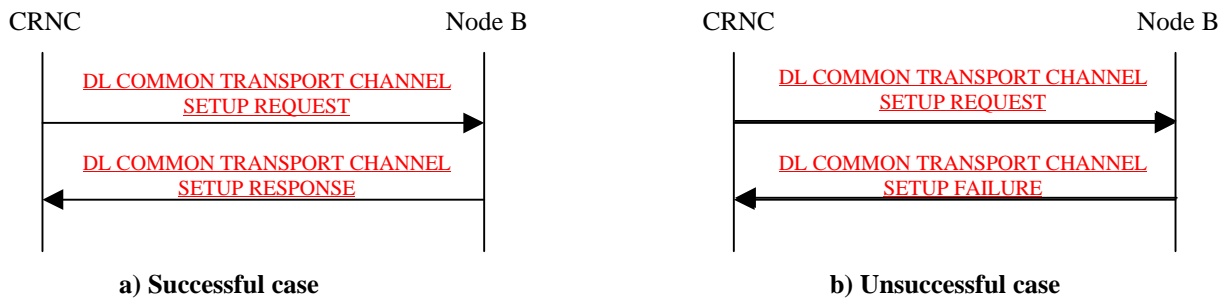
The RNC initiates a definition of downlink common transport channels in a cell within Node B, which defines the ordered channels and takes them into service. The result is communicated back to the RNC.

For the procedure to be executed successfully the following is needed:

- The cell context, to which the common transport channels are to be defined, has to be defined within Node B, i.e. the cell setup procedure has to be successfully executed for the cell in question.
- Node B equipment has previously been defined and configured to support the requested channels on the Implementation Specific O&M interface.

- A Node B control port is available for communication between the RNC and the Node B, for the procedure to be executed successfully.

This NBAP common procedure is used by the CRNC to request Node B to support the logical resources FACH, PCH, and BCH. This procedure is initiated by CRNC.



The DOWNLINK COMMON TRANSPORT CHANNEL SETUP REQUEST message contains the following mandatory information:

- Transaction ID (assumed unique in the RNC)
- Cell Identity
- Cell Carrier Id
- Downlink Scrambling Code Id - FFS
- Downlink Common Transport Control Channel Id
- Downlink Common Transport Control Channel type
- Downlink Common Transport Control Channel data

The DOWNLINK COMMON TRANSPORT CHANNEL SETUP RESPONSE message contains the following mandatory information:

- Transaction ID
- Downlink Common Transport Control Channel data

The DOWNLINK COMMON TRANSPORT CHANNEL SETUP FAILURE message contains the following mandatory information:

- Transaction ID
- Failure Cause

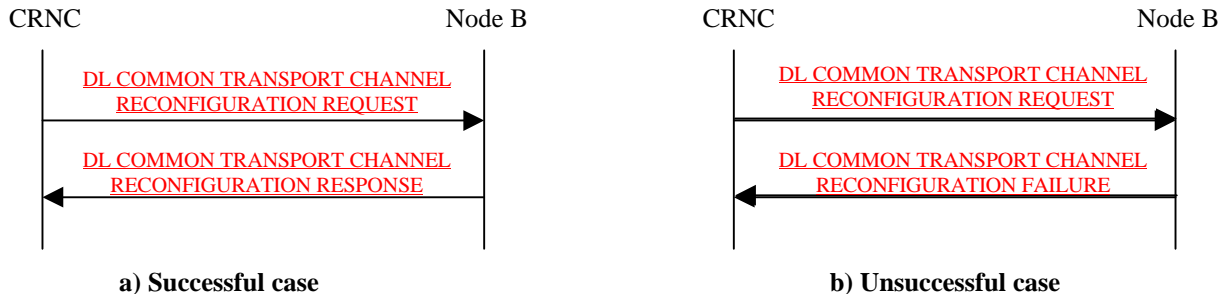
8.1.1.1.2 Downlink Common Transport Channel Reconfigure

The RNC initiates a change of the configuration of downlink common transport channels in Node B, which reconfigures the channels. The result is communicated back to the RNC.

For the procedure to be executed successfully the following is needed:

- The downlink transport common channel(s) exist in the cell within the Node B

- Node B equipment has previously been defined and configured to support the changed channels on the Implementation Specific O&M interface
- A Node B control port is available for communication between the RNC and the Node B, for the procedure to be executed successfully
- The RNC shall use the following procedure to re-configure a downlink common transport channel



The DL COMMON TRANSPORT CHANNEL RECONFIGURATION REQUEST message contains the following information:

- Cell Id (allows the Node B to reference the channel against the correct cell where a Node B supports multiple cells)
- Common channel type (e.g. FACH, BCCH, PCCH) and identifier (for the case where more than one common transport channel of the same type exists in a cell)
- New DL radio resource (DL channelisation code, frequency)
- Transaction Id (identifies the procedure)

The DL COMMON TRANSPORT CHANNEL RECONFIGURATION RESPONSE contains the following information:

- Transaction Id (identifies the procedure)

The DL COMMON TRANSPORT CHANNEL RECONFIGURATION FAILURE contains the following information:

- Transaction Id (identifies the procedure)
- Cause (cause value for the failure)

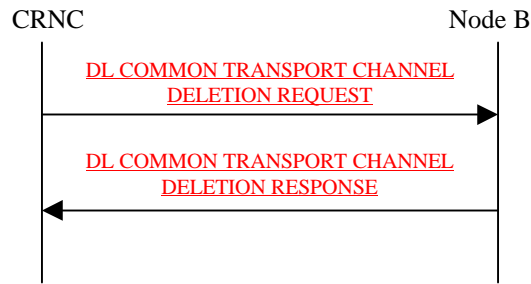
8.1.1.1.3 Downlink Common Transport Channel Delete

The RNC initiates the deletion of downlink common transport channel(s) in a cell within Node B, which deletes the requested channels. The result is communicated back to the RNC.

For the procedure to be executed successfully the following is needed:

- The downlink common transport channel(s) exist in the cell within the Node B.
- A Node B control port is available for communication between the RNC and the Node B.

This NBAP common procedure is used by the Controlling RNC to request Node B to delete Downlink Common Transport Channels. This procedure is initiated by CRNC.



The DOWNLINK COMMON TRANSPORT CHANNEL DELETION message contains the following mandatory information:

- Transaction ID
- Downlink Common Transport Control Channel Id

The DOWNLINK COMMON TRANSPORT CHANNEL DELETION RESPONSE message contains the following mandatory information:

- Transaction ID

8.1.1.2 Uplink Common Transport Channel Configuration Procedures

The Procedures for Uplink Common Transport Channel Configuration:

- Uplink Common Transport Channel Setup (e.g. RACH)
- Uplink Common Transport Channel Reconfigure
- Uplink Common Transport Channel Delete

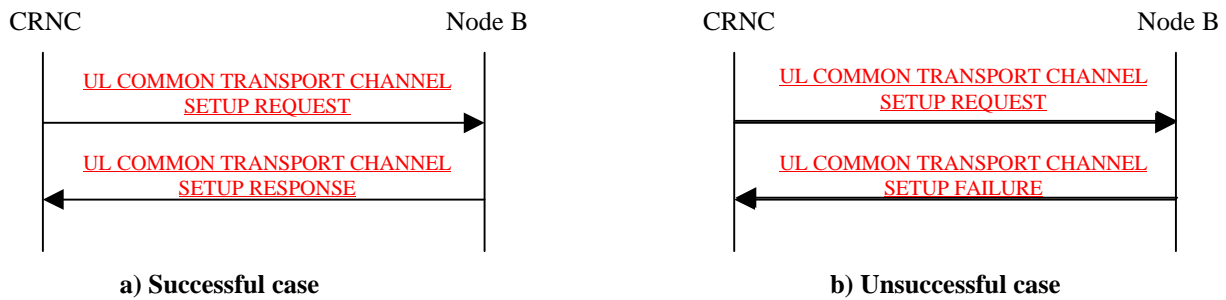
8.1.1.2.1 Uplink Common Transport Channel Setup

The RNC initiates a definition of uplink common transport channels in a cell within Node B, which defines the ordered channels and takes them into service. The result is communicated back to the RNC.

For the procedure to be executed successfully the following is needed:

- The cell to which the common transport channels are to be defined in has been defined within Node B.
- Node B equipment has previously been defined and configured to support the requested channels on the Implementation Specific O&M interface.
- A Node B control port is available for communication between the RNC and the Node B

This NBAP common procedure is used by the Controlling RNC to request Node B to support the logical resources RACH. This procedure is initiated by CRNC.



The UPLINK COMMON TRANSPORT CHANNEL SETUP REQUEST message contains the following mandatory information:

- Transaction ID
- Cell Identity
- Cell Carrier Id
- Uplink Common Transport Control Channel Id
- Uplink Common Transport Control Channel type
- Uplink Common Transport Control Channel data

The UPLINK COMMON TRANSPORT CHANNEL SETUP RESPONSE message contains the following mandatory information:

- Transaction ID
- Uplink Common Transport Control Channel data

The UPLINK COMMON TRANSPORT CHANNEL SETUP FAILURE message contains the following mandatory information:

- Transaction ID
- Failure Cause

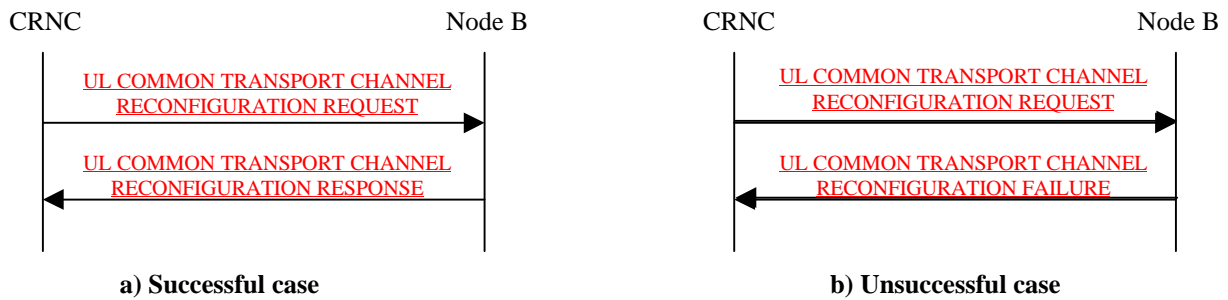
8.1.1.2.2 Uplink Common Transport Channel Reconfigure

The RNC initiates a change of the configuration of uplink common transport channels in Node B, which reconfigures the channels. The result is communicated back to the RNC.

For the procedure to be executed successfully the following is needed:

- The uplink common transport channel(s) exist in the cell within the Node B.
- Node B equipment has previously been defined and configured to support the changed channels on the Implementation Specific O&M interface.
- A Node B control port is available for communication between the RNC and the Node B

The RNC shall use the following procedure to re-configure an uplink common transport channel:



The UL COMMON TRANSPORT CHANNEL RECONFIGURATION REQUEST message contains the following information:

- Cell Id (allows the Node B to reference the channel against the correct cell where a Node B supports multiple cells)
- Common channel type (e.g. FACH,) and identifier (for the case where more than one common transport channel of the same type exists in a cell)
- New UL radio resource (UL channelisation code, frequency)
- Transaction Id (identifies the procedure)

The UL COMMON TRANSPORT CHANNEL RECONFIGUREATION RESPONSE contains the following information:

- Transaction Id (identifies the procedure)

The UL COMMON TRANSPORT CHANNEL RECONFIGURATION FAILURE contains the following information:

- Transaction Id (identifies the procedure)
- Cause (cause value for the failure)

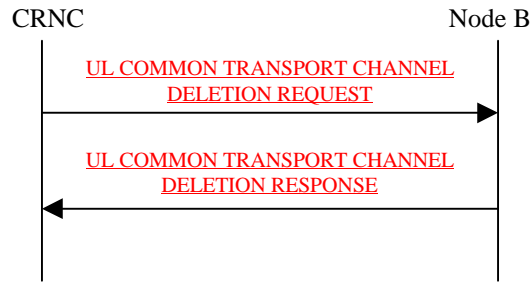
8.1.1.2.3 Uplink Common Transport Channel Delete

The RNC initiates the deletion of uplink common transport channel(s) in a cell within Node B, which deletes the requested channels. The result is communicated back to the RNC.

For the procedure to be executed successfully the following is needed:

- The uplink common transport channel(s) exist in the cell within the Node B.
- A Node B control port is available for communication between the RNC and the Node B.

This NBAP common procedure is used by the Controlling RNC to request Node B to delete the logical resource RACH. This procedure is initiated by CRNC.



The UPLINK COMMON TRANSPORT CHANNEL DELETION REQUEST message contains the following mandatory information:

- Transaction ID
- Uplink Common Transport Control Channel Id

The UPLINK COMMON TRANSPORT CHANNEL DELETION RESPONSE message contains the following mandatory information:

- Transaction ID

8.1.2 Radio Resource Management

When a procedure is executed at Node B or the RNC, the result may be an impact on the logical radio resources supported. Under these conditions, for optimisation of the radio resource algorithms the RNC and Node B must be able to interact functionally, in order that both Nodes can co-ordinate and execute measures to compensate for such scenarios. Such conditions may also arise when Implementation Specific procedures are executed at Node B or the RNC (e.g. restarts or software updates). Therefore the Radio Resource Management procedures should provide the means for the Node B and RNC to interact on the management of the Logical Resources supported by Node B.

The Procedures for Radio Resource Management:

- Block Resource
- Node B Restarted
- RNC Restarted

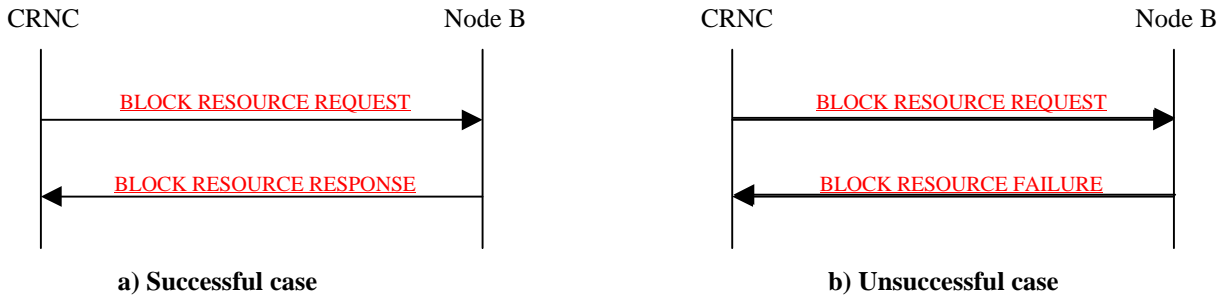
8.1.2.1 Block Resource

Node B requests that logical resources in the RNC are taken out of service, due to an O&M action (i.e. manual intervention for example due to that a piece of equipment, that supports a logical resource in the RNC, shall be upgraded). The RNC answers when the logical resource is taken out of service and the O&M action can continue in Node B.

For the procedure to be executed successfully the following is needed:

- A configured cell exists in Node B (downlink and uplink common channels can be defined in the cell).
- A Node B control port is available for communication between the RNC and the Node B.

The Node B shall use the following procedure to request a logical resource block from the RNC:



The BLOCK RESOURCE REQUEST message contains the following information:

- Cell Id (allows the Node B to block a resource in the correct cell where a Node B supports multiple cells)
- Resource Identifier (e.g. resource type and identifier)
- Priority Indicator (enables the Node B to request an immediate block instead of allowing the RNC the option to suspend) – definition FFS
- Transaction Id (identifies the procedure)

The BLOCK RESOURCE RESPONSE message contains the following information:

- Transaction Id (identifies the procedure)

The BLOCK RESOURCE FAILURE message contains the following information:

- Transaction Id (identifies the procedure)

8.1.2.2 Node B Restarted

The Node B informs the RNC that the Node B has restarted.

For the procedure to be executed successfully the following is needed:

- A Node B control port is available for communication between the RNC and the Node B.

The Node B shall use the following procedure to advise the RNC of a Node B restart:



The NODE B RESTART INDICATION message contains the following information:

- Node B Id (an Id unique to a Node B on a given C-RNC, known by both RNC and Node B via initial configuration)
- Cause (cause value for the Node B restart trigger)

- Transaction Id (identifies the procedure) -FFS

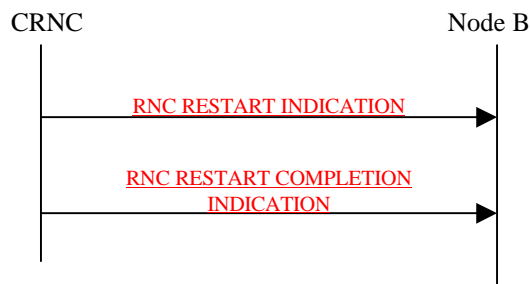
8.1.2.3 RNC Restarted

The RNC informs the Node B that the RNC has restarted.

For the procedure to be executed successfully the following is needed:

- A Node B control port is available for communication between the RNC and the Node B.

The RNC shall use the following procedure to advise the Node B of an RNC restart:



The RNC RESTART INDICATION message contains the following information:

- Service Impact Level (indicates the grade of the service degradation i.e. total loss or degradation, also may indicate whether the fault is permanent or temporary (FFS))
- Transaction Id (identifies the procedure)

The RNC RESTART COMPLETION INDICATION message contains the following information:

- Transaction Id (identifies the procedure)

NOTE: The use of this procedure for partial restarts is ffs.

8.1.3 Iub Link Management

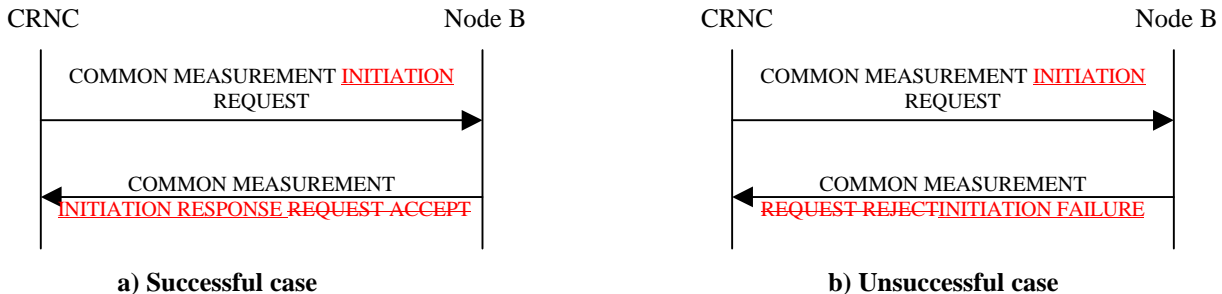
[Editor's note] The necessity of Link Management within the NBAP protocol is F.F.S.

This procedure shall deal with the management of the Iub link. This will address not only initial link establishment, but also the ongoing monitoring of link health, link recovery, load sharing and distribution.

8.1.4 Radio Network Performance Measurement

8.1.4.1 Measurement Request

For requesting measurements, the RNC use the following procedure:



Measurement Request Procedure

The **COMMON MEASUREMENT INITIATION REQUEST** message includes the following information:

- **Measurement Id:** This is a RNC defined identifier that uniquely identifies the measurement.
- **Measurement Object:** This defines on which resource the measurement should be performed. For example might this identifier point out a cell or a carrier within the Node B.
- **Measurement Type:** This defines what measurement that should be performed. This could for example be “interference on the uplink”, “Undecoded RACH frames“, or “DL Cell Power Load“~~“used power on the downlink”~~.
- **Measurement Characteristics:** This defines how the measurements should be performed. For example measurement frequency, timing information, filtering information. *The exact structure and contents of this parameter is dependent on the Measurement Type and is FFS.*
- **Report Characteristics:** The reporting could be any of the following classes:
 - Periodic:** Reports should be delivered in a periodic matter with some frequency. In this case the update frequency have to be specified.
 - Event Triggered:** Reports should be delivered upon a specific event in Node B e.g Performance threshold crossing. In this case the event have to be specified.
 - Immediate Reporting:** A report should be delivered immediately. Only one measurement report should be sent and after that the measurement is automatically cancelled.

The possibility to request several measurements for the same event is FFS.

The **COMMON MEASUREMENT INITIATION REQUEST ACCEPT** message is used to accept a requested measurement and it includes the following information:

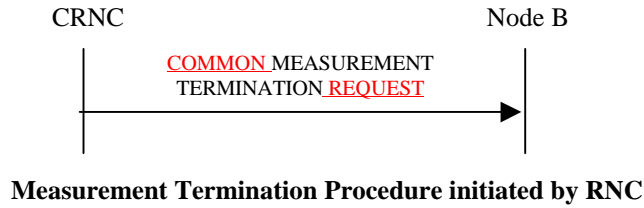
- **Measurement Id:** This is the same Id that was used in the request.

The **COMMON MEASUREMENT INITIATION FAILURE REQUEST REJECT** message is used to reject a requested measurement and it includes the following information:

- **Measurement Id:** This is the same Id that was used in the request.
- **Cause:** This states the cause for the reject. *The exact content of this parameter is FFS.*

8.1.4.2 Measurement Termination initiated by RNC

For termination of previously requested measurements, the RNC use the following procedure:

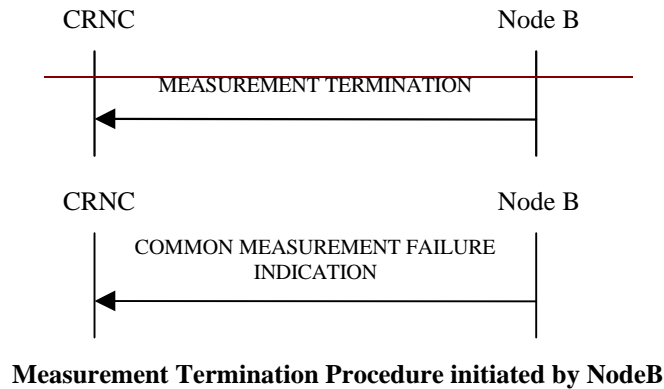


The COMMON MEASUREMENT TERMINATION REQUEST message includes the following information:

- **Measurement Id:** This is the same Id that was used in the request.

8.1.4.3 Measurement Termination initiated by NodeB

For termination of previously requested measurements from NodeB, the NodeB use the following procedure:

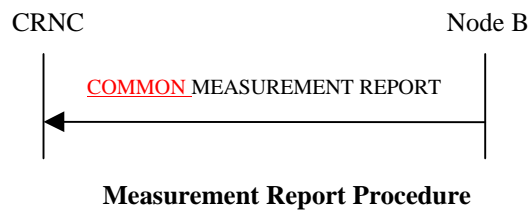


The COMMON MEASUREMENT TERMINATION FAILURE INDICATION message includes the following information:

- **Measurement Id:** This is the same Id that was used in the request.
- **Cause:** This states the reason for the termination. *The exact content of this parameter is F.F.S.*

8.1.4.4 Measurement Report

To report a previously requested measurement, Node B uses the following procedure:



The COMMON MEASUREMENT REPORT message includes the following information:

- **Measurement Id:** This is the same id that was used in the request.

- **Time Reference:** This is a time reference showing the time of the measurement. *The accuracy of this is FFS.*
- **Value**

The possibilities for including several values and/or several measurements in the same report are FFS.

8.1.5 Cell Configuration Management

This procedure provides the means for the RNC to configure the cell related parameters of the node B and also the means for the node B to transfer the values of these and other parameters back to the RNC. Examples are: RF parameters, system information parameters and, channel configuration data. The overall Cell Configuration Management procedure should support a set of individual procedures which allow specific areas of the cell configuration to be updated independently. This will reduce the signalling on the Iub in the case where individual parameters need to be updated.

The following procedures should form part of the overall Cell Configuration Management procedure (*the inclusion of further procedures is FFS*).

The Procedures for cell configuration:

- Cell Setup
- Cell Delete

[Editor's note] It is F.F.S. whether Cell Reconfiguration procedures is required or not.

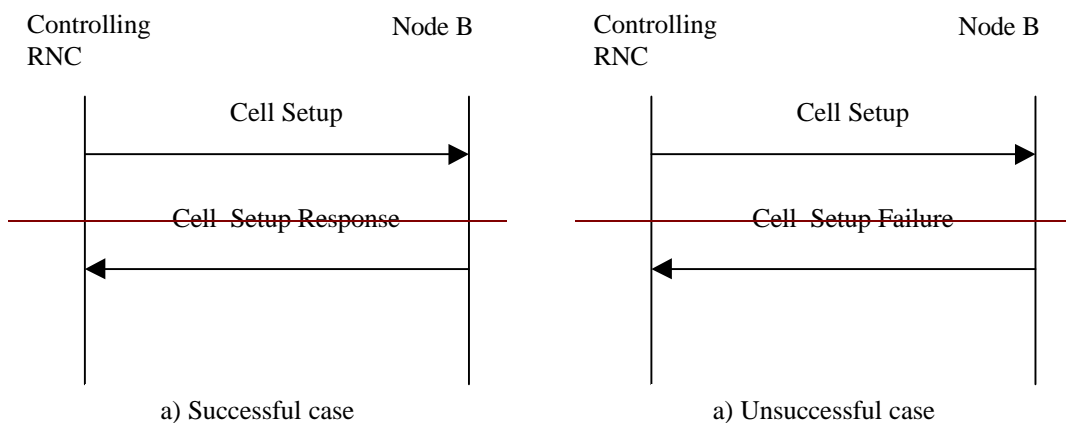
8.1.5.1 Cell Setup

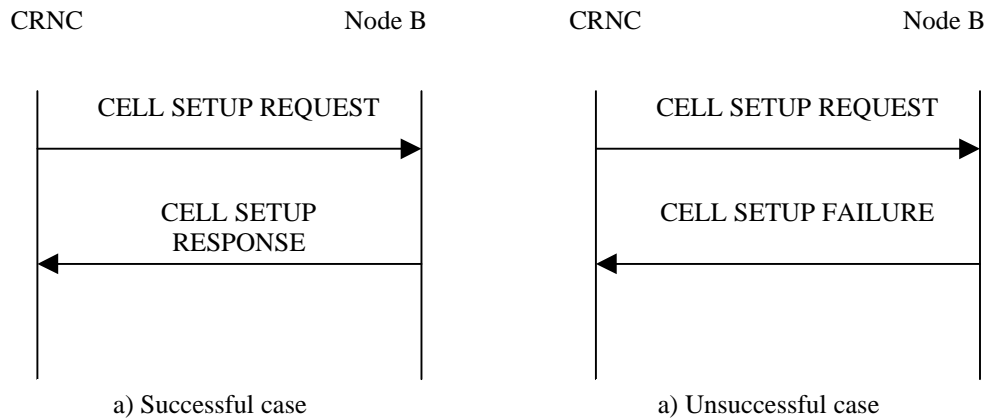
This NBAP common procedure is used to configure one cell in a Node B. This procedure is initiated by the Controlling RNC.

The RNC initiates a definition of a cell in Node B, which creates and configures a cell context in Node B. The result is communicated back to the RNC.

For the procedure to be executed successfully the following is needed:

- Node B equipment has previously been defined and configured to support the cell on the Implementation Specific O&M interface.
- A Node B control port is available for communication between the RNC and the Node B, for the procedure to be executed successfully.





Cell Setup Procedures

The CELL SETUP REQUEST message contains the following administrative information:

- Local Cell Id (a pre-configured cell identity local to Node B, known by both RNC and Node B)
- Cell Id (The Cell Id to be used in all other NBAP messages, unique in UTRAN)
- Transaction Id (to identify this invocation of the procedure)

Information for Cell Configuration includes:

- Max transmission Power
- Frequency
- DL Scrambling Code

The CELL SETUP RESPONSE message contains the following information:

- Transaction Id (same Id as in the corresponding CELL SETUP REQUEST message)

The CELL SETUP FAILURE message contains the following information:

- Transaction Id (same Id as in the corresponding CELL SETUP REQUEST message)
- Reason

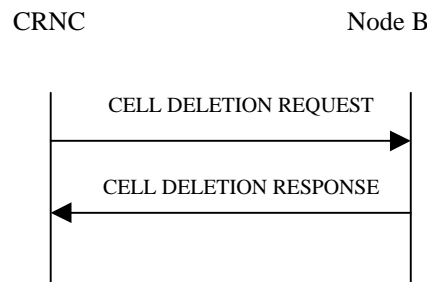
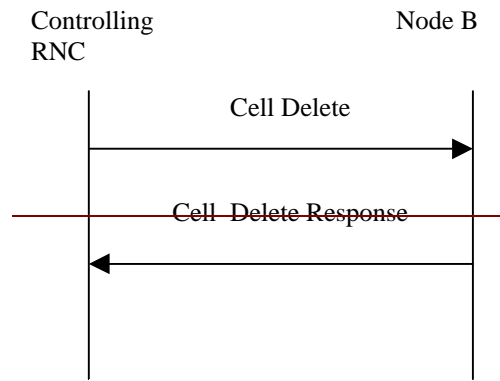
8.1.5.2 Cell Delete

This NBAP common procedure is used to remove one cell in a Node B. This procedure is initiated by the Controlling RNC.

The RNC initiates deletion of a cell in Node B, which deletes the cell context. The result is communicated back to the RNC.

For the procedure to be executed successfully the following is needed:

- The cell in question must be configured in Node B.
- A Node B control port is available for communication between the RNC and the Node B.



Cell Delete Procedure

The CELL ~~DELETE~~ DELETION REQUEST message contains the following information:

- Cell Id
- Transaction Id (to identify this invocation of the procedure)

The CELL ~~DELETE~~ DELETION RESPONSE message contains the following information:

- Transaction Id (same Id as in the corresponding CELL ~~DELETE~~ DELETION REQUEST message)

8.1.6 Resource Event Management

When the resources of node B which are available to the RNC change (eg due to failures within Node B or due to interactions with management system), this procedure provides the means to inform the RNC of this change.

Where events at Node B occur on implementation specific entities within it, but the result is an impact on the logical resources of Node B, the Resource Event Management procedure shall be used to indicate this impact to the RNC. Any such impact on logical resources should include both total loss and performance degradation (for example fault such as receiver sensitivity reduction). Scenarios anticipated to trigger such a situation include:

- Timing and synchronisation errors in Node B
- Radio Resource events (see section 8.1.2)
- Node B equipment failure
- Interaction with the management plane
- Node B/ RNC synchronisation (FFS)

~~When the resources of node B which are available to the RNC change (eg due to failures within Node B or due to interactions with management system), this procedure provides the means to inform the RNC of this change and/or to warn the RNC of the impending change. In the case of the latter, the procedure should support the ability for the RNC to~~

authorise such changes, (e.g. in the case where the management system wishes to perform service-affecting routine operations, the RNC should be provided with the ability to reject these dependent on the traffic conditions).

~~Where events at Node B occur on implementation-specific entities within it, but the result is an impact on the logical resources of Node B, the Resource Event Management procedure shall be used to indicate this impact to the RNC. Any such impact on logical resources should include both total loss and performance degradation (for example fault such as receiver sensitivity reduction). Scenarios anticipated to trigger such a situation include:~~

- ~~– Timing and synchronisation errors in Node B~~
- ~~– Loss of the Implementation-Specific O&M link [1]~~
- ~~– Radio Resource events (see section 8.1.2)~~
- ~~– Node B common equipment events~~
- ~~– Maintenance procedures (either internal to Node B or initiated from the management system)~~

The Procedures for Resource event management:

- Node-B Failure
- NodeB Resource Notification

8.1.6.1 Node B Failure

~~The Node B informs the RNC about a degradation of service for logical resources handled by the RNC, due to equipment fault in Node B. The faulty equipment is taken out of service in Node B, which means that the logical resource that it serves is taken out of service or its service is degraded. The RNC can block and/or release the logical resources in the Node B, as desired.~~

~~For the procedure to be executed successfully the following is needed:~~

- ~~– A configured cell exists in Node B. Downlink and uplink common channels may/may not have been defined in the cell.~~
- A Node B control port is available for communication between the RNC and the Node B

With the Node B failure message the Node B informs the RNC about the abnormal condition of a logical resource that is the result of a temporary or permanent HW failure.

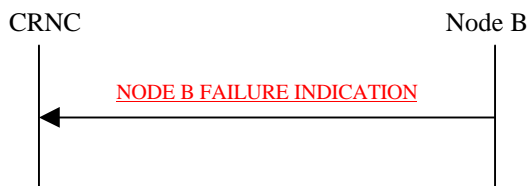
The following reasons to start this procedure are foreseen (list is not exhaustive):

The Node B starts this procedure when a faulty equipment is taken out of service in Node B, and the logical resource that it serves is taken out of service or its service is degraded. The loss of equipment could result in the loss of a cell, carrier, number of codes supported or power availability.

The Node B starts this procedure when it has detected that HW resources allocated for the cell control are no longer available and HW resources must be reallocated for that purpose. Node B sends the common NBAP message „Node B Failure“ to the RNC to indicate that cell parameters have been cleared and common transport channels of the cell have been locally released. The RNC may also initiate other procedures to clear resources affected by the failure. It is up to the RNC to e.g. retransmit the configuration data and reallocate the common transport channels. In this case the message contains at least the Local Cell Identifier.

The Node B starts this procedure when it has detected that HW resources allocated for the traffic termination point are no longer available and HW resources must be reallocated for that purpose. Node B sends the common NBAP message „Node B Failure“ to the RNC to indicate that all radio links and Node B communication contexts of the traffic termination point have been locally released. In this case the message contains at least the communication control port identifier, which uniquely also identifies the traffic termination point. At reception of the Traffic Termination Point Failure message the C-RNC is expected to locally release all the radio links and the C-RNC communication contexts of the identified traffic termination point.

The Node B shall use the following procedure to advise the RNC of a failure at Node B:



The NODE B FAILURE INDICATION message may include the following parameters:

- Failure type (e.g. service degradation, cell control or traffic termination point restart)
- Local Cell Id
- Cell Id (if configured) – FFS
- Resource information (e.g. cell capacity, logical resources configured, communications control port identifier)
- Service Impact Level (indicates the grade of the service degradation i.e. total loss or degradation, also may indicate whether the fault is permanent or temporary (FFS))

For the procedure to be executed successfully, the following is needed:

- A configured cell exists in Node B. Downlink and uplink common channel(s) may or may not have been defined in the cell.
- A Node B control port is available for communication between the RNC and the Node B.

8.1.6.2 Node B Resource Notification

The Node B resource notification procedure provides the means for Node B to advise the RNC of it's high level resource capabilities. The ability for Node B to provide this information to the RNC is important particularly at initial cell configuration, where the status of the Node B following both Implementation Specific configuration and cell configuration should be provided to the RNC.

The Node B shall use the following procedure to provide resource notification to the RNC:

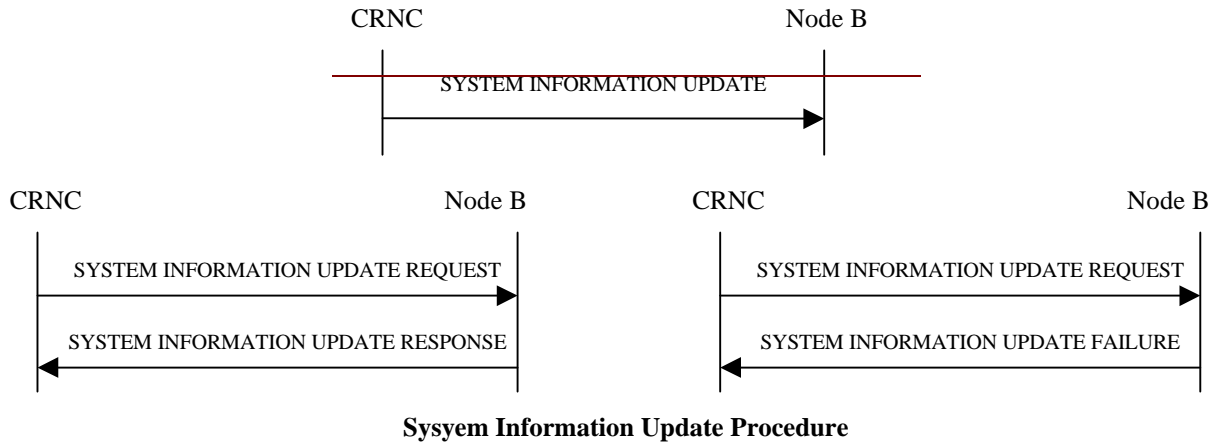


The RESOURCE NOTIFICATION INDICATION message contains the following information:

- Local Cell Id (a pre-configured cell identity local to Node B, known by both RNC and Node B)
- Actual Cell Id (if configured)
- Resources Supported (e.g. cell capacity, logical resources configured)
- Transaction Id (identifies the procedure)
- Add/Delete Indicator (advises Node B if the resource identified is to be added or deleted from the current resource record)

8.1.7 System Information Update Procedure

This NBAP common procedure is used by the CRNC to send system information to its Node B, which broadcasts them on the logical channel BCCH. The procedure is triggered when CRNC sets the system information at start/restart and when the system information needs to be modified.

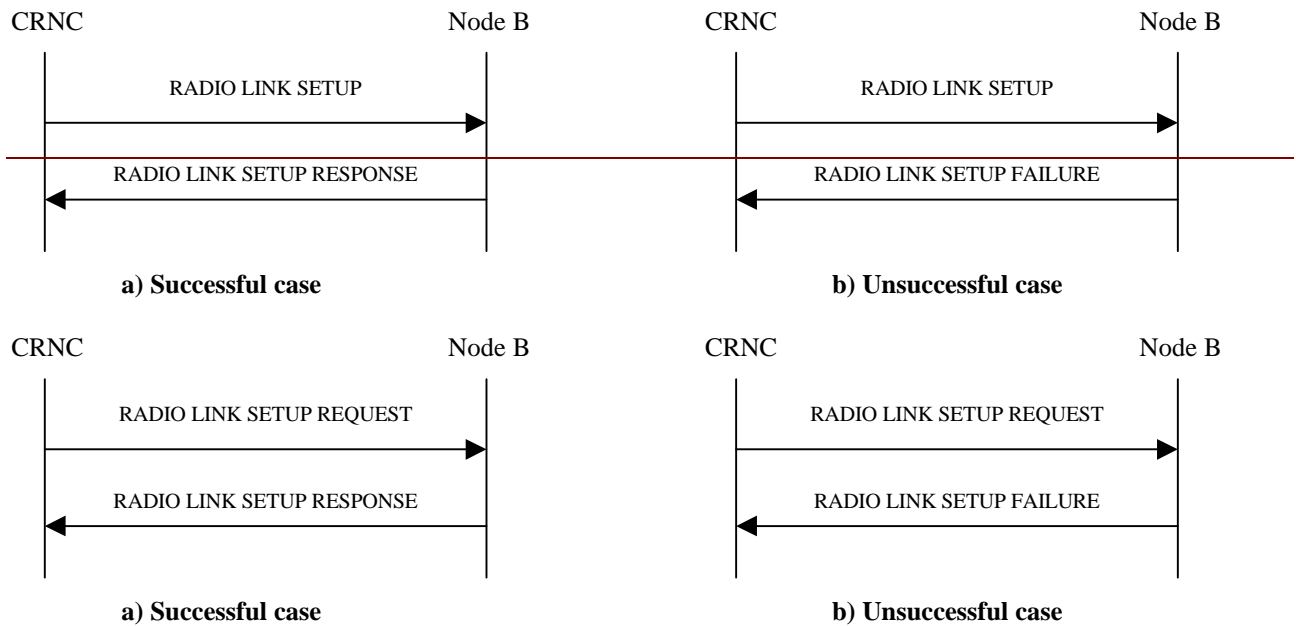


The SYSTEM INFORMATION UPDATE REQUEST message contains new information to be broadcast on the BCCH.

The SYSTEM INFORMATION UPDATE RESPONSE message indicates successful completion of the update procedure while SYSTEM INFORMATION UPDATE FAILURE message indicates unsuccessful completion. When the SYSTEM INFORMATION UPDATE RESPONSE message indicates successful procedure completion, the information broadcast on the BCCH is updated successfully with the newly received information.

8.1.8 Radio Link Setup

This NBAP common procedure is used when there is no Radio Link for this UE in the Node B.



Radio Link Setup Procedure

The RADIO LINK SETUP REQUEST message contains the following information (~~the identification of the UE is FFS~~):

- UL Radio Resource (UL Scrambling Code, UL Channelisation Code)
- DL Radio Resource (DL Channelisation Codes and DL Scrambling Code per Radio Link, ~~DL Scrambling Code is FFS~~)
- DCH Information (DCH Identifier, Transmission Rate, Transport Format Set) (for each DCH in the UE)
- DSCH Information (DSCH Identifier, RL Identifier, Transport Format Set)
- Transport Format Combination Set
- Power control information
- Frequency
- RL identifier #1
- Target cell identifier #
- RL identifier #2
- Target cell identifier #
- Soft combining indication (may, must, or must not be combined with already existing radio links)
- ...
- RL identifier #n
- Target cell identifier #
- Soft combining indication (may, must, or must not be combined with already existing radio links)

When setting up coordinated DCH's, if the receiver is not able to setup one of the DCH's, the setup of the other DCH's requested with the same DCH Combination Indicator value shall be rejected.

The RADIO LINK SETUP RESPONSE message contains

- Transport layer addressing information (Transport layer address, Binding ID~~AAL2~~ address) per RL

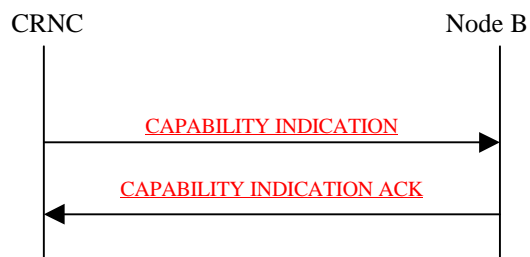
8.1.9 Capability Exchange Procedure

The purpose of a capability exchange is to allow Network Elements (CRNC and Node B) to run unaligned versions of software. Customer rollout and upgrade strategies and differing Network Element (NE) software product release schedules may result in software releases with different functional content and capabilities within the same UTRAN.

A capability exchange is necessary in order to negotiate the software capabilities to be used between NEs. If a feature/functionality affects the interface between NEs, it is included in a capability exchange. If a feature/functionality is isolated to a particular NE, it is not controlled by a capability exchange.

Cross-NE functionality is only available when it is supported by NEs on both ends of an interface. Thus, only the greatest common capabilities between NEs are supported.

The Capability Exchange Procedure requires two message types, a Capability Indication and a Capability Indication Ack. The Node B may initiate the Capability Indication. CRNC-initiated case may be needed (FFS).



CAPABILITY INDICATION message contains:

- Transaction ID
- Feature set - NE feature set (FFS)

CAPABILITY INDICATION ACK message contains:

- Transaction ID
- Feature set - greatest common feature set (FFS)

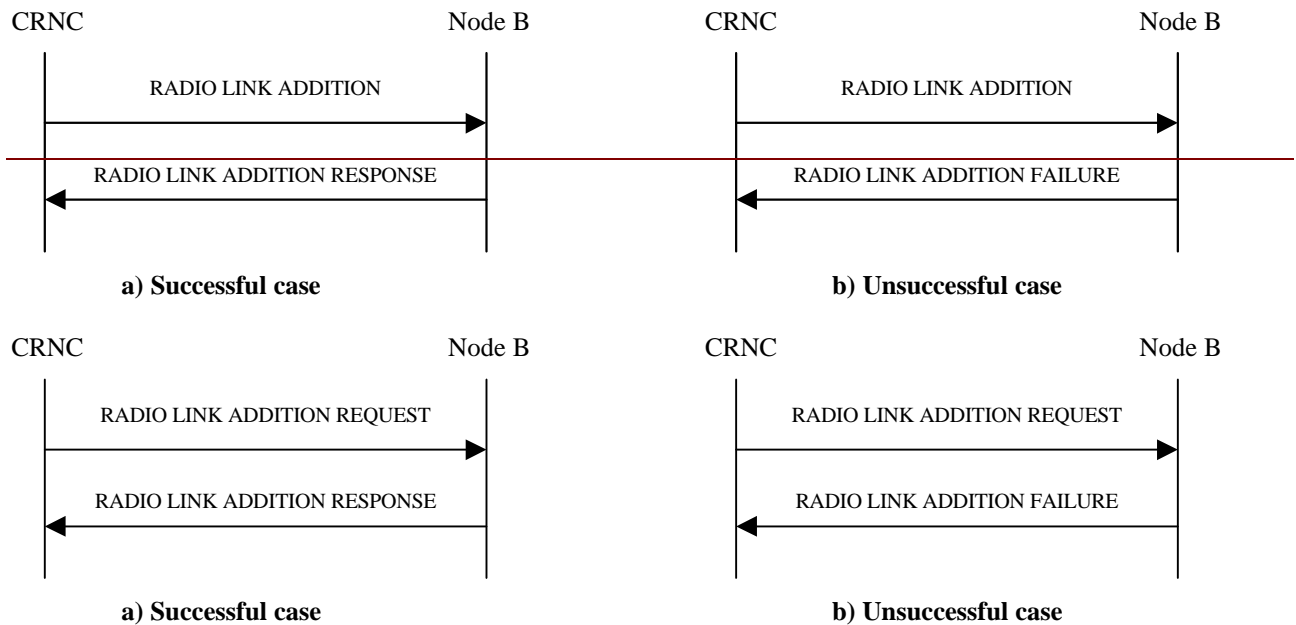
A Capability Indication message contains a transaction id and the feature set (FFS) and protocol versions of the Network Element initiating the exchange. When a NE receives a Capability Indication, it responds with a Capability Indication Ack containing the transaction id from the received Capability Indication and the greatest common capabilities of itself and the originating NE. A NE uses the transaction id to distinguish between capability exchanges with different NEs or with a single NE.

8.2 NBAP Dedicated Procedures

[Editor's Note: This section is not stable]

8.2.1 Radio Link Addition

This procedure is used when there is already one or more existing Radio Link(s) for this UE in the Node B.



Radio Link Addition Procedure

The RADIO LINK ADDITION REQUEST message contains the following information (~~the identification of the UE is FFS~~):

- DL Radio Resource (DL channelisation codes) per RL
- Power control information
- the parameter “OFF” (frame offset information)
- Frequency
- RL identifier #n+1
- Target cell identifier #
- Soft combining indication (may, must, or must not be combined with already existing radio links)
- RL identifier #n+2
- Target cell identifier #
- Soft combining indication (may, must, or must not be combined with already existing radio links)
-

Other parameters are already known in the Node B, therefore there is no need to send them.

The RADIO LINK ADDITION RESPONSE message contains

- Transport layer addressing information (AAL2 address, AAL2 binding ID) per RL

If the transport layer addressing information is not needed in case Node B decides to use an existing AAL2 connection, then the AAL2 address is not needed and the AAL2 binding ID of the already existing AAL2 connection is sent. If the Controlling RNC receives the AAL2 binding ID of an already existing AAL2 connection, the Controlling

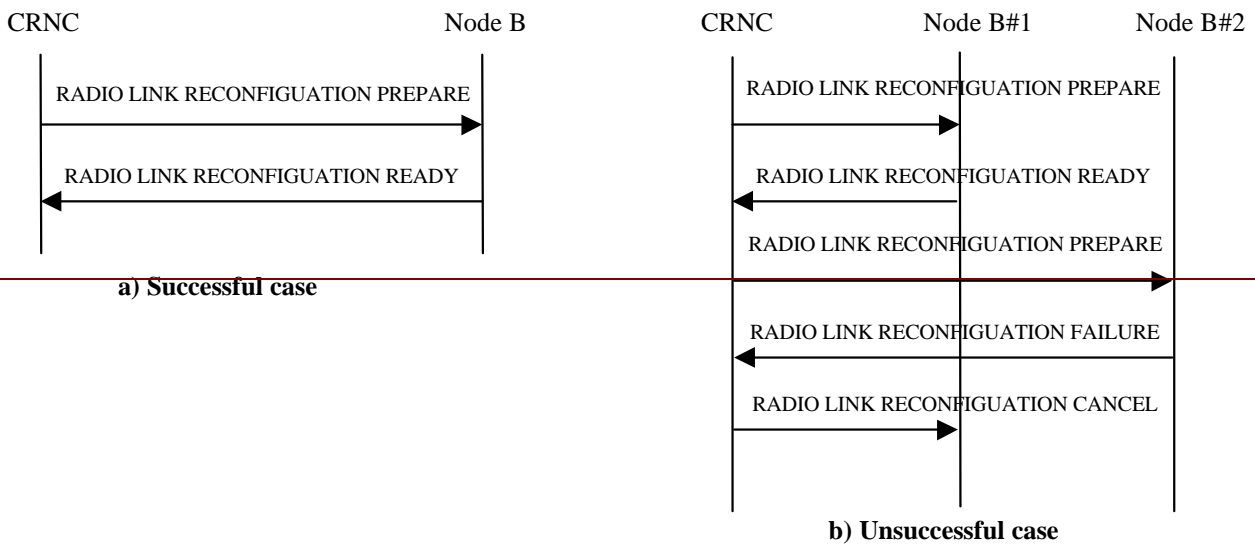
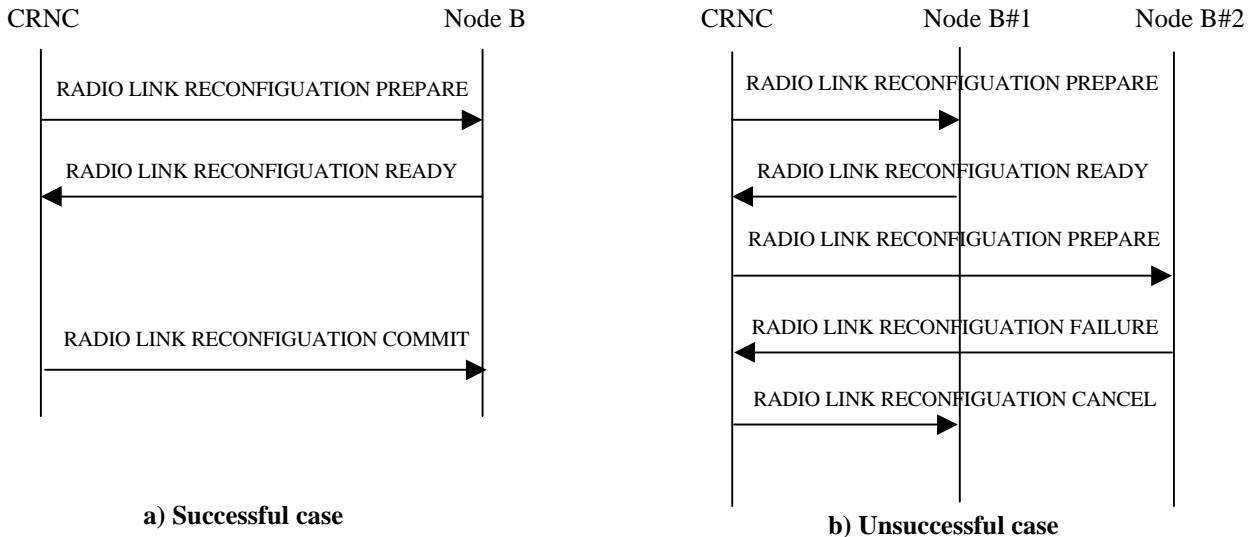
RNC does not execute the setting of the AAL2 connection.

8.2.2 Radio Link Reconfiguration (Synchronized)

The Radio Link Reconfiguration (Synchronized) procedure is used to reconfigure radio links related to one UE-UTRAN connection within Node B. The procedure can be used to add, delete or reconfigure a DCH. It can also be used to put, remove a UE on a DSCH and modify the usage the UE is making of the DSCH.

The Radio Link Reconfiguration procedure is initiated by the Controlling RNC by sending the message RADIO LINK RECONFIGURATION PREPARE to the Node B. The message is sent using the relevant signalling connection. It includes the desired radio link parameters for the radio links to be used continuously after completion of this procedure (no change in active set). If the proposed modifications are approved by the Node B resource management algorithms, and when the Node B has successfully reserved the required resources, it responds to the Controlling RNC with the RADIO LINK RECONFIGURATION READY message. In the unsuccessful case a NBAP message RADIO LINK RECONFIGURATION FAILURE is returned, indicating among other things the reason for failure. The Controlling RNC informs the UE about the changes in the RL with the relevant RRC message(s) after sending the RADIO LINK RECONFIGURATION COMMIT message to the Node Bs. If necessary (for example when the new L1/L2 configuration cannot coexist with the old one), the SRNC selects the most suitable CFN for the switching between the old and new configuration and includes it in the RRC message and in the RADIO LINK RECONFIGURATION COMMIT message. The Controlling RNC is responsible for releasing unnecessary Iub transport bearers (in case of DCH deletion).

This procedure is not used for adding or deleting radio links.



Radio Link Reconfiguration (Synchronized) Procedure

The RADIO LINK RECONFIGURATION PREPARE message contains:

- UL Radio Resources (UL Channelisation code type)
- DL Radio Resources (DL Channelisation code per RL) (if changed)
- Transport Format Combination Set

In case of DCH addition, this message also contains

- DCH Information (new DCH ID to add, Transmission Rate, Transport Format Set)
- Priority of DCH (How is it used?)

When setting up co-ordinated DCH's, if the receiver is not able to setup one of the DCH's, the setup of the other DCH's requested with the same DCH Combination Indicator value shall be rejected.

In case of DCH reconfiguration, this message also contains

- DCH Information (existing DCH ID to modify, Transmission Rate, Transport Format Set)
- Priority of modified DCH (How is it used?)

In case of DCH deletion, this message also contains

- DCH Information (DCH ID to delete)

In case of deleting one or more co-ordinated DCH's, the deletion of all DCH's established together with the same value for the DCH Combination Ind, shall be requested with one message. If deletion of only a subset of the co-ordinated DCH's is requested, the complete deletion shall be rejected.

In case of DSCH addition, this message also contains

- DSCH Information (DSCH Identifier to add, RL identifier, Transport Format Set)

In case of DSCH modification, this message also contains

- DSCH Information (DSCH Identifier to modify, Transport Format Set)

In case of DSCH deletion, this message also contains

- DSCH Information (DSCH Identifier to delete)

The RADIO LINK RECONFIGURATION PREPARE message may consist of a combination of DCH addition, deletion, and reconfiguration.

The RADIO LINK RECONFIGURATION READY message contains:

- FFS

In case of DCH addition, this message also contains

- Transport layer addressing information (Transport layer AAL2 address, AAL2-binding ID) for added DCH

In case of DCH reconfiguration, this message also contains

- Transport layer addressing information (Transport layer AAL2 address, AAL2-binding ID) for modified DCH (if needed)

In case of DSCH addition, this message also contains

- Transport layer addressing information (Transport layer address, binding ID) for added DSCH

In case of DSCH reconfiguration, this message also contains

- Transport layer addressing information (Transport layer address, binding ID) for modified DSCH

The RADIO LINK RECONFIGURATION FAILURE message contains

- CAUSE

The RADIO LINK RECONFIGURATION COMMIT message contains

- Timing information (e.g. CFN) to change old resource to new resource ~~(FFS)~~

The RADIO LINK RECONFIGURATION CANCEL message contains

- Cancel information to reconfigure resources

Note: A mechanism for synchronising the switching from the old to the new configuration in the UE and in the Controlling RNC is needed and FFS.

8.2.3 Radio Link Reconfiguration (Unsynchronised)

The Radio Link Reconfiguration (Unsynchronised) procedure is used to reconfigure radio links related to one UE-UTRAN connection within Node B. The procedure can be used to add, delete or reconfigure a DCH. It can also be used to put, remove a UE on a DSCH and modify the usage the UE is making of the DSCH.

The Unsynchronised RL Reconfiguration is used when there is no need to synchronise the time of the switching from the old to the new configuration in the node-Bs used by the UE-UTRAN connection. This is the case when new TFCs are added or old TFCs are deleted without changing the TFCI values of the TFCs that are maintained during the reconfiguration.

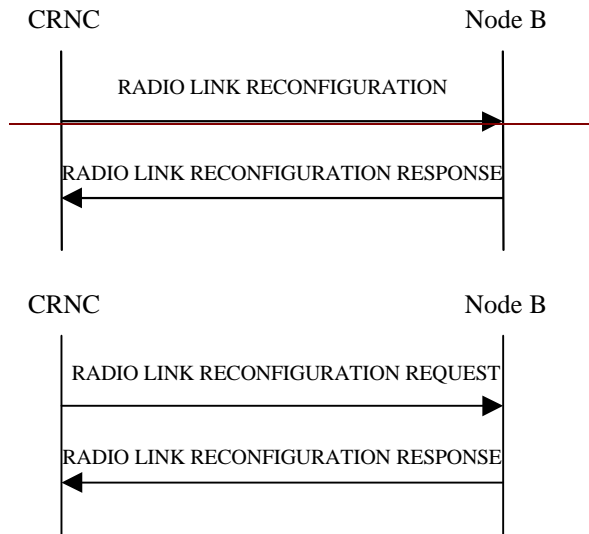
The Radio Link Reconfiguration procedure is initiated by the Controlling RNC by sending the message RADIO LINK RECONFIGURATION REQUEST to the Node B. The message is sent using the relevant signalling connection. It includes the desired radio link parameters for the radio links to be used continuously after completion of this procedure (no change in active set).

If the proposed modifications are approved by the Node B resource management algorithms, and when the Node B has successfully reserved the required resources, it responds to the Controlling RNC with the RADIO LINK RECONFIGURATION RESPONSE message.

In the unsuccessful case a NBAP message RADIO LINK RECONFIGURATION FAILURE is returned, indicating among other things the reason for failure.

The Controlling RNC is responsible for releasing unnecessary Iub transport bearers (in case of DCH deletion).

This procedure is not used for adding or deleting radio links.



Radio Link Reconfiguration (Unsynchronized) Procedure

The RADIO LINK RECONFIGURATION REQUEST message contains:

- Transport Format Combination Set

In case of DCH addition, this message also contains

- DCH Information (new DCH ID to add, Transmission Rate, Transport Format Set)
- Priority of DCH (How is it used?)

When setting up co-ordinated DCH's, if the receiver is not able to setup one of the DCH's, the setup of the other DCH's requested with the same DCH Combination Indicator value shall be rejected.

In case of DCH reconfiguration, this message also contains

- DCH Information (existing DCH ID to modify, Transmission Rate, Transport Format Set)
- Priority of modified DCH (How is it used?)

In case of DCH deletion, this message also contains

- DCH Information (DCH ID to delete)

In case of deleting one or more coordinated DCH's, the deletion of all DCH's established together with the same value for the DCH Combination Ind, shall be requested with one message. If deletion of only a subset of the coordinated DCH's is requested, the complete deletion shall be rejected.

In case of DSCH addition, this message also contains

- DSCH Information (DSCH Identifier to add, RL identifier, Transport Format Set)

In case of DSCH modification, this message also contains

- DSCH Information (DSCH Identifier to modify, Transport Format Set)

In case of DSCH deletion, this message also contains

- DSCH Information (DSCH Identifier to delete)

The RADIO LINK RECONFIGURATION REQUEST message may consist of a combination of DCH addition, deletion, and reconfiguration.

The RADIO LINK RECONFIGURATION RESPONSE message contains:

- FFS

In case of DCH addition, this message also contains

- Transport layer addressing information (Transport layer AAL2 address, AAL2-binding ID) for added DCH

In case of DCH reconfiguration, this message also contains

- Transport layer addressing information (Transport layer AAL2 address, AAL2-binding ID) for modified DCH (if needed)

In case of DSCH addition, this message also contains

- Transport layer addressing information (Transport layer address, binding ID) for added DSCH

In case of DSCH reconfiguration, this message also contains

- Transport layer addressing information (Transport layer address, binding ID) for modified DSCH

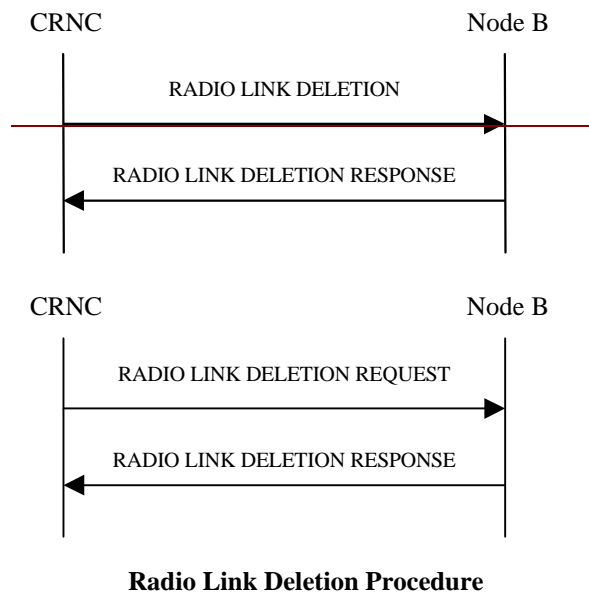
The RADIO LINK RECONFIGURATION FAILURE message contains

- CAUSE

8.2.4 Radio Link Deletion

When the Controlling RNC is asked to delete a cell from the active set of a specific RRC connection, the message RADIO LINK DELETION REQUEST is sent to the corresponding Node B. The message contains essentially the Radio Link identifier of the Radio Link to be deleted. Upon reception of the message, Node B should delete immediately the radio link and all related allocations within the Node B and acknowledge the deletion to the Controlling RNC with the message RADIO LINK DELETION RESPONSE.

The Controlling RNC is responsible to release the corresponding Iub transport bearers if they are not used by other radio links.



The RADIO LINK DELETION REQUEST message contains ~~(the identification of the UE is FFS)~~:

- Radio Link Identifiers (of cells to be deleted)

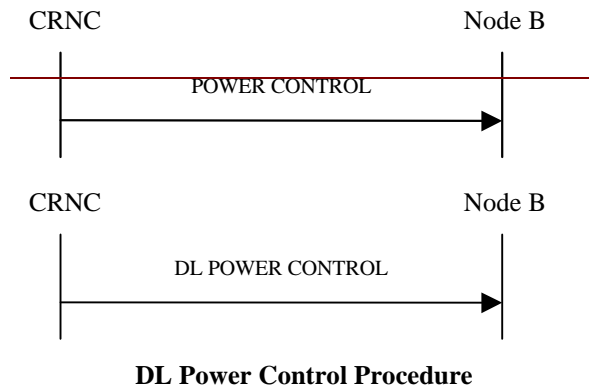
The RADIO LINK DELETION RESPONSE message contains:

- FFS

8.2.5 DL Power Control

The purpose of this procedure is to balance the DL transmission powers of Radio Links used for the related RRC connection within the NodeB. DL POWER CONTROL procedure is initiated by the Controlling RNC by sending a *DL POWER CONTROL* NBAP message, which contains the desired power ~~range~~reference for the Radio Links within the node B.

The DL POWER CONTROL procedure can be initiated by the CRNC at any time when the NodeB communication context exists, irrespective of other ongoing CRNC initiated dedicated NBAP procedures towards this NodeB communication context. The only exception occurs when the CRNC has requested the deletion of the last RL via this NodeB, in which case the DL POWER CONTROL procedure shall no longer be initiated.

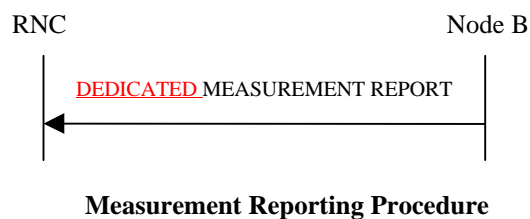


8.2.6 Measurement Reporting Procedure

This procedure is used by the NodeB to report its radio measurements to the RNC.

When the measurement reporting criteria are met, the NodeB sends the DEDICATED MEASUREMENT REPORT message to the RNC. Message includes the required radio interface measurement.

The NodeB is allowed to initiate the MEASUREMENT REPORTING message at any time after having sent the RADIO LINK SETUP RESPONSE message, as long as the NodeB communication context exists.



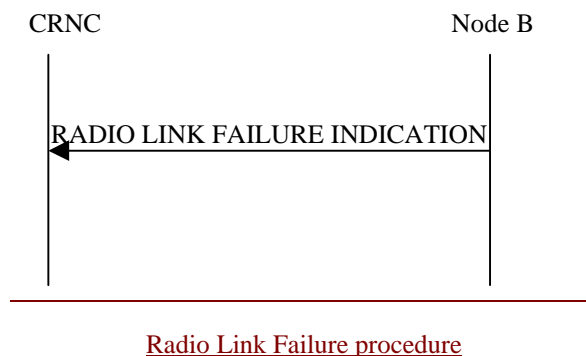
8.2.7 Radio Link Failure

The Node B starts this procedure when a radio link is no longer available. The reason for this is a NodeB internal failure or lost radio interface synchronization due to bad radio conditions. Other reasons are FFS.

As a consequence the NodeB sends the NBAP message, RADIO LINK FAILURE INDICATION to the CRNC.

The message specifies at least:

- RL ID(s): This may address some or all of the radio links of the Node B.
- A reason code for the release (ex: RF failure, hardware failures, overload condition)



Whether this procedure can also be used to notify dropping of DCH(s) is FFS.

9 Elements for NBAP communication

9.1 Message functional definition and content

9.1.1 Message Contents

An information element can be of the following *types*:

M	The information element is mandatory, i.e. always present in the message
O	The information element is optional, i.e. may or may not be present in the message independently on the presence or value of other information elements in the same message
C	The presence of the information element is conditional to the presence or to the value of another information element, as reported in the correspondent footnote

In case of an information element group, the group is preceded by a name for the info group (in bold). It is also indicated whether the group is mandatory, optional or conditional. Each group may be also repeated within one message. The presence field of the information elements inside one group defines if the information element is mandatory, optional or conditional if the group is present.

[Editor's note] Most right columns in the table indicate whether each parameter is used for FDD, TDD, or both. TDD parameters will be added if needed. This field is kept open for the time being.

9.1.2 RADIO LINK SETUP REQUEST

This message is sent from CRNC to Node B in order to start radio link setup for the UE in the Node B.

Information Element	Reference	Type
Message Discriminator		M
Message Type		M
CRNC Communication Context ID		M
<u>Transaction ID</u>		<u>M</u>
UL Scrambling Code		M
UL Channelization Code		M
Length of UL Channelization Code		M
DCH Information		M
DCH ID		M
<u>DCH Combination Ind</u>		<u>O</u>
DCH <u>PriorityType</u>		<u>MFFS</u>
UL Transport Format Set		M

DL Transport Format Set		M
UL Transport Format Combination Set		M
UL TFCI used flag		(FFS)
DL Transport Format Combination Set		M
DL TFCI used Flag		(FFS)
RL Information		M
RL ID		M
Cell ID		M
OFF		M
Chip Offset		M
Diversity Control Field		C ¹
DL Scrambling Code		M
DL Channelization Code		M
DL Channelization Code Number		M
(initial) DL transmission power		M
Maximum DL power		M
Minimum DL power		M
UL Eb/No Target <u>Setpoint</u>		FFS <u>M</u>
UL Eb/No Adjustment Parameters		FFS
Maximum UL Eb/No		FFS
Minimum UL Eb/No		FFS
DL Reference Power		M

9.1.3 RADIO LINK SETUP RESPONSE

This message is sent from Node B to CRNC as response to the Radio Link Setup message when all RLS have been successfully setup.

Information Element	Reference	Type
Message Discriminator		M
Message Type		M
CRNC Communication Context ID		M
Node B Communication Context ID		M
Communication Control Port ID		M
<u>Transaction ID</u>		<u>M</u>
RL Information Response		M
RL ID		M
Diversity Indication		C ²

¹ This Information Element is present for all the radio links except the first radio link in the Node B.

² This Information Element is present for all the radio links except the first radio link in the Node B.

Reference RL ID		C ³
DCH Information Response		C ⁴
DCH ID		M
Binding ID		M
Transport Layer Address		FFS

9.1.4 RADIO LINK SETUP FAILURE

This message is sent from Node B to CRNC as response to the Radio Link Setup **REQUEST** message when at least one RL has not been successfully setup.

Information Element	Reference	Type
Message Discriminator		M
Message Type		M
CRNC Communication Context ID		M
Node B Communication Context ID		M
Communication Control Port ID		O
<u>Transaction ID</u>		<u>M</u>
Successful RL Information Response		O
RL ID		M
Diversity Indication		C ⁵
Reference RL ID		C ⁶
DCH Information Response		C ⁷
DCH ID		M
Binding ID		M
Transport Layer Address		FFS
Unsuccessful RL Information Response		M
RL ID		M
RL Failure Cause		M

9.1.5 RADIO LINK ADDITION **REQUEST**

This message is sent from CRNC to Node B in order to add radio link(s) for the UE in the Node B.

Information Element	Reference	Type
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³ This Information Element is present when the Diversity Indication Information Element indicates combining.
⁴ This Information Element is present when the Diversity Indication Information Element indicates non-combining.
⁵ This Information Element is present for all the radio links except the first radio link in the Node B.
⁶ This Information Element is present when the Diversity Indication Information Element indicates combining.
⁷ This Information Element is present when the Diversity Indication Information Element indicates non-combining.

Message Discriminator		M
Message Type		M
Node B Communication Context ID		M
Transaction ID		M
RL Information		M
RL ID		M
Cell ID		M
OFF		M
Chip Offset		M
Diversity Control Field		M
DL Scrambling Code		M
DL Channelization Code		M
DL Channelization Code Number		M
(initial) DL transmission power		M
Maximum DL power		M
Minimum DL power		M
UL Eb/No Setpoint		FFS
UL Eb/No Adjustment Parameters		FFS
Maximum UL Eb/No		FFS
Minimum UL Eb/No		FFS
DL Reference Power		M

9.1.6 RADIO LINK ADDITION RESPONSE

This message is sent from Node B to CRNC as response to the Radio Link Addition message when all RLS have been successfully added.

Information Element	Reference	Type
Message Discriminator		M
Message Type		M
CRNC Communication Context ID		M
Transaction ID		M
RL Information Response		M
RL ID		M
Diversity Indication		M
Reference RL ID		C ⁸
DCH Information Response		C⁹

⁸ This Information Element is present when the Diversity Indication Information Element indicates combining.

⁹ This Information Element is present when the Diversity Indication Information Element indicates non-combining.

DCH ID		M
Binding ID		M
Transport Layer Address		FFS

9.1.7 RADIO LINK ADDITION FAILURE

This message is sent from Node B to CRNC as response to the Radio Link Addition REQUEST message when at least one RL has not been successfully added.

Information Element	Reference	Type
Message Discriminator		M
Message Type		M
CRNC Communication Context ID		M
Transaction ID		M
Successful RL Information Response		O
RL ID		M
Diversity Indication		M
Reference RL ID		C ¹⁰
DCH Information Response		C ¹¹
DCH ID		M
Binding ID		M
Transport Layer Address		FFS
Unsuccessful RL Information Response		M
RL ID		M
RL Failure Cause		M

9.1.8 RADIO LINK DELETION REQUEST

This message is sent from CRNC to Node B in order to delete radio link(s) for the UE in the Node B.

Information Element	Reference	Type
Message Discriminator		M
Message Type		M
Node B Communication Context ID		M
Transaction ID		M
RL Information		M
RL ID		M

¹⁰ This Information Element is present when the Diversity Indication Information Element indicates combining.

¹¹ This Information Element is present when the Diversity Indication Information Element indicates non-combining.

9.1.9 RADIO LINK DELETION RESPONSE

This message is sent from Node B to CRNC as response to the Radio Link Deletion REQUEST message.

Information Element	Reference	Type
Message Discriminator		M
Message Type		M
CRNC Communication Context ID		M
Transaction ID		M

9.1.10 RADIO LINK RECONFIGURATION PREPARE

<u>Information element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message type</u>		<u>M</u>
<u>Node B Communication Context ID</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>DCHs to modify</u>		<u>O</u>
<u>DCH ID</u>		<u>M</u>
<u>DCH Priority</u>		<u>FFS</u>
<u>Transport format set (DL)</u>		<u>O</u>
<u>Transport format set (UL)</u>		<u>O</u>
<u>DCHs to add</u>		<u>O</u>
<u>DCH ID</u>		<u>M</u>
<u>DCH Combination Ind</u>		<u>O</u>
<u>DCH Priority</u>		<u>FFS</u>
<u>Transport format set (DL)</u>		<u>M</u>
<u>Transport format set (UL)</u>		<u>M</u>
<u>DCHs to delete</u>		<u>O</u>
<u>DCH ID</u>		<u>M</u>
<u>TFCS (DL)</u>		<u>M</u>
<u>TFCS (UL)</u>		<u>M</u>
<u>Uplink Scrambling code</u>		<u>O</u>
<u>UL Channelisation Codes</u>		<u>O</u>
<u>Channelisation code (UL)</u>		<u>M</u>
<u>RL Information</u>		<u>O</u>
<u>RL ID</u>		<u>M</u>
<u>DL Scrambling Code</u>		<u>M</u>
<u>DL Channelisation Code</u>		<u>M</u>
<u>Channelisation code Number (DL)</u>		<u>M</u>
<u>DL reference power</u>		<u>FFS</u>

INFORMATION ELEMENT	REFERENCE	DIRECTION	TYPE	LEN
Link Reference		DRNC-NodeB	M	

Message Identifier			M	
Length			M	
Message Compatibility Information			M	
No. of DCHs			M	
DCH ID (# 1)		For Addition	M	
TFS (for DCH ID# 1)			O	
DCH QoS			M	
DCH ID (# n)			O	
TFS (for DCH ID# n)			O	
DCH QoS		O		
TFCS (for DCHs)		For Reconfiguration	M	
UL channelization code type			M	
No. of UL channelization code			M	
UL channelization code id(s)			M	
DL channelization code type			M	
No. of DL channelization code		M		
No. of Radio Links		For Deletion	M	
Radio Link ID#1			M	
Radio Link ID#2			O	

9.1.11 RADIO LINK RECONFIGURATION READY

<u>Information element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message type</u>		<u>M</u>
<u>CRNC Communication Context ID</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>RLs to be reconfigured (synch)</u>		<u>O</u>
<u>RL ID</u>		<u>M</u>
<u>DCH to be setup</u>		<u>O</u>
<u>DCH ID</u>		<u>M</u>
<u>Binding ID</u>		<u>M</u>
<u>Transport Layer Address</u>		<u>FFS</u>
<u>DCH to be modified</u>		<u>O</u>
<u>DCH ID</u>		<u>M</u>
<u>Binding ID</u>		<u>M</u>
<u>Transport Layer Address</u>		<u>FFS</u>

INFORMATION ELEMENT	REFERENCE	DIRECTION	TYPE	LEN
Link Reference		NodeB-DRNC	M	
Message Identifier			M	
Length			M	
Message Compatibility Information			M	
No. of DCHs			O	
DCH ID (# 1)		For Addition	O	
ATM Binding ID			O	
ATM Address			O	
DCH ID (# n)			O	
ATM Binding ID			O	
ATM Address		O		

No. of Radio Links		For Reconfiguration	M	
Radio Link ID			M	
No. of DL channelization code			M	
DL channelization code id #1			M	
DL channelization code id #m			M	
Radio Link ID		For Deletion	O	
No. of DL channelization code			O	
DL channelization code id #1			O	
DL channelization code id #m			O	

9.1.12 RADIO LINK RECONFIGURATION COMMIT

<u>Information element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message type</u>		<u>M</u>
<u>Node B Communication Context ID</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>CFN</u>		<u>M</u>

INFORMATION ELEMENT	REFERENCE	DIRECTION	TYPE	LEN
Link Reference		DRNC-NodeB	M	
Message Identifier			M	
Length			M	
Message Compatibility Information			M	
Execution Time			M	

9.1.13 RADIO LINK RECONFIGURATION FAILURE

<u>Information element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message type</u>		<u>M</u>
<u>CRNC Communication Context ID</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>Cause1</u>		<u>M</u>
<u>RLs causing reconfiguration failure</u>		<u>O</u>
<u>RL ID</u>		<u>M</u>
<u>Cause2</u>		<u>M</u>

INFORMATION ELEMENT	REFERENCE	DIRECTION	TYPE	LEN
Link Reference		NodeB-DRNC	M	
Message Identifier			M	
Length			M	
Message Compatibility Information			M	

9.1.14 RADIO LINK RECONFIGURATION CANCEL

<u>Information element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message type</u>		<u>M</u>
<u>Node B Communication Context ID</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>

<u>INFORMATION ELEMENT</u>	<u>REFERENCE</u>	<u>DIRECTION</u>	<u>TYPE</u>	<u>LEN</u>
<u>Link Reference</u>		DRNC-NodeB	<u>M</u>	
<u>Message Identifier</u>			<u>M</u>	
<u>Length</u>			<u>M</u>	
<u>Message Compatibility Information</u>			<u>M</u>	

9.1.15 RADIO LINK RECONFIGURATION REQUEST

<u>Information element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message type</u>		<u>M</u>
<u>Node B Communication Context ID</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>DCHs to modify</u>		<u>O</u>
<u>DCH ID</u>		<u>M</u>
<u>DCH Priority</u>		<u>FFS</u>
<u>Transport format set (DL)</u>		<u>O</u>
<u>Transport format set (UL)</u>		<u>O</u>
<u>DCHs to add</u>		<u>O</u>
<u>DCH ID</u>		<u>M</u>
<u>DCH Combination Ind</u>		<u>O</u>
<u>DCH Priority</u>		<u>FFS</u>
<u>Transport format set (DL)</u>		<u>M</u>
<u>Transport format set (UL)</u>		<u>M</u>
<u>DCHs to delete</u>		<u>O</u>
<u>DCH ID</u>		<u>M</u>
<u>TFCS (DL)</u>		<u>O</u>
<u>TFCS (UL)</u>		<u>O</u>
<u>DL reference power</u>		<u>FFS</u>

9.1.16 RADIO LINK RECONFIGURATION RESPONSE

<u>Information element</u>	<u>Reference</u>	<u>Type</u>
----------------------------	------------------	-------------

<u>Message Discriminator</u>		<u>M</u>
<u>Message type</u>		<u>M</u>
<u>CRNC Communication Context ID</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>RLs to be reconfigured (unsync.)</u>		<u>O</u>
<u>RL ID</u>		<u>M</u>
<u>DCHs requiring a new transport bearer to be setup</u>		<u>O</u>
<u>DCH ID</u>		<u>M</u>
<u>Binding ID</u>		<u>M</u>
<u>Transport Layer Address</u>		<u>FFS</u>

9.1.159.1.17 DOWNLINK_DL POWER CONTROL

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>
<u>NodeB Communication Context ID</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>DL Reference Power</u>		<u>M</u>

INFORMATION ELEMENT	REFERENCE	DIRECTION	TYPE	LEN
Link Reference		DRNC-NodeB	M	
Message Identifier			M	
Length			M	
Message Compatibility Information			M	
DL Power Range			M	

9.1.18 COMMON MEASUREMENT INITIATION REQUEST

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>Measurement ID</u>		<u>M</u>
<u>Measurement Object</u>		<u>M</u>
<u>Measurement Type</u>		<u>M</u>

<u>Measurement Characteristic</u>		<u>M</u>
<u>Report Characteristics¹²</u>		<u>M</u>

9.1.19 COMMON MEASUREMENT INITIATION RESPONSE

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>Measurement ID¹³</u>		<u>M</u>

9.1.20 COMMON MEASUREMENT INITIATION FAILURE

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>Measurement ID¹⁴</u>		<u>M</u>
<u>Cause</u>		<u>O</u>

9.1.21 COMMON MEASUREMENT TERMINATION REQUEST

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>Measurement ID¹⁵</u>		<u>M</u>

9.1.22 COMMON MEASUREMENT FAILURE INDICATION

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
----------------------------	------------------	-------------

¹² Can be periodic, event triggered or immediate.

¹³ This is the same measurement ID as that sent in Request message.

¹⁴ This is the same measurement ID as that sent in Request message.

¹⁵ This is the same measurement ID as that sent in Request message.

<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>
<u>Transaction ID</u>		
<u>Measurement ID¹⁶</u>		<u>M</u>

9.1.23 COMMON MEASUREMENT REPORT

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>
<u>Transaction ID</u>		
<u>Measurement ID¹⁷</u>		<u>M</u>
<u>Time Reference</u>		<u>O</u>
<u>Value</u>		<u>M</u>

9.1.24 RADIO LINK FAILURE INDICATION

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>
<u>CRNC Communication Context ID</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>RL ID</u>		<u>M</u>
<u>Radio Link Failure Cause</u>		<u>M</u>

9.1.25 DL COMMON TRANSPORT CHANNEL SETUP REQUEST

This message is sent from the RNC to the Node B to request the setup and configuration of a common transport channel in the Node B. One downlink common transport channel at a time can be setup using this procedure. The channel is available for use after the successful completion of this procedure.

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>

¹⁶ This is the same measurement ID as that sent in Request message.

¹⁷ This is the same measurement ID as that sent in Request message

<u>Transaction ID</u>		<u>M</u>
<u>Cell ID</u>		<u>M</u>
<u>Cell carrier ID</u>		<u>M</u>
<u>DL scrambling code ID -FFS</u>		<u>M</u>
<u>DL common transport channel ID</u>		<u>M</u>
<u>DL common transport channel type</u>		<u>M</u>
<u>FACH parameters</u>		<u>O</u>
<u>DL channelisation code number</u>		<u>M</u>
<u>DL channelisation code spreading factor</u>		<u>M</u>
<u>BCH parameters</u>		<u>O</u>
<u>DL channelisation code number</u>		<u>M</u>
<u>DL channelisation code spreading factor</u>		<u>M</u>
<u>BCH power</u>		<u>M</u>
<u>PCH parameters</u>		<u>FFS</u>
<u>DL channelisation code number</u>		<u>M</u>
<u>DL channelisation code spreading factor</u>		<u>M</u>
<u>PCH power</u>		<u>FFS</u>
<u>PICH parameters</u>		<u>FFS</u>
<u>DL channelisation code</u>		<u>M</u>
<u>PICH power</u>		<u>M</u>

9.1.26 DL COMMON TRANSPORT CHANNEL SETUP RESPONSE

This message is sent to inform the RNC about the downlink common transport channel that Node B has been able to define, and return any transport layer information required. Information on one channel at a time is given using this response.

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>FACH/PCH parameters</u>		<u>O</u>
<u>Transport layer address</u>		<u>M</u>
<u>Binding ID</u>		<u>M</u>

9.1.27 DL COMMON TRANSPORT CHANNEL SETUP FAILURE

This message is sent to inform the RNC that the attempt to configure a downlink common transport channel has failed.

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>Failure cause</u>		<u>M</u>

9.1.28 DL COMMON TRANSPORT CHANNEL DELETION REQUEST

This message is sent to inform the Node B about what downlink common transport that the RNC no longer wants to be supported by Node B.

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>DL common transport channel ID</u>		<u>M</u>

9.1.29 DL COMMON TRANSPORT CHANNEL DELETION RESPONSE

This message is sent to inform the RNC about what downlink common transport channels that Node B no longer shall support.

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>

9.1.30 UL COMMON TRANSPORT CHANNEL SETUP REQUEST

This message is sent from the RNC to the Node B to request the setup and configuration of a common transport channel in the Node B. One uplink common transport channel at a time can be setup using this procedure. The channel is available for use after the successful completion of this procedure.

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>Cell ID</u>		<u>M</u>
<u>Cell carrier ID</u>		<u>M</u>
<u>UL common transport channel ID</u>		<u>M</u>
<u>UL common transport channel type</u>		<u>M</u>

<u>RACH parameters</u>		<u>M</u>
<u>Preamble spreading code</u>		<u>M</u>
<u>Allowed preamble signatures</u>		<u>M</u>
<u>Allowed spreading factors for the message part</u>		<u>M</u>
<u>Allowed access slots</u>		<u>M</u>
<u>Preamble to preamble timing</u>		<u>M</u>
<u>AICH parameters</u>		<u>FFS</u>
<u>DL channelisation code</u>		<u>M</u>
<u>AICH power</u>		<u>M</u>

9.1.31 UL COMMON TRANSPORT CHANNEL SETUP RESPONSE

This message is sent to inform the RNC about the uplink common transport channel that Node B has defined, and return any transport layer information required.

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>RACH parameters</u>		<u>O</u>
<u>Transport layer address</u>		<u>M</u>
<u>Binding ID</u>		<u>M</u>

9.1.32 UL COMMON TRANSPORT CHANNEL SETUP FAILURE

This message is sent to inform the RNC that the attempt to configure uplink common transport channels has failed.

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>Failure cause</u>		<u>M</u>

9.1.33 UL COMMON TRANSPORT CHANNEL DELETION REQUEST

This message is sent to inform the Node B about what uplink common transport that the RNC no longer wants to be supported by Node B.

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>

<u>Message Type</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>
<u>UL common transport channel ID</u>		<u>M</u>

9.1.34 UL COMMON TRANSPORT CHANNEL DELETION RESPONSE

This message is sent to inform the RNC about what uplink common transport channels that Node B no longer shall support.

<u>Information Element</u>	<u>Reference</u>	<u>Type</u>
<u>Message Discriminator</u>		<u>M</u>
<u>Message Type</u>		<u>M</u>
<u>Transaction ID</u>		<u>M</u>

9.1.169.1.35 RESET (FFS)

9.1.179.1.36 RESET ACKNOWLEDGE (FFS)

9.1.189.1.37 CONFUSION (FFS)

9.2 Information Element Functional Definition and Contents

9.2.1 Message discriminator

This field is used to discriminate between Dedicated NBAP and Common NBAP messages.

9.2.2 Message Type

The Message Type uniquely identifies the message being sent.

~~9.2.3~~ UE Context ID

~~Identifies the UE context in the Node B~~

~~9.2.49.2.3~~ CRNC Communication Context ID

The CRNC Communication Context ID is the identifier of the Communication Context in the CRNC.

~~9.2.59.2.4~~ UL Scrambling Code

The UL Scrambling Code is the scrambling code used by UE. Every UE has its specific UL Scrambling Code.

~~9.2.69.2.5~~ UL Channelization Code Number

~~The UL Channelization Code is used to preserve the orthogonality between a UE's different UL physical channels, e.g. DPDCH/DPCCH. The UL Channelization Code Number indicates the UL Channelization Code number for a specific UL physical channel an UE has.~~

~~9.2.79.2.5~~ Length of UL Channelization Code

The Length of UL Channelization Code defines the level of the channelization code in the code tree. It is equivalent to the Spreading Factor.

~~9.2.89.2.6~~ DCH ID

The DCH ID is the identifier of an active dedicated transport channel. It is unique for each active DCH among the active DCHs simultaneously allocated for the same UE.

~~9.2.99.2.7~~ DCH PriorityType

The DCH ~~Type~~ Priority is used to indicate the DCH priority level.

~~9.2.109.2.8~~ UL Transport Format Set

The Transport Format Set is defined as the set of Transport Formats associated to a Transport Channel, e.g. DCH. The UL Transport Format Set is applicable for UL.

~~9.2.119.2.9~~ DL Transport Format Set

The Transport Format Set is defined as the set of Transport Formats associated to a Transport Channel, e.g. DCH. The DL Transport Format Set is applicable for DL.

~~9.2.129.2.10~~ UL Transport Format Combination Set

The Transport Format Combination Set is defined as a set of Transport Format Combinations on a Coded Composite Transport Channel. It is the allowed Transport Format Combinations of the corresponding Transport Channels. The UL Transport Format Combination Set is applicable for UL Transport Channels.

~~9.2.139.2.11~~ **9.2.11 TFCI used flag**

Indicates whether TFCI shall be included in the DPCCCH.

~~9.2.149.2.12~~ **9.2.12 DL Transport Format Combination Set**

The Transport Format Combination Set is defined as a set of Transport Format Combinations on a Coded Composite Transport Channel. It is the allowed Transport Format Combinations of the corresponding Transport Channels. The DL Transport Format Combination Set is applicable for DL Transport Channels.

~~9.2.159.2.13~~ **9.2.13 RL ID**

The RL ID is the unique identifier for one RL associated with a UE

~~9.2.169.2.14~~ **9.2.14 Cell ID**

The Cell ID is the identifier of a cell.

~~9.2.179.2.15~~ **9.2.15 OFF**

The OFF (Frame Offset) is the required offset between the dedicated channel downlink transmission frames (CFN, Connection Frame Number) and the broadcast channel frame offset (Cell Frame Number). The OFF is UE and cell specific.

~~9.2.189.2.16~~ **9.2.16 Chip Offset**

The Chip Offset is defined as the radio timing offset inside a radio frame. The precision is on chip level.

~~9.2.199.2.17~~ **9.2.17 Diversity Control Field**

The Diversity Control Field indicates if the current RL may, must or must not be combined with the already existing RLs.

~~9.2.209.2.18~~ **9.2.18 DL Scrambling Code**

The DL Scrambling Code is the scrambling code used for each cell/RL. It is the same for all physical channels in one cell, but different for different cells. One cell may have several DL Scrambling Codes available.

~~9.2.219.2.19~~ **9.2.19 DL Channelization Code Number**

The DL Channelization Code is used to preserve the orthogonality between a cell's different DL physical channels, e.g. DPCH/CCPCH. The DL Channelization Code Number indicates the DL Channelization Code number for a specific DL physical channel a cell has.

~~9.2.229.2.20~~ **9.2.20 Length of DL Channelization Code**

The Length of UL Channelization Code defines the level of the channelization code in the code tree. It is equivalent to the Spreading Factor.

~~9.2.23~~ 9.2.21 ~~UL Eb/No Setpoint~~ UL Eb/No Target

The UL Eb/No ~~Target~~Setpoint indicates the UL Eb/No target to be used by the UL inner loop power control. This is FFS and depends on the outcome of Study Item Iur/1: Signalling for UL Outer Loop Power Control and DL Power Balancing.

~~9.2.24~~ 9.2.24 ~~UL Eb/No Adjustment Parameters~~

The UL Eb/No Adjustment Parameters indicate the steps to be used to increase or decrease the Eb/No setpoint for the UL inner loop power control. The increase/decrease commands are carried by the FP. This is FFS and depends on the outcome of Study Item Iur/1: Signalling for UL Outer Loop Power Control and DL Power Balancing.

~~9.2.25~~ 9.2.25 ~~Maximum UL Eb/No~~

The Maximum UL Eb/No indicates the maximum allowed Eb/No to be used by the UL inner loop power control. This is FFS and depends on the outcome of Study Item Iub/2 (admission control in Node B).

~~9.2.26~~ 9.2.26 ~~Minimum UL Eb/No~~

The Minimum UL Eb/No indicates the minimum allowed Eb/No to be used by the UL inner loop power control. This is FFS and depends on the outcome of Study Item Iub/2 (admission control in Node B).

~~9.2.27~~ 9.2.22 ~~DL Reference Power~~

The DL Reference Power indicates the reference transmission power used by the fast UL inner loop power control to eliminate the power drifting problem. This is FFS and depends on the outcome of Study Item Iur/1: Signalling for UL Outer Loop Power Control and DL Power Balancing.

~~9.2.28~~ 9.2.23 ~~Node B Communication Context ID~~

The Node B Communication Context ID is the identifier of the Communication Context in the Node B, it corresponds to all the dedicated resources which are necessary for an UE using one or more dedicated channels in a given Node B.

~~9.2.29~~ 9.2.24 ~~Communication Control Port ID~~

A Communication Control Port corresponds to one signalling bearer between the RNC and Node B for the control of Node B Communication Contexts. Node B may have multiple Communication Control Ports (one per Traffic Termination Point). The Communication Control Port is selected at creation of the Node B Communication Context. The Communication Control Port ID is the identifier of the Communication Control Port.

~~9.2.30~~ 9.2.25 ~~Diversity Indication~~

The Diversity Indication indicates if the RL has been (ON) or has not been (OFF) combined with another RL.

~~9.2.31~~ 9.2.26 ~~Reference RL ID~~

The Reference RL ID is the identifier of the radio link that the indicated radio link has been combined with.

~~9.2.32~~ 9.2.27 ~~Binding ID~~

The Binding ID is the identifier of an user data stream. It is allocated at Node B and it is unique for each active transport bearer to/from the Node B.

9.2.339.2.28 Transport Layer Address

The Transport Layer Address indicates the Node B transport address. The format of the Transport Layer Address is FFS.

9.2.349.2.29 RL Failure Cause

The RL Failure Cause indicates the reason of unsuccessful radio link setup.

9.2.359.2.30 Transaction ID

The Transaction ID is used to associate all the messages belonging to the same pending procedure of the same NBAP procedure type (e.g. Radio Link Addition), i.e. the Request-, Response-, Confirm-type of messages have the same Transaction ID. The messages belonging to different pending procedures have different Transaction IDs.

9.2.31 Measurement ID

RNC defined identifier that uniquely identifies the measurement.

9.2.32 Measurement Object

Defines on which resource the measurement should be performed, e.g. cell.

9.2.33 Measurement Type

Defines what measurements should be performed, e.g. the interference on UL.

9.2.34 Measurement Characteristic

Defines how the measurements should be performed, e.g. measurement frequency, timing information, filtering information.

9.2.35 Report Characteristics

Reporting can be any of the following:

- Periodic: Reports shall be delivered with a periodicity which shall be defined.
- Event: Reports shall be delivered upon a specified event in the node B.
- Immediate: Reports shall be delivered immediately. Once the report is sent the measurement is cancelled.

9.2.36 Time Reference

Shows the time of the measurement (timestamp).

9.2.37 Value

Includes the reported data.

DCH Combination Indicator

bearer. The value should be unique for each group of coordinated DCH' er request message.

9.3 Message and Information element abstract syntax (with ASN.1)

[Editor's Note: ASN.1 shall be applied to describe the contents of each NBAP message.

FFS]

PDU Description for NBAP

```

-- *****
--
--
-- *****
DEFINITIONS AUTOMATIC TAGS ::=
BEGIN
-- *****
--
--
-- *****
-- Imports PDU content types from NBAP PDU contents module
-- *** TO BE D
ExampleMessageContents1,
ExampleMessageContents2-v1,
ExampleMessageContents3
-- *****
--
--
-- NBAP-PDU-
-- identifier.
--
NBAP-PDU-DESCR ::= CLASS {
&versionID VersionID UNIQUE,
&compatibilityInformation on,
-- Editor's note

```

```

    &LogicalProcedure LogicalProcedure
}
WITH SYNTAX {
    PDU TYPE &PDUType
}
-- compatibilityInformation --
/
LOGICAL PROCEDURE
}

VersionID ::= SEQUENCE {
    pduID INTEGER (0..63),
    versionNumber
}

Ver ::= INTEGER (1 .. 255)

--
-- releaseIndicator,
-- discardMessages,
--
--
--
LogicalProcedure ::= ENUMERATED { cCOMMON, dDEDICATED }

--
--
--
*****
--
--
--
--
--
--
}

exam
    ExampleMessageContents1
    VERSION NUMBER AND ID { pduID 1, versionNumber 1 }
    { cCOMMON }
-
exampleMessage2-v1 NBAP-PDU-DESCR ::= {
    PDU TYPE sageContents2-v1
    VERSION NUMBER AND ID { pduID 2, versionNumber 1 }
    { dDEDICATED }
-

```

```

exampleMessage2-v2 NBAP-PDU-DESCR ::= {
  PDU TYPE      ExampleMessageContents2-v2
  VERSION NUMBER AND ID  { pduID 2, versionNumber 2 }
  -- COMPATIBILITY INFORMATION  releaseIndicator
  LOGICAL PROCEDURE  { dEDICATED }
}

exampleMessage3 NBAP-PDU-DESCR ::= {
  PDU TYPE      ExampleMessageContents3
  VERSION NUMBER AND ID  { pduID 3, versionNumber 1 }
  -- COMPATIBILITY INFORMATION  discardMessages
  LOGICAL PROCEDURE  { cCOMMON | dEDICATED }
}

-- *****
--
-- Generic PDU structure. The NBAP-PDUs table above describes
-- valid contents for the vid, indication and value fields.
--
-- *****

NBAP-PDU ::= SEQUENCE {
  vid      NBAP-PDU-DESCR.&versionID      ({NBAP-PDUs}),
  --      indication NBAP-PDU-DESCR.&compatibilityInformation  ({NBAP-PDUs}{@vid}),
  value    NBAP-PDU-DESCR.&PDUType      ({NBAP-PDUs}{@vid})
}

END

```

9.3.2 NBAP PDU Content Definitions

```

-- *****
--
-- NBAP PDU content definitions
--
-- *****

NBAP-PDU-contents DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

-- *** TO BE DEFINED ***
FROM NBAP-IEs;

-- *** TO BE DEFINED ***
FROM NBAP-Constants;

-- Definitions of NBAP PDU content types one by one
-- *** TO BE DEFINED ***

ExampleMessageContents1 ::= SEQUENCE {
  -- *** IEs to be defined ***
  ...
}

ExampleMessageContents2-v1 ::= SEQUENCE {
  -- *** IEs to be defined ***
  ...
}

```

```

ExampleMessageContents2-v2 ::= SEQUENCE {
  -- *** IEs to be defined ***
  ...
  -
ExampleMessageContents3 ::= SEQUENCE {
  defined ***
  -
  }
END
    
```

NBAP Information Elements

```

--
-- NBAP Information Elements
--
-- *****
NBAP-IEs DEFINITIONS AUTOMATIC TAGS
BEGIN
IMPORTS
FROM NBAP-Constants:
-- Definitions of NBAP IEs one by one
END
    
```

```

-- *****
--
-- Constant definitions for NBAP
--
-- *****
NBAP-Constants DEFINITIONS AUTOMATIC TAGS ::=
--
-- Definitions of NBAP constants one by one
-- *** TO BE DEFINED ***
    
```

9.4

[Editor’s Note: The transfer syntax to be used is FFS]

This paragraph contains the CODING of the signaling elements used.

The following convention are assumed for the sequence of transmission of bits and bytes:

Each bit position is marked as 1 to 8. Bit 1 is the least significant bit and is transmitted first.

In an element octets are identified by number, octet 1 is transmitted first, then octet 2 etc.

Length Indicator

It is desirable to have Length for messages and parameters because future version of protocol may have extension to the present message or parameter, and also variable size can be present in some parameters as well.

In case of message size exceeding 256 byte it is better to have 2 bytes for message LENGTH.

However it is enough to have 1 byte for parameter LENGTH.

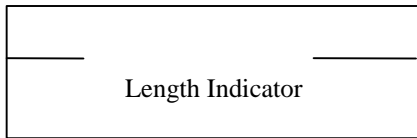


Fig. 9.2.4.1-1 Length Indicator for Message

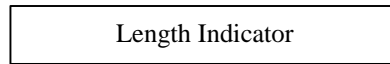


Fig. 9.2.4.1-2 Length Indicator for Parameter

Compatibility Information

Compatibility Information is used in the situation of unrecognized messages or parameter. This parameter should be placed at a certain place then it is easy to pick up this parameter in any circumstances.

Consequently, the format can be as follow:

Message Identifier / Length / Compatibility Info / parameters

Parameter Identifier / Length / Compatibility Info / Fields

Figure 3 shows the coding format of message and Figure 4 shows the coding format of parameter.

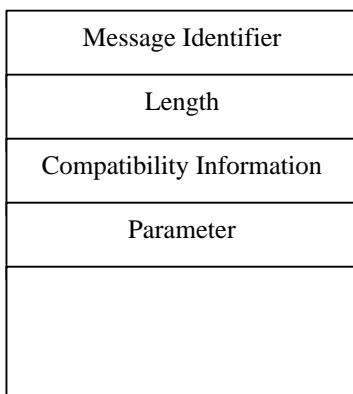


Fig. 9.2.4.1-3 Message Coding Format

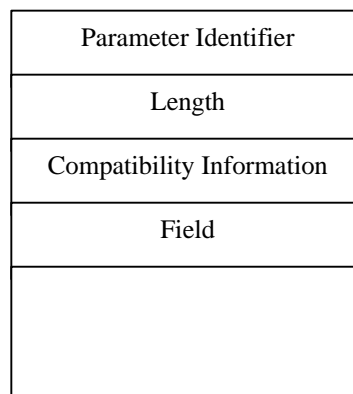


Fig. 9.2.4.1-4 Parameter Coding Format

Fixed size data and Variable size data in Field

fixed size field. Figure 5 shows an example of fixed size data in field.

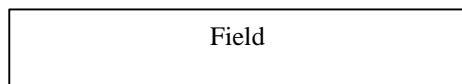
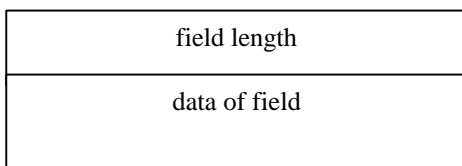


Fig. 9.2.4.1-

Regarding the variable size of data



6 Length method

Element Identifier		Reference
---------------------------	--	------------------

Coding		
	ATM Binding ID	
	ATM Address	
	No of DCHs	
	DCH ID	
	TFS(for DCH)	
	TFCS(for DCHs)	
	Radio Frequency	
	UL scrambling code	
	UL channelization code type	
	No. of UL channelization code	
	UL channelization code ID	
	UL Interference Level	
	DL channelization code type	
	No. of DL channelization code	
	DL channelization code id	
	Cell ID	
	Neighbor Cell Information	
	Soft Combination Indication	
	Phase Difference	
	Radio Link ID	
	No. of Radio Links	
	Execution Time	
	Slot offset	
	Frame offset	
	Initial DL Power	
	DL Power Range	
	Target UL Eb/Io	
	DCH QoS	
	LAI	
	Group number of incoming call	
	Cause	

9.4.1 Message Identifier

Message Identifier uniquely identifies the message being sent. It is a single octet element, mandatory in all messages.

8765 4321	
	RADIO LINK SETUP RADIO LINK SETUP RESPONSE RADIO LINK SETUP FAILURE
	RADIO LINK ADDITION RADIO LINK ADDITION RESPONSE RADIO LINK ADDITION FAILURE
	RADIO LINK DELETION RADIO LINK DELETION RESPONSE
	RADIO LINK RECONFIGURATION PREPARE RADIO LINK RECONFIGURATION READY RADIO LINK RECONFIGURATION COMMIT RADIO LINK RECONFIGURATION FAILURE RADIO LINK RECONFIGURATION CANCEL
	POWER CONTROL
	OUTER LOOP POWER CONTROL
	PAGING
	RESET (FFS)
	RESET ACKNOWLEDGE (FFS)
	RESET (FFS)

Message Compatibility Information

Message Compatibility Information is used in the situation of unrecognized messages.

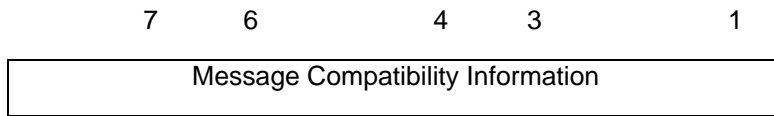


Figure: Message Compatibility Information

Table: Message Compatibility Information octet

Bit	
8	Reserved
:	
4	Pass On not possible
3	Discard Message
2	Send Notify (1)
1	Release Indicator

1. It should be used in CONFUSION message

9.4.2 Parameter Compatibility Information

Parameter Compatibility Information is used in the situation of unrecognized messages.

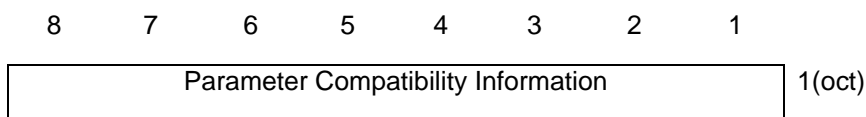
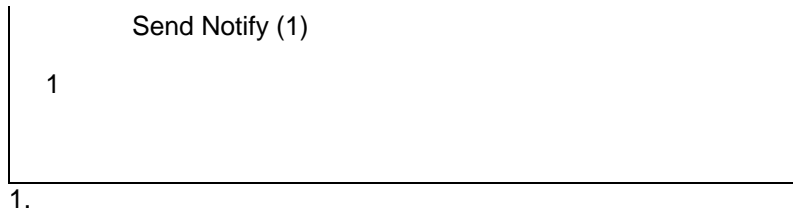


Figure: Parameter Compatibility Information

Table: Parameter Compatibility Information octet (The detail is FFS.)

Bit	
8	Reserved
:	
4	Pass On not possible
3	Discard Message



9.4.3

This element is included ATM address.

[Note: The following should be described the coding format. (The detail is FFS.)]

ATM Binding ID

[Note: The following should be described the coding format. (The detail is FFS.)]

9.4.5 Cell ID

This element uniquely identifies cell which a RNC and is of variable length containing.

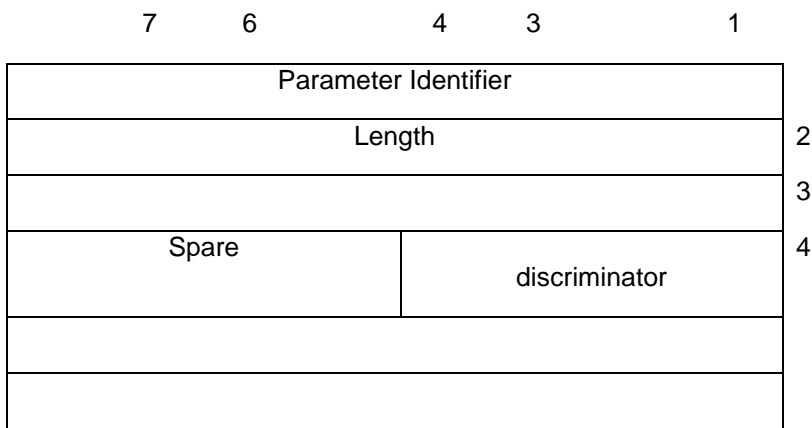


Figure: format of Cell Identifier

9.4.6 Neighbour Cell information

- 9.4.7 No of DCHs
- 9.4.8 DCH ID
- 9.4.9 TFS(for DCH)
- 9.4.10 TFCS(for DCHs)
- 9.4.11 Soft Combination Indication
- 9.4.12 Phase Difference
- 9.4.13 Radio Frequency
- 9.4.14 UL Interference level
- 9.4.15 UL scrambling code
- 9.4.16 UL channelization code type
- 9.4.17 No. of UL channelization codes
- 9.4.18 UL channelization code ID
- 9.4.19 DL channelization code type
- 9.4.20 No. of Radio Links

9.4.21

9.4.22

9.4.23

9.4.24

9.4.25

9.4.26

This Information element defines the DL transmission power range to be used for the radio links used for the related RRC connection in the node-B.

Target UL Eb/lo

Slot Offset

Frame Offset

DCH QoS

LAI

Group number of incoming call

Cause

shown below.

The cause value is a single octet element if the extension bit (bit 8) is set to 0. If it is set to 1 then the

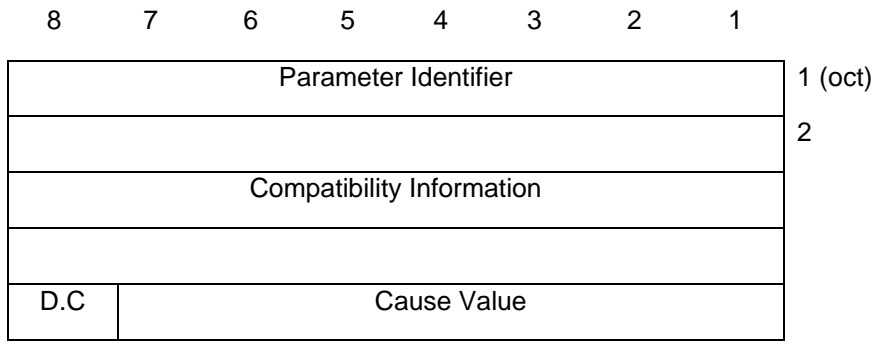


Figure: format of Cause

Cause Value:

Normal event

Class:

Class: Resource unavailable

Service or option not available

Class:

Class: invalid message (e.g. parameter out of range)

protocol error

Class:

The following table shows example of cause value.

Table: cause value

Class	value	
—	<u>4321</u>	

	<p>Normal termination</p> <p>Mobile illegal (ex. Authentication NG)</p> <p>O & M intervention</p> <p>Equipment failure</p> <p>Protocol error</p> <p>Message type non-existent or not implemented</p> <p>Information element/parameter non-existent or not implemented</p> <p>Radio link failure</p> <p>BS approach link failure</p> <p>Timer expired</p> <p>Ciphering algorithm not supported</p> <p>Resource unavailable</p> <p>Other values are reserved</p>
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9.5 Timers

10 Handling of unknown, unforeseen and erroneous protocol data

11 Annex A (normative):

12 Annex B (informative):

Document Stability Assessment Table

<u>Section</u>	<u>Content missing</u>	<u>Incomplete</u>	<u>Restructuring needed</u>	<u>Checking needed</u>	<u>Editorial work required</u>	<u>Finalisation needed</u>	<u>Almost stable</u>	<u>Stable</u>
<u>1</u>								<u>√</u>
<u>2</u>					<u>√</u>			
<u>3</u>				<u>√</u>				
<u>4</u>		<u>√</u>						
<u>5</u>				<u>√</u>				
<u>6</u>	<u>√</u>							
<u>7</u>				<u>√</u>				
<u>8.1</u>				<u>√</u>				
<u>8.2</u>				<u>√</u>				
<u>9.1</u>		<u>√</u>						
<u>9.2</u>		<u>√</u>						
<u>9.3</u>	<u>√</u>							
<u>9.4</u>	<u>√</u>							
<u>9.5</u>	<u>√</u>							
<u>10</u>	<u>√</u>							

4213 History

Document history		
V0.0.1	March 1999	First Draft
V0.0.2	March 1999	Introduction of content from the Merged Description of I _{ub} Interface, V0.0.2 1999-03
V0.0.3	April 1999	<p>New sections “8.1.4. Measurement Request”, “8.1.5. Measurement Termination requested by RNC”, “8.1.6. Measurement Termination requested by NodeB” and “8.1.7. Measurement Report” have been introduced. Contents in Tdoc R3-99191 have been reflected. Contents for “Measurement Termination requested by NodeB” will be contributed.</p> <p>New section “8.1.9. System Information Update Procedure” has been introduced. Contents in Tdoc R99-192 have been reflected. Several corrections and modifications have been made to “4 General”, “8.1.11 Paging”, “8.2.2 Radio Link Reconfiguration (Synchronized)”, and “8.2.4 Radio Link Deletion” reflecting the proposals in Tdoc R3-99193</p> <p>Editor’s notes were added to “8.2.6 Outer Loop Power Control”. The notes describe the raised discussion items to be solved from Tdoc R3-99176.</p> <p>“8.2.7 Down Link Code Reconfiguration Trigger” has been deleted according to the result of study item “ARC/2: DL Channelization codes are managed and allocated by CRNC to NodeB”. “9.1.16 DL CODE RECONFIGURATION REQUEST” has also been deleted.</p> <p>“Spreading Code” were renamed to “Channelization Code”</p> <p>Editor’s notes were added onto the top of 8.1.1 stating that Logical O&M procedures would be included in NBAP Common Procedures</p>
V0.0.4	April 1999	New section “8.1.6 Measurement Termination initiated by NodeB” has been added according to the result from TSG-RAN WG3 meeting #2. In accordance, the title of section 8.1.5 has been changed to “8.1.5 Measurement Termination initiated by RNC”
V0.1.0	April 1999	V0.0.4 has been updated to V0.1.0 after the approval by TSG-RAN WG3
V1.0.0	April 1999	V0.1.0 has been updated to V1.0.0 after the approval by TSG-RAN WG3

V1.0.1	May 1999	<p>Chapter 3 has been detailed (definition and abbreviation were added)</p> <p>Chapter 7 has been detailed (List of messages were added)</p> <p>Section 8.1.2 has been deleted due to the change of paging termination point</p> <p>DL Power Control will be done in outband singaling (8.2.5)</p> <p>Outerloop Power Control will be done in inband signaling (8.2.6)</p> <p>Chapter 9 has been updated</p> <p>Section 9.2 has been divided into two sections, Section 9.2 and Section 9.4; Section 9.2 is for "Information Element Functional Definition and Contents. Section 9.4 is for "Message Transfer Syntax"</p> <p>New Section 9.3 will be prepared for "Message and Information element abstract syntax with ASN.1"</p> <p>Chapter 12 (Annex B) has been deleted</p>
V1.0.2	June 1999	<p>Several Logical O&M procedures have been introduced and added. Chapter 7 and 8 have been updated according the agreement</p> <p>Small editorial modification/correction have been made to Chapter 2 and 3</p> <p>A new section in Chapter 5 has been added. This section described the current policy how to handle "Parallel Transactions"</p> <p>The names of the procedures have been placed under the figures</p>
<u>V1.1.0</u>	<u>July 1999</u>	<p><u>Several editorial modifications (e.g. remove FFS that are already solved) have been made</u></p> <p><u>FDD/TDD columns have been removed in order to be aligned with the layout in 25.423 RNSAP specification</u></p> <p><u>Modifications related to outer-loop power control have been made</u></p> <p><u>Several new parameter tables for e.g. Measurement Procedures, DL power control have been added in chapter 9.1</u></p> <p><u>RL setup procedure and RL reconfiguration procedure(sync/unsync) have been updated according to the decisions on DSCH.</u></p> <p><u>Logical O&M procedures and parameters have been detailed.</u></p> <p><u>Transaction ID has been added to all parameters</u></p>

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This document is written in Microsoft Word 98.