TSG-RAN Meeting #12
Stockholm, Sweden, 12 - 15 June 2001

TSGRP#12(01) 0377

Title: **Agreed CRs to TS 25.419**

Source: **TSG-RAN WG3**

Agenda item: **8.3.3/8.3.4**

Tdoc_Num	Specification	CR_Num	Revision_Num	CR_Subject	CR_Category	WG_Status	Cur_Ver_Num	New_Ver_Num	Workitem
R3-011860	25.419	035	1	Corrections and introduction of an appendix for usage of Criticality Diagnostics IE	F	agreed	3.4.0	3.5.0	TEI
R3-011861	25.419	036	1	Corrections and introduction of an appendix for usage of Criticality Diagnostics IE	A	agreed	4.0.0	4.1.0	TEI
R3-011325	25.419	037		Reporting of Logical Error with Error Indication Procedure	F	agreed	3.4.0	3.5.0	TEI
R3-011326	25.419	038		Reporting of Logical Error with Error Indication Procedure	A	agreed	4.0.0	4.1.0	TEI
R3-011333	25.419	039		Clarification of IEs order rule	F	agreed	3.4.0	3.5.0	TEI
R3-011334	25.419	040		Clarification of IEs order rule	A	agreed	4.0.0	4.1.0	TEI
R3-011358	25.419	041		Corrections to the SABP	F	agreed	3.4.0	3.5.0	TEI
R3-011359	25.419	042		Corrections to the SABP	A	agreed	4.0.0	4.1.0	TEI
R3-011756	25.419	043	1	Alignment of 25.419 (v4.0.0) with 23.041	A	agreed	4.0.0	4.1.0	TEI
R3-011758	25.419	044	1	Changing of ‘Broadcast Message Content ‘ IE maximum size	A	agreed	4.0.0	4.1.0	TEI
R3-011755	25.419	045	1	Alignment of 25.419 (v3.4.0) with 23.041	F	agreed	3.4.0	3.5.0	TEI
R3-011757	25.419	046	1	Changing of ‘Broadcast Message Content ‘ IE maximum	F	agreed	3.4.0	3.5.0	TEI

R3-011670	25.419	047		Corrections in 25.419 due to terminology of PLMN Identity as requested by SA1	F	agreed	3.4.0	3.5.0	TEI
R3-011671	25.419	048		Corrections in 25.419 due to terminology of PLMN Identity as requested by SA1	A	agreed	4.0.0	4.1.0	TEI
R3-011735	25.419	049		Reference to superseded versions of ASN.1 documents	F	agreed	3.4.0	3.5.0	TEI
R3-011736	25.419	050		Reference to superseded versions of ASN.1 documents	A	agreed	4.0.0	4.1.0	TEI

3GPP TSG-RAN WG3 Meeting #21
Busan, Korea, May 21st – 25th, 2001

R3-011860

CR-Form-v3

CHANGE REQUEST

⌘ **25.419** **CR** **035** ⌘ rev **1** ⌘ Current version: **3.4.0** ⌘

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

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

Title:	⌘	Corrections and introduction of an appendix for usage of *Criticality Diagnostics* IE
Source:	⌘	R-WG3
Work item code:	⌘	TEI
Date:	⌘	2001-05-16
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change: ⌘ The *Criticality Diagnostics* IE cannot tell if a reported error is due to a not understood or a missing IE. This needs to be added.
Also the usage of Criticality Diagnostics IE needs to be made easier to understand. An informative annex is thus added.

Summary of change: ⌘ Type of Error is added to the *Criticality Diagnostics* IE and an informative appendix with examples of the usage of *Criticality Diagnostics* IE is also added.

Changes since R3 #20:

- The semantics of the *Repetition Number* IE in the *Criticality Diagnostics* IE and *Message Structure* IE have been improved.
- One figure per example have been included in the Appendix.
- One example on “missing IE” has been included in the Appendix.
- The *Type of Error* IE has been added in the *Information Element Criticality Diagnostics* IE in the *Criticality Diagnostics* IE to allow the reporting of multiple causes to the inclusion of the Criticality Diagnostics IE.
  The main reason for reporting Criticality Diagnostics can be indicated by the *Cause* IE, but the reason may be different for different reported IEs. E.g the main reason my be a missing IE (cause=“Abstract Syntax Error (Falsely Constructed Message)”) but still there may be a not understood IE reported as well (cause=”Abstract Syntax Error (Reject)” or ”Abstract Syntax Error (Ignore and Notify)”).
- The value range for the *Repetition Number* IE in the *Criticality Diagnostics* IE has been changed from (1..256) to (0..255, …).
- The value range for the *Repetition Number* IE in the *Message Structure* IE has been changed from (1..256) to (1..256, …).

Information for revision 1:

It was recognised, that the addition of the extension marker for the *Repetition Number* IE in the *Criticality Diagnostics* IE and the *Message Structure* IE will lead to a non backwards compatible change, as it e.g. causes an transfer syntax (decoder) error if this IE is received by a node of an version which did not

		implemented this change. As an outcome one correction in ASN.1+removal of ellipsis from the repetition number were performed.
Consequences if not approved:	⌘	It will not be possible to know what type of error that is reported, making it difficult to take appropriate actions. The proposed change is not backwards compatible due to: • The changes done to the value range for Repetition Number. • The introduction of the possibility to report missing IEs, thus making received information ambiguous for a receiver implemented according to Criticality Diagnostics without this possibility.

Clauses affected:	⌘	9.2.17, 9.2.20, 9.3.4, 9.3.6 and Appendix A (new)			
Other specs	⌘	**X**	Other core specifications	⌘	25.413 V3.5.0, CR276 25.413 V4.0.0, CR277 25.419 V4.0.0, CR036 25.423 V3.5.0, CR340 25.423 V4.0.0, CR341 25.433 V3.5.0, CR389 25.433 V4.0.0, CR390
affected:			Test specifications		
			O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.2.17 Criticality Diagnostics

For further details on how to use the *Criticality Diagnostics* IE, see Annex A.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Criticality Diagnostics				
>Procedure Code	O		INTEGER (0..255)	Procedure Code is to be used if Criticality Diagnostics is part of Error Indication procedure, and not within the response message of the same procedure that caused the error
>Triggering Message	O		ENUMERATED(initiating message, successful outcome, unsuccessful outcome, outcome)	The Triggering Message is used only if the Criticality Diagnostics is part of Error Indication procedure.
>Procedure Criticality	O		ENUMERATED(reject, ignore, notify)	This Procedure Criticality is used for reporting the Criticality of the Triggering message (Procedure). The value 'ignore' shall never be used.
Information Element Criticality Diagnostics		0 to <maxnoof errors>		
>IE Criticality	M		ENUMERATED(reject, ignore, notify)	The IE Criticality is used for reporting the criticality of the triggering IE. The value 'ignore' shall not be used.
>IE ID	M		INTEGER (0..65535)	The IE Id of the not understood or missing IE
>Repetition Number	O		INTEGER (0~~1~~..255~~6~~)	The *Repetition Number* IE gives • in case of a not understood IE: The number of occurrences of the reported IE up to and including the not understood occurrence • in case of a missing IE: The number of occurrences up to but not including the missing occurrence. Note: All the counted occurrences of the reported IE must have the same topdown hierachical message structure of IEs with assigned criticality above them.~~The repetition number of the not understood IE within the bottom most repetition level identified by the message~~

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Criticality Diagnostics				
				~~structure IE, if applicable~~
>Message Structure	O		9.2.20	The *Message Structure* IE describes the structure where the not understood or missing IE was detected. This IE is included if the not understood IE is not the top level of the message.
>Type of Error	M		ENUMERATED(not understood, missing, …)	

Range bound	Explanation
Maxnooferrors	Maximum no. of IE errors allowed to be reported with a single message. The value for maxnooferrors is 256.

9.2.20 Message Structure

The *Message Structure* IE gives information for each level with assigned criticality in an hierachical message structure from top level down to the lowest level above the reported level for the occured error (reported in the *Information Element Criticality Diagnostics* IE).

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message structure		1 to <maxnooflevels>		The first repetition of the *Message Structure* IE corresponds to the top level of the message. The last repetition of the *Message Structure* IE corresponds to the level above the reported level for the occured error of the message.~~Information given per level with assigned criticality in an hierachical message structure. Given from top level down to the level above the reported level for the occured error (reported in the *Information Element Criticality Diagnostics* IE).~~	GLOBAL	ignore
>IE ID	M		INTEGER (0..65535)	The IE ID of this level's IE containing the not understood or missing IE.	-	
>Repetition Number	O		INTEGER (1..256)	The *Repetition Number* IE gives, if applicable, the number of occurrences of this level's reported IE up to and including the occurrence containing the not understood or missing IE. Note: All the counted occurrences of the reported IE must have the same topdown hierachical message structure of IEs with assigned criticality above them.~~The repetition number of this level's reported IE, if applicable~~	-	

Range bound	Explanation
maxnooflevels	Maximum no. of message levels to report. The value for maxnooflevels is 256.

9.3.4 Information Element Definitions

```
-- **************************************************************
--
-- Information Element Definitions
--
-- **************************************************************


SABP-IEs {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS
    maxRadio-Resource-Loading-List,
    maxFailure-List,
    maxNo-of-Broadcasts-Completed-List,
    maxNrOfErrors,
    maxService-Areas-List,
    maxNrOfLevels,

    id-MessageStructure,
    id-TypeOfError

FROM SABP-Constants

    Criticality,
    ProcedureCode,
    TriggeringMessage,
    ProtocolIE-ID
FROM SABP-CommonDataTypes

    ProtocolExtensionContainer{},

    SABP-PROTOCOL-EXTENSION
FROM SABP-Containers;


-- A

Available-Bandwidth         ::= INTEGER (0..20480)
-- bits/sec

-- B

Broadcast-Message-Content ::= OCTET STRING (SIZE (1246))
```

```
-- This IE is sent from the CN to the RNC containing user information i.e.
-- the message.

-- C

Category ::= ENUMERATED {
    high-priority,
    background-priority,
    normal-priority,
    default-priority,
    ...
}

Cause                   ::= INTEGER {
    parameter-not-recognised                            (0),
    parameter-value-invalid                             (1),
    valid-CN-message-not-identified                     (2),
    service-area-identity-not-valid                     (3),
    unrecognised-message                                (4),
    missing-mandatory-element                           (5),
    rNC-capacity-exceeded                               (6),
    rNC-memory-exceeded                                 (7),
    service-area-broadcast-not-supported                (8),
    service-area-broadcast-not-operational              (9),
    message-reference-already-used                      (10),
    unspecifed-error                                    (11),
    transfer-syntax-error                               (12),
    semantic-error                                      (13),
    message-not-compatible-with-receiver-state          (14),
    abstract-syntax-error-reject                        (15),
    abstract-syntax-error-ignore-and-notify             (16),
    abstract-syntax-error-falsely-constructed-message   (17)
} (0..255)

Criticality-Diagnostics         ::= SEQUENCE {
    procedureCode           ProcedureCode           OPTIONAL,
    triggeringMessage       TriggeringMessage       OPTIONAL,
    procedureCriticality        Criticality         OPTIONAL,
    iEsCriticalityDiagnostics       CriticalityDiagnostics-IE-List  OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { {CriticalityDiagnostics-ExtIEs} } OPTIONAL,
    ...
}

CriticalityDiagnostics-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

CriticalityDiagnostics-IE-List ::= SEQUENCE (SIZE (1..maxNrOfErrors)) OF
    SEQUENCE {
        iECriticality       Criticality,
        iE-ID               ProtocolIE-ID,
        repetitionNumber        RepetitionNumber0       OPTIONAL,
        iE-Extensions           ProtocolExtensionContainer { {CriticalityDiagnostics-IE-List-ExtIEs} } OPTIONAL,
```

```
        ...
    }

CriticalityDiagnostics-IE-List-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    {   ID id-MessageStructure      CRITICALITY ignore      EXTENSION MessageStructure      PRESENCE optional}|-
    {   ID id-TypeOfError           CRITICALITY ignore      EXTENSION TypeOfError           PRESENCE mandatory   },
    ...
}


MessageStructure ::= SEQUENCE (SIZE (1..maxNrOfLevels)) OF
    SEQUENCE {
        iE-ID                   ProtocolIE-ID,
        repetitionNumber        RepetitionNumber1       OPTIONAL,
        iE-Extensions           ProtocolExtensionContainer { {MessageStructure-ExtIEs} } OPTIONAL,
        ...
    }


MessageStructure-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}
```

****** LOTS OF UNAFFECTED ASN.1 DESCRIPTION FROM SECTION 9.3.4 NOT SHOWN ******

```
Recovery-Indication ::= ENUMERATED {
    data-lost,
    data-available
}

RepetitionNumber0           ::= INTEGER(01..2556)

RepetitionNumber1           ::= INTEGER(1..256)


Repetition-Period           ::= INTEGER (1..4096)
-- Each unit represents a repetition of one second to a maximum of
-- once per 4096 seconds (~1 hour).


-- S

Serial-Number               ::= INTEGER (0..65535)


Service-Area-Identifier ::= SEQUENCE {
    plmn-id             OCTET STRING (SIZE (3))
                    -- Digits 0 to 9, two digits per octet.          --
                    -- Each octet encoded 0000 to 1001.              --
                    -- 1111 used as filler                          --
```

```
                    -- Bit 4 to 1 of octet n encoding digit 2n-1.    --
                    -- Bit 8 to 5 of octet n encoding digit 2n.      --
                    -- The PLMN-ID consists of 3 digits from MCC     --
                    -- followed by either a filler plus 2 digits     --
                    -- from MNC (in case of 2 digit MNC) or 3 digits --
                    -- from MNC (in case of 3 digit MNC).            -- ,
    lac             OCTET STRING (SIZE (2))
                    -- 0000 and FFFE not allowed                     -- ,
    sac             OCTET STRING (SIZE (2))
}

-- **TODO** The IE type for these parameters is not known as yet
Service-Areas-List ::= SEQUENCE (SIZE (1..maxService-Areas-List)) OF Service-Area-Identifier



-- T

TypeOfError ::= ENUMERATED {
    not-understood,
    missing,
    ...
}


-- U

-- V

-- W

-- X

-- Y

END
```

9.3.6 Constant Definitions

```
-- **************************************************************
--
-- Constant definitions
--
-- **************************************************************

SABP-Constants {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-Constants (4) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- **************************************************************
--
-- Elementary Procedures
--
-- **************************************************************

id-Write-Replace            INTEGER ::= 0
id-Kill                 INTEGER ::= 1
id-Status-Load-Enquiry          INTEGER ::= 2
id-Status-Message-Query         INTEGER ::= 3
id-Restart-Indication           INTEGER ::= 4
id-Reset                INTEGER ::= 5
id-Failure-Indication           INTEGER ::= 6
id-Error-Indication         INTEGER ::= 7

-- **************************************************************
--
-- IEs
--
-- **************************************************************

id-Broadcast-Message-Content        INTEGER ::= 0
id-Category                 INTEGER ::= 1
id-Cause                INTEGER ::= 2
id-Criticality-Diagnostics  INTEGER ::=3
id-Data-Coding-Scheme           INTEGER ::= 4
id-Failure-List             INTEGER ::= 5
id-Message-Identifier           INTEGER ::= 6
id-New-Serial-Number            INTEGER ::= 7
id-No-of-Broadcasts-Completed-List  INTEGER ::= 8
id-No-of-Broadcasts-Requested       INTEGER ::= 9
id-Old-Serial-Number                INTEGER ::= 10
id-Radio-Resource-Loading-List      INTEGER ::= 11
id-Recovery-Indication          INTEGER ::= 12
```

```
id-Repetition-Period            INTEGER ::= 13
id-Serial-Number            INTEGER ::= 14
id-Service-Areas-List           INTEGER ::= 15
id-MessageStructure             INTEGER ::= 16
id-TypeOfError                  INTEGER ::= 17


-- **************************************************************
--
-- Extension constants
--
-- **************************************************************

-- **************************************************************
--
-- Lists
--
-- **************************************************************

maxRadio-Resource-Loading-List  INTEGER ::= 65535
maxFailure-List             INTEGER ::= 65535
maxNo-of-Broadcasts-Completed-List  INTEGER ::= 65535
maxNrOfErrors               INTEGER ::= 256
maxService-Areas-List           INTEGER ::= 65535

maxProtocolExtensions           INTEGER ::= 65535
maxProtocolIEs              INTEGER ::= 65535
maxNrOfLevels                       INTEGER ::= 256

END
```

Annex A (informative)
Guidelines for Usage of the Criticality Diagnostics IE

A.1 EXAMPLE MESSAGE Layout

Assume the following message format:

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M				YES	reject
A	M				YES	reject
B	M				YES	reject
>E		*1..<maxE>*			EACH	ignore
>>F		*1..<maxF>*			-	
>>>G		*0..3, …*			EACH	ignore
>>H		*1..<maxH>*			EACH	ignore
>>>G		*0..3, …*			EACH	ignore and notify
>>G	M				YES	reject
>>J		*1..<maxJ>*			-	
>>>G		*0..3, …*			EACH	reject
C	M				YES	reject
>K		*1..<maxK>*			EACH	ignore and notify
>>L		*1..<maxL>*			-	
>>>M	O				-	
D	M				YES	reject

Note 1. The IEs F, J, and L do not have assigned criticality. The IEs F, J, and L are consequently realised as the ASN.1 type SEQUENCE OF of "ordinary" ASN.1 type, e.g. INTEGER. On the other hand, the repeatable IEs with assigned criticality are realised as the ASN.1 type SEQUENCE OF of an IE object, e.g. ProtocolIE-Container.

For the corresponding ASN.1 layout, see subclause A.4.

A.2 Example on a Received EXAMPLE MESSAGE

Assume further more that a received message based on the above tabular format is according to the figure below.

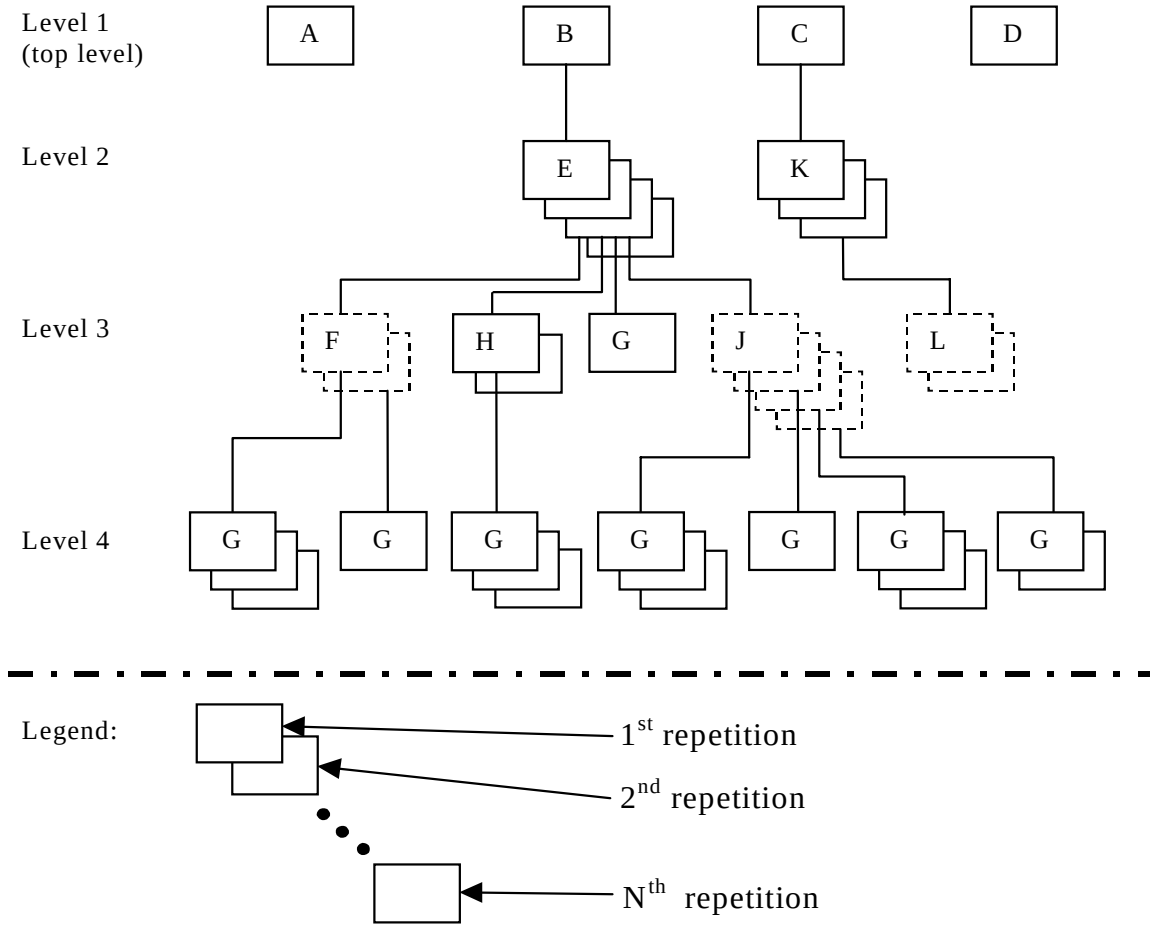


Figure A.1: Example of content of a received SABP message based on the EXAMPLE MESSAGE

A.3 Content of Criticality Diagnostics

A.3.1 Example 1

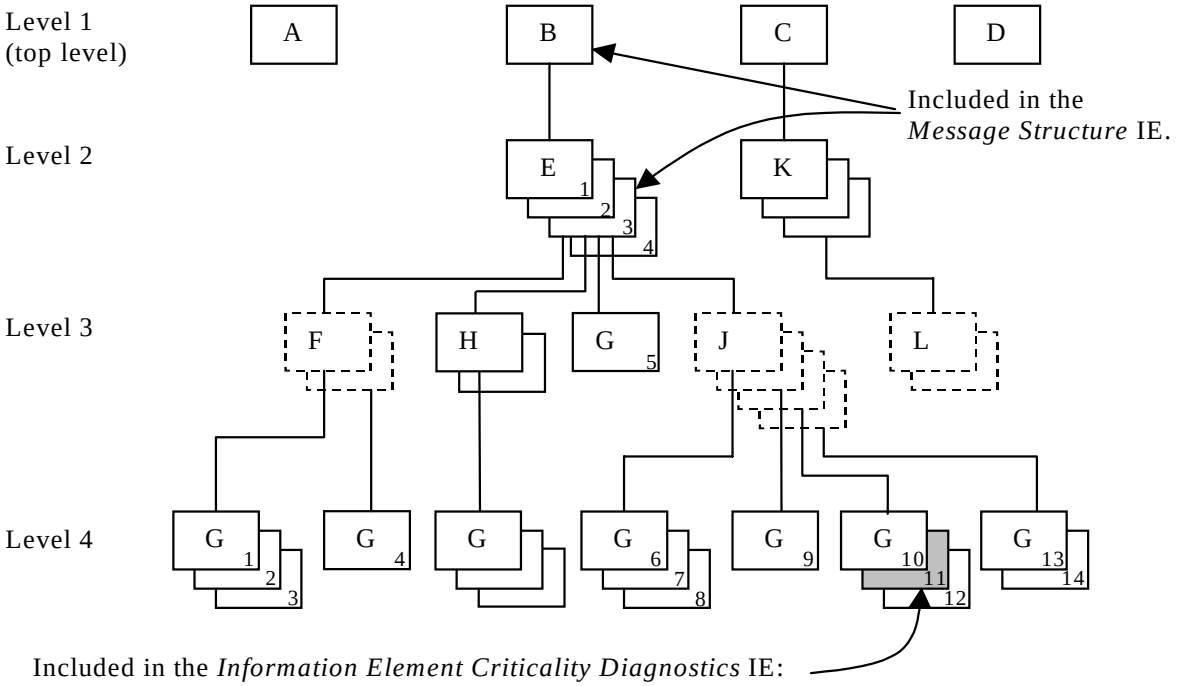


Figure A.2: Example of a received SABP message containing a not comprehended IE

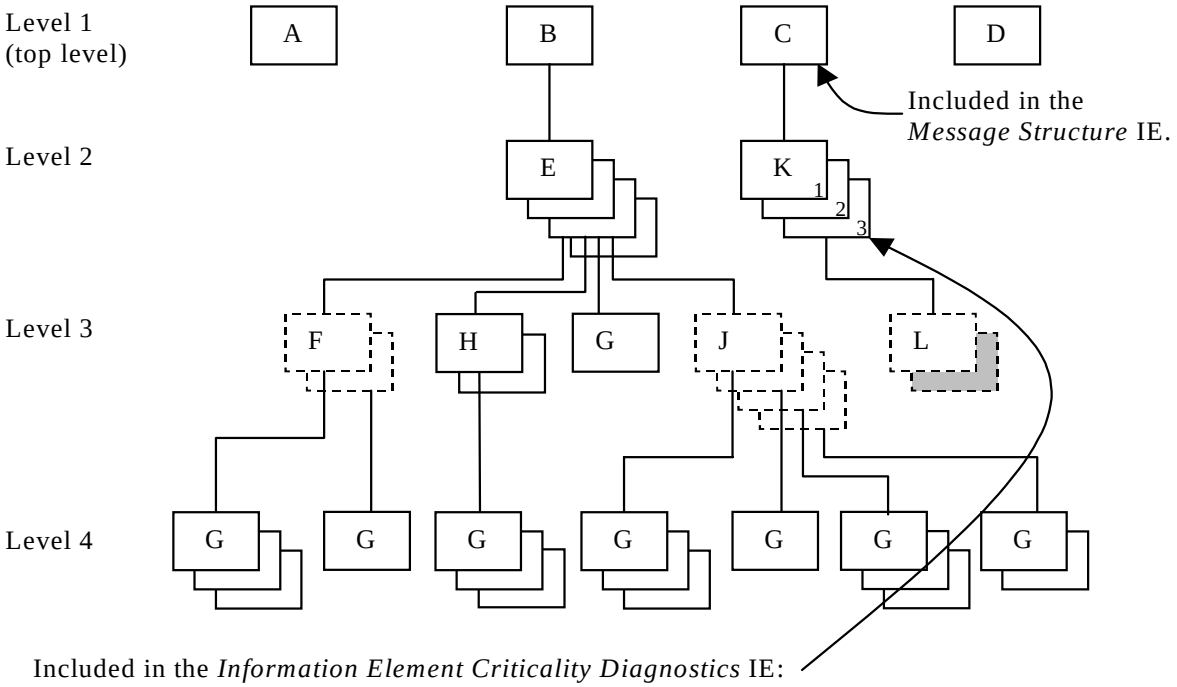
If there is an error within the instance marked as grey in the IE G in the IE J shown in the figure A.2 above, this will be reported within the *Information Element Criticality Diagnostics* IE within the *Criticality Diagnostics* IE as follows:

IE name	Value	Comment
IE Criticality	reject	Criticality for IE on the reported level, i.e. level 4.
IE ID	id-G	IE ID from the reported level, i.e. level 4.
Repetition Number	11	Repetition number on the reported level, i.e. level 4. (Since the IE E (level 2) is the lowest level included in the *Message Structure* IE this is the eleventh occurrence of IE G within the IE E (level 2).
Type of Error	not understood	
Message Structure, *first repetition*		
>IE ID	id-B	IE ID from level 1.
Message Structure, *second repetition*		
>IE ID	id-E	IE ID from the lowest level above the reported level, i.e. level 2.
>Repetition Number	3	Repetition number from the lowest level above the reported level, i.e. level 2.

Note 2. The IE J on level 3 cannot be included in the *Message Structure* IE since they have no criticality of their own.

Note 3. The repetition number of the reported IE indicates the number of repetitions of IE G received up to the detected erroneous repetition, counting all occurrences of the IE G below the same instance of the previous level with assigned criticality (instance 3 of IE E on level 2).

A.3.2 Example 2



Included in the *Information Element Criticality Diagnostics* IE:
a) *IE ID* IE
b) *Repetition Number* IE

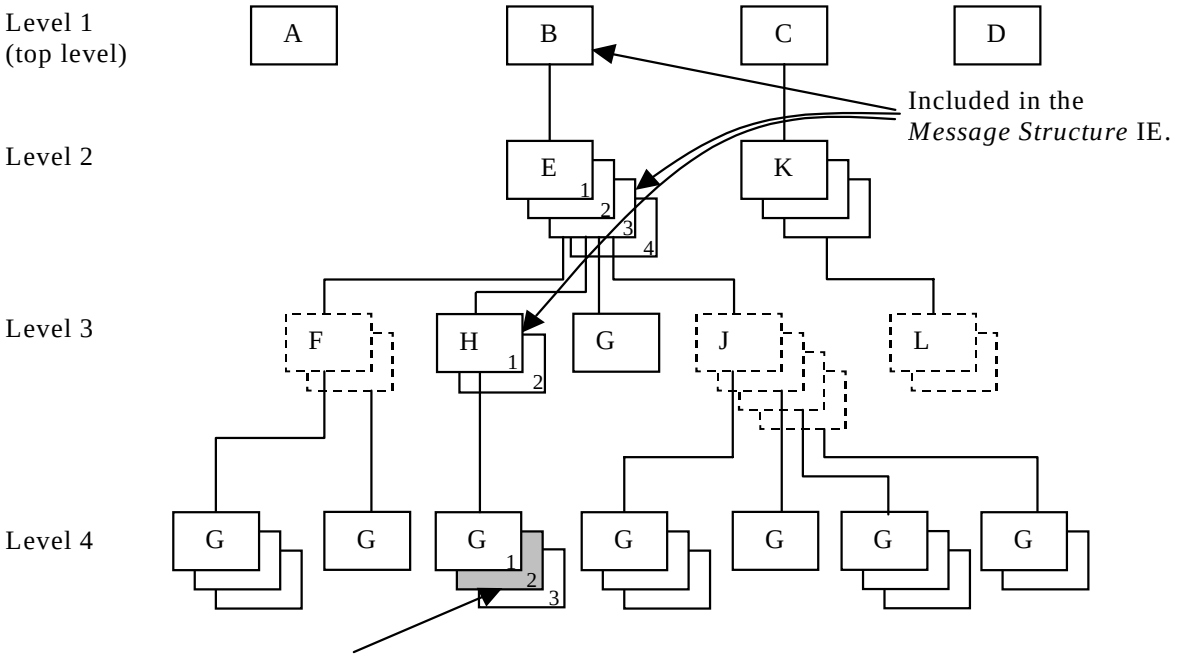
Figure A.3: Example of a received SABP message containing a not comprehended IE

If there is an error within the second instance (marked as grey) in the sequence (IE L in the tabular format) on level 3 below IE K in the structure shown in the figure A.3 above, this will be reported within the *Information Element Criticality Diagnostics* IE within the *Criticality Diagnostics* IE as follows:

IE name	Value	Comment
IE Criticality	ignore and notify	Criticality for IE on the reported level, i.e. level 2.
IE ID	id-K	IE ID from the reported level, i.e. level 2.
Repetition Number	3	Repetition number on the reported level, i.e. level 2.
Type of Error	not understood	
Message Structure, *first repetition*		
>IE ID	id-C	IE ID from the lowest level above the reported level, i.e. level 1.

Note 4. The IE L on level 3 cannot be reported individually included in the *Message Structure* IE since it has no criticality of its own.

A.3.3 Example 3



Included in the *Information Element Criticality Diagnostics* IE:
a) *IE ID* IE
b) *Repetition Number* IE

Figure A.4: Example of a received SABP message containing a not comprehended IE

If there is an error within the instance marked as grey in the IE G in the IE H shown in the figure A.4 above, this will be reported within the *Information Element Criticality Diagnostics* IE within the *Criticality Diagnostics* IE as follows:

IE name	Value	Comment
IE Criticality	reject	Criticality for IE on the reported level, i.e. level 4.
IE ID	id-G	IE ID from the reported level, i.e. level 4.
Repetition Number	2	Repetition number on the reported level, i.e. level 4.
Type of Error	not understood	
Message Structure, *first repetition*		
>IE ID	id-B	IE ID from level 1.
Message Structure, *second repetition*		
>IE ID	id-E	IE ID from level 2.
>Repetition Number	3	Repetition number from level 2.
Message Structure, *third repetition*		
>IE ID	id-H	IE ID from the lowest level above the reported level, i.e. level 3.
>Repetition Number	1	Repetition number from the lowest level above the reported level, i.e. level 3.

Note 5. The repetition number of level 4 indicates the number of repetitions of IE G received up to the detected erroneous repetition, counted below the same instance of the previous level with assigned criticality (instance 1 of IE H on level 3).

A.3.4 Example 4

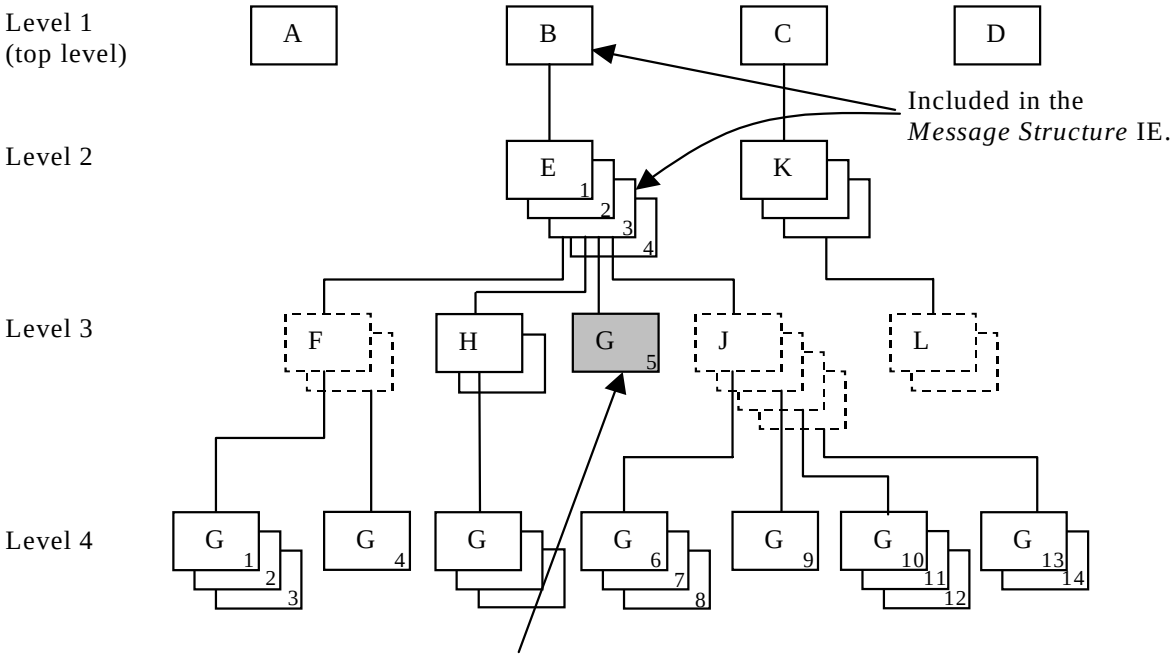


Figure A.5: Example of a received SABP message containing a not comprehended IE

If there is an error within the instance marked as grey in the IE G in the IE E shown in the figure A.5 above, this will be reported within the *Information Element Criticality Diagnostics* IE within the *Criticality Diagnostics* IE as follows:

IE name	Value	Comment
IE Criticality	reject	Criticality for IE on the reported level, i.e. level 3.
IE ID	id-G	IE ID from the reported level, i.e. level 3.
Repetition Number	5	Repetition number on the reported level, i.e. level 3. (Since the IE E (level 2) is the lowest level included in the *Message Structure* IE this is the fifth occurrence of IE G within the IE E (level 2).
Type of Error	not understood	
Message Structure, *first repetition*		
>IE ID	id-B	IE ID from level 1.
Message Structure, *second repetition*		
>IE ID	id-E	IE ID from the lowest level above the reported level, i.e. level 2.
>Repetition Number	3	Repetition number from the lowest level above the reported level, i.e. level 2.

Note 6. The repetition number of the reported IE indicates the number of repetitions of IE G received up to the detected erroneous repetition, counting all occurrences of the IE G below the same instance of the previous level with assigned criticality (instance 3 of IE E on level 2).

A.3.5 Example 5

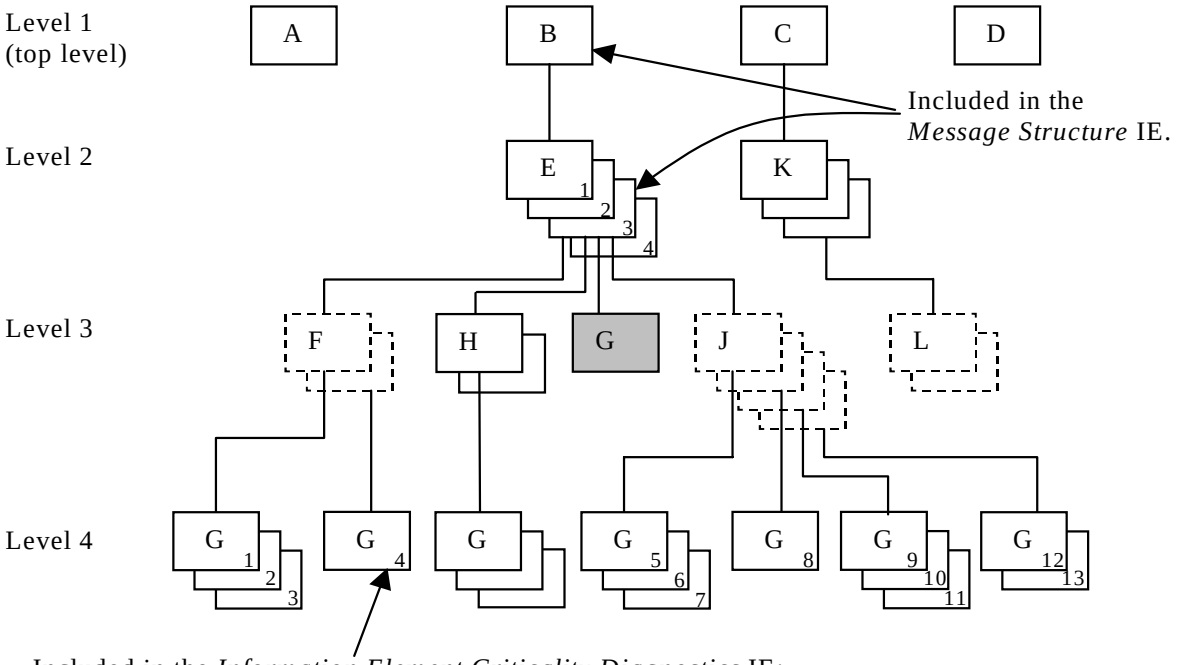


Figure A.6: Example of a received SABP message with a missing IE

If the instance marked as grey in the IE G in the IE E shown in the figure A.6 above, is missing this will be reported within the *Information Element Criticality Diagnostics* IE within the *Criticality Diagnostics* IE as follows:

IE name	Value	Comment
IE Criticality	reject	Criticality for IE on the reported level, i.e. level 3.
IE ID	id-G	IE ID from the reported level, i.e. level 3.
Repetition Number	4	Repetition number up to the missing IE on the reported level, i.e. level 3. (Since the IE E (level 2) is the lowest level included in the *Message Structure* IE there have been four occurrences of IE G within the IE E (level 2) up to the missing occurrence.
Type of Error	missing	
Message Structure, *first repetition*		
>IE ID	id-B	IE ID from level 1.
Message Structure, *second repetition*		
>IE ID	id-E	IE ID from the lowest level above the reported level, i.e. level 2.
>Repetition Number	3	Repetition number from the lowest level above the reported level, i.e. level 2.

Note 7. The repetition number of the reported IE indicates the number of repetitions of IE G received up to but not including the missing occurrence, counting all occurrences of the IE G below the same instance of the previous level with assigned criticality (instance 3 of IE E on level 2).

A.4 ASN.1 of EXAMPLE MESSAGE

```
ExampleMessage ::= SEQUENCE {
    ProtocolIEs         ProtocolIE-Container        {{ExampleMessage-IEs}},
    ProtocolExtensions  ProtocolExtensionContainer  {{ExampleMessage-Extensions}}   OPTIONAL,
    ...
}

ExampleMessage-IEs SABP-PROTOCOL-IES ::= {
    { ID id-A   CRITICALITY reject  TYPE A  PRESENCE mandatory} |
    { ID id-B   CRITICALITY reject  TYPE B  PRESENCE mandatory} |
    { ID id-C   CRITICALITY reject  TYPE C  PRESENCE mandatory} |
    { ID id-D   CRITICALITY reject  TYPE D  PRESENCE mandatory} ,
    ...
}

B ::= SEQUENCE {
    e               E-List,
    iE-Extensions   ProtocolExtensionContainer { {B-ExtIEs} }   OPTIONAL,
    ...
}

B-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

E-List ::= SEQUENCE (SIZE (1..maxE)) OF ProtocolIE-Container { {E-IEs} }

E-IEs SABP-PROTOCOL-IES ::= {
    { ID id-E   CRITICALITY ignore  TYPE E  PRESENCE mandatory  },
    ...
}

E ::= SEQUENCE {
    f               F-List,
    h               H-List,
    g               G-List1,
    j               J-List,
    iE-Extensions   ProtocolExtensionContainer { {E-ExtIEs} }   OPTIONAL,
    ...
}

E-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

F-List ::= SEQUENCE (SIZE (1..maxF)) OF F

F ::= SEQUENCE {
    g               G-List2 OPTIONAL,
    iE-Extensions   ProtocolExtensionContainer { {F-ExtIEs} }   OPTIONAL,
    ...
}

F-ExtIEs    SABP-PROTOCOL-EXTENSION ::= {
    ...
}

G-List2 ::= SEQUENCE (SIZE (1..3, ...)) OF ProtocolIE-Container { {G2-IEs} }

G2-IEs SABP-PROTOCOL-IES ::= {
    { ID id-G   CRITICALITY ignore  TYPE G  PRESENCE mandatory  },
    ...
}

H-List ::= SEQUENCE (SIZE (1..maxH)) OF ProtocolIE-Container { {H-IEs} }

H-IEs SABP-PROTOCOL-IES ::= {
    { ID id-H   CRITICALITY ignore  TYPE H  PRESENCE mandatory  },
    ...
}

H ::= SEQUENCE {
    g               G-List3 OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { {H-ExtIEs} } OPTIONAL,
    ...
}

H-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
```

```
    ...
}

G-List3 ::= SEQUENCE (SIZE (1..3, ...)) OF ProtocolIE-Container { {G3-IEs} }

G3-IEs SABP-PROTOCOL-IES ::= {
    { ID id-G   CRITICALITY notify  TYPE G  PRESENCE mandatory  },
    ...
}

G-List1 ::= ProtocolIE-Container { {G1-IEs} }

G1-IEs SABP-PROTOCOL-IES ::= {
    { ID id-G   CRITICALITY reject  TYPE G  PRESENCE mandatory  },
    ...
}

J-List ::= SEQUENCE (SIZE (1..maxJ)) OF J

J ::= SEQUENCE {
    g               G-List4 OPTIONAL,
    iE-Extensions   ProtocolExtensionContainer { {J-ExtIEs} }   OPTIONAL,
    ...
}

J-ExtIEs    SABP-PROTOCOL-EXTENSION ::= {
    ...
}

G-List4 ::= SEQUENCE (SIZE (1..3, ...)) OF ProtocolIE-Container { {G4-IEs} }

G4-IEs SABP-PROTOCOL-IES ::= {
    { ID id-G   CRITICALITY reject  TYPE G  PRESENCE mandatory  },
    ...
}

C ::= SEQUENCE {
    k               K-List,
    iE-Extensions   ProtocolExtensionContainer { {C-ExtIEs} }   OPTIONAL,
    ...
}

C-ExtIEsA -PROTOCOL-EXTENSION ::= {
    ...
}

K-List ::= SEQUENCE (SIZE (1..maxK)) OF ProtocolIE-Container { {K-IEs} }

K-IEs SABP-PROTOCOL-IES ::= {
    { ID id-K   CRITICALITY notify  TYPE K  PRESENCE mandatory  }
    ...
}

K ::= SEQUENCE {
    l               L-List,
    iE-Extensions   ProtocolExtensionContainer { {K-ExtIEs} }   OPTIONAL,
    ...
}

K-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

L-List ::= SEQUENCE (SIZE (1..maxL)) OF L

L ::= SEQUENCE {
    m               M   OPTIONAL,
    iE-Extensions   ProtocolExtensionContainer { {L-ExtIEs} }   OPTIONAL,
    ...
}

L-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

ExampleMessage-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}
```

3GPP TSG-RAN WG3 Meeting #21
Busan, Korea, May 21st – 25th, 2001

R3-011861

CR-Form-v3

CHANGE REQUEST

⌘ **25.419** **CR** **036** ⌘ rev **1** ⌘ Current version: **4.0.0** ⌘

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

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

Title:	⌘	Corrections and introduction of an appendix for usage of *Criticality Diagnostics* IE
Source:	⌘	R-WG3
Work item code:	⌘	TEI
Date:	⌘	2001-05-16
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change: ⌘ The *Criticality Diagnostics* IE cannot tell if a reported error is due to a not understood or a missing IE. This needs to be added.
Also the usage of Criticality Diagnostics IE needs to be made easier to understand. An informative annex is thus added.

Summary of change: ⌘ Type of Error is added to the *Criticality Diagnostics* IE and an informative appendix with examples of the usage of *Criticality Diagnostics* IE is also added.

Changes since R3 #20:

- The semantics of the *Repetition Number* IE in the *Criticality Diagnostics* IE and *Message Structure* IE have been improved.
- One figure per example have been included in the Appendix.
- One example on “missing IE” has been included in the Appendix.
- The *Type of Error* IE has been added in the *Information Element Criticality Diagnostics* IE in the *Criticality Diagnostics* IE to allow the reporting of multiple causes to the inclusion of the Criticality Diagnostics IE.
  The main reason for reporting Criticality Diagnostics can be indicated by the *Cause* IE, but the reason may be different for different reported IEs. E.g the main reason my be a missing IE (cause=“Abstract Syntax Error (Falsely Constructed Message)”) but still there may be a not understood IE reported as well (cause=”Abstract Syntax Error (Reject)” or ”Abstract Syntax Error (Ignore and Notify)”).
- The value range for the *Repetition Number* IE in the *Criticality Diagnostics* IE has been changed from (1..256) to (0..255, …).
- The value range for the *Repetition Number* IE in the *Message Structure* IE has been changed from (1..256) to (1..256, …).

Information for revision 1:

It was recognised, that the addition of the extension marker for the *Repetition Number* IE in the *Criticality Diagnostics* IE and the *Message Structure* IE will lead to a non backwards compatible change, as it e.g. causes an transfer syntax (decoder) error if this IE is received by a node of an version which did not

		implemented this change. As an outcome one correction in ASN.1+removal of ellipsis from the repetition number were performed.
Consequences if not approved:	⌘	It will not be possible to know what type of error that is reported, making it difficult to take appropriate actions. The proposed change is not backwards compatible due to: • The changes done to the value range for Repetition Number. • The introduction of the possibility to report missing IEs, thus making received information ambiguous for a receiver implemented according to Criticality Diagnostics without this possibility.

Clauses affected:	⌘	9.2.17, 9.2.20, 9.3.4, 9.3.6 and Appendix A (new)			
Other specs	⌘	X	Other core specifications	⌘	25.413 V3.5.0, CR276 25.413 V4.0.0, CR277 25.419 V3.4.0, CR035 25.423 V3.5.0, CR340 25.423 V4.0.0, CR341 25.433 V3.5.0, CR389 25.433 V4.0.0, CR390
affected:			Test specifications		
			O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.2.17 Criticality Diagnostics

For further details on how to use the *Criticality Diagnostics* IE, see Annex A.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Criticality Diagnostics				
>Procedure Code	O		INTEGER (0..255)	Procedure Code is to be used if Criticality Diagnostics is part of Error Indication procedure, and not within the response message of the same procedure that caused the error
>Triggering Message	O		ENUMERATED(initiating message, successful outcome, unsuccessful outcome, outcome)	The Triggering Message is used only if the Criticality Diagnostics is part of Error Indication procedure.
>Procedure Criticality	O		ENUMERATED(reject, ignore, notify)	This Procedure Criticality is used for reporting the Criticality of the Triggering message (Procedure). The value 'ignore' shall never be used.
Information Element Criticality Diagnostics		0 to <maxnoof errors>		
>IE Criticality	M		ENUMERATED(reject, ignore, notify)	The IE Criticality is used for reporting the criticality of the triggering IE. The value 'ignore' shall not be used.
>IE ID	M		INTEGER (0..65535)	The IE Id of the not understood or missing IE
>Repetition Number	O		INTEGER (0~~1~~..255~~6~~)	The *Repetition Number* IE gives • in case of a not understood IE: The number of occurrences of the reported IE up to and including the not understood occurrence • in case of a missing IE: The number of occurrences up to but not including the missing occurrence. Note: All the counted occurrences of the reported IE must have the same topdown hierachical message structure of IEs with assigned criticality above them.~~The repetition number of the not understood IE within the bottom most repetition level identified by the message~~

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Criticality Diagnostics				
				~~structure IE, if applicable~~
>Message Structure	O		9.2.20	The *Message Structure* IE describes the structure where the not understood or missing IE was detected. This IE is included if the not understood IE is not the top level of the message.
>Type of Error	M		ENUMERATED(not understood, missing, …)	

Range bound	Explanation
Maxnooferrors	Maximum no. of IE errors allowed to be reported with a single message. The value for maxnooferrors is 256.

9.2.20 Message Structure

The *Message Structure* IE gives information for each level with assigned criticality in an hierachical message structure from top level down to the lowest level above the reported level for the occured error (reported in the *Information Element Criticality Diagnostics* IE).

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message structure		1 to <maxnooflevels>		The first repetition of the *Message Structure* IE corresponds to the top level of the message. The last repetition of the *Message Structure* IE corresponds to the level above the reported level for the occured error of the message.~~Information given per level with assigned criticality in an hierachical message structure. Given from top level down to the level above the reported level for the occured error (reported in the *Information Element Criticality Diagnostics* IE).~~	GLOBAL	ignore
>IE ID	M		INTEGER (0..65535)	The IE ID of this level's IE containing the not understood or missing IE.	-	
>Repetition Number	O		INTEGER (1..256)	The *Repetition Number* IE gives, if applicable, the number of occurrences of this level's reported IE up to and including the occurrence containing the not understood or missing IE. Note: All the counted occurrences of the reported IE must have the same topdown hierachical message structure of IEs with assigned criticality above them.~~The repetition number of this level's reported IE, if applicable~~	-	

Range bound	Explanation
maxnooflevels	Maximum no. of message levels to report. The value for maxnooflevels is 256.

9.3.4 Information Element Definitions

```
-- **************************************************************
--
-- Information Element Definitions
--
-- **************************************************************


SABP-IEs {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS
    maxRadio-Resource-Loading-List,
    maxFailure-List,
    maxNo-of-Broadcasts-Completed-List,
    maxNrOfErrors,
    maxService-Areas-List,
    maxNrOfLevels,

    id-MessageStructure,
    id-TypeOfError

FROM SABP-Constants

    Criticality,
    ProcedureCode,
    TriggeringMessage,
    ProtocolIE-ID
FROM SABP-CommonDataTypes

    ProtocolExtensionContainer{},

    SABP-PROTOCOL-EXTENSION
FROM SABP-Containers;


-- A

Available-Bandwidth         ::= INTEGER (0..20480)
-- bits/sec

-- B

Broadcast-Message-Content ::= OCTET STRING (SIZE (1246))
```

```
-- This IE is sent from the CN to the RNC containing user information i.e.
-- the message.

-- C

Category ::= ENUMERATED {
    high-priority,
    background-priority,
    normal-priority,
    default-priority,
    ...
}

Cause                   ::= INTEGER {
    parameter-not-recognised                            (0),
    parameter-value-invalid                             (1),
    valid-CN-message-not-identified                     (2),
    service-area-identity-not-valid                     (3),
    unrecognised-message                                (4),
    missing-mandatory-element                           (5),
    rNC-capacity-exceeded                               (6),
    rNC-memory-exceeded                                 (7),
    service-area-broadcast-not-supported                (8),
    service-area-broadcast-not-operational              (9),
    message-reference-already-used                      (10),
    unspecifed-error                                    (11),
    transfer-syntax-error                               (12),
    semantic-error                                      (13),
    message-not-compatible-with-receiver-state          (14),
    abstract-syntax-error-reject                        (15),
    abstract-syntax-error-ignore-and-notify             (16),
    abstract-syntax-error-falsely-constructed-message   (17)
} (0..255)

Criticality-Diagnostics         ::= SEQUENCE {
    procedureCode           ProcedureCode           OPTIONAL,
    triggeringMessage       TriggeringMessage       OPTIONAL,
    procedureCriticality        Criticality         OPTIONAL,
    iEsCriticalityDiagnostics       CriticalityDiagnostics-IE-List  OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { {CriticalityDiagnostics-ExtIEs} } OPTIONAL,
    ...
}

CriticalityDiagnostics-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

CriticalityDiagnostics-IE-List ::= SEQUENCE (SIZE (1..maxNrOfErrors)) OF
    SEQUENCE {
        iECriticality       Criticality,
        iE-ID               ProtocolIE-ID,
        repetitionNumber        RepetitionNumber0       OPTIONAL,
        iE-Extensions           ProtocolExtensionContainer { {CriticalityDiagnostics-IE-List-ExtIEs} } OPTIONAL,
```

```
        ...
    }

CriticalityDiagnostics-IE-List-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    {   ID id-MessageStructure      CRITICALITY ignore      EXTENSION MessageStructure      PRESENCE optional}|
    {   ID id-TypeOfError           CRITICALITY ignore      EXTENSION TypeOfError           PRESENCE mandatory   },
    ...
}


MessageStructure ::= SEQUENCE (SIZE (1..maxNrOfLevels)) OF
    SEQUENCE {
        iE-ID                   ProtocolIE-ID,
        repetitionNumber        RepetitionNumber1       OPTIONAL,
        iE-Extensions           ProtocolExtensionContainer { {MessageStructure-ExtIEs} } OPTIONAL,
        ...
    }


MessageStructure-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}
```

****** LOTS OF UNAFFECTED ASN.1 DESCRIPTION FROM SECTION 9.3.4 NOT SHOWN ******

```
Recovery-Indication ::= ENUMERATED {
    data-lost,
    data-available
}

RepetitionNumber0           ::= INTEGER(01..2556)

RepetitionNumber1           ::= INTEGER(1..256)

Repetition-Period           ::= INTEGER (1..4096)
-- Each unit represents a repetition of one second to a maximum of
-- once per 4096 seconds (~1 hour).


-- S

Serial-Number               ::= INTEGER (0..65535)


Service-Area-Identifier ::= SEQUENCE {
    plmn-id             OCTET STRING (SIZE (3))
                    -- Digits 0 to 9, two digits per octet.          --
                    -- Each octet encoded 0000 to 1001.              --
                    -- 1111 used as filler                           --
                    -- Bit 4 to 1 of octet n encoding digit 2n-1.    --
                    -- Bit 8 to 5 of octet n encoding digit 2n.      --
```

```
                    -- The PLMN-ID consists of 3 digits from MCC     --
                    -- followed by either a filler plus 2 digits     --
                    -- from MNC (in case of 2 digit MNC) or 3 digits --
                    -- from MNC (in case of 3 digit MNC).            -- ,
    lac             OCTET STRING (SIZE (2))
                    -- 0000 and FFFE not allowed                     -- ,
    sac             OCTET STRING (SIZE (2))
}

-- **TODO** The IE type for these parameters is not known as yet
Service-Areas-List ::= SEQUENCE (SIZE (1..maxService-Areas-List)) OF Service-Area-Identifier



-- T

TypeOfError ::= ENUMERATED {
    not-understood,
    missing,
    ...
}

-- U

-- V

-- W

-- X

-- Y

END
```

9.3.6 Constant Definitions

```
-- **************************************************************
--
-- Constant definitions
--
-- **************************************************************

SABP-Constants {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-Constants (4) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- **************************************************************
--
-- Elementary Procedures
--
-- **************************************************************

id-Write-Replace            INTEGER ::= 0
id-Kill                 INTEGER ::= 1
id-Status-Load-Enquiry          INTEGER ::= 2
id-Status-Message-Query         INTEGER ::= 3
id-Restart-Indication           INTEGER ::= 4
id-Reset                INTEGER ::= 5
id-Failure-Indication           INTEGER ::= 6
id-Error-Indication         INTEGER ::= 7

-- **************************************************************
--
-- IEs
--
-- **************************************************************

id-Broadcast-Message-Content        INTEGER ::= 0
id-Category                 INTEGER ::= 1
id-Cause                INTEGER ::= 2
id-Criticality-Diagnostics  INTEGER ::=3
id-Data-Coding-Scheme           INTEGER ::= 4
id-Failure-List             INTEGER ::= 5
id-Message-Identifier           INTEGER ::= 6
id-New-Serial-Number            INTEGER ::= 7
id-No-of-Broadcasts-Completed-List  INTEGER ::= 8
id-No-of-Broadcasts-Requested       INTEGER ::= 9
id-Old-Serial-Number                INTEGER ::= 10
id-Radio-Resource-Loading-List      INTEGER ::= 11
id-Recovery-Indication          INTEGER ::= 12
```

```
id-Repetition-Period            INTEGER ::= 13
id-Serial-Number            INTEGER ::= 14
id-Service-Areas-List           INTEGER ::= 15
id-MessageStructure             INTEGER ::= 16
id-TypeOfError                  INTEGER ::= 17


-- **************************************************************
--
-- Extension constants
--
-- **************************************************************

-- **************************************************************
--
-- Lists
--
-- **************************************************************

maxRadio-Resource-Loading-List  INTEGER ::= 65535
maxFailure-List             INTEGER ::= 65535
maxNo-of-Broadcasts-Completed-List  INTEGER ::= 65535
maxNrOfErrors               INTEGER ::= 256
maxService-Areas-List           INTEGER ::= 65535

maxProtocolExtensions           INTEGER ::= 65535
maxProtocolIEs              INTEGER ::= 65535
maxNrOfLevels                       INTEGER ::= 256

END
```

Annex A (informative)
Guidelines for Usage of the Criticality Diagnostics IE

A.1 EXAMPLE MESSAGE Layout

Assume the following message format:

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message Type	M				YES	reject
A	M				YES	reject
B	M				YES	reject
>E		*1..<maxE>*			EACH	ignore
>>F		*1..<maxF>*			-	
>>>G		*0..3, …*			EACH	ignore
>>H		*1..<maxH>*			EACH	ignore
>>>G		*0..3, …*			EACH	ignore and notify
>>G	M				YES	reject
>>J		*1..<maxJ>*			-	
>>>G		*0..3, …*			EACH	reject
C	M				YES	reject
>K		*1..<maxK>*			EACH	ignore and notify
>>L		*1..<maxL>*			-	
>>>M	O				-	
D	M				YES	reject

Note 1. The IEs F, J, and L do not have assigned criticality. The IEs F, J, and L are consequently realised as the ASN.1 type SEQUENCE OF of "ordinary" ASN.1 type, e.g. INTEGER. On the other hand, the repeatable IEs with assigned criticality are realised as the ASN.1 type SEQUENCE OF of an IE object, e.g. ProtocolIE-Container.

For the corresponding ASN.1 layout, see subclause A.4.

A.2 Example on a Received EXAMPLE MESSAGE

Assume further more that a received message based on the above tabular format is according to the figure below.

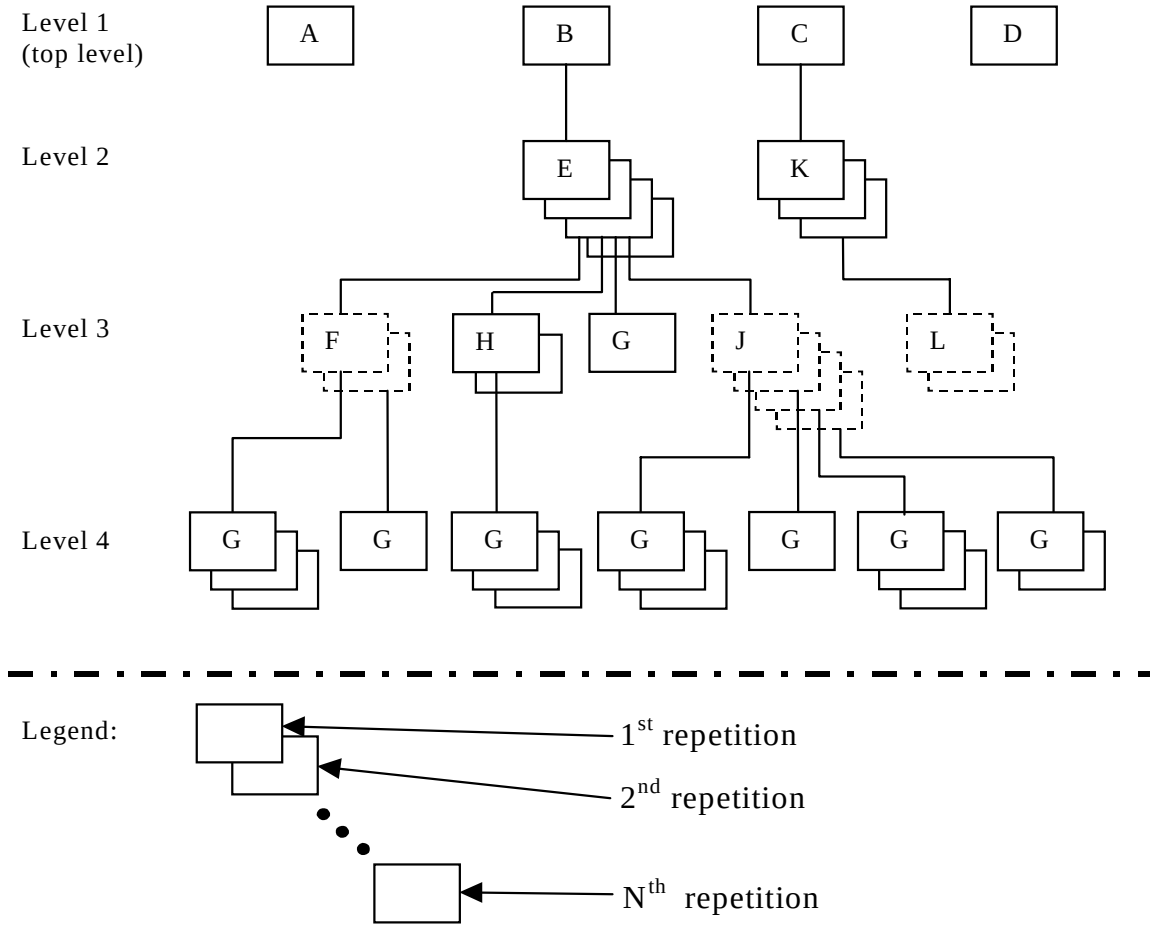


Figure A.1: Example of content of a received SABP message based on the EXAMPLE MESSAGE

A.3 Content of Criticality Diagnostics

A.3.1 Example 1

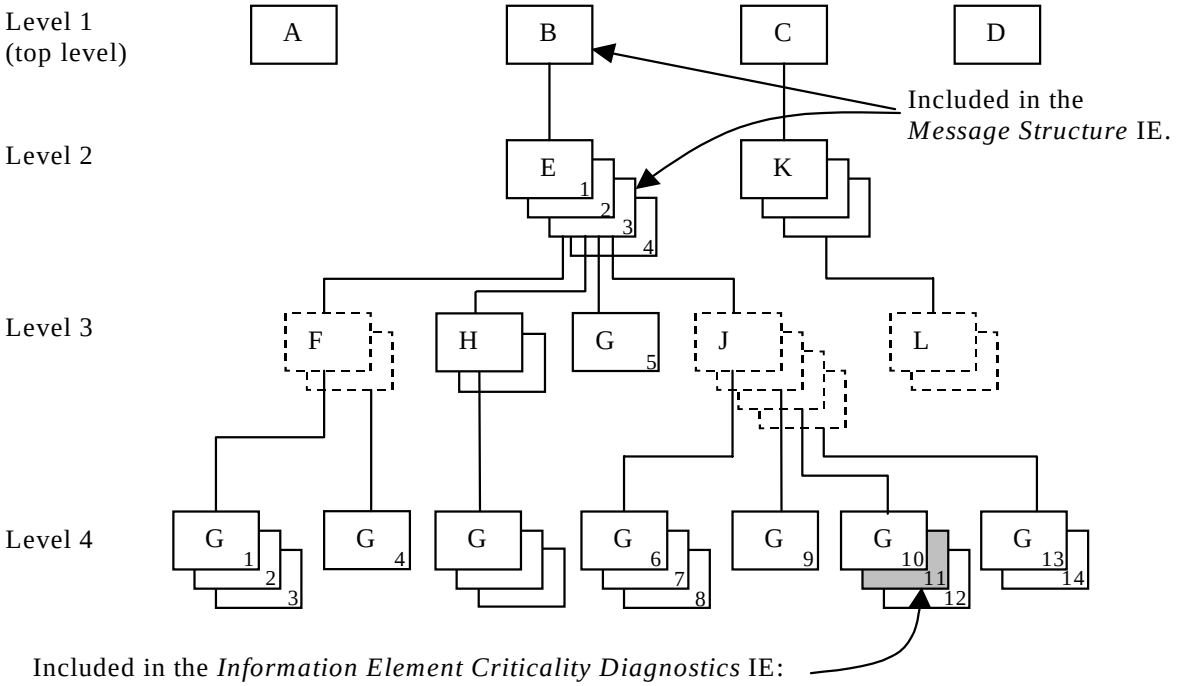


Figure A.2: Example of a received SABP message containing a not comprehended IE

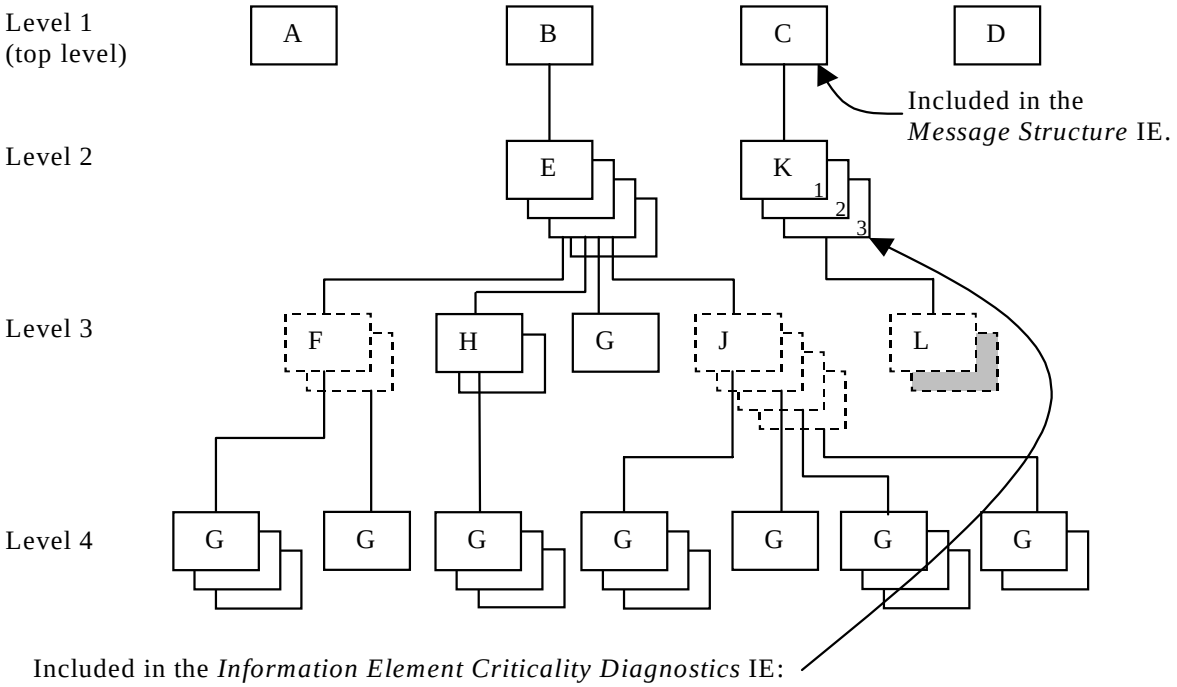
If there is an error within the instance marked as grey in the IE G in the IE J shown in the figure A.2 above, this will be reported within the *Information Element Criticality Diagnostics* IE within the *Criticality Diagnostics* IE as follows:

IE name	Value	Comment
IE Criticality	reject	Criticality for IE on the reported level, i.e. level 4.
IE ID	id-G	IE ID from the reported level, i.e. level 4.
Repetition Number	11	Repetition number on the reported level, i.e. level 4. (Since the IE E (level 2) is the lowest level included in the *Message Structure* IE this is the eleventh occurrence of IE G within the IE E (level 2).
Type of Error	not understood	
Message Structure, *first repetition*		
>IE ID	id-B	IE ID from level 1.
Message Structure, *second repetition*		
>IE ID	id-E	IE ID from the lowest level above the reported level, i.e. level 2.
>Repetition Number	3	Repetition number from the lowest level above the reported level, i.e. level 2.

Note 2. The IE J on level 3 cannot be included in the *Message Structure* IE since they have no criticality of their own.

Note 3. The repetition number of the reported IE indicates the number of repetitions of IE G received up to the detected erroneous repetition, counting all occurrences of the IE G below the same instance of the previous level with assigned criticality (instance 3 of IE E on level 2).

A.3.2 Example 2



Included in the *Information Element Criticality Diagnostics* IE:
a) *IE ID* IE
b) *Repetition Number* IE

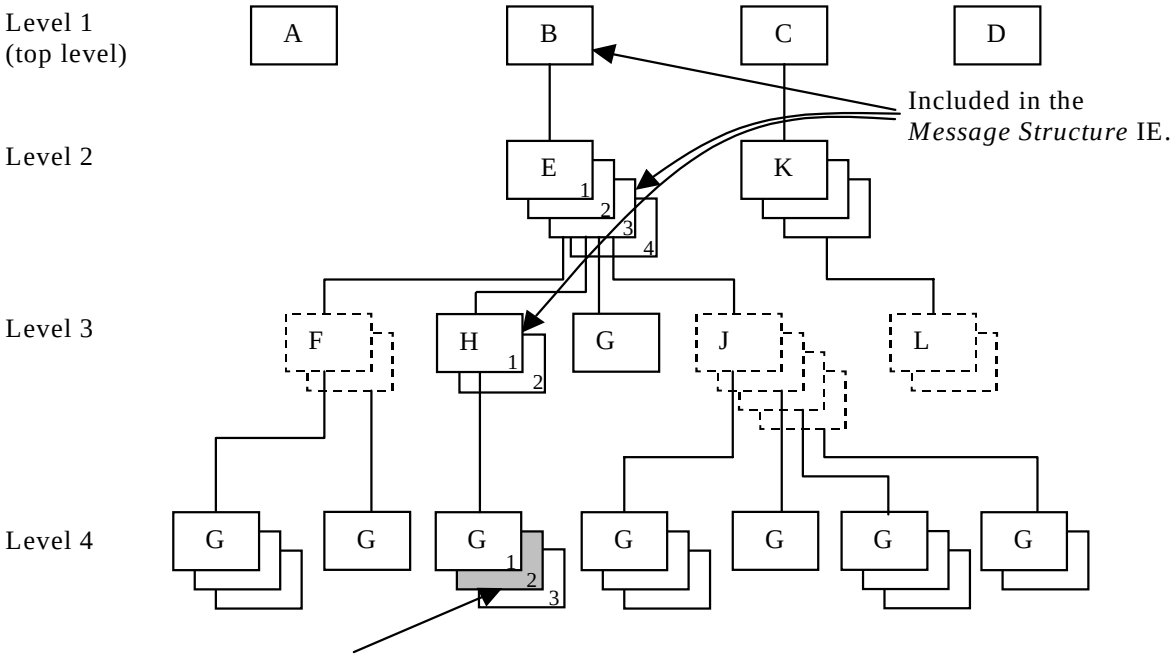
Figure A.3: Example of a received SABP message containing a not comprehended IE

If there is an error within the second instance (marked as grey) in the sequence (IE L in the tabular format) on level 3 below IE K in the structure shown in the figure A.3 above, this will be reported within the *Information Element Criticality Diagnostics* IE within the *Criticality Diagnostics* IE as follows:

IE name	Value	Comment
IE Criticality	ignore and notify	Criticality for IE on the reported level, i.e. level 2.
IE ID	id-K	IE ID from the reported level, i.e. level 2.
Repetition Number	3	Repetition number on the reported level, i.e. level 2.
Type of Error	not understood	
Message Structure, *first repetition*		
>IE ID	id-C	IE ID from the lowest level above the reported level, i.e. level 1.

Note 4. The IE L on level 3 cannot be reported individually included in the *Message Structure* IE since it has no criticality of its own.

A.3.3 Example 3



Included in the *Information Element Criticality Diagnostics* IE:
a) *IE ID* IE
b) *Repetition Number* IE

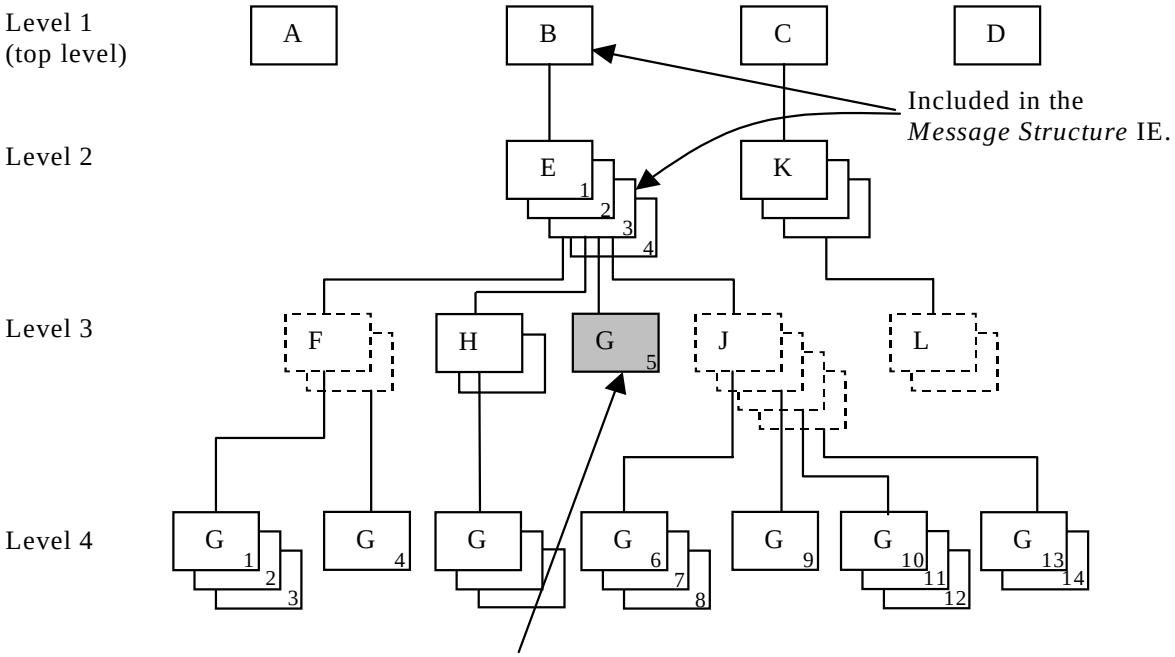
Figure A.4: Example of a received SABP message containing a not comprehended IE

If there is an error within the instance marked as grey in the IE G in the IE H shown in the figure A.4 above, this will be reported within the *Information Element Criticality Diagnostics* IE within the *Criticality Diagnostics* IE as follows:

IE name	Value	Comment
IE Criticality	reject	Criticality for IE on the reported level, i.e. level 4.
IE ID	id-G	IE ID from the reported level, i.e. level 4.
Repetition Number	2	Repetition number on the reported level, i.e. level 4.
Type of Error	not understood	
Message Structure, *first repetition*		
>IE ID	id-B	IE ID from level 1.
Message Structure, *second repetition*		
>IE ID	id-E	IE ID from level 2.
>Repetition Number	3	Repetition number from level 2.
Message Structure, *third repetition*		
>IE ID	id-H	IE ID from the lowest level above the reported level, i.e. level 3.
>Repetition Number	1	Repetition number from the lowest level above the reported level, i.e. level 3.

Note 5. The repetition number of level 4 indicates the number of repetitions of IE G received up to the detected erroneous repetition, counted below the same instance of the previous level with assigned criticality (instance 1 of IE H on level 3).

A.3.4 Example 4



Included in the *Information Element Criticality Diagnostics* IE:

a) *IE ID* IE

b) *Repetition Number* IE

Figure A.5: Example of a received SABP message containing a not comprehended IE

If there is an error within the instance marked as grey in the IE G in the IE E shown in the figure A.5 above, this will be reported within the *Information Element Criticality Diagnostics* IE within the *Criticality Diagnostics* IE as follows:

IE name	Value	Comment
IE Criticality	reject	Criticality for IE on the reported level, i.e. level 3.
IE ID	id-G	IE ID from the reported level, i.e. level 3.
Repetition Number	5	Repetition number on the reported level, i.e. level 3. (Since the IE E (level 2) is the lowest level included in the *Message Structure* IE this is the fifth occurrence of IE G within the IE E (level 2).
Type of Error	not understood	
Message Structure, *first repetition*		
>IE ID	id-B	IE ID from level 1.
Message Structure, *second repetition*		
>IE ID	id-E	IE ID from the lowest level above the reported level, i.e. level 2.
>Repetition Number	3	Repetition number from the lowest level above the reported level, i.e. level 2.

Note 6. The repetition number of the reported IE indicates the number of repetitions of IE G received up to the detected erroneous repetition, counting all occurrences of the IE G below the same instance of the previous level with assigned criticality (instance 3 of IE E on level 2).

A.3.5 Example 5

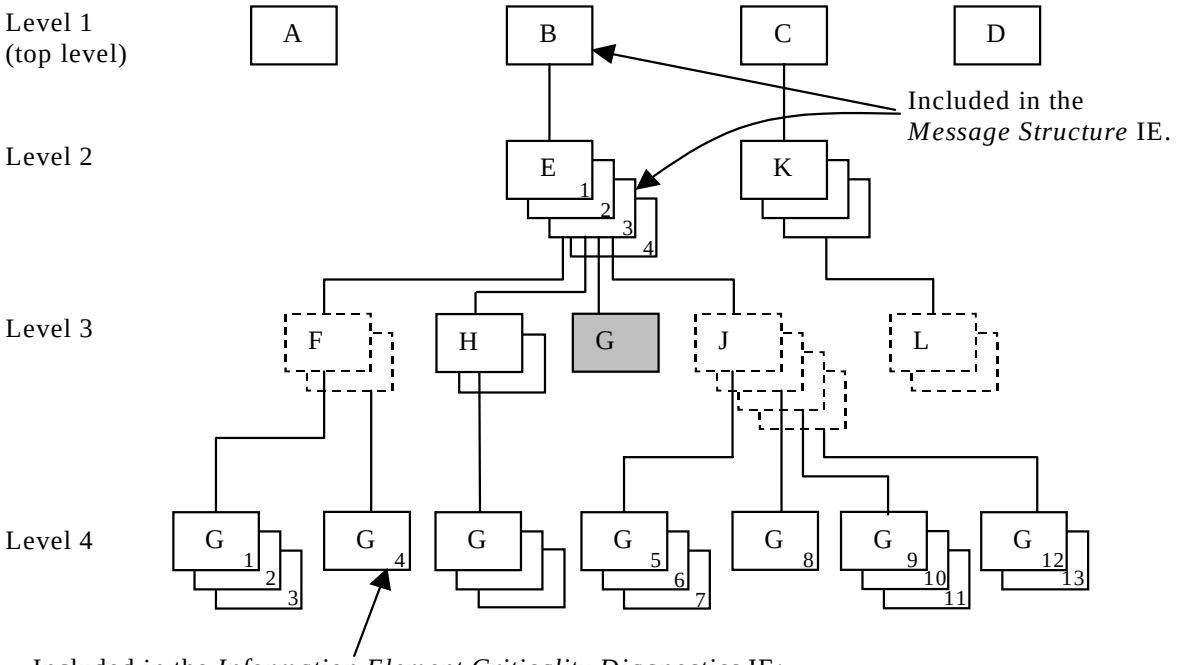


Figure A.6: Example of a received SABP message with a missing IE

If the instance marked as grey in the IE G in the IE E shown in the figure A.6 above, is missing this will be reported within the *Information Element Criticality Diagnostics* IE within the *Criticality Diagnostics* IE as follows:

IE name	Value	Comment
IE Criticality	reject	Criticality for IE on the reported level, i.e. level 3.
IE ID	id-G	IE ID from the reported level, i.e. level 3.
Repetition Number	4	Repetition number up to the missing IE on the reported level, i.e. level 3. (Since the IE E (level 2) is the lowest level included in the *Message Structure* IE there have been four occurrences of IE G within the IE E (level 2) up to the missing occurrence.
Type of Error	missing	
Message Structure, *first repetition*		
>IE ID	id-B	IE ID from level 1.
Message Structure, *second repetition*		
>IE ID	id-E	IE ID from the lowest level above the reported level, i.e. level 2.
>Repetition Number	3	Repetition number from the lowest level above the reported level, i.e. level 2.

Note 7. The repetition number of the reported IE indicates the number of repetitions of IE G received up to but not including the missing occurrence, counting all occurrences of the IE G below the same instance of the previous level with assigned criticality (instance 3 of IE E on level 2).

A.4 ASN.1 of EXAMPLE MESSAGE

```
ExampleMessage ::= SEQUENCE {
    ProtocolIEs         ProtocolIE-Container        {{ExampleMessage-IEs}},
    ProtocolExtensions  ProtocolExtensionContainer  {{ExampleMessage-Extensions}}   OPTIONAL,
    ...
}

ExampleMessage-IEs SABP-PROTOCOL-IES ::= {
    { ID id-A   CRITICALITY reject  TYPE A  PRESENCE mandatory} |
    { ID id-B   CRITICALITY reject  TYPE B  PRESENCE mandatory} |
    { ID id-C   CRITICALITY reject  TYPE C  PRESENCE mandatory} |
    { ID id-D   CRITICALITY reject  TYPE D  PRESENCE mandatory} ,
    ...
}

B ::= SEQUENCE {
    e               E-List,
    iE-Extensions   ProtocolExtensionContainer { {B-ExtIEs} }   OPTIONAL,
    ...
}

B-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

E-List ::= SEQUENCE (SIZE (1..maxE)) OF ProtocolIE-Container { {E-IEs} }

E-IEs SABP-PROTOCOL-IES ::= {
    { ID id-E   CRITICALITY ignore  TYPE E  PRESENCE mandatory  },
    ...
}

E ::= SEQUENCE {
    f               F-List,
    h               H-List,
    g               G-List1,
    j               J-List,
    iE-Extensions   ProtocolExtensionContainer { {E-ExtIEs} }   OPTIONAL,
    ...
}

E-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

F-List ::= SEQUENCE (SIZE (1..maxF)) OF F

F ::= SEQUENCE {
    g               G-List2 OPTIONAL,
    iE-Extensions   ProtocolExtensionContainer { {F-ExtIEs} }   OPTIONAL,
    ...
}

F-ExtIEs    SABP-PROTOCOL-EXTENSION ::= {
    ...
}

G-List2 ::= SEQUENCE (SIZE (1..3, ...)) OF ProtocolIE-Container { {G2-IEs} }

G2-IEs SABP-PROTOCOL-IES ::= {
    { ID id-G   CRITICALITY ignore  TYPE G  PRESENCE mandatory  }
    ...
}

H-List ::= SEQUENCE (SIZE (1..maxH)) OF ProtocolIE-Container { {H-IEs} }

H-IEs SABP-PROTOCOL-IES ::= {
    { ID id-H   CRITICALITY ignore  TYPE H  PRESENCE mandatory  },
    ...
}

H ::= SEQUENCE {
    g               G-List3 OPTIONAL,
    iE-Extensions                   ProtocolExtensionContainer { {H-ExtIEs} } OPTIONAL,
    ...
}

H-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
```

```
    ...
}

G-List3 ::= SEQUENCE (SIZE (1..3, ...)) OF ProtocolIE-Container { {G3-IEs} }

G3-IEs SABP-PROTOCOL-IES ::= {
    { ID id-G   CRITICALITY notify  TYPE G  PRESENCE mandatory  },
    ...
}

G-List1 ::= ProtocolIE-Container { {G1-IEs} }

G1-IEs SABP-PROTOCOL-IES ::= {
    { ID id-G   CRITICALITY reject  TYPE G  PRESENCE mandatory  },
    ...
}

J-List ::= SEQUENCE (SIZE (1..maxJ)) OF J

J ::= SEQUENCE {
    g               G-List4 OPTIONAL,
    iE-Extensions   ProtocolExtensionContainer { {J-ExtIEs} }   OPTIONAL,
    ...
}

J-ExtIEs    SABP-PROTOCOL-EXTENSION ::= {
    ...
}

G-List4 ::= SEQUENCE (SIZE (1..3, ...)) OF ProtocolIE-Container { {G4-IEs} }

G4-IEs SABP-PROTOCOL-IES ::= {
    { ID id-G   CRITICALITY reject  TYPE G  PRESENCE mandatory  },
    ...
}

C ::= SEQUENCE {
    k               K-List,
    iE-Extensions   ProtocolExtensionContainer { {C-ExtIEs} }   OPTIONAL,
    ...
}

C-ExtIEsA -PROTOCOL-EXTENSION ::= {
    ...
}

K-List ::= SEQUENCE (SIZE (1..maxK)) OF ProtocolIE-Container { {K-IEs} }

K-IEs SABP-PROTOCOL-IES ::= {
    { ID id-K   CRITICALITY notify  TYPE K  PRESENCE mandatory  },
    ...
}

K ::= SEQUENCE {
    l               L-List,
    iE-Extensions   ProtocolExtensionContainer { {K-ExtIEs} }   OPTIONAL,
    ...
}

K-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

L-List ::= SEQUENCE (SIZE (1..maxL)) OF L

L ::= SEQUENCE {
    m               M   OPTIONAL,
    iE-Extensions   ProtocolExtensionContainer { {L-ExtIEs} }   OPTIONAL,
    ...
}

L-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

ExampleMessage-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}
```

3GPP TSG-RAN WG3 Meeting #20 ***R3-011325***
Beijing, China, April 2nd – April 6th, 2001

CR-Form-v3

CHANGE REQUEST

⌘ **25.419** **CR** **037** ⌘ rev **-** ⌘ Current version: **3.4.0** ⌘

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

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

Title:	⌘	Error Indication for reporting of logical error
Source:	⌘	R-WG3
Work item code:	⌘	TEI
Date:	⌘	2001-04-23
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	In clause 10.4 it is not clear that when reporting a logical error with the ERROR INDICATION message, the *Procedure Code* IE and the *Triggering Message* IE within the *Criticality Diagnostics* IE must be included in order to identify the message containing the logical error.
Summary of change:	⌘	Text in clause 10.4 is updated in order to clarify that the *Procedure Code* IE and the *Triggering Message* IE within the *Criticality Diagnostics* IE must be included in order to identify the message containing the logical error.
Consequences if not approved:	⌘	It will not be clear which information to include in ERROR INDICATION when reporting a logical error, which may lead to different implementations. Additional information: The proposed change is backwards compatible.

Clauses affected:	⌘	9.2.17, 10.4		
Other specs affected:	⌘	☒ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	25.419 CR038 REL-4
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.2.17 Criticality Diagnostics

The *Criticality Diagnostics* IE is sent by the RNC or the CN when parts of a received message have not been comprehended or were missing, or if the message contained logical errors. When applicable, it contains information about which IEs that were not comprehended or were missing.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Criticality Diagnostics				
>Procedure Code	O		INTEGER (0..255)	Procedure Code is to be used if Criticality Diagnostics is part of Error Indication procedure, and not within the response message of the same procedure that caused the error
>Triggering Message	O		ENUMERATED(initiating message, successful outcome, unsuccessful outcome, outcome)	The Triggering Message is used only if the Criticality Diagnostics is part of Error Indication procedure.
>Procedure Criticality	O		ENUMERATED(reject, ignore, notify)	This Procedure Criticality is used for reporting the Criticality of the Triggering message (Procedure). The value 'ignore' shall never be used.
Information Element Criticality Diagnostics		0 to <maxnoof errors>		
>IE Criticality	M		ENUMERATED(reject, ignore, notify)	The IE Criticality is used for reporting the criticality of the triggering IE. The value 'ignore' shall not be used.
>IE ID	M		INTEGER (0..65535)	The IE Id of the not understood or missing IE
>Repetition Number	O		INTEGER (1..256)	The repetition number of the not understood IE within the bottom most repetition level identified by the message structure IE, if applicable
>Message Structure	O		9.2.20	

Range bound	Explanation
Maxnooferrors	Maximum no. of IE errors allowed to be reported with a single message. The value for maxnooferrors is 256.

10.4 Logical Error

Logical error situations occur when a message is comprehended correctly, but the information contained within the message is not valid (i.e. semantic error), or describes a procedure which is not compatible with the state of the receiver. In these conditions, the following behaviour shall be performed (unless otherwise specified) as defined by the class of the elementary procedure, irrespective of the criticality information of the IE's/IE groups containing the erroneous values.

Class 1:

Where the logical error occurs in a request message of a class 1 procedure, and the procedure has a failure message, the failure message shall be sent with an appropriate cause value. Typical cause values are:

- Semantic Error;
- Message not compatible with receiver state.

Where the logical error is contained in a request message of a class 1 procedure, and the procedure does not have a failure message, the procedure shall be terminated and the Error Indication procedure shall be initiated with an appropriate cause value. The *Procedure Code* IE and the *Triggering Message* IE within the *Criticality Diagnostics* IE shall then be included in order to identify the message containing the logical error.

Where the logical error exists in a response message of a class 1 procedure, local error handling shall be initiated.

Class 2:

Where the logical error occurs in a message of a class 2 procedure, the procedure shall be terminated and the Error Indication procedure shall be initiated with an appropriate cause value. The *Procedure Code* IE and the *Triggering Message* IE within the *Criticality Diagnostics* IE shall then be included in order to identify the message containing the logical error.

3GPP TSG-RAN WG3 Meeting #20 ***R3-011326***
Beijing, China, April 2nd – April 6th, 2001

CR-Form-v3

CHANGE REQUEST

⌘ **25.419** **CR** **038** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

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

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

Title:	⌘	Error Indication for reporting of logical error
Source:	⌘	R-WG3
Work item code:	⌘	TEI
Date:	⌘	2001-04-23
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	In clause 10.4 it is not clear that when reporting a logical error with the ERROR INDICATION message, the *Procedure Code* IE and the *Triggering Message* IE within the *Criticality Diagnostics* IE must be included in order to identify the message containing the logical error.
Summary of change:	⌘	Text in clause 10.4 is updated in order to clarify that the *Procedure Code* IE and the *Triggering Message* IE within the *Criticality Diagnostics* IE must be included in order to identify the message containing the logical error.
Consequences if not approved:	⌘	It will not be clear which information to include in ERROR INDICATION when reporting a logical error, which may lead to different implementations. Additional information: The proposed change is backwards compatible.

Clauses affected:	⌘	9.2.17, 10.4		
Other specs affected:	⌘	☒ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	25.419 CR037 R99
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.2.17 Criticality Diagnostics

The *Criticality Diagnostics* IE is sent by the RNC or the CN when parts of a received message have not been comprehended or were missing, or if the message contained logical errors. When applicable, it contains information about which IEs that were not comprehended or were missing.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Criticality Diagnostics				
>Procedure Code	O		INTEGER (0..255)	Procedure Code is to be used if Criticality Diagnostics is part of Error Indication procedure, and not within the response message of the same procedure that caused the error
>Triggering Message	O		ENUMERATED(initiating message, successful outcome, unsuccessful outcome, outcome)	The Triggering Message is used only if the Criticality Diagnostics is part of Error Indication procedure.
>Procedure Criticality	O		ENUMERATED(reject, ignore, notify)	This Procedure Criticality is used for reporting the Criticality of the Triggering message (Procedure). The value 'ignore' shall never be used.
Information Element Criticality Diagnostics		0 to <maxnoof errors>		
>IE Criticality	M		ENUMERATED(reject, ignore, notify)	The IE Criticality is used for reporting the criticality of the triggering IE. The value 'ignore' shall not be used.
>IE ID	M		INTEGER (0..65535)	The IE Id of the not understood or missing IE
>Repetition Number	O		INTEGER (1..256)	The repetition number of the not understood IE within the bottom most repetition level identified by the message structure IE, if applicable
>Message Structure	O		9.2.20	

Range bound	Explanation
Maxnooferrors	Maximum no. of IE errors allowed to be reported with a single message. The value for maxnooferrors is 256.

10.4 Logical Error

Logical error situations occur when a message is comprehended correctly, but the information contained within the message is not valid (i.e. semantic error), or describes a procedure which is not compatible with the state of the receiver. In these conditions, the following behaviour shall be performed (unless otherwise specified) as defined by the class of the elementary procedure, irrespective of the criticality information of the IE's/IE groups containing the erroneous values.

Class 1:

Where the logical error occurs in a request message of a class 1 procedure, and the procedure has a failure message, the failure message shall be sent with an appropriate cause value. Typical cause values are:

- Semantic Error;
- Message not compatible with receiver state.

Where the logical error is contained in a request message of a class 1 procedure, and the procedure does not have a failure message, the procedure shall be terminated and the Error Indication procedure shall be initiated with an appropriate cause value. The *Procedure Code* IE and the *Triggering Message* IE within the *Criticality Diagnostics* IE shall then be included in order to identify the message containing the logical error.

Where the logical error exists in a response message of a class 1 procedure, local error handling shall be initiated.

Class 2:

Where the logical error occurs in a message of a class 2 procedure, the procedure shall be terminated and the Error Indication procedure shall be initiated with an appropriate cause value. The *Procedure Code* IE and the *Triggering Message* IE within the *Criticality Diagnostics* IE shall then be included in order to identify the message containing the logical error.

3GPP TSG-RAN WG3 Meeting #21
Busan, Korea, May 21st – 25th, 2001

R3-011333

CR-Form-v3

CHANGE REQUEST

⌘ **25.419** **CR** **039** ⌘ rev **-** ⌘ Current version: **3.4.0** ⌘

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

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

Title:	⌘	Clarification IEs order rule			
Source:	⌘	R-WG3			
Work item code:	⌘	TEI	***Date:***	⌘	May 2001
Category:	⌘	**F**	***Release:***	⌘	R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Introduction of new IEs in the extension containers results in different message contents in different specification versions. To ensure interoperability the receiving node shall be able to interprete correctly messages coming from nodes of higher specification versions. Therefore when determining the right order of the IEs the receiving node shall ignore IEs specified only in the higher specification version and consider only IEs of it's own specification version.
Summary of change:	⌘	A clarification to consider only IEs specified in the specification version of the receiving node when determining the right order of the IEs has been added into chapter 'Handling of Unknown, Unforeseen and Erroneous Protocol Data'.
Consequences if not approved:	⌘	In case this CR is not approved there might be interoperability problems between nodes of different specification versions. This change is backward compatible.

Clauses affected:	⌘	10.3.6			
Other specs	⌘	**X**	Other core specifications	⌘	CR280 R99 TS 25.413, CR281 Rel4 TS 25.413, CR040 Rel4 TS 25.419, CR344 R99 TS 25.423, CR345 Rel4 TS 25.423, CR393 R99 TS 25.433, CR394 Rel4 TS 25.433.

affected:	☐ Test specifications ☐ O&M Specifications	
Other comments: ⌘		

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

10.3.6 IEs or IE groups received in wrong order or with too many occurrences

If a message with IEs or IE groups in wrong order or with too many occurrences is received, the receiving node shall behave according to the following:

- If a message *initiating* a procedure is received containing IEs or IE groups in wrong order or with too many occurrences, none of the functional requests of the message shall be executed. The receiving node shall reject the procedure and report the cause value "Abstract Syntax Error (Falsely Constructed Message)" using the message normally used to report unsuccessful outcome of the procedure. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the message used to report the unsuccessful outcome of the procedure, the receiving node shall instead terminate the procedure and initiate the Error Indication procedure.

- If a message *initiating* a procedure that does not have a message to report unsuccessful outcome is received containing IEs or IE groups in wrong order or with too many occurrences, the receiving node shall terminate the procedure and initiate the Error Indication procedure, and use cause value "Abstract Syntax Error (Falsely Constructed Message)".

- If a *response* message is received containing IEs or IE groups in wrong order or with too many occurrences, the receiving node shall initiate local error handling.

When determining the correct order only the IEs specified in the specification version used by the receiver shall be considered.

3GPP TSG-RAN WG3 Meeting #21
Busan, Korea, May 21st – 25th, 2001

R3-011334

CR-Form-v3

CHANGE REQUEST

⌘ **25.419** **CR** **040** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

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

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

Title:	⌘	Clarification IEs order rule
Source:	⌘	R-WG3
Work item code:	⌘	TEI
Date:	⌘	May 2001
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Introduction of new IEs in the extension containers results in different message contents in different specification versions. To ensure interoperability the receiving node shall be able to interprete correctly messages coming from nodes of higher specification versions. Therefore when determining the right order of the IEs the receiving node shall ignore IEs specified only in the higher specification version and consider only IEs of it's own specification version.
Summary of change:	⌘	A clarification to consider only IEs specified in the specification version of the receiving node when determining the right order of the IEs has been added into chapter 'Handling of Unknown, Unforeseen and Erroneous Protocol Data'.
Consequences if not approved:	⌘	In case this CR is not approved there might be interoperability problems between nodes of different specification versions. This change is backward compatible.

Clauses affected:	⌘	10.3.6		
Other specs	⌘	**X** Other core specifications	⌘	CR280 R99 TS 25.413, CR281 Rel4 TS 25.413, CR039 R99 TS 25.419, CR344 R99 TS 25.423, CR345 Rel4 TS 25.423, CR393 R99 TS 25.433, CR394 Rel4 TS 25.433.

affected:	☐ Test specifications ☐ O&M Specifications	
Other comments: ⌘		

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

10.3.6 IEs or IE groups received in wrong order or with too many occurrences

If a message with IEs or IE groups in wrong order or with too many occurrences is received, the receiving node shall behave according to the following:

- If a message *initiating* a procedure is received containing IEs or IE groups in wrong order or with too many occurrences, none of the functional requests of the message shall be executed. The receiving node shall reject the procedure and report the cause value "Abstract Syntax Error (Falsely Constructed Message)" using the message normally used to report unsuccessful outcome of the procedure. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the message used to report the unsuccessful outcome of the procedure, the receiving node shall instead terminate the procedure and initiate the Error Indication procedure.

- If a message *initiating* a procedure that does not have a message to report unsuccessful outcome is received containing IEs or IE groups in wrong order or with too many occurrences, the receiving node shall terminate the procedure and initiate the Error Indication procedure, and use cause value "Abstract Syntax Error (Falsely Constructed Message)".

- If a *response* message is received containing IEs or IE groups in wrong order or with too many occurrences, the receiving node shall initiate local error handling.

When determining the correct order only the IEs specified in the specification version used by the receiver shall be considered.

3GPP TSG- Working Group 3 Meeting #21
Busan, Korea, 21st – 25th May

Tdoc R3-011358

CR-Form-v3

CHANGE REQUEST

⌘ **25.419** **CR** **41** ⌘ rev **-** ⌘ Current version: **3.4.0** ⌘

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

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

Title:	⌘	Correction to the SABP(25.419)
Source:	⌘	R-WG3
Work item code:	⌘	TEI
Date:	⌘	May 2001
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘ In order to make a SABP specification clear and unambiguous, the procedure text descriptions in the SABP specification needs to be improved.

Summary of change: ⌘ Provide the procedure description text to describe the functional behaviour of the RNC exactly and completely.

The procedure that have been improved in this CR are: Write-Replace, Kill, Load Status Enquiry, Message Status Query, Reset, Restart Indication, Failure Indication and Error Indication.

Some correction to the mistakes are also done.

Some editorial improvements to the figures are also done.

The improved text are based on 23.041(R99) and 25.324(R99).

Consequences if not approved: ⌘ If this correction is not done, the SABP specification will remain as ambiguity.

This CR has no impact on the backward compatibility.

Clauses affected: ⌘ 2, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 9.1.3, 9.1.4, 9.1.5, 9.1.7, 9.1.8, 9.1.13, 9.1.14, 9.2.9, 9.2.10, 9.2.19, 9.3.3, 9.3.4, 9.3.6

Other specs affected: ⌘
☒ Other core specifications ⌘ 25.419 CR42 Rel4
☐ Test specifications
☐ O&M Specifications

Other comments: ⌘

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3GPP TS 25.419 V3.4.0 (2001-03)

Technical Specification

3rd Generation Partnership Project;
Technical Specification Group RAN;
UTRAN Iu-BC Interface: Service Area Broadcast Protocol SABP
(Release 1999)

Keywords
UMTS, radio

3GPP

Postal address

3GPP support office address
650 Route des Lucioles - Sophia Antipolis
Valbonne - FRANCE
Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Internet
http://www.3gpp.org

Contents

Foreword

This Technical Specification (TS) has been produced by the 3rd Generation Partnership Project (3GPP).

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

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document specifies the *Service Area Broadcast Protocol (SABP)* between the Cell Broadcast Centre (CBC) and the Radio Network Controller (RNC). It fulfils the CBC - RNC communication requirements specified in [5] and is defined over the Iu-BC – reference point.

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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 23.930: "Iu Principles".

[2] 3GPP TS 25.410: "UTRAN Iu Interface; General Aspects and Principles".

[3] 3GPP TS 25.401: "UTRAN Overall Description".

[4] 3GPP TS 25.931: "UTRAN Functions, Examples on Signalling Procedures".

[5] 3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".

[6] 3GPP TS 25.414: "UTRAN Iu Interface Data Transport and Transport Signalling".

[7] ITU-T Recommendation X.680 (12/94): "Information Technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".

[8] ITU-T Recommendation X.681 (12/94): "Information Technology - Abstract Syntax Notation One (ASN.1): Information object specification".

[9] ITU-T Recommendation X.691 (12/94): "Information Technology - ASN.1 encoding rules - Specification of Packed Encoding Rules (PER)".

[10] 3GPP TR 25.921: "Guidelines and Principles for Protocol Description and Error Handling".

[11] 3GPP TS25.324: "Broadcast/Multicast Control BMC".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

Elementary Procedure: The SABP consists of Elementary Procedures (EPs). An Elementary Procedure is a unit of interaction between the CN (CBC) and the RNC. These EPs are defined separately and are intended to be used to build up complete sequences in a flexible manner. If the independence between some EPs is restricted, it is described under the relevant EP description. Unless otherwise stated by the restrictions, the EPs may be invoked independently of each other as stand alone procedures, which can be active in parallel. Examples on using several SABP EPs together with each other and EPs from other interfaces can be found in reference [4].

An EP consists of an initiating message and possibly a response message. Two kinds of EPs are used:

- **Class 1:** Elementary Procedures with response (success or failure).
- **Class 2:** Elementary Procedures without response.

For Class 1 EPs, the types of responses can be as follows:

Successful

- A signalling message explicitly indicates that the elementary procedure successfully completed with the receipt of the response.

Unsuccessful

- A signalling message explicitly indicates that the EP failed.
- On time supervision expiry (i.e. absence of expected response).

Class 2 EPs are considered always successful.

Message Reference: This is defined as consisting of the following parameters: Message Identifier, Serial Number, and SAI (Service Area Identifier).

3.2 Abbreviations

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

CBC	Cell Broadcast Centre
CBS	Cell Broadcast Service
CN	Core Network
EP	Elementary Procedure
FP	Frame Protocol
PDU	Protocol Data Unit
RNC	Radio Network Controller
SA	Service Area
SABP	Service Area Broadcast Protocol

4 General

The protocol described in the present document is the protocol between CN (CBC) and RNC needed for the CBC Application. The CBC Application is described in [5].

4.1 Procedure Specification Principles

The principle for specifying the procedure logic is to specify the functional behaviour of the RNC exactly and completely. The CN functional behaviour is left unspecified.

The following specification principles have been applied for the procedure text in chapter 8:

- The procedure text discriminates between:

  1) Functionality which "shall" be executed

  The procedure text indicates that the receiving node "shall" perform a certain function Y under a certain condition. If the receiving node supports procedure X but cannot perform functionality Y requested in the REQUEST message of a Class 1 EP, the receiving node shall respond with the message used to report unsuccessful outcome for this procedure, containing an appropriate cause value.

  2) Functionality which "shall, if supported" be executed

The procedure text indicates that the receiving node "shall, if supported," perform a certain function Y under a certain condition. If the receiving node supports procedure X, but does not support functionality Y, the receiving node shall proceed with the execution of the EP, possibly informing the requesting node about the not supported functionality.

- Any required inclusion of an optional IE in a response message is explicitly indicated in the procedure text. If the procedure text does not explicitly indicate that an optional IE shall be included in a response message, the optional IE shall not be included.

4.2 Forwards and Backwards Compatibility

The forwards and backwards compatibility of the protocol is assured by mechanism where all current and future messages, and IEs or groups of related IEs, include Id and criticality fields that are coded in a standard format that will not be changed in the future. These parts can always be decoded regardless of the standard version.

4.3 Specification Notations

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

Procedure	When referring to an elementary procedure in the specification the Procedure Name is written with the first letters in each word in upper case characters followed by the word "procedure", e.g. Write-Replace procedure.
Message	When referring to a message in the specification the MESSAGE NAME is written with all letters in upper case characters followed by the word "message", e.g. WRITE-REPLACE message.
IE	When referring to an information element (IE) in the specification the *Information Element Name* is written with the first letters in each word in upper case characters and all letters in Italic font followed by the abbreviation "IE", e.g. *Old Serial Number* IE.
Value of an IE	When referring to the value of an information element (IE) in the specification the "Value" is written as it is specified in subclause 9.2 enclosed by quotation marks, e.g. "Abstract Syntax Error (Reject)" or "Background ".

5 Services provided by SABP

- During normal operation the CN (CBC) initiates all message transfer and query operations. The RNC responds to the message transfer and query operations initiated by the CBC.
- The RNC will open the connection only in case an error (Failure Indication Procedure) or recovery (Restart Indication Procedure) is to be reported.
- The initiator of a connection is responsible for the termination of the connection.

6 Services expected from the Transport layer

Following service is expected from the transport layer:

- in sequence delivery of FP PDU [6].

7 Functions of SABP

The SABP has the following functions:

- Message Handling. This function is responsible for the broadcast of new messages, amend existing broadcasted messages and to stop the broadcasting of specific messages.

- Load Handling. This function is responsible for determining the loading of the broadcast channels at any particular point in time.
- Reset. This function permits the CBC to end broadcasting in one or more Service Areas.
- Error Handling. This function allows the reporting of general error situations, for which function specific error messages have not been defined.

These functions are implemented by one or several SABP elementary procedures described in the following clauses.

8 SABP Procedures

8.1 Elementary Procedures

In the following tables, all EPs are divided into Class 1, and Class 2 Procedures:

Table 1: Class 1

Elementary Procedure	Initiating Message	Successful Outcome	Unsuccessful Outcome
		Response message	Response message
Write-Replace	WRITE-REPLACE	WRITE-REPLACE COMPLETE	WRITE-REPLACE FAILURE
Kill	KILL	KILL COMPLETE	KILL FAILURE
Status Load Enquiry	LOAD QUERY	LOAD QUERY COMPLETE	LOAD QUERY FAILURE
Status Message Query	MESSAGE QUERY	MESSAGE QUERY COMPLETE	MESSAGE QUERY FAILURE
Reset	RESET	RESET COMPLETE	RESET FAILURE

Table 2: Class 2

Elementary Procedure	Message
Restart Indication	RESTART
Failure Indication	FAILURE
Error Indication	ERROR INDICATION

8.2 Write-Replace

8.2.1 General

The purpose of this Write-Replace procedure is to broadcast new information or replace a message already broadcast to a chosen Service Area(s).

8.2.2 Successful Operation

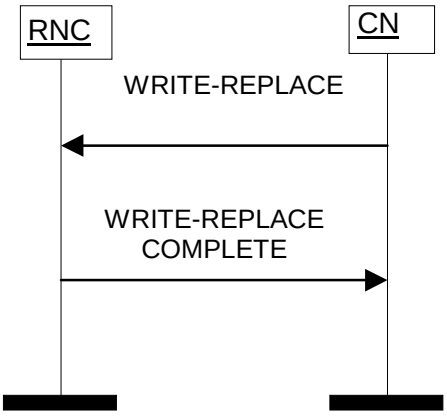


Figure 1: Write-Replace Procedure: Successful Operation

The CN shall initiate the procedure by sending a WRITE-REPLACE message to the RNC.

The presence of a *New Serial Number* IE will indicate that this is a new broadcast. The presence of both the *Old Serial Number* IE and a *New Serial Number* IE will indicate that this ~~is~~ message is a replacement of an existing broadcast. The RNC will initiate broadcasting of a new message or replace a message already broadcast as requested to the service areas as indicated in the *Service Areas List* IE.

The RNC shall uniquely identify the CBS message by the *Message Identifier* IE together with the serial number in the *New Serial Number* IE and the ~~*SAI*~~*Service Areas List* IE.

The RNC shall perform the broadcast according to the value of the *Category* IE as follows:

- The *Category* IE, if given in the WRITE-REPLACE message, shall be treated as follows:

  1. If the value of *Category* IE is indicated as "High Priority", the RNC shall perform the broadcast immediately

  2. If the value of *Category* IE is indicated as "Background", the RNC shall perform the broadcast when no other broadcast message indicated as "High Priority" or "Normal"

  3. If the value of *Category* IE is indicated as "Normal", the RNC shall perform the broadcast according to the *Repetition Period* IE.

- If the *Category* IE is not given in the WRITE-REPLACE message, the RNC shall perform the broadcast as the same category indicated as "Normal".

The RNC shall pass the *Data Coding Scheme* IE transparently to the radio interface protocol.

The RNC shall pass the *Broadcast Message Content* IE Transparently to the radio interface protocol.

The RNC shall broadcast the message frequently according to the value of the *Number of Broadcasts Requested* IE. If the value is set to "0", the RNC shall broadcast the message until the CN request otherwise.

Upon receipt of the WRITE-REPLACE message the RNC shall respond using the WRITE-REPLACE COMPLETE message containing a *New Serial Number* IE indicating that resources are available as requested for the Service Area(s) specified and a *Number of Broadcast Complete List* IE contains each Service Area which successfully performed the requested operation and for each of these Service Area(s), the number of times the broadcast message has been sent to the particular Service Area(s) for broadcast.

8.2.3 Unsuccessful Operation

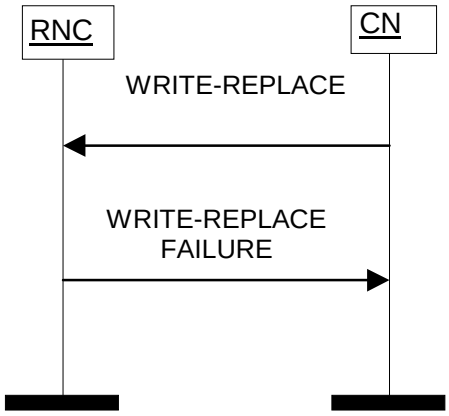


Figure 2: Write-Replace Procedure: Un-Successful Operation

If the RNC cannot allocate all the resources requested for the Service Area(s) specified in the WRITE-REPLACE message, then the RNC shall return a WRITE-REPLACE FAILURE message to the CN. A list of Service Area(s) where the requested resources are unavailable and appropriate cause value ~~will~~ shall be provided in this WRITE-REPLACE FAILURE message in the *Failure List* IE.

This WRITE-REPLACE FAILURE message may also include those Service Area(s) where the requested resources were available and ~~will~~shall indicate in the *Number of Broadcasts Completed List* IE those Service Area(s) which completed the request.

8.2.4 Abnormal Conditions

8.3 Kill

8.3.1 General

The purpose of the Kill procedure is to stop the broadcast of the indicated message.

8.3.2 Successful Operation

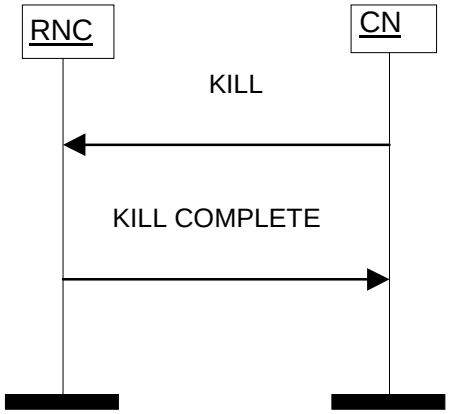


Figure 3: Kill Procedure: Successful Operation

The CN shall initiate the procedure by sending a KILL message to the RNC.

Upon receipt of the KILL message the RNC shall stop broadcasting the indicated message, which is indicated in the *Message Identifier* IE and *Old Serial Number* IE, in the indicated Service Area(s) as indicated in the *Service Areas List* IE.

The RNC shall respond using the KILL COMPLETE message, containing the *Old Serial Number* IE and the *Number of Broadcast Complete List* IE contains each Service Area which successfully performed the requested operation and for each of these Service Area(s), the number of times the broadcast message has been sent to the particular Service Area(s) for broadcast.

8.3.3 Unsuccessful Operation

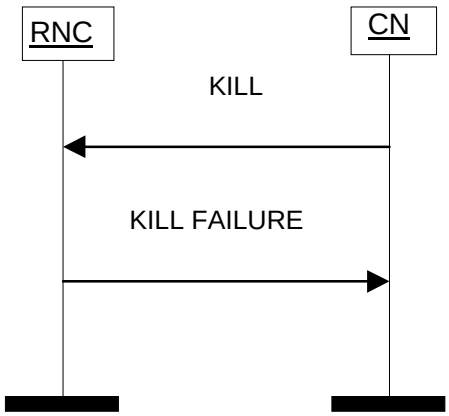


Figure 4: Kill Procedure: Un-Successful Operation

If the RNC fails to stop broadcasting the indicated message as indicated in the KILL message, the RNC shall return the KILL FAILURE message to the CN. A *Failure List* IE indicating the list of Service Area(s) where the message reference is not valid and appropriate cause value ~~will~~shall be provided in a KILL FAILURE message. This response message may also – if applicable - indicate in the *Number of Broadcasts Completed List* IE those Service Area(s) which completed the request where the KILL message was successful.

8.3.4 Abnormal Conditions

8.4 Load Status Enquiry

8.4.1 General

The purpose of this Load Status Enquiry procedure is to obtain the current permissible bandwidth available for broadcast within particular Service Area(s).

8.4.2 Successful Operation

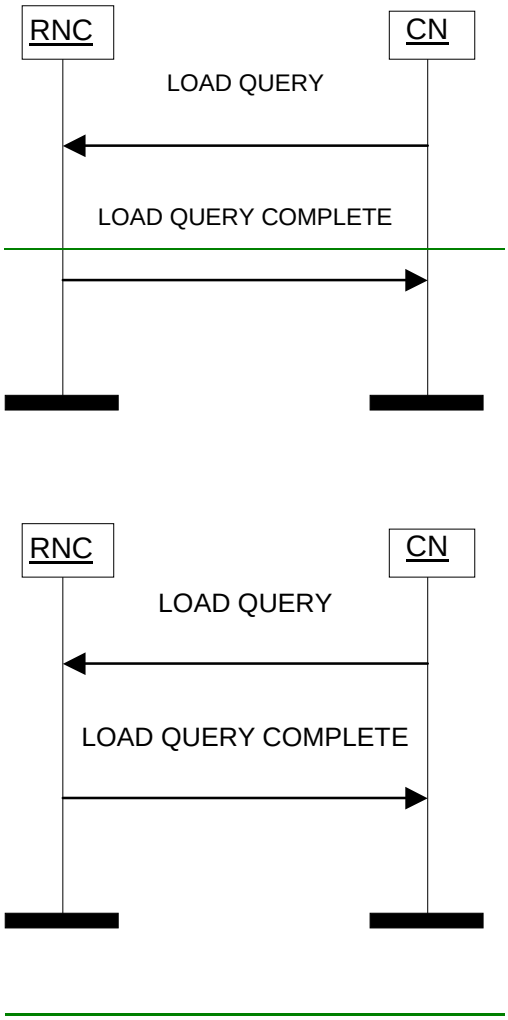


Figure 5: Load Status Enquiry Procedure: Successful Operation

The CN shall initiate the procedure by sending a LOAD QUERY message to the RNC. The message shall include a *Service Areas List* IE. Upon reception of the LOAD QUERY message the RNC shall respond with a LOAD QUERY COMPLETE message containing the *Radio Resource Loading List* IE indicating the available bandwidth of the Service Area(s).

8.4.3 Unsuccessful Operation

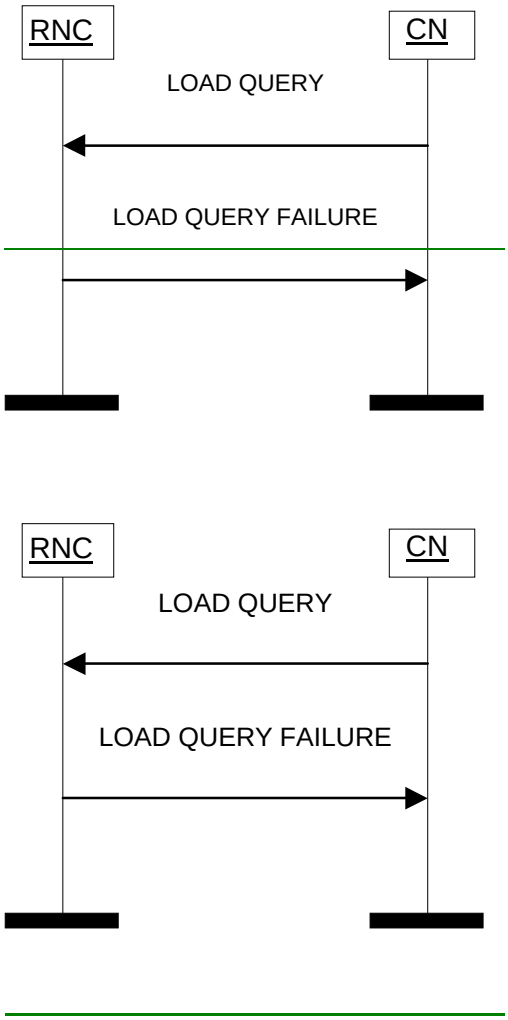


Figure 6: Load Status Enquiry Procedure: Un-Successful Operation

If the RNC contains Service Area(s) for which the RNC was not able to respond to, it shall respond with a LOAD QUERY FAILURE message which includes the *Failure List* IE.

The LOAD QUERY FAILURE response message may – if applicable - also contain a *Radio Resource Loading List* IE for which the LOAD STATUS QUERY reporting was successful.

8.4.4 Abnormal Conditions

8.5 Message Status Query

8.5.1 General

The Message Status Query procedure is used by the CN to obtain the message status of a broadcast message.

8.5.2 Successful Operation

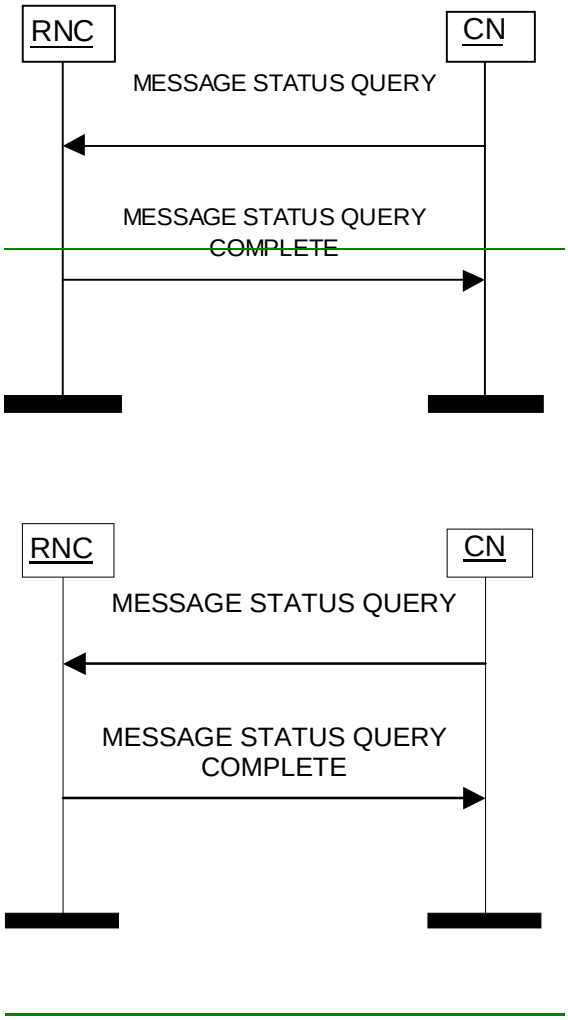


Figure 7: Message Status ~~Enquiry~~Query Procedure: Successful Operation

The CN shall initiate the procedure by sending a MESSAGE STATUS QUERY message to the RNC. The message ~~will~~shall contain the *Old Serial Number* IE along with the ~~appropriate~~ *Service Areas List* IE containing the Service Area Identifiers the status query is intended for.

Upon receipt of the MESSAGE STATUS QUERY message the RNC shall respond using the MESSAGE STATUS QUERY COMPLETE message.

Within this message the ~~*No*~~*Number of Broadcasts Completed List* IE contains each Service Area which successfully performed the requested operation and for each of these Service Area(s), the number of times this broadcast message has been sent to this particular Service Area(s) for broadcast.

8.5.3 Unsuccessful Operation

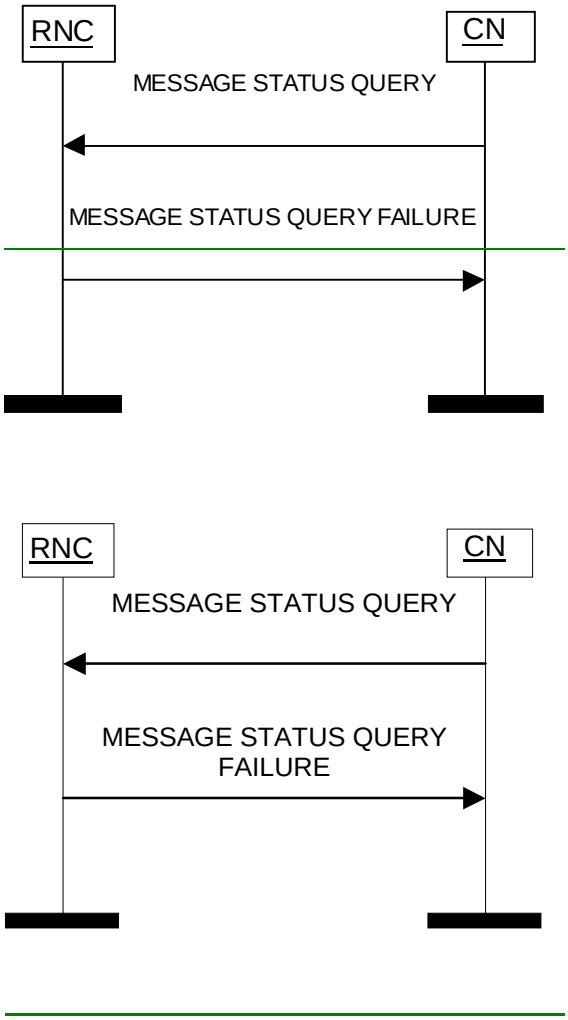


Figure 8: Message Status ~~Enquiry~~Query Procedure: Un-Successful Operation

If the requested operation fails (e.g. because the Message Identifier is unknown, or when the RNC cannot send the status for a known Message Identifier) the RNC shall send a MESSAGE STATUS QUERY FAILURE message to the CN containing a *Failure List* IE for Service Area(s) for which the requested operation failed.

The MESSAGE STATUS QUERY FAILURE message may – if applicable - also include the ~~*No*~~*Number of Broadcasts Completed List* IE indicating those Service Area(s) for which the MESSAGE STATUS QUERY message was successful.

8.5.4 Abnormal Conditions

8.6 Reset

8.6.1 General

The purpose of the Reset procedure is to end broadcasting in one or more Service Areas in the RNC.

8.6.2 Successful Operation

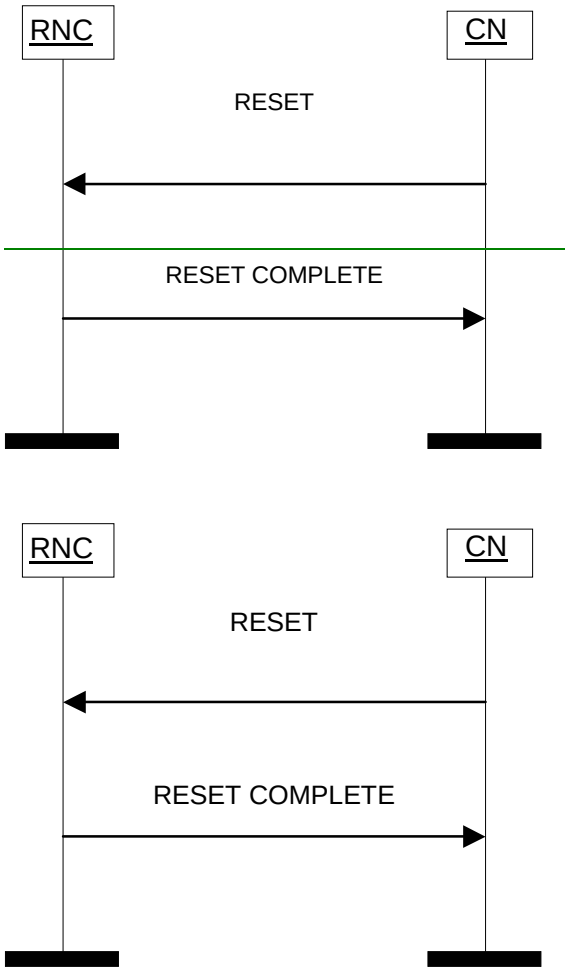


Figure 9: Reset Procedure: Successful Operation

The CN shall initiate the procedure by sending a RESET message to the RNC, in order to end broadcasting in one or more Service Areas of the RNC.

It may also be used by the CN to inquire about the Service Area broadcasting operational state of Service Area(s) who had earlier indicated as having failed.

Upon receipt of this message the RNC shall end broadcasting in the indicated Service Area(s) and shall respond using a RESET COMPLETE message.

8.6.3 Unsuccessful Operation

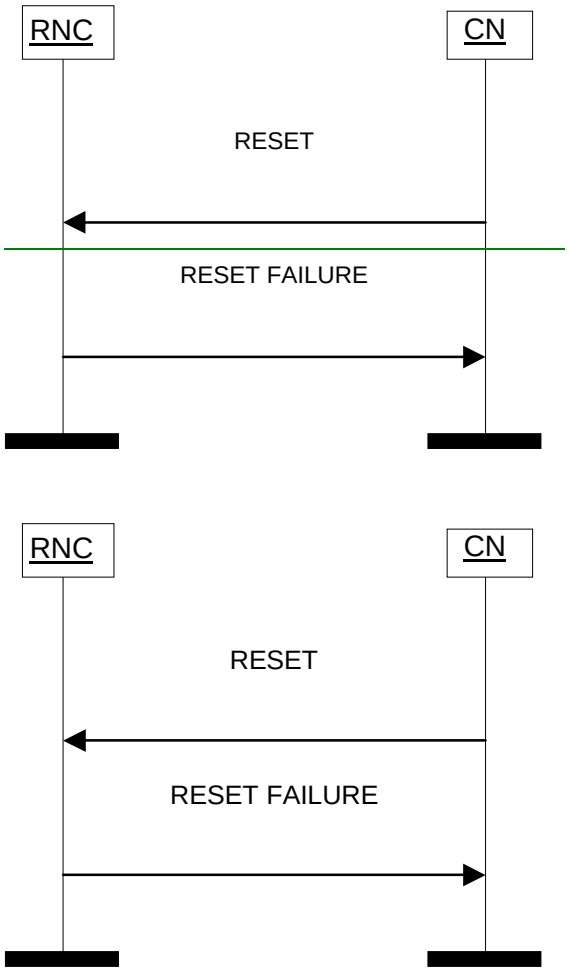


Figure 10: Reset Procedure: Un-Successful Operation

If upon receipt of this message the RNC can not end broadcasting in the indicated Service Area(s), it shall respond using a RESET FAILURE message containing the ~~*Service Areas List*~~ *Failure List* IE indicating the relevant Service Area(s) and the appropriate cause value.

The RESET FAILURE message may – if applicable - also include those Service Area(s) in the *Service Areas List* IE for which the RESET message was successful.

8.6.4 Abnormal Conditions

8.7 Restart Indication

8.7.1 General

The purpose of the Restart Indication procedure is for the RNC to indicate to the CN that a Service Area broadcasting related restart situation has occurred in one or more of its Service Areas e.g. when a Service Area becomes operational or when the RNC is initialised.

8.7.2 Successful Operation

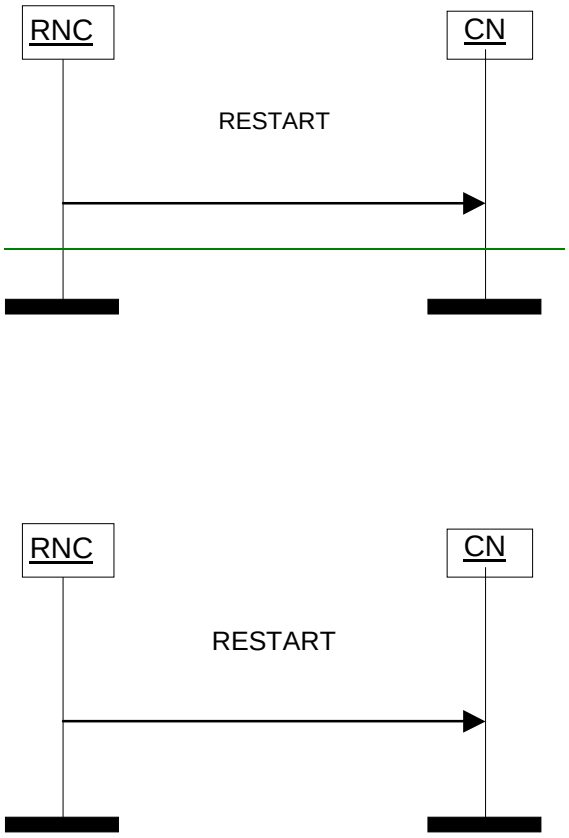


Figure 11: Restart Indication Procedure: Successful Operation

The RNC shall initiate the procedure by sending a RESTART message to the CN. This message shall contain a *Service Areas List* IE for reference and may also include ~~an indication~~ the *Recovery Indication* IE to indicate ~~as to~~ whether the previous~~ly~~ ~~sent~~broadcast information needs to be re-~~-l~~loaded. In the absence of the Recovery Indication IE, the CN shall interpret it as "lost".

8.7.3 Abnormal Conditions

8.8 Failure Indication

8.8.1 General

The purpose of the Failure Indication procedure is to indicate to the CN from the RNC that a Service Area broadcasting related problem is occurring in one or more of its Service Areas.

8.8.2 Successful Operation

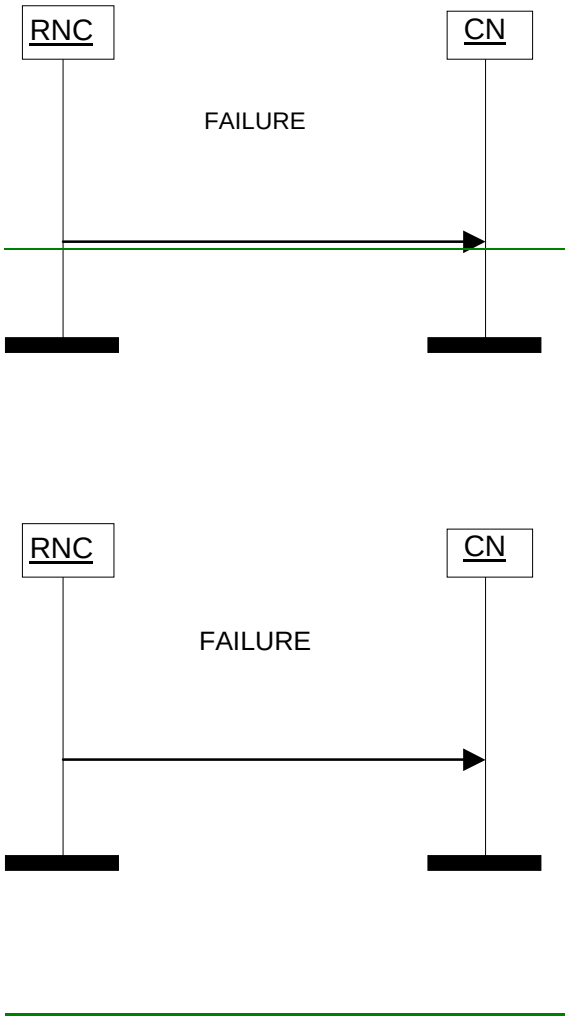


Figure 12: Failure Indication Procedure: Successful Operation

The RNC shall initiate the procedure by sending a FAILURE message to the CN. The FAILURE message shall contain the *Service Areas List* IE to indicate which Service Area(s) has a Service Area broadcasting related problem.

Upon receipt of this FAILURE message, the CN will not generate further WRITE or REPLACE messages for these Service Area(s) until the CN is informed by a RESTART message that the Service Area can resume normal Service Area broadcasting operation.

8.8.3 Abnormal Conditions

8.9 Error Indication

8.9.1 General

The Error Indication procedure is used by the RNC to indicate to the CN that a message is not understood, provided it cannot be reported by an appropriate failure message.

8.9.2 Successful Operation

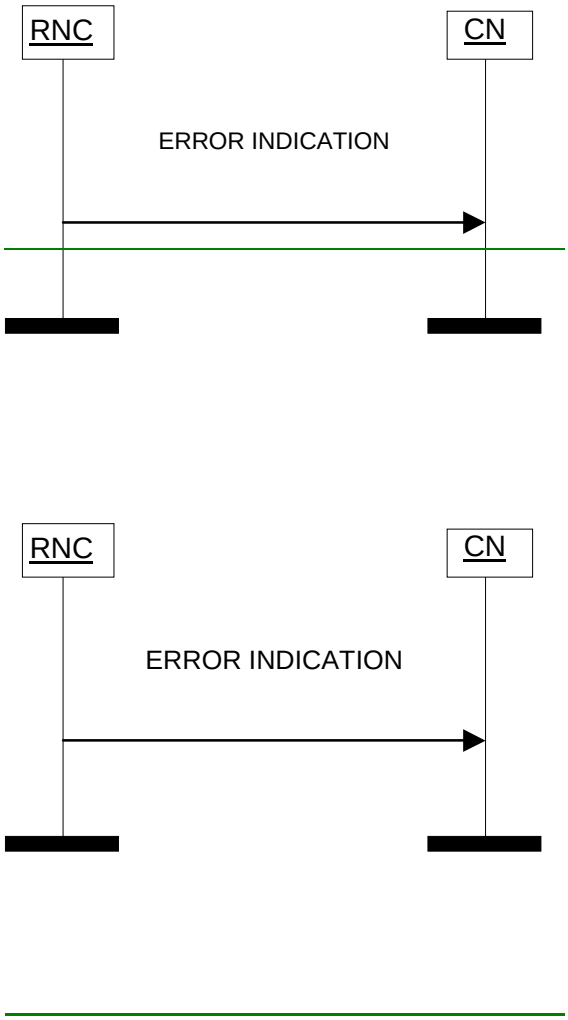


Figure 13: Error Indication Procedure: Successful Operation

The RNC shall initiate the procedure by sending an ERROR INDICATION message to the CN in response to any message that is not understood e.g. invalid parameter or parameter value. This message shall contain information necessary for the CN to be able to identify which initial message this is in response to by the *Message Identifier* IE and may also contain *Serial Number* IE.~~,~~ The appropriate cause value – if applicable- may be ~~and additional information e.g. Cause Value~~indicated in the *Cause* IE.

8.9.3 Abnormal Conditions

9 Elements for SABP Communication

9.1 Message Functional Definition and Content

9.1.1 General

NOTE: The messages have been defined in accordance to the guidelines specified in [10].

For each message there is, a table listing the signalling elements in their order of appearance in the transmitted message.

9.1.2 Message Contents

9.1.2.1 Presence

All information elements in the message descriptions below are marked mandatory, optional or conditional according to the following table:

Table 3: Meaning of abbreviations used in SABP messages

Abbreviation	Meaning
M	IE's marked as Mandatory (M) will always be included in the message.
O	IE's marked as Optional (O) may or may not be included in the message.
C	IE's marked as Conditional (C) will be included in a message only if the condition is satisfied. Otherwise the IE is not included.

9.1.2.2 Criticality

Each Information Element or Group of Information Elements may have a criticality information applied to it. Following cases are possible:

Table 4: Meaning of content within "Criticality" column

Abbreviation	Meaning
–	No criticality information is applied explicitly.
YES	Criticality information is applied. This is usable only for non-repeatable IEs
GLOBAL	The IE and all its repetitions together have one common criticality information. This is usable only for repeatable IEs.
EACH	Each repetition of the IE has its own criticality information. It is not allowed to assign different criticality values to the repetitions. This is usable only for repeatable IEs.

9.1.2.3 Range

The Range column indicates the allowed number of copies of repetitive IEs/IE groups.

9.1.2.4 Assigned Criticality

This column provides the actual criticality information as defined in chapter 10.3.2, if applicable.

9.1.3 WRITE-REPLACE

This message is sent by the CN to the RNC.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
New Serial Number	M		9.2.5		yes	reject
Old Serial Number	O		9.2.4		yes	ignore
Service Areas List	M		9.2.6		ves	reject
Category	O		9.2.7		yes	ignore
Repetition Period	O		9.2.8		yes	ignore
~~No~~Number of Broadcasts Requested	M		9.2.9		yes	reject
Data Coding Scheme	M		9.2.15		yes	reject
Broadcast Message Content	M		9.2.2		yes	reject

9.1.4 WRITE-REPLACE COMPLETE

This message will be sent by the RNC to the CN in a successful response to a WRITE-REPLACE message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
New Serial Number	M		9.2.5		yes	reject
Number~~No~~ of Broadcasts Completed List	M		9.2.~~9~~10		yes	reject
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.5 WRITE-REPLACE FAILURE

This message will be sent by the RNC to the CN as an unsuccessful response to a WRITE-REPLACE message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
New Serial Number	M		9.2.5		yes	reject
Failure List	M		9.2.12		yes	reject
~~No~~Number of Broadcasts Completed List	O		9.2.10		yes	ignore
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.6 KILL

This message is sent by the CN to the RNC to stop broadcasting of a specific message.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
Old Serial Number	M		9.2.4		yes	reject
Service Areas List	M		9.2.6		yes	reject

9.1.7 KILL COMPLETE

This message is sent by the RNC to the CN as a successful response to a KILL message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
Old Serial Number	M		9.2.4		yes	reject
~~No~~Number of Broadcasts Completed List	M		9.2.~~9~~10		yes	reject
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.8 KILL FAILURE

This message is sent by the RNC to the CN as unsuccessful response to a KILL message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
Old Serial Number	M		9.2.4		yes	reject
Failure List	M		9.2.12		yes	reject
~~No~~Number of Broadcasts Completed List	O		9.2.10		yes	ignore
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.9 LOAD QUERY

This message is sent by the CN to the RNC to gain an indication of broadcast resources available.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Service Areas List	M		9.2.6		yes	reject

9.1.10 LOAD QUERY COMPLETE

This message will be sent by the RNC as a successful response to the LOAD QUERY message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Radio Resource Loading List	M		9.2.13		yes	reject
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.11 LOAD QUERY FAILURE

This message is sent by the RNC to the CN as an unsuccessful response to a LOAD QUERY message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Failure List	M		9.2.12		yes	reject
Radio Resource Loading List	O		9.2.13		yes	ignore
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.12 MESSAGE STATUS QUERY

This message is sent by the CN to the RNC to obtain the current status of a Service Area broadcasting message.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
Old Serial Number	M		9.2.4		yes	reject
Service Areas List	M		9.2.6		yes	reject

9.1.13 MESSAGE STATUS QUERY COMPLETE

This message is sent by the RNC to the CN as a successful response to a MESSAGE QUERY message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
Old Serial Number	M		9.2.4		yes	reject
~~No~~Number of Broadcasts Completed List	M		9.2.10		yes	reject
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.14 MESSAGE STATUS QUERY FAILURE

This message is sent by the RNC to the CN in an unsuccessful response to a MESSAGE QUERY message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
Failure List	M		9.2.12		yes	reject
Old Serial Number	M		9.2.4		yes	reject
~~No~~Number of Broadcasts Completed List	O		9.2.10		yes	ignore
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.15 RESET

The message is sent by the CN to the RNC to request that the RNC end broadcasting in one or more Service Areas.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Service Areas List	M		9.2.6		yes	reject

9.1.16 RESET COMPLETE

This message is sent from the RNC to the CN as a successful response to a RESET message where indicated Service-Area(s) are now not broadcasting any messages.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Service Areas List	M		9.2.6		yes	reject
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.17 RESET FAILURE

This message is sent from the RNC to the CN as an unsuccessful response to a RESET message to indicate that a Service Area broadcasting related problem exists in one or more of its Service Areas.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Failure List	M		9.2.12		yes	reject
Service Areas List	O		9.2.6		yes	ignore
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.18 RESTART

This message is sent from the RNC to the CN to indicate a Service Area broadcasting related restart situation in one or more of its Service-Areas.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	ignore
Service Areas List	M		9.2.6		yes	ignore
Recovery Indication	O		9.2.16		yes	ignore

9.1.19 FAILURE

This message is sent from the RNC to the CN to indicate that a Service Area broadcasting related problem exists in one or more of its Service-Areas.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	ignore
Service Areas List	M		9.2.6		yes	ignore

9.1.20 ERROR INDICATION

This message is sent by the RNC to the CN in response to any message which is not understood (e.g. invalid parameter or parameter value).

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	ignore
Message Identifier	M		9.2.19		yes	ignore
Serial Number	O		9.2.3		yes	ignore
Cause	O		9.2.14		yes	ignore
Criticality Diagnostics	O		9.2.17		yes	ignore

9.2 Information Element Definitions

9.2.1 MessageType

Message Type IE uniquely identifies the message being sent. It is mandatory for all messages.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Message Type				
>Procedure Code	M		ENUMERATED (Write-Replace, Kill, Load Query, Message Status Query, Reset, Restart, Failure, Error Indication ,…)	
>Type of Message	M		ENUMERATED (Initiating Message, Successful Outcome, Unsuccessful Outcome, Outcome)	

9.2.2 Broadcast Message Content

Broadcast Message Content IE is sent from the CN to the RNC containing user information i.e. the message, and will be broadcast over the radio interface.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Broadcast Message Content	M		OCTET STRING (1246)	

9.2.3 Serial Number

Serial Number IE is a 16-bit integer which identifies a particular message from the source and type indicated by the Message Identifier and is altered every time the message with a given Message Identifier is changed.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Serial Number	O		INTEGER (16)	

9.2.4 Old Serial Number

Old Serial Number IE enables identification of an existing message to be identified. The format of this IE is defined in 9.2.3.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Old Serial Number	M		9.2.3	

9.2.5 New Serial Number

New Serial Number IE enables identification of a new message for broadcast to be identified, and is altered every time the message is changes. The format of this IE is defined in 9.2.3.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
New Serial Number	O		9.2.3	

9.2.6 Service Areas List

Service Areas List IE is sent from the CN to the RNC. It indicates the group of Service Area(s) that the message will be broadcast to. The *Service Areas List* IE must include at least one Service Area.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Service Areas List		1 to <maxno of SAI>		
>Service Area Identifier	M		9.2.11	

Range bound	Explanation
MaxnoofSAI	Maximum no. of SAI in Service Areas List. Value is 65535

9.2.7 Category

Category IE is sent from the CN to the RNC, and is used to indicate the priority of the message.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Category	O		Enumerated (High Priority, Background, Normal, ~~or~~ Default)	This IE contains the broadcast priority of the message.

9.2.8 Repetition Period

Repetition Period IE is sent from the CN to the RNC and indicates the periodicity of message broadcasts.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Repetition Period	M		INTEGER 1…4096	Range is 1 to 4096 where each unit will represent a repetition of one second to a maximum of once per ~1 hour

9.2.9 ~~No~~Number of Broadcasts Requested

~~No~~Number of Broadcasts Requested IE is sent from the CN to the RNC and indicates the number of times a message is to be broadcast.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Number~~No~~ of Broadcasts Requested	M	0 to 65535	INTEGER 0…. 65535	This specifies the number of times the message is to be broadcast. "0" indicates the message shall be broadcasted until CN request otherwise

9.2.10 ~~No~~Number of Broadcasts Completed List

~~No~~Number of Broadcasts Completed List IE is sent from the RNC to the CN, and indicates the number of times that a CN message (all pages) has been sent to each Service Area specified in the *Service Areas List* IE of the request message for broadcast over the radio interface.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
~~No~~Number of-Broadcasts Completed List		1 to <maxnoof SAI>		
>Service Area Identifier	M		OCTET STRING (7)	
>~~No~~Number of Broadcasts	M		INTEGER (0.. 65535)	
>~~No~~Number of Broadcasts Completed Info	O		ENUMERATED (overflow, unknown)	Overflow indicates that the number of times that CN message sent to the radio interface has been overflow. Unknown indicates that no information regarding the number of times that CN message sent to the radio interface.

Range bound	Explanation
MaxnoofSAI	Maximum no. of SAI in Service Areas List Value is 65535

9.2.11 Service Area Identifier

Service Area Identifier IE is used to identify an area consisting of one or more cells belonging to the same Location Area. Such an area is called a Service Area. For this protocol, only a Service Area that is defined to be applicable to the BC domain shall be used.

IE/Group Name	Presence	Range	IE type and Reference	Semantics description
SAI				
>PLMN ID	M		OCTET STRING (SIZE (3))	- digits 0 to 9, two digits per octet, - each digit encoded 0000 to 1001, - 1111 used as filler - bit 4 to 1 of octet n encoding digit 2n-1 - bit 8 to 5 of octet n encoding digit 2n -The PLMN-ID consists of 3 digits from MCC followed by either -a filler plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>LAC	M		OCTET STRING (2)	0000 and FFFE not allowed.
>SAC	M		OCTET STRING (2)	

9.2.12 Failure List

Failure List IE identifies the list of Service-Area(s) for which the RNC could not complete as requested.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Failure List		1 to <maxnoof SAI>		
>Service Area Identifier	M		9.2.11	
>Cause	M		9.2.14	

Range bound	Explanation
MaxnoofSAI	Maximum no. of SAI in Service-Area-List. Value is 65535

9.2.13 Radio Resource Loading List

Radio Resource Loading List IE presents the available bandwidth available for Broadcast purposes of a specific Service Area.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Radio Resource Loading List		1 to <maxnoof SAI>		
>Service Area Identifier	M		9.2.11	
>Available Bandwidth	M		9.2.18	

Range bound	Explanation
MaxnoofSAI	Maximum no. of SAI in Service Area List. Value is 65535

9.2.14 Cause

Cause IE indicates the reason for a particular error event for the SABP protocol.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and Reference	Semantics Description
>Cause	M		INTEGER (	Range is 0-255
			Parameter-not-recognised(0),	Sent when the recipient (CN or RNC) was unable to act upon the message received due to an unrecognised parameter. A message should not be rejected only because a parameter is not recognised as this would prevent extensions to the service
			Parameter-value invalid(1),	Sent when a failure occurred due to the value of a parameter being invalid, e.g. out of range, or in Write-Replace, the parameter "no of pages" does not equal the number of pages received
			Valid-CN-message-not-identified(2),	Sent when the RNC does not recognise the CN message reference
			Service-Area-identity-not-valid(3),	Sent when the RNC does not recognise a Service-Area Identity
			Unrecognised-message(4)	Sent when the RNC did not recognise the message at all
			Missing-mandatory-element(5),	Sent when a mandatory element is missing from the message
			RNC-capacity-exceeded(6),	Sent when a write-replace fails because the RNC cannot meet the requested repetition period because of the cell loading

IE/GROUP NAME	PRESENCE	RANGE	IE Type and Reference	Semantics Description
			RNC-memory-exceeded(7),	Sent when the RNC is unable to store a CBS message as the RNC memory has been exceeded.
			Service-Area-broadcast-not-supported(8),	Sent when the SABCH/CN related Radio Resource is not configured for a Service-Area
			Service-Area-broadcast-not-operational(9),	Sent when the SABCH/CN related radio resource is not available because of error conditions or due to maintenance activities
			Message-reference already-used(10),	Sent when the recipient was unable to act upon the Write-Replace message received due to a previous Write-Replace received with the same message reference.
			Unspecified-error(11),	Sent when none of the above cause values apply.
			(Transfer Syntax Error(12),	Sent to indicate transfer syntax error in any message
			Semantic Error (12),	Sent to indicate semantic error any message
			Message not compatible with receiver state (14),	Sent to indicate that received message is not compatible with the receiver state
			Abstract Syntax Error (Reject)	Sent to indicate rejection due to

IE/GROUP NAME	PRESENCE	RANGE	IE Type and Reference	Semantics Description
			(15), Abstract Syntax Error (Ignore and Notify) (16), Abstract Syntax Error (Falsely Constructed Message) (17), …)	Abstract Syntax Error Sent to indicate Abstract Syntax Error in some IE that has been ignored Sent to indicate Abstract Syntax Error due to false message construction

9.2.15 Data Coding Scheme

Data Coding Scheme IE is sent from the RNC to the CN and identifies the alphabet or coding employed for the message characters and message handling at the UE (it is passed transparently from the CN to the UE).

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Data Coding Scheme	M		INTEGER (0..255)	

9.2.16 Recovery Indication

Recovery I*ndication* IE is used to indicate whether the CN related data was lost or is still available.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Recovery Indication	O		ENUMERATED (Available, Lost)	

9.2.17 Criticality Diagnostics

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Criticality Diagnostics				
>Procedure Code	O		INTEGER (0..255)	Procedure Code is to be used if Criticality Diagnostics is part of Error Indication procedure, and not within the response message of the same procedure that caused the error
>Triggering Message	O		ENUMERATED(initiating message, successful outcome, unsuccessful outcome, outcome)	The Triggering Message is used only if the Criticality Diagnostics is part of Error Indication procedure.
>Procedure Criticality	O		ENUMERATED(reject, ignore, notify)	This Procedure Criticality is used for reporting the Criticality of the Triggering message (Procedure). The value 'ignore' shall never be used.
Information Element Criticality Diagnostics		0 to <maxnoof errors>		
>IE Criticality	M		ENUMERATED(reject, ignore, notify)	The IE Criticality is used for reporting the criticality of the triggering IE. The value 'ignore' shall not be used.
>IE ID	M		INTEGER (0..65535)	The IE Id of the not understood or missing IE
>Repetition Number	O		INTEGER (1..256)	The repetition number of the not understood IE within the bottom most repetition level identified by the message structure IE, if applicable
>Message Structure	O		9.2.20	

Range bound	Explanation
Maxnooferrors	Maximum no. of IE errors allowed to be reported with a single message. The value for maxnooferrors is 256.

9.2.18 Available Bandwidth

Available Bandwidth IE is used to indicate the Bandwidth available for the broadcast of messages.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Available Bandwidth	O		INTEGER (0...20480)	The unit is: bit/second

9.2.19 Message Identifier

Message Identifier IE is set by the CN, transfer to the UE by the RNC.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and Reference	Semantics Description
Message Identifier	M		OCTET STRING (SIZE(2))	This IE is set by the CN, transfer to the UE by the RNC, the RNC needs not to understand what is the meaning of the value but shall treat it as a identifier of a message. The Message Identifier is defined in [11]

9.2.20 Message Structure

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message structure		1 to <maxnooflevels>		Information given per level with assigned criticality in an hierachical message structure. Given from top level down to the level above the reported level for the occured error (reported in the *Information Element Criticality Diagnostics* IE).	GLOBAL	ignore
>IE ID	M		INTEGER (0..65535)	The IE ID of this level's IE containing the not understood or missing IE.	-	
>Repetition Number	O		INTEGER (1..256)	The repetition number of this level's reported IE, if applicable	-	

Range bound	Explanation
maxnooflevels	Maximum no. of message levels to report. The value for maxnooflevels is 256.

9.3 Message and Information Element Abstract Syntax (with ASN.1)

9.3.0 General

SABP ASN.1 definition conforms with [7] and [8].

The ASN.1 definition specifies the structure and content of SABP messages. SABP messages can contain any IEs specified in the object set definitions for that message without the order or number of occurrence being restricted by ASN.1. However, for this version of the standard, a sending entity shall construct a SABP message according to the PDU definitions module and with the following additional rules (Note that in the following IE means an IE in the object

set with an explicit id. If one IE needed to appear more than once in one object set, then the different occurrences have different IE ids):

- IEs shall be ordered (in an IE container) in the order they appear in object set definitions.
- Object set definitions specify how many times IEs may appear. An IE shall appear exactly once if the presence field in an object has value "mandatory". An IE may appear at most once if the presence field in an object has value "optional" or "conditional". If in a tabular format there is multiplicity specified for an IE (i.e. an IE list) then in the corresponding ASN.1 definition the list definition is separated into two parts. The first part defines an IE container list where the list elements reside. The second part defines list elements. The IE container list appears as an IE of its own. For this version of the standard an IE container list may contain only one kind of list elements.

If a SABP message that is not constructed as defined above is received, this shall be considered as Abstract Syntax Error, and the message shall be handled as defined for Abstract Syntax error in Chapter 103.6.

9.3.1 Usage of protocol extension mechanism for non-standard use

The protocol extension mechanism for non-standard use may be used:

- for special operator- (and/or vendor) specific features considered not to be part of the basic functionality, i.e. the functionality required for a complete and high-quality specification in order to guarantee multivendor interoperability.
- by vendors for research purposes, e.g. to implement and evaluate new algorithms/features before such features are proposed for standardisation.

The extension mechanism shall not be used for basic functionality. Such functionality shall be standardised.

9.3.2 Elementary Procedure Definitions

```
-- **************************************************************
--
-- Elementary Procedure definitions
--
-- **************************************************************

SABP-PDU-Descriptions {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-PDU-Descriptions (0)}

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- **************************************************************
--
-- IE parameter types from other modules.
--
-- **************************************************************

IMPORTS
    Criticality,
    ProcedureCode
FROM SABP-CommonDataTypes

    Error-Indication,
    Failure,
    Kill,
    Kill-Complete,
    Kill-Failure,
    Load-Query,
    Load-Query-Complete,
    Load-Query-Failure,
    Reset,
    Reset-Complete,
    Reset-Failure,
    Restart,
    Message-Status-Query,
    Message-Status-Query-Complete,
    Message-Status-Query-Failure,
    Write-Replace,
    Write-Replace-Complete,
    Write-Replace-Failure
FROM SABP-PDU-Contents

    id-Error-Indication,
    id-Failure-Indication,
```

```
    id-Kill,
    id-Reset,
    id-Restart-Indication,
    id-Status-Load-Enquiry,
    id-Status-Message-Query,
    id-Write-Replace
FROM SABP-Constants;

-- **************************************************************
--
-- Interface Elementary Procedure Class
--
-- **************************************************************

SABP-ELEMENTARY-PROCEDURE ::= CLASS {
    &InitiatingMessage              ,
    &SuccessfulOutcome              OPTIONAL,
    &UnsuccessfulOutcome                OPTIONAL,
    &procedureCode          ProcedureCode   UNIQUE,
    &criticality            Criticality     DEFAULT ignore
}
WITH SYNTAX {
    INITIATING MESSAGE      &InitiatingMessage
    [SUCCESSFUL OUTCOME
```

```
&SuccessfulOutcome]
    [UNSUCCESSFUL OUTCOME       &UnsuccessfulOutcome]
    PROCEDURE CODE          &procedureCode
    [CRITICALITY            &criticality]
}

-- **************************************************************
--
-- Interface PDU Definition
--
-- **************************************************************

SABP-PDU ::= CHOICE {
    initiatingMessage   InitiatingMessage,
    successfulOutcome   SuccessfulOutcome,
    unsuccessfulOutcome UnsuccessfulOutcome,
    ...
}

InitiatingMessage ::= SEQUENCE {
    procedureCode   SABP-ELEMENTARY-PROCEDURE.&procedureCode    ({SABP-ELEMENTARY-PROCEDURES}),
    criticality SABP-ELEMENTARY-PROCEDURE.&criticality      ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value       SABP-ELEMENTARY-PROCEDURE.&InitiatingMessage    ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

SuccessfulOutcome ::= SEQUENCE {
    procedureCode   SABP-ELEMENTARY-PROCEDURE.&procedureCode    ({SABP-ELEMENTARY-PROCEDURES}),
    criticality SABP-ELEMENTARY-PROCEDURE.&criticality      ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value       SABP-ELEMENTARY-PROCEDURE.&SuccessfulOutcome    ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

UnsuccessfulOutcome ::= SEQUENCE {
    procedureCode   SABP-ELEMENTARY-PROCEDURE.&procedureCode    ({SABP-ELEMENTARY-PROCEDURES}),
    criticality SABP-ELEMENTARY-PROCEDURE.&criticality      ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value       SABP-ELEMENTARY-PROCEDURE.&UnsuccessfulOutcome  ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

-- **************************************************************
--
-- Interface Elementary Procedure List
--
-- **************************************************************

SABP-ELEMENTARY-PROCEDURES SABP-ELEMENTARY-PROCEDURE ::= {
    SABP-ELEMENTARY-PROCEDURES-CLASS-1  |
    SABP-ELEMENTARY-PROCEDURES-CLASS-2  ,
    ...
}

SABP-ELEMENTARY-PROCEDURES-CLASS-1 SABP-ELEMENTARY-PROCEDURE ::= {
    write-Replace       |
    kill            |
```

```
    status-Load-Enquiry |
    status-Message-Query    |
    reset           ,
    ...
}

SABP-ELEMENTARY-PROCEDURES-CLASS-2 SABP-ELEMENTARY-PROCEDURE ::= {
    restart-Indication  |
    failure-Indication  |
    error-Indication    ,
    ...
}

write-Replace SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Write-Replace
    SUCCESSFUL OUTCOME  Write-Replace-Complete
    UNSUCCESSFUL OUTCOME    Write-Replace-Failure
    PROCEDURE CODE      id-Write-Replace
}

kill SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Kill
    SUCCESSFUL OUTCOME  Kill-Complete
    UNSUCCESSFUL OUTCOME    Kill-Failure
    PROCEDURE CODE          id-Kill
}

status-Load-Enquiry SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Load-Query
    SUCCESSFUL OUTCOME  Load-Query-Complete
    UNSUCCESSFUL OUTCOME    Load-Query-Failure
    PROCEDURE CODE          id-Status-Load-Enquiry
}

status-Message-Query SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Message-Status-Query
    SUCCESSFUL OUTCOME  Message-Status-Query-Complete
    UNSUCCESSFUL OUTCOME    Message-Status-Query-Failure
    PROCEDURE CODE          id-Status-Message-Query
}

reset SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Reset
    SUCCESSFUL OUTCOME  Reset-Complete
    UNSUCCESSFUL OUTCOME    Reset-Failure
    PROCEDURE CODE          id-Reset
}

restart-Indication SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Restart
    PROCEDURE CODE          id-Restart-Indication
}
```

```
failure-Indication SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Failure
    PROCEDURE CODE          id-Failure-Indication
}

error-Indication SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Error-Indication
    PROCEDURE CODE          id-Error-Indication
}

END
```

9.3.3 PDU Definitions

```
-- **************************************************************
--
-- PDU definitions for SABP.
--
-- **************************************************************

SABP-PDU-Contents {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-PDU-Contents (1) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- **************************************************************
--
-- IE parameter types from other modules.
--
-- **************************************************************

IMPORTS
    Broadcast-Message-Content,
    Category,
    Cause,
Criticality-Diagnostics,
    Data-Coding-Scheme,
    Failure-List,
    Message-Identifier,
    New-Serial-Number,
    ~~No~~Number-of-Broadcasts-Completed-List,
    ~~No~~Number-of-Broadcasts-Requested,
    Old-Serial-Number,
    Radio-Resource-Loading-List,
    Recovery-Indication,
    Repetition-Period,
    Serial-Number ,
    Service-Areas-List
```

```
FROM SABP-IEs

    ProtocolExtensionContainer{},
    ProtocolIE-Container{},
    SABP-PROTOCOL-EXTENSION,
    SABP-PROTOCOL-IES
FROM SABP-Containers

    id-Broadcast-Message-Content,
    id-Category,
    id-Criticality-Diagnostics,
    id-Cause,
    id-Data-Coding-Scheme,
    id-Failure-List,
    id-Message-Identifier,
    id-New-Serial-Number,
    id-~~No~~Number-of-Broadcasts-Completed-List,
    id-~~No~~Number-of-Broadcasts-Requested,
    id-Old-Serial-Number,
    id-Radio-Resource-Loading-List,
    id-Recovery-Indication,
    id-Repetition-Period,
    id-Serial-Number,
    id-Service-Areas-List
FROM SABP-Constants;

-- **************************************************************
--
-- Write-Replace
--
-- **************************************************************

Write-Replace ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container      { {Write-Replace-IEs} },
    protocolExtensions      ProtocolExtensionContainer { {Write-Replace-Extensions} } OPTIONAL,
    ...
}

Write-Replace-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-New-Serial-Number   CRITICALITY reject  TYPE New-Serial-Number      PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY ignore  TYPE Old-Serial-Number      PRESENCE optional } |
    { ID id-Service-Areas-List  CRITICALITY reject  TYPE Service-Areas-List     PRESENCE mandatory } |
    { ID id-Category            CRITICALITY ignore  TYPE Category           PRESENCE optional  } |
    { ID id-Repetition-Period   CRITICALITY ignore  TYPE Repetition-Period      PRESENCE optional  } |
    { ID id-~~No~~Number-of-Broadcasts-Requested
                    CRITICALITY reject  TYPE ~~No~~Number-of-Broadcasts-Requested   PRESENCE mandatory } |
    { ID id-Data-Coding-Scheme  CRITICALITY reject  TYPE Data-Coding-Scheme     PRESENCE mandatory } |
    { ID id-Broadcast-Message-Content
                    CRITICALITY reject  TYPE Broadcast-Message-Content  PRESENCE mandatory } ,
    ...
}
```

```
Write-Replace-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Write-Replace-Complete
--
-- **************************************************************

Write-Replace-Complete ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {Write-Replace-Complete-IEs} },
    protocolExtensions      ProtocolExtensionContainer { {Write-Replace-Complete-Extensions} } OPTIONAL,
    ...
}

Write-Replace-Complete-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-New-Serial-Number   CRITICALITY reject  TYPE New-Serial-Number      PRESENCE mandatory } |
    { ID id-NoNumber-of-Broadcasts-Completed-List
                        CRITICALITY reject  TYPE NoNumber-of-Broadcasts-Completed-List
                                                    PRESENCE mandatory  }|
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics    PRESENCE optional },
    ...
}

Write-Replace-Complete-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Write-Replace-Failure
--
-- **************************************************************

Write-Replace-Failure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {Write-Replace-Failure-IEs} },
    protocolExtensions      ProtocolExtensionContainer { {Write-Replace-Failure-Extensions} } OPTIONAL,
    ...
}

Write-Replace-Failure-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-New-Serial-Number   CRITICALITY reject  TYPE New-Serial-Number      PRESENCE mandatory } |
    { ID id-Failure-List        CRITICALITY reject  TYPE Failure-List       PRESENCE mandatory } |
    { ID id-NoNumber-of-Broadcasts-Completed-List
                    CRITICALITY ignore  TYPE NoNumber-of-Broadcasts-Completed-List
                                            PRESENCE optional  } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
```

```
}
Write-Replace-Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Kill
--
-- **************************************************************

Kill ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Kill-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Kill-Extensions}}      OPTIONAL,
    ...
}

Kill-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY reject  TYPE Old-Serial-Number      PRESENCE mandatory } |
    { ID id-Service-Areas-List  CRITICALITY reject  TYPE Service-Areas-List     PRESENCE mandatory } ,
    ...
}

Kill-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Kill-Complete
--
-- **************************************************************

Kill-Complete ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Kill-Complete-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Kill-Complete-Extensions}}     OPTIONAL,
    ...
}

Kill-Complete-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY reject  TYPE Old-Serial-Number      PRESENCE mandatory } |
    { ID id-~~No~~Number-of-Broadcasts-Completed-List
                    CRITICALITY reject      TYPE ~~No~~Number-of-Broadcasts-Completed-List
                                                    PRESENCE mandatory }|
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Kill-Complete-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
```

```
}

-- **************************************************************
--
-- Kill-Failure
--
-- **************************************************************

Kill-Failure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Kill-Failure-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Kill-Failure-Extensions}}      OPTIONAL,
    ...
}

Kill-Failure-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY reject  TYPE Old-Serial-Number      PRESENCE mandatory } |
    { ID id-Failure-List        CRITICALITY reject  TYPE Failure-List       PRESENCE mandatory } |
    { ID id-NoNumber-of-Broadcasts-Completed-List
                        CRITICALITY ignore  TYPE NoNumber-of-Broadcasts-Completed-List
                                                    PRESENCE optional } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Kill-Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Load-Query
--
-- **************************************************************

Load-Query ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Load-Query-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Load-Query-Extensions}}    OPTIONAL,
    ...
}

Load-Query-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Service-Areas-List  CRITICALITY reject  TYPE Service-Areas-List     PRESENCE mandatory } ,
    ...
}

Load-Query-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
```

```
-- Load-Query-Complete
--
-- **************************************************************

Load-Query-Complete ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Load-Query-Complete-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Load-Query-Complete-Extensions}} OPTIONAL,
    ...
}

Load-Query-Complete-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Radio-Resource-Loading-List
                        CRITICALITY reject  TYPE Radio-Resource-Loading-List
                                                    PRESENCE mandatory }  |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Load-Query-Complete-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Load-Query-Failure
--
-- **************************************************************

Load-Query-Failure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Load-Query-Failure-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Load-Query-Failure-Extensions}} OPTIONAL,
    ...
}

Load-Query-Failure-IEs SABP-PROTOCOL-IES ::= {

    { ID id-Failure-List        CRITICALITY reject  TYPE Failure-List       PRESENCE mandatory } |
    { ID id-Radio-Resource-Loading-List
                        CRITICALITY ignore  TYPE Radio-Resource-Loading-List
                                            PRESENCE optional  } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Load-Query-Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Message-Status-Query
```

```
--
-- **********************************************************

Message-Status-Query ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Message-Status-Query-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Message-Status-Query-Extensions}} OPTIONAL,
    ...
}

Message-Status-Query-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY reject  TYPE Old-Serial-Number      PRESENCE mandatory } |
    { ID id-Service-Areas-List  CRITICALITY reject  TYPE Service-Areas-List     PRESENCE mandatory } ,
    ...
}

Message-Status-Query-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **********************************************************
--
-- Message-Status-Query-Complete
--
-- **********************************************************

Message-Status-Query-Complete ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container       {{Message-Status-Query-Complete-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Message-Status-Query-Complete-Extensions}} OPTIONAL,
    ...
}

Message-Status-Query-Complete-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY reject  TYPE Old-Serial-Number      PRESENCE mandatory } |
    { ID id-~~No~~Number-of-Broadcasts-Completed-List
                        CRITICALITY reject  TYPE ~~No~~Number-of-Broadcasts-Completed-List
                                                    PRESENCE mandatory } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Message-Status-Query-Complete-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **********************************************************
--
-- Message-Status-Query-Failure
--
-- **********************************************************
```

```
Message-Status-Query-Failure ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container       {{Message-Status-Query-Failure-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Message-Status-Query-Failure-Extensions}} OPTIONAL,
    ...
}

Message-Status-Query-Failure-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Failure-List        CRITICALITY reject  TYPE Failure-List       PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY reject  TYPE Old-Serial-Number      PRESENCE mandatory } |

    { ID id-NoNumber-of-Broadcasts-Completed-List
                  CRITICALITY ignore  TYPE NoNumber-of-Broadcasts-Completed-List
                                                        PRESENCE optional  } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Message-Status-Query-Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Reset
--
-- **************************************************************

Reset ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Reset-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Reset-Extensions}}     OPTIONAL,
    ...
}

Reset-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Service-Areas-List  CRITICALITY reject  TYPE Service-Areas-List         PRESENCE mandatory } ,
    ...
}

Reset-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Reset-Complete
--
-- **************************************************************

Reset-Complete ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Reset-Complete-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Reset-Complete-Extensions}}    OPTIONAL,
```

```
    ...
}

Reset-Complete-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Service-Areas-List  CRITICALITY reject  TYPE Service-Areas-List     PRESENCE mandatory } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Reset-Complete-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Reset-Failure
--
-- **************************************************************

Reset-Failure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Reset-Failure-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Reset-Failure-Extensions}}     OPTIONAL,
    ...
}

Reset-Failure-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Failure-List        CRITICALITY reject  TYPE Failure-List       PRESENCE mandatory } |
    { ID id-Service-Areas-List  CRITICALITY reject  TYPE Service-Areas-List     PRESENCE optional  } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics    PRESENCE optional } ,
    ...
}

Reset-Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Restart
--
-- **************************************************************

Restart ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container       {{Restart-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Restart-Extensions}}   OPTIONAL,
    ...
}

Restart-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Service-Areas-List  CRITICALITY ignore  TYPE Service-Areas-List     PRESENCE mandatory } |
    { ID id-Recovery-Indication     CRITICALITY ignore  TYPE Recovery-Indication    PRESENCE optional  } ,
```

```
    ...
}

Restart-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Failure
--
-- **************************************************************

Failure ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container       {{Failure-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Failure-Extensions}}   OPTIONAL,
    ...
}

Failure-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Service-Areas-List  CRITICALITY ignore  TYPE Service-Areas-List     PRESENCE mandatory } ,
    ...
}

Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Error-Indication
--
-- **************************************************************

Error-Indication ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container       {{Error-Indication-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Error-Indication-Extensions}}  OPTIONAL,
    ...
}

Error-Indication-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY ignore  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Serial-Number       CRITICALITY ignore  TYPE Serial-Number      PRESENCE optional  } |
    { ID id-Cause           CRITICALITY ignore  TYPE Cause              PRESENCE optional  } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics    PRESENCE optional },
    ...
}

Error-Indication-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```
END
```

9.3.4 Information Element Definitions

```
-- **************************************************************
--
-- Information Element Definitions
--
-- **************************************************************


SABP-IEs {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS
    maxRadio-Resource-Loading-List,
    maxFailure-List,
    maxNoNumber-of-Broadcasts-Completed-List,
    maxNrOfErrors,
    maxService-Areas-List,
    maxNrOfLevels,

    id-MessageStructure

FROM SABP-Constants

    Criticality,
    ProcedureCode,
    TriggeringMessage,
    ProtocolIE-ID
FROM SABP-CommonDataTypes

    ProtocolExtensionContainer{},

    SABP-PROTOCOL-EXTENSION
FROM SABP-Containers;


-- A

Available-Bandwidth         ::= INTEGER (0..20480)
-- bits/sec

-- B
```

```
Broadcast-Message-Content ::= OCTET STRING (SIZE (1246))
-- This IE is sent from the CN to the RNC containing user information i.e.
-- the message.

-- C

Category ::= ENUMERATED {
    high-priority,
    background-priority,
    normal-priority,
    default-priority,
    ...
}

Cause                   ::= INTEGER {
    parameter-not-recognised                            (0),
    parameter-value-invalid                             (1),
    valid-CN-message-not-identified                     (2),
    service-area-identity-not-valid                     (3),
    unrecognised-message                                (4),
    missing-mandatory-element                           (5),
    rNC-capacity-exceeded                               (6),
    rNC-memory-exceeded                                 (7),
    service-area-broadcast-not-supported                (8),
    service-area-broadcast-not-operational              (9),
    message-reference-already-used                      (10),
    unspecifed-error                                    (11),
    transfer-syntax-error                               (12),
    semantic-error                                      (13),
    message-not-compatible-with-receiver-state          (14),
    abstract-syntax-error-reject                        (15),
    abstract-syntax-error-ignore-and-notify             (16),
    abstract-syntax-error-falsely-constructed-message   (17)
} (0..255)

Criticality-Diagnostics         ::= SEQUENCE {
    procedureCode           ProcedureCode           OPTIONAL,
    triggeringMessage       TriggeringMessage       OPTIONAL,
    procedureCriticality        Criticality         OPTIONAL,
    iEsCriticalityDiagnostics       CriticalityDiagnostics-IE-List  OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { {CriticalityDiagnostics-ExtIEs} } OPTIONAL,
    ...
}

CriticalityDiagnostics-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

CriticalityDiagnostics-IE-List ::= SEQUENCE (SIZE (1..maxNrOfErrors)) OF
    SEQUENCE {
        iECriticality       Criticality,
        iE-ID               ProtocolIE-ID,
```

```
        repetitionNumber        RepetitionNumber        OPTIONAL,
        iE-Extensions           ProtocolExtensionContainer { {CriticalityDiagnostics-IE-List-ExtIEs} } OPTIONAL,
        ...
    }

CriticalityDiagnostics-IE-List-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    {   ID id-MessageStructure      CRITICALITY ignore      EXTENSION MessageStructure      PRESENCE optional },
    ...
}


MessageStructure ::= SEQUENCE (SIZE (1..maxNrOfLevels)) OF
    SEQUENCE {
        iE-ID                   ProtocolIE-ID,
        repetitionNumber        RepetitionNumber        OPTIONAL,
        iE-Extensions           ProtocolExtensionContainer { {MessageStructure-ExtIEs} } OPTIONAL,
        ...
    }


MessageStructure-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}


-- D

Data-Coding-Scheme          ::= INTEGER (0..255)

-- E

-- F

Failure-List ::= SEQUENCE (SIZE (1..maxFailure-List)) OF Failure-List-Item

Failure-List-Item ::= SEQUENCE {
    service-area-identifier     Service-Area-Identifier,
    cause                   Cause,
        iE-Extensions       ProtocolExtensionContainer { {FailureListItemIE-ExtIEs} } OPTIONAL,
        ...
}

FailureListItemIE-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
...
}

-- G

-- H

-- I

-- J
```

```
-- K

-- L

-- M

Message-Identifier ::= OCTET STRING (SIZE (2))

-- N

New-Serial-Number               ::= Serial-Number

NoNumber-of-Broadcasts-Completed-List ::=   SEQUENCE (SIZE (1..maxNoNumber-of-Broadcasts-Completed-List)) OF
    NoNumber-of-Broadcasts-Completed-List-Item

NoNumber-of-Broadcasts-Completed-List-Item ::= SEQUENCE {
    service-area-identifier     Service-Area-Identifier,
    nonumber-of-broadcasts-completed        INTEGER (0..65535),
    nonumber-of-broadcasts-completed-info   NoNumber-Of-Broadcasts-Completed-Info           OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {NoOfBroadcastsCompletedListItemIE-ExtIEs} } OPTIONAL,
        ...
}

NoOfBroadcastsCompletedListItemIE-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
...
}

NoNumber-Of-Broadcasts-Completed-Info       ::= ENUMERATED {
    overflow,
    unknown,
    ...
}

NoNumber-of-Broadcasts-Requested        ::= INTEGER {
    broadcast-indefinitely (0)
} (0..65535)

-- O

Old-Serial-Number               ::= Serial-Number

-- P

-- Q

-- R

Radio-Resource-Loading-List ::= SEQUENCE (SIZE (1..maxRadio-Resource-Loading-List)) OF
    Radio-Resource-Loading-List-Item

Radio-Resource-Loading-List-Item ::= SEQUENCE {
    service-area-identifier     Service-Area-Identifier,
```

```
    available-bandwidth     Available-Bandwidth,
    iE-Extensions       ProtocolExtensionContainer { {RadioResourceLoadingListItemIE-ExtIEs} } OPTIONAL,
        ...
}

RadioResourceLoadingListItemIE-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
...
}

Recovery-Indication ::= ENUMERATED {
    data-lost,
    data-available
}

RepetitionNumber            ::= INTEGER(1..256)

Repetition-Period           ::= INTEGER (1..4096)
-- Each unit represents a repetition of one second to a maximum of
-- once per 4096 seconds (~1 hour).


-- S

Serial-Number               ::= INTEGER (0..65535)


Service-Area-Identifier ::= SEQUENCE {
    plmn-id             OCTET STRING (SIZE (3))
                    -- Digits 0 to 9, two digits per octet.          --
                    -- Each octet encoded 0000 to 1001.              --
                    -- 1111 used as filler                          --
                    -- Bit 4 to 1 of octet n encoding digit 2n-1.    --
                    -- Bit 8 to 5 of octet n encoding digit 2n.      --
                    -- The PLMN-ID consists of 3 digits from MCC     --
                    -- followed by either a filler plus 2 digits     --
                    -- from MNC (in case of 2 digit MNC) or 3 digits --
                    -- from MNC (in case of 3 digit MNC).            -- ,
    lac             OCTET STRING (SIZE (2))
                    -- 0000 and FFFE not allowed                     -- ,
    sac             OCTET STRING (SIZE (2))
}

-- **TODO** The IE type for these parameters is not known as yet
Service-Areas-List ::= SEQUENCE (SIZE (1..maxService-Areas-List)) OF Service-Area-Identifier



-- T

-- U

-- V
```

```
-- W

-- X

-- Y

END
```

9.3.5 Common Definitions

```
-- **************************************************************
--
-- Common definitions
--
-- **************************************************************

SABP-CommonDataTypes {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-CommonDataTypes (3) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

Criticality     ::= ENUMERATED { reject, ignore, notify }

Presence        ::= ENUMERATED { optional, conditional, mandatory }

ProcedureCode       ::= INTEGER (0..255)

ProtocolExtensionID ::= INTEGER (0..65535)

ProtocolIE-ID       ::= INTEGER (0..65535)

TriggeringMessage       ::= ENUMERATED {initiating-message, successful-outcome, unsuccessful-outcome, outcome}

END
```

9.3.6 Constant Definitions

```
-- **************************************************************
--
-- Constant definitions
--
-- **************************************************************

SABP-Constants {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-Constants (4) }

DEFINITIONS AUTOMATIC TAGS ::=
```

```
BEGIN

-- **************************************************************
--
-- Elementary Procedures
--
-- **************************************************************

id-Write-Replace            INTEGER ::= 0
id-Kill                 INTEGER ::= 1
id-Status-Load-Enquiry          INTEGER ::= 2
id-Status-Message-Query         INTEGER ::= 3
id-Restart-Indication           INTEGER ::= 4
id-Reset                INTEGER ::= 5
id-Failure-Indication           INTEGER ::= 6
id-Error-Indication         INTEGER ::= 7

-- **************************************************************
--
-- IEs
--
-- **************************************************************

id-Broadcast-Message-Content        INTEGER ::= 0
id-Category                INTEGER ::= 1
id-Cause                INTEGER ::= 2
id-Criticality-Diagnostics  INTEGER ::=3
id-Data-Coding-Scheme           INTEGER ::= 4
id-Failure-List             INTEGER ::= 5
id-Message-Identifier           INTEGER ::= 6
id-New-Serial-Number            INTEGER ::= 7
id-NoNumber-of-Broadcasts-Completed-List    INTEGER ::= 8
id-NoNumber-of-Broadcasts-Requested         INTEGER ::= 9
id-Old-Serial-Number                INTEGER ::= 10
id-Radio-Resource-Loading-List      INTEGER ::= 11
id-Recovery-Indication          INTEGER ::= 12
id-Repetition-Period            INTEGER ::= 13
id-Serial-Number            INTEGER ::= 14
id-Service-Areas-List           INTEGER ::= 15
id-MessageStructure             INTEGER ::= 16


-- **************************************************************
--
-- Extension constants
--
-- **************************************************************

-- **************************************************************
--
-- Lists
--
```

```
-- **************************************************************

maxRadio-Resource-Loading-List  INTEGER ::= 65535
maxFailure-List             INTEGER ::= 65535
maxNoNumber-of-Broadcasts-Completed-List    INTEGER ::= 65535
maxNrOfErrors               INTEGER ::= 256
maxService-Areas-List           INTEGER ::= 65535

maxProtocolExtensions           INTEGER ::= 65535
maxProtocolIEs              INTEGER ::= 65535
maxNrOfLevels                       INTEGER ::= 256

END
```

9.3.7 Container Definitions

```
-- **************************************************************
--
-- Container definitions
--
-- **************************************************************

SABP-Containers {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-Containers (5) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- **************************************************************
--
-- IE parameter types from other modules.
--
-- **************************************************************

IMPORTS
    Criticality,
    Presence,
    ProtocolExtensionID,
    ProtocolIE-ID
FROM SABP-CommonDataTypes

    maxProtocolExtensions,
    maxProtocolIEs
FROM SABP-Constants;

-- **************************************************************
--
-- Class Definition for Protocol IEs
--
```

```
-- **************************************************************

SABP-PROTOCOL-IES ::= CLASS {
    &id             ProtocolIE-ID       UNIQUE,
    &criticality            Criticality     DEFAULT ignore,
    &Value,
    &presence           Presence
}
WITH SYNTAX {
    ID              &id
    CRITICALITY         &criticality
    TYPE                &Value
    PRESENCE            &presence
}

-- **************************************************************
--
-- Class Definition for Protocol Extensions
--
-- **************************************************************

SABP-PROTOCOL-EXTENSION ::= CLASS {
    &id             ProtocolExtensionID     UNIQUE,
    &criticality            Criticality     DEFAULT ignore,
    &Extension,
    &presence       Presence
}
WITH SYNTAX {
    ID              &id
    CRITICALITY         &criticality
    EXTENSION           &Extension
    PRESENCE            &presence
}

-- **************************************************************
--
-- Container for Protocol IEs
--
-- **************************************************************

ProtocolIE-Container {SABP-PROTOCOL-IES : IEsSetParam} ::=
    SEQUENCE (SIZE (0..maxProtocolIEs)) OF
    ProtocolIE-Field {{IEsSetParam}}

ProtocolIE-Field {SABP-PROTOCOL-IES : IEsSetParam} ::= SEQUENCE {
    id              SABP-PROTOCOL-IES.&id               ({IEsSetParam}),
    criticality         SABP-PROTOCOL-IES.&criticality          ({IEsSetParam}{@id}),
    value               SABP-PROTOCOL-IES.&Value                ({IEsSetParam}{@id})
}

-- **************************************************************
--
-- Container Lists for Protocol IE Containers
```

```
--
-- **************************************************************

ProtocolIE-ContainerList {INTEGER : lowerBound, INTEGER : upperBound, SABP-PROTOCOL-IES : IEsSetParam} ::=
    SEQUENCE (SIZE (lowerBound..upperBound)) OF
    ProtocolIE-Container {{IEsSetParam}}

-- **************************************************************
--
-- Container for Protocol Extensions
--
-- **************************************************************

ProtocolExtensionContainer {SABP-PROTOCOL-EXTENSION : ExtensionSetParam} ::=
    SEQUENCE (SIZE (1..maxProtocolExtensions)) OF
    ProtocolExtensionField {{ExtensionSetParam}}

ProtocolExtensionField {SABP-PROTOCOL-EXTENSION : ExtensionSetParam} ::= SEQUENCE {
    id              SABP-PROTOCOL-EXTENSION.&id         ({ExtensionSetParam}),
    criticality         SABP-PROTOCOL-EXTENSION.&criticality        ({ExtensionSetParam}{@id}),
    extensionValue          SABP-PROTOCOL-EXTENSION.&Extension      ({ExtensionSetParam}{@id})
}


END
```

Places with no impact are not shown

3GPP TSG- Working Group 3 Meeting #21
Busan, Korea, 21st – 25th April

Tdoc R3-011359

CR-Form-v3

CHANGE REQUEST

⌘ **25.419** **CR** **42** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

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

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

Title:	⌘	Correction to the SABP(25.419)
Source:	⌘	R-WG3
Work item code:	⌘	TEI
Date:	⌘	May 2001
Category:	⌘	**A**
Release:	⌘	Rel4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	In order to make a SABP specification clear and unambiguous, the procedure text descriptions in the SABP specification needs to be improved.
Summary of change:	⌘	Providing the procedure description text to describe the functional behaviour of the RNC exactly and completely. The procedure that have been improved in this CR are: Write-Replace, Kill, Load Status Enquiry, Message Status Query, Reset, Restart Indication, Failure Indication and Error Indication. Some correction to the mistakes are also done. Some editorial improvements to the figures are also done. The improved text are based on 23.041(R99) and 25.324(R99).
Consequences if not approved:	⌘	If this correction is not done, the SABP specification will remain as ambiguity. This CR has no impact on the backward compatibility.

Clauses affected:	⌘	2, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 9.1.3, 9.1.4, 9.1.5, 9.1.7, 9.1.8, 9.1.13, 9.1.14, 9.2.9, 9.2.10, 9.2.19, 9.3.3, 9.3.4, 9.3.6
Other specs affected:	⌘	[X] Other core specifications ⌘ 25.419 CR41 Rel99 ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3GPP TS 25.419 V4.0.0 (2001-03)

Technical Specification

3rd Generation Partnership Project;
Technical Specification Group RAN;
UTRAN Iu-BC Interface: Service Area Broadcast Protocol SABP
(Release 1999)

Keywords
UMTS, radio

3GPP

Postal address

3GPP support office address
650 Route des Lucioles - Sophia Antipolis
Valbonne - FRANCE
Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Internet
http://www.3gpp.org

Contents

Foreword

This Technical Specification (TS) has been produced by the 3rd Generation Partnership Project (3GPP).

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

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document specifies the *Service Area Broadcast Protocol (SABP)* between the Cell Broadcast Centre (CBC) and the Radio Network Controller (RNC). It fulfils the CBC - RNC communication requirements specified in [5] and is defined over the Iu-BC – reference point.

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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 23.930: "Iu Principles".

[2] 3GPP TS 25.410: "UTRAN Iu Interface; General Aspects and Principles".

[3] 3GPP TS 25.401: "UTRAN Overall Description".

[4] 3GPP TS 25.931: "UTRAN Functions, Examples on Signalling Procedures".

[5] 3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".

[6] 3GPP TS 25.414: "UTRAN Iu Interface Data Transport and Transport Signalling".

[7] ITU-T Recommendation X.680 (12/94): "Information Technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".

[8] ITU-T Recommendation X.681 (12/94): "Information Technology - Abstract Syntax Notation One (ASN.1): Information object specification".

[9] ITU-T Recommendation X.691 (12/94): "Information Technology - ASN.1 encoding rules - Specification of Packed Encoding Rules (PER)".

[10] 3GPP TR 25.921: "Guidelines and Principles for Protocol Description and Error Handling".

[11] 3GPP TS25.324: "Broadcast/Multicast Control BMC".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply.

Elementary Procedure: The SABP consists of Elementary Procedures (EPs). An Elementary Procedure is a unit of interaction between the CN (CBC) and the RNC. These EPs are defined separately and are intended to be used to build up complete sequences in a flexible manner. If the independence between some EPs is restricted, it is described under the relevant EP description. Unless otherwise stated by the restrictions, the EPs may be invoked independently of each other as stand alone procedures, which can be active in parallel. Examples on using several SABP EPs together with each other and EPs from other interfaces can be found in reference [4].

An EP consists of an initiating message and possibly a response message. Two kinds of EPs are used:

- **Class 1:** Elementary Procedures with response (success or failure).
- **Class 2:** Elementary Procedures without response.

For Class 1 EPs, the types of responses can be as follows:

Successful

- A signalling message explicitly indicates that the elementary procedure successfully completed with the receipt of the response.

Unsuccessful

- A signalling message explicitly indicates that the EP failed.
- On time supervision expiry (i.e. absence of expected response).

Class 2 EPs are considered always successful.

Message Reference: This is defined as consisting of the following parameters: Message Identifier, Serial Number, and SAI (Service Area Identifier).

3.2 Abbreviations

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

CBC	Cell Broadcast Centre
CBS	Cell Broadcast Service
CN	Core Network
EP	Elementary Procedure
FP	Frame Protocol
PDU	Protocol Data Unit
RNC	Radio Network Controller
SA	Service Area
SABP	Service Area Broadcast Protocol

4 General

The protocol described in the present document is the protocol between CN (CBC) and RNC needed for the CBC Application. The CBC Application is described in [5].

4.1 Procedure Specification Principles

The principle for specifying the procedure logic is to specify the functional behaviour of the RNC exactly and completely. The CN functional behaviour is left unspecified.

The following specification principles have been applied for the procedure text in chapter 8:

- The procedure text discriminates between:

  1) Functionality which "shall" be executed

  The procedure text indicates that the receiving node "shall" perform a certain function Y under a certain condition. If the receiving node supports procedure X but cannot perform functionality Y requested in the REQUEST message of a Class 1 EP, the receiving node shall respond with the message used to report unsuccessful outcome for this procedure, containing an appropriate cause value.

  2) Functionality which "shall, if supported" be executed

The procedure text indicates that the receiving node "shall, if supported," perform a certain function Y under a certain condition. If the receiving node supports procedure X, but does not support functionality Y, the receiving node shall proceed with the execution of the EP, possibly informing the requesting node about the not supported functionality.

- Any required inclusion of an optional IE in a response message is explicitly indicated in the procedure text. If the procedure text does not explicitly indicate that an optional IE shall be included in a response message, the optional IE shall not be included.

4.2 Forwards and Backwards Compatibility

The forwards and backwards compatibility of the protocol is assured by mechanism where all current and future messages, and IEs or groups of related IEs, include Id and criticality fields that are coded in a standard format that will not be changed in the future. These parts can always be decoded regardless of the standard version.

4.3 Specification Notations

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

Procedure	When referring to an elementary procedure in the specification the Procedure Name is written with the first letters in each word in upper case characters followed by the word "procedure", e.g. Write-Replace procedure.
Message	When referring to a message in the specification the MESSAGE NAME is written with all letters in upper case characters followed by the word "message", e.g. WRITE-REPLACE message.
IE	When referring to an information element (IE) in the specification the *Information Element Name* is written with the first letters in each word in upper case characters and all letters in Italic font followed by the abbreviation "IE", e.g. *Old Serial Number* IE.
Value of an IE	When referring to the value of an information element (IE) in the specification the "Value" is written as it is specified in subclause 9.2 enclosed by quotation marks, e.g. "Abstract Syntax Error (Reject)" or "Background ".

5 Services provided by SABP

- During normal operation the CN (CBC) initiates all message transfer and query operations. The RNC responds to the message transfer and query operations initiated by the CBC.
- The RNC will open the connection only in case an error (Failure Indication Procedure) or recovery (Restart Indication Procedure) is to be reported.
- The initiator of a connection is responsible for the termination of the connection.

6 Services expected from the Transport layer

Following service is expected from the transport layer:

- in sequence delivery of FP PDU [6].

7 Functions of SABP

The SABP has the following functions:

- Message Handling. This function is responsible for the broadcast of new messages, amend existing broadcasted messages and to stop the broadcasting of specific messages.

- Load Handling. This function is responsible for determining the loading of the broadcast channels at any particular point in time.
- Reset. This function permits the CBC to end broadcasting in one or more Service Areas.
- Error Handling. This function allows the reporting of general error situations, for which function specific error messages have not been defined.

These functions are implemented by one or several SABP elementary procedures described in the following clauses.

8 SABP Procedures

8.1 Elementary Procedures

In the following tables, all EPs are divided into Class 1, and Class 2 Procedures:

Table 1: Class 1

Elementary Procedure	Initiating Message	Successful Outcome	Unsuccessful Outcome
		Response message	Response message
Write-Replace	WRITE-REPLACE	WRITE-REPLACE COMPLETE	WRITE-REPLACE FAILURE
Kill	KILL	KILL COMPLETE	KILL FAILURE
Status Load Enquiry	LOAD QUERY	LOAD QUERY COMPLETE	LOAD QUERY FAILURE
Status Message Query	MESSAGE QUERY	MESSAGE QUERY COMPLETE	MESSAGE QUERY FAILURE
Reset	RESET	RESET COMPLETE	RESET FAILURE

Table 2: Class 2

Elementary Procedure	Message
Restart Indication	RESTART
Failure Indication	FAILURE
Error Indication	ERROR INDICATION

8.2 Write-Replace

8.2.1 General

The purpose of this Write-Replace procedure is to broadcast new information or replace a message already broadcast to a chosen Service Area(s).

8.2.2 Successful Operation

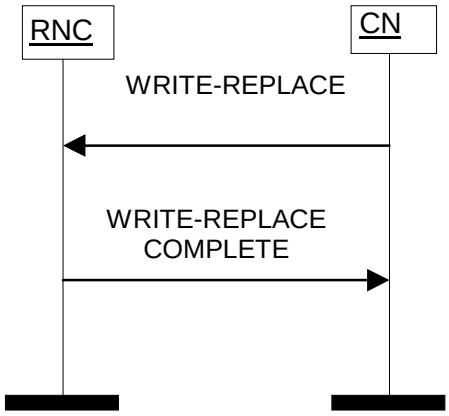


Figure 1: Write-Replace Procedure: Successful Operation

The CN shall initiate the procedure by sending a WRITE-REPLACE message to the RNC.

The presence of a *New Serial Number* IE will indicate that this is a new broadcast. The presence of both the *Old Serial Number* IE and a *New Serial Number* IE will indicate that this ~~is~~ message is a replacement of an existing broadcast. The RNC will initiate broadcasting of a new message or replace a message already broadcast as requested to the service areas as indicated in the *Service Areas List* IE.

The RNC shall uniquely identify the CBS message by the *Message Identifier* IE together with the serial number in the *New Serial Number* IE and the ~~*SAI*~~*Service Areas List* IE.

The RNC shall perform the broadcast according to the value of the *Category* IE as follows:

- The *Category* IE, if given in the WRITE-REPLACE message, shall be treated as follows:

  1. If the value of *Category* IE is indicated as "High Priority", the RNC shall perform the broadcast immediately

  2. If the value of *Category* IE is indicated as "Background", the RNC shall perform the broadcast when no other broadcast message indicated as "High Priority" or "Normal"

  3. If the value of *Category* IE is indicated as "Normal", the RNC shall perform the broadcast according to the *Repetition Period* IE.

- If the *Category* IE is not given in the WRITE-REPLACE message, the RNC shall perform the broadcast as the same category indicated as "Normal".

The RNC shall pass the *Data Coding Scheme* IE transparently to the radio interface protocol.

The RNC shall pass the *Broadcast Message Content* IE Transparently to the radio interface protocol.

The RNC shall broadcast the message frequently according to the value of the *Number of Broadcasts Requested* IE. If the value is set to "0", the RNC shall broadcast the message until the CN request otherwise.

Upon receipt of the WRITE-REPLACE message the RNC shall respond using the WRITE-REPLACE COMPLETE message containing a *New Serial Number* IE indicating that resources are available as requested for the Service Area(s) specified and a *Number of Broadcast Complete List* IE contains each Service Area which successfully performed the requested operation and for each of these Service Area(s), the number of times the broadcast message has been sent to the particular Service Area(s) for broadcast.

8.2.3 Unsuccessful Operation

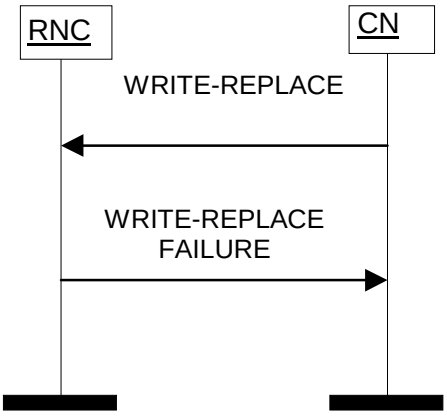


Figure 2: Write-Replace Procedure: Un-Successful Operation

If the RNC cannot allocate all the resources requested for the Service Area(s) specified in the WRITE-REPLACE message, then the RNC shall return a WRITE-REPLACE FAILURE message to the CN. A list of Service Area(s) where the requested resources are unavailable and appropriate cause value ~~will~~ shall be provided in this WRITE-REPLACE FAILURE message in the *Failure List* IE.

This WRITE-REPLACE FAILURE message may also include those Service Area(s) where the requested resources were available and ~~will~~shall indicate in the *Number of Broadcasts Completed List* IE those Service Area(s) which completed the request.

8.2.4 Abnormal Conditions

8.3 Kill

8.3.1 General

The purpose of the Kill procedure is to stop the broadcast of the indicated message.

8.3.2 Successful Operation

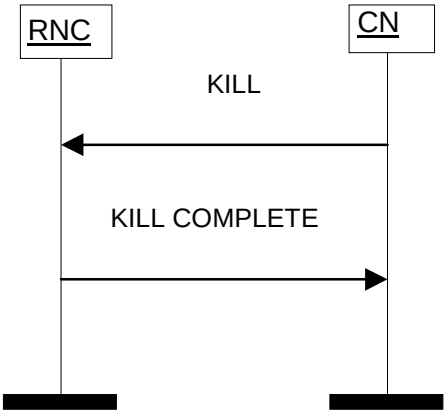


Figure 3: Kill Procedure: Successful Operation

The CN shall initiate the procedure by sending a KILL message to the RNC.

Upon receipt of the KILL message the RNC shall stop broadcasting the indicated message, which is indicated in the *Message Identifier* IE and *Old Serial Number* IE, in the indicated Service Area(s) as indicated in the *Service Areas List* IE.

The RNC shall respond using the KILL COMPLETE message, containing the *Old Serial Number* IE and the *Number of Broadcast Complete List* IE contains each Service Area which successfully performed the requested operation and for each of these Service Area(s), the number of times the broadcast message has been sent to the particular Service Area(s) for broadcast.

8.3.3 Unsuccessful Operation

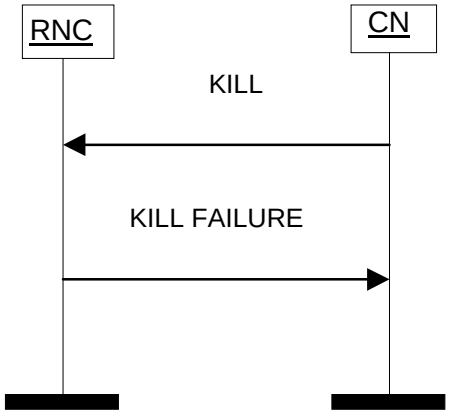


Figure 4: Kill Procedure: Un-Successful Operation

If the RNC fails to stop broadcasting the indicated message as indicated in the KILL message, the RNC shall return the KILL FAILURE message to the CN. A *Failure List* IE indicating the list of Service Area(s) where the message reference is not valid and appropriate cause value ~~will~~shall be provided in a KILL FAILURE message. This response message may also – if applicable - indicate in the *Number of Broadcasts Completed List* IE those Service Area(s) which completed the request where the KILL message was successful.

8.3.4 Abnormal Conditions

8.4 Load Status Enquiry

8.4.1 General

The purpose of this Load Status Enquiry procedure is to obtain the current permissible bandwidth available for broadcast within particular Service Area(s).

8.4.2 Successful Operation

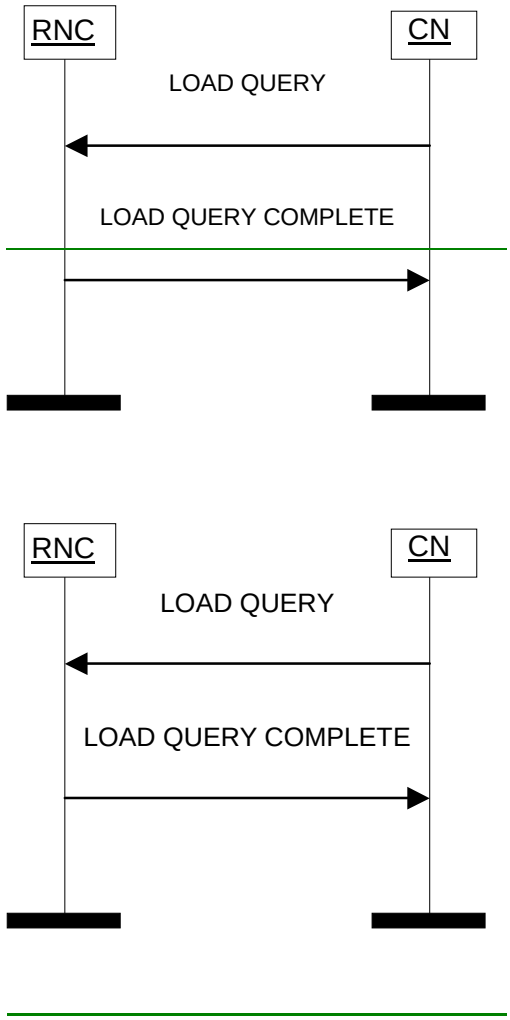


Figure 5: Load Status Enquiry Procedure: Successful Operation

The CN shall initiate the procedure by sending a LOAD QUERY message to the RNC. The message shall include a *Service Areas List* IE. Upon reception of the LOAD QUERY message the RNC shall respond with a LOAD QUERY COMPLETE message containing the *Radio Resource Loading List* IE indicating the available bandwidth of the Service Area(s).

8.4.3 Unsuccessful Operation

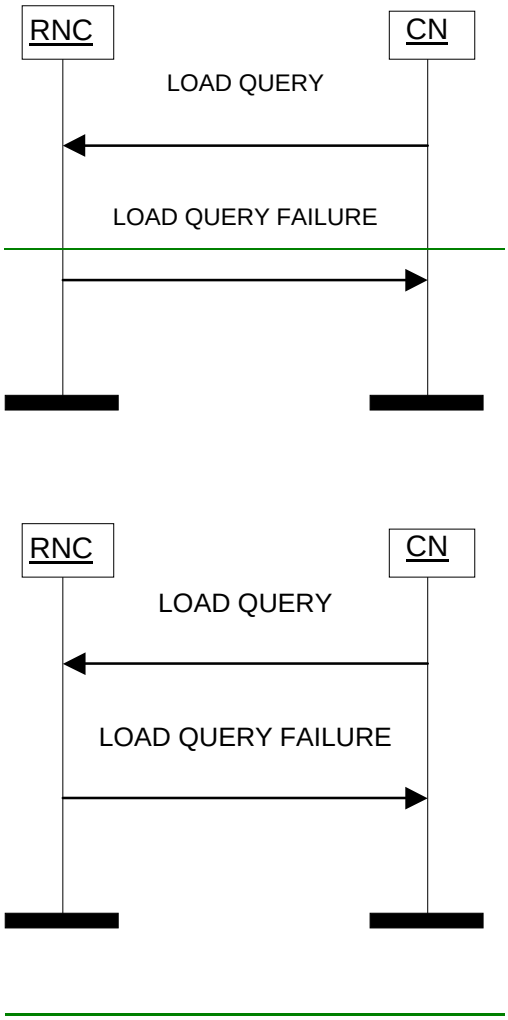


Figure 6: Load Status Enquiry Procedure: Un-Successful Operation

If the RNC contains Service Area(s) for which the RNC was not able to respond to, it shall respond with a LOAD QUERY FAILURE message which includes the *Failure List* IE.

The LOAD QUERY FAILURE response message may – if applicable - also contain a *Radio Resource Loading List* IE for which the LOAD STATUS QUERY reporting was successful.

8.4.4 Abnormal Conditions

8.5 Message Status Query

8.5.1 General

The Message Status Query procedure is used by the CN to obtain the message status of a broadcast message.

8.5.2 Successful Operation

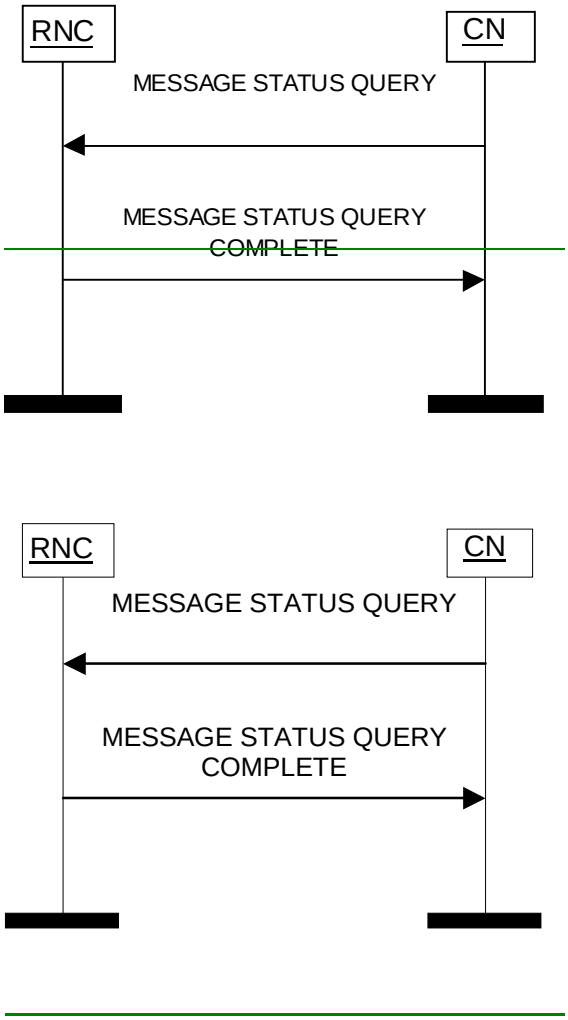


Figure 7: Message Status ~~Enquiry~~Query Procedure: Successful Operation

The CN shall initiate the procedure by sending a MESSAGE STATUS QUERY message to the RNC. The message ~~will~~shall contain the *Old Serial Number* IE along with the ~~appropriate~~ *Service Areas List* IE containing the Service Area Identifiers the status query is intended for.

Upon receipt of the MESSAGE STATUS QUERY message the RNC shall respond using the MESSAGE STATUS QUERY COMPLETE message.

Within this message the ~~*No*~~*Number of Broadcasts Completed List* IE contains each Service Area which successfully performed the requested operation and for each of these Service Area(s), the number of times this broadcast message has been sent to this particular Service Area(s) for broadcast.

8.5.3 Unsuccessful Operation

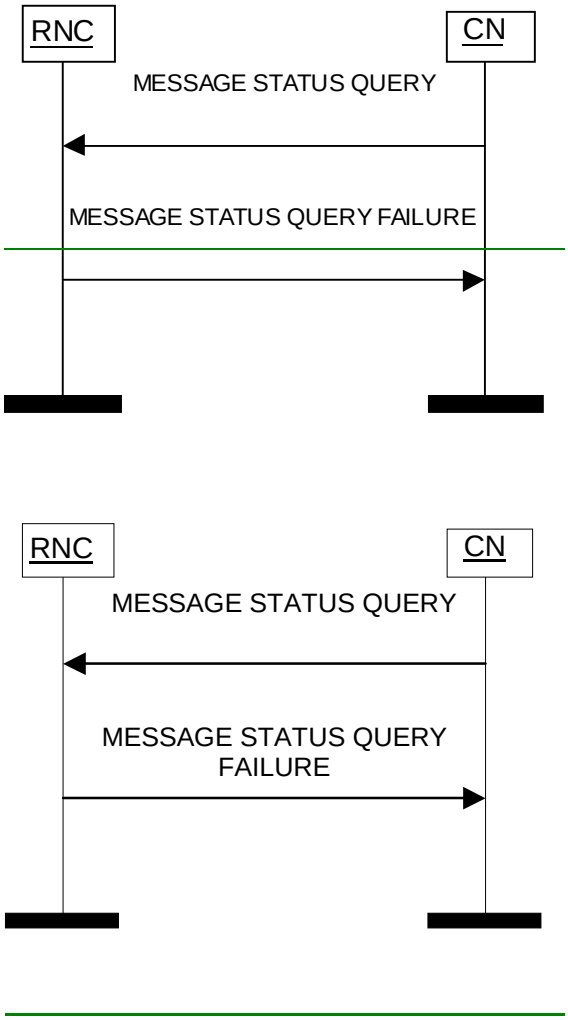


Figure 8: Message Status ~~Enquiry~~Query Procedure: Un-Successful Operation

If the requested operation fails (e.g. because the Message Identifier is unknown, or when the RNC cannot send the status for a known Message Identifier) the RNC shall send a MESSAGE STATUS QUERY FAILURE message to the CN containing a *Failure List* IE for Service Area(s) for which the requested operation failed.

The MESSAGE STATUS QUERY FAILURE message may – if applicable - also include the ~~*No*~~*Number of Broadcasts Completed List* IE indicating those Service Area(s) for which the MESSAGE STATUS QUERY message was successful.

8.5.4 Abnormal Conditions

8.6 Reset

8.6.1 General

The purpose of the Reset procedure is to end broadcasting in one or more Service Areas in the RNC.

8.6.2 Successful Operation

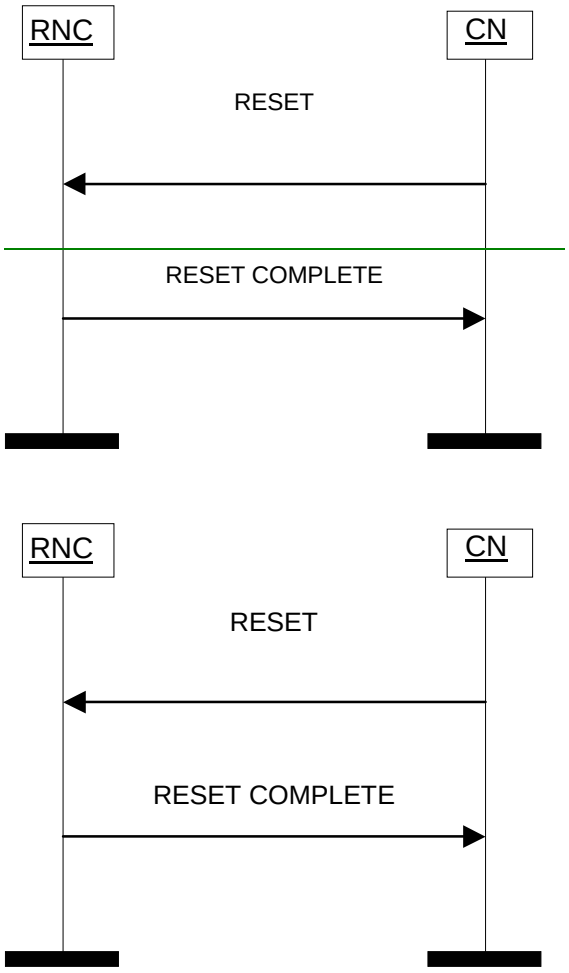


Figure 9: Reset Procedure: Successful Operation

The CN shall initiate the procedure by sending a RESET message to the RNC, in order to end broadcasting in one or more Service Areas of the RNC.

It may also be used by the CN to inquire about the Service Area broadcasting operational state of Service Area(s) who had earlier indicated as having failed.

Upon receipt of this message the RNC shall end broadcasting in the indicated Service Area(s) and shall respond using a RESET COMPLETE message.

8.6.3 Unsuccessful Operation

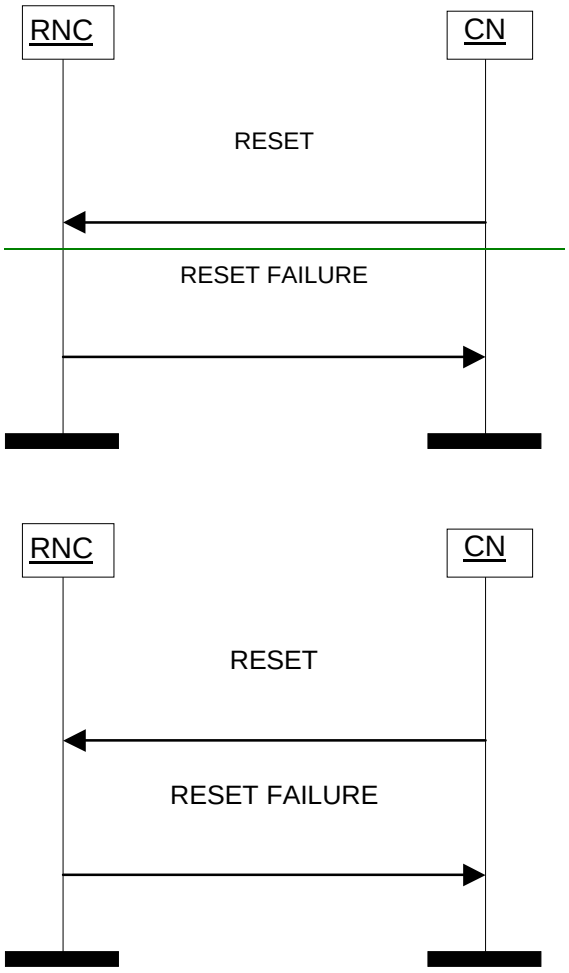


Figure 10: Reset Procedure: Un-Successful Operation

If upon receipt of this message the RNC can not end broadcasting in the indicated Service Area(s), it shall respond using a RESET FAILURE message containing the ~~*Service Areas List*~~ *Failure List* IE indicating the relevant Service Area(s) and the appropriate cause value.

The RESET FAILURE message may – if applicable - also include those Service Area(s) in the *Service Areas List* IE for which the RESET message was successful.

8.6.4 Abnormal Conditions

8.7 Restart Indication

8.7.1 General

The purpose of the Restart Indication procedure is for the RNC to indicate to the CN that a Service Area broadcasting related restart situation has occurred in one or more of its Service Areas e.g. when a Service Area becomes operational or when the RNC is initialised.

8.7.2 Successful Operation

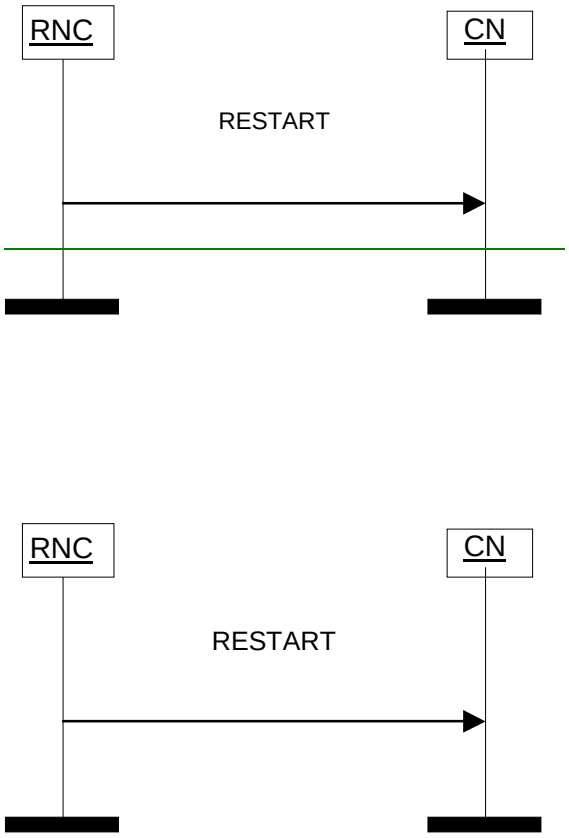


Figure 11: Restart Indication Procedure: Successful Operation

The RNC shall initiate the procedure by sending a RESTART message to the CN. This message shall contain a *Service Areas List* IE for reference and may also include ~~an indication~~ the *Recovery Indication* IE to indicate ~~as to~~ whether the previous~~ly sent~~broadcast information needs to be re~~-l~~loaded. In the absence of the Recovery Indication IE, the CN shall interpret it as "lost".

8.7.3 Abnormal Conditions

8.8 Failure Indication

8.8.1 General

The purpose of the Failure Indication procedure is to indicate to the CN from the RNC that a Service Area broadcasting related problem is occurring in one or more of its Service Areas.

8.8.2 Successful Operation

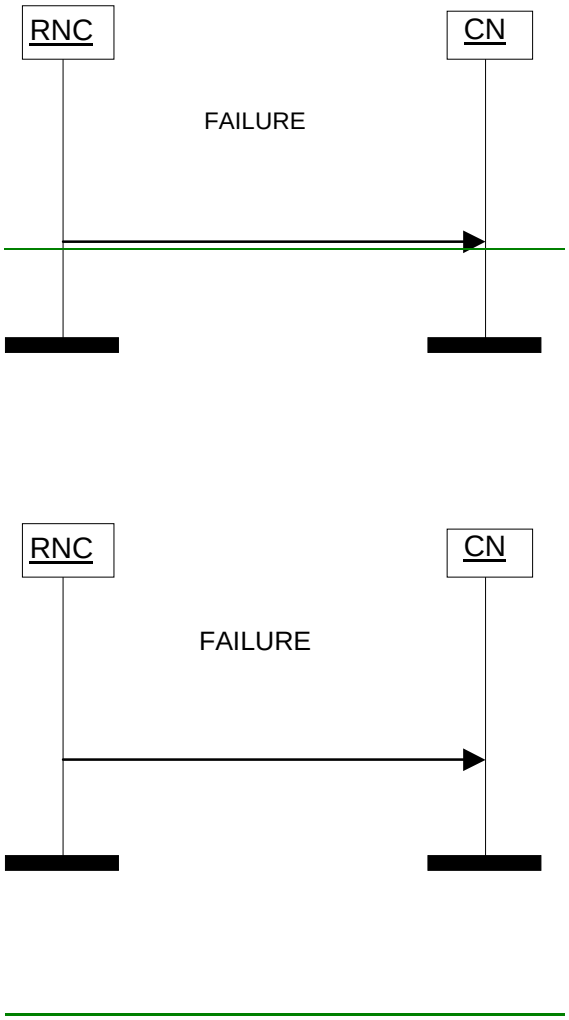


Figure 12: Failure Indication Procedure: Successful Operation

The RNC shall initiate the procedure by sending a FAILURE message to the CN. The FAILURE message shall contain the *Service Areas List* IE to indicate which Service Area(s) has a Service Area broadcasting related problem.

Upon receipt of this FAILURE message, the CN will not generate further WRITE or REPLACE messages for these Service Area(s) until the CN is informed by a RESTART message that the Service Area can resume normal Service Area broadcasting operation.

8.8.3 Abnormal Conditions

8.9 Error Indication

8.9.1 General

The Error Indication procedure is used by the RNC to indicate to the CN that a message is not understood, provided it cannot be reported by an appropriate failure message.

8.9.2 Successful Operation

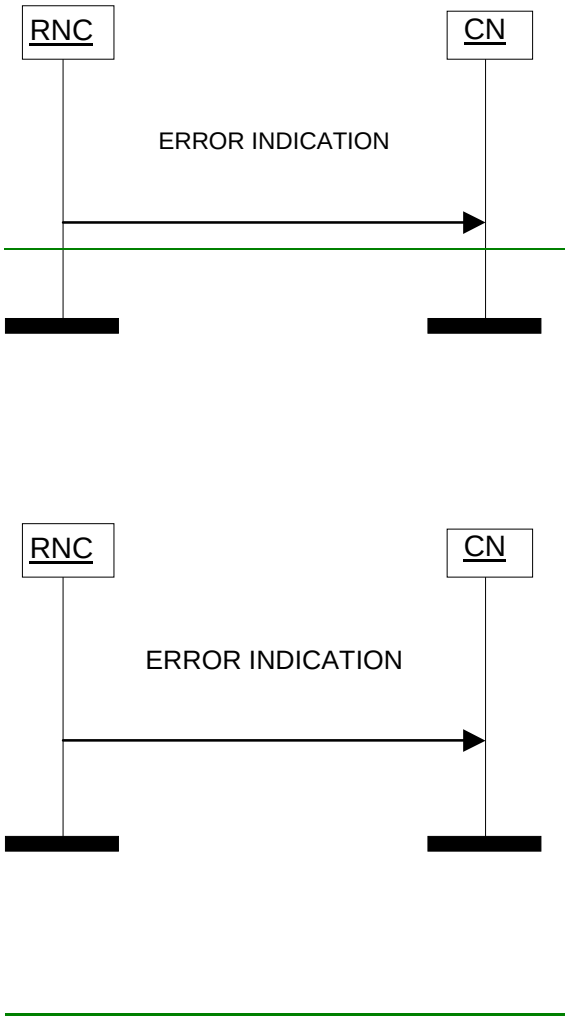


Figure 13: Error Indication Procedure: Successful Operation

The RNC shall initiate the procedure by sending an ERROR INDICATION message to the CN in response to any message that is not understood e.g. invalid parameter or parameter value. This message shall contain information necessary for the CN to be able to identify which initial message this is in response to by the *Message Identifier* IE and may also contain *Serial Number* IE.~~,~~ The appropriate cause value – if applicable- may be ~~and additional information e.g. Cause Value~~indicated in the *Cause* IE.

8.9.3 Abnormal Conditions

9 Elements for SABP Communication

9.1 Message Functional Definition and Content

9.1.1 General

NOTE: The messages have been defined in accordance to the guidelines specified in [10].

For each message there is, a table listing the signalling elements in their order of appearance in the transmitted message.

9.1.2 Message Contents

9.1.2.1 Presence

All information elements in the message descriptions below are marked mandatory, optional or conditional according to the following table:

Table 3: Meaning of abbreviations used in SABP messages

Abbreviation	Meaning
M	IE's marked as Mandatory (M) will always be included in the message.
O	IE's marked as Optional (O) may or may not be included in the message.
C	IE's marked as Conditional (C) will be included in a message only if the condition is satisfied. Otherwise the IE is not included.

9.1.2.2 Criticality

Each Information Element or Group of Information Elements may have a criticality information applied to it. Following cases are possible:

Table 4: Meaning of content within "Criticality" column

Abbreviation	Meaning
–	No criticality information is applied explicitly.
YES	Criticality information is applied. This is usable only for non-repeatable IEs
GLOBAL	The IE and all its repetitions together have one common criticality information. This is usable only for repeatable IEs.
EACH	Each repetition of the IE has its own criticality information. It is not allowed to assign different criticality values to the repetitions. This is usable only for repeatable IEs.

9.1.2.3 Range

The Range column indicates the allowed number of copies of repetitive IEs/IE groups.

9.1.2.4 Assigned Criticality

This column provides the actual criticality information as defined in chapter 10.3.2, if applicable.

9.1.3 WRITE-REPLACE

This message is sent by the CN to the RNC.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
New Serial Number	M		9.2.5		yes	reject
Old Serial Number	O		9.2.4		yes	ignore
Service Areas List	M		9.2.6		ves	reject
Category	O		9.2.7		yes	ignore
Repetition Period	O		9.2.8		yes	ignore
~~No~~Number of Broadcasts Requested	M		9.2.9		yes	reject
Data Coding Scheme	M		9.2.15		yes	reject
Broadcast Message Content	M		9.2.2		yes	reject

9.1.4 WRITE-REPLACE COMPLETE

This message will be sent by the RNC to the CN in a successful response to a WRITE-REPLACE message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
New Serial Number	M		9.2.5		yes	reject
Number~~No~~ of Broadcasts Completed List	M		9.2.~~9~~10		yes	reject
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.5 WRITE-REPLACE FAILURE

This message will be sent by the RNC to the CN as an unsuccessful response to a WRITE-REPLACE message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
New Serial Number	M		9.2.5		yes	reject
Failure List	M		9.2.12		yes	reject
~~No~~Number of Broadcasts Completed List	O		9.2.10		yes	ignore
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.6 KILL

This message is sent by the CN to the RNC to stop broadcasting of a specific message.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
Old Serial Number	M		9.2.4		yes	reject
Service Areas List	M		9.2.6		yes	reject

9.1.7 KILL COMPLETE

This message is sent by the RNC to the CN as a successful response to a KILL message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
Old Serial Number	M		9.2.4		yes	reject
~~No~~Number of Broadcasts Completed List	M		9.2.~~9~~10		yes	reject
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.8 KILL FAILURE

This message is sent by the RNC to the CN as unsuccessful response to a KILL message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
Old Serial Number	M		9.2.4		yes	reject
Failure List	M		9.2.12		yes	reject
~~No~~Number of Broadcasts Completed List	O		9.2.10		yes	ignore
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.9 LOAD QUERY

This message is sent by the CN to the RNC to gain an indication of broadcast resources available.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Service Areas List	M		9.2.6		yes	reject

9.1.10 LOAD QUERY COMPLETE

This message will be sent by the RNC as a successful response to the LOAD QUERY message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Radio Resource Loading List	M		9.2.13		yes	reject
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.11 LOAD QUERY FAILURE

This message is sent by the RNC to the CN as an unsuccessful response to a LOAD QUERY message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Failure List	M		9.2.12		yes	reject
Radio Resource Loading List	O		9.2.13		yes	ignore
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.12 MESSAGE STATUS QUERY

This message is sent by the CN to the RNC to obtain the current status of a Service Area broadcasting message.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
Old Serial Number	M		9.2.4		yes	reject
Service Areas List	M		9.2.6		yes	reject

9.1.13 MESSAGE STATUS QUERY COMPLETE

This message is sent by the RNC to the CN as a successful response to a MESSAGE QUERY message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
Old Serial Number	M		9.2.4		yes	reject
~~No~~Number of Broadcasts Completed List	M		9.2.10		yes	reject
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.14 MESSAGE STATUS QUERY FAILURE

This message is sent by the RNC to the CN in an unsuccessful response to a MESSAGE QUERY message.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
Failure List	M		9.2.12		yes	reject
Old Serial Number	M		9.2.4		yes	reject
~~No~~Number of Broadcasts Completed List	O		9.2.10		yes	ignore
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.15 RESET

The message is sent by the CN to the RNC to request that the RNC end broadcasting in one or more Service Areas.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Service Areas List	M		9.2.6		yes	reject

9.1.16 RESET COMPLETE

This message is sent from the RNC to the CN as a successful response to a RESET message where indicated Service-Area(s) are now not broadcasting any messages.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Service Areas List	M		9.2.6		yes	reject
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.17 RESET FAILURE

This message is sent from the RNC to the CN as an unsuccessful response to a RESET message to indicate that a Service Area broadcasting related problem exists in one or more of its Service Areas.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Failure List	M		9.2.12		yes	reject
Service Areas List	O		9.2.6		yes	ignore
Criticality Diagnostics	O		9.2.17		yes	ignore

9.1.18 RESTART

This message is sent from the RNC to the CN to indicate a Service Area broadcasting related restart situation in one or more of its Service-Areas.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	ignore
Service Areas List	M		9.2.6		yes	ignore
Recovery Indication	O		9.2.16		yes	ignore

9.1.19 FAILURE

This message is sent from the RNC to the CN to indicate that a Service Area broadcasting related problem exists in one or more of its Service-Areas.

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	ignore
Service Areas List	M		9.2.6		yes	ignore

9.1.20 ERROR INDICATION

This message is sent by the RNC to the CN in response to any message which is not understood (e.g. invalid parameter or parameter value).

Direction: RNC → CN

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	ignore
Message Identifier	M		9.2.19		yes	ignore
Serial Number	O		9.2.3		yes	ignore
Cause	O		9.2.14		yes	ignore
Criticality Diagnostics	O		9.2.17		yes	ignore

9.2 Information Element Definitions

9.2.1 MessageType

Message Type IE uniquely identifies the message being sent. It is mandatory for all messages.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Message Type				
>Procedure Code	M		ENUMERATED (Write-Replace, Kill, Load Query, Message Status Query, Reset, Restart, Failure, Error Indication ,…)	
>Type of Message	M		ENUMERATED (Initiating Message, Successful Outcome, Unsuccessful Outcome, Outcome)	

9.2.2 Broadcast Message Content

Broadcast Message Content IE is sent from the CN to the RNC containing user information i.e. the message, and will be broadcast over the radio interface.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Broadcast Message Content	M		OCTET STRING (1246)	

9.2.3 Serial Number

Serial Number IE is a 16-bit integer which identifies a particular message from the source and type indicated by the Message Identifier and is altered every time the message with a given Message Identifier is changed.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Serial Number	O		INTEGER (16)	

9.2.4 Old Serial Number

Old Serial Number IE enables identification of an existing message to be identified. The format of this IE is defined in 9.2.3.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Old Serial Number	M		9.2.3	

9.2.5 New Serial Number

New Serial Number IE enables identification of a new message for broadcast to be identified, and is altered every time the message is changes. The format of this IE is defined in 9.2.3.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
New Serial Number	O		9.2.3	

9.2.6 Service Areas List

Service Areas List IE is sent from the CN to the RNC. It indicates the group of Service Area(s) that the message will be broadcast to. The *Service Areas List* IE must include at least one Service Area.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Service Areas List		1 to <maxno of SAI>		
>Service Area Identifier	M		9.2.11	

Range bound	Explanation
MaxnoofSAI	Maximum no. of SAI in Service Areas List. Value is 65535

9.2.7 Category

Category IE is sent from the CN to the RNC, and is used to indicate the priority of the message.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Category	O		Enumerated (High Priority, Background, Normal, ~~or~~ Default)	This IE contains the broadcast priority of the message.

9.2.8 Repetition Period

Repetition Period IE is sent from the CN to the RNC and indicates the periodicity of message broadcasts.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Repetition Period	M		INTEGER 1…4096	Range is 1 to 4096 where each unit will represent a repetition of one second to a maximum of once per ~1 hour

9.2.9 ~~No~~Number of Broadcasts Requested

~~No~~Number of Broadcasts Requested IE is sent from the CN to the RNC and indicates the number of times a message is to be broadcast.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Number~~No~~ of Broadcasts Requested	M	0 to 65535	INTEGER 0…. 65535	This specifies the number of times the message is to be broadcast. "0" indicates the message shall be broadcasted until CN request otherwise

9.2.10 ~~No~~Number of Broadcasts Completed List

~~No~~Number of Broadcasts Completed List IE is sent from the RNC to the CN, and indicates the number of times that a CN message (all pages) has been sent to each Service Area specified in the *Service Areas List* IE of the request message for broadcast over the radio interface.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
~~No~~Number of-Broadcasts Completed List		1 to <maxnoof SAI>		
>Service Area Identifier	M		OCTET STRING (7)	
>~~No~~Number of Broadcasts	M		INTEGER (0.. 65535)	
>~~No~~Number of Broadcasts Completed Info	O		ENUMERATED (overflow, unknown)	Overflow indicates that the number of times that CN message sent to the radio interface has been overflow. Unknown indicates that no information regarding the number of times that CN message sent to the radio interface.

Range bound	Explanation
MaxnoofSAI	Maximum no. of SAI in Service Areas List Value is 65535

9.2.11 Service Area Identifier

Service Area Identifier IE is used to identify an area consisting of one or more cells belonging to the same Location Area. Such an area is called a Service Area. For this protocol, only a Service Area that is defined to be applicable to the BC domain shall be used.

IE/Group Name	Presence	Range	IE type and Reference	Semantics description
SAI				
>PLMN ID	M		OCTET STRING (SIZE (3))	- digits 0 to 9, two digits per octet, - each digit encoded 0000 to 1001, - 1111 used as filler - bit 4 to 1 of octet n encoding digit 2n-1 - bit 8 to 5 of octet n encoding digit 2n -The PLMN-ID consists of 3 digits from MCC followed by either -a filler plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>LAC	M		OCTET STRING (2)	0000 and FFFE not allowed.
>SAC	M		OCTET STRING (2)	

9.2.12 Failure List

Failure List IE identifies the list of Service-Area(s) for which the RNC could not complete as requested.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Failure List		1 to <maxnoof SAI>		
>Service Area Identifier	M		9.2.11	
>Cause	M		9.2.14	

Range bound	Explanation
MaxnoofSAI	Maximum no. of SAI in Service-Area-List. Value is 65535

9.2.13 Radio Resource Loading List

Radio Resource Loading List IE presents the available bandwidth available for Broadcast purposes of a specific Service Area.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Radio Resource Loading List		1 to <maxnoof SAI>		
>Service Area Identifier	M		9.2.11	
>Available Bandwidth	M		9.2.18	

Range bound	Explanation
MaxnoofSAI	Maximum no. of SAI in Service Area List. Value is 65535

9.2.14 Cause

Cause IE indicates the reason for a particular error event for the SABP protocol.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and Reference	Semantics Description
>Cause	M		INTEGER (	Range is 0-255
			Parameter-not-recognised(0),	Sent when the recipient (CN or RNC) was unable to act upon the message received due to an unrecognised parameter. A message should not be rejected only because a parameter is not recognised as this would prevent extensions to the service
			Parameter-value invalid(1),	Sent when a failure occurred due to the value of a parameter being invalid, e.g. out of range, or in Write-Replace, the parameter "no of pages" does not equal the number of pages received
			Valid-CN-message-not-identified(2),	Sent when the RNC does not recognise the CN message reference
			Service-Area-identity-not-valid(3),	Sent when the RNC does not recognise a Service-Area Identity
			Unrecognised-message(4)	Sent when the RNC did not recognise the message at all
			Missing-mandatory-element(5),	Sent when a mandatory element is missing from the message
			RNC-capacity-exceeded(6),	Sent when a write-replace fails because the RNC cannot meet the requested repetition period because of the cell loading

IE/GROUP NAME	PRESENCE	RANGE	IE Type and Reference	Semantics Description
			RNC-memory-exceeded(7),	Sent when the RNC is unable to store a CBS message as the RNC memory has been exceeded.
			Service-Area-broadcast-not-supported(8),	Sent when the SABCH/CN related Radio Resource is not configured for a Service-Area
			Service-Area-broadcast-not-operational(9),	Sent when the SABCH/CN related radio resource is not available because of error conditions or due to maintenance activities
			Message-reference already-used(10),	Sent when the recipient was unable to act upon the Write-Replace message received due to a previous Write-Replace received with the same message reference.
			Unspecified-error(11),	Sent when none of the above cause values apply.
			(Transfer Syntax Error(12),	Sent to indicate transfer syntax error in any message
			Semantic Error (12),	Sent to indicate semantic error any message
			Message not compatible with receiver state (14),	Sent to indicate that received message is not compatible with the receiver state
			Abstract Syntax Error (Reject)	Sent to indicate rejection due to

IE/GROUP NAME	PRESENCE	RANGE	IE Type and Reference	Semantics Description
			(15), Abstract Syntax Error (Ignore and Notify) (16), Abstract Syntax Error (Falsely Constructed Message) (17), …)	Abstract Syntax Error Sent to indicate Abstract Syntax Error in some IE that has been ignored Sent to indicate Abstract Syntax Error due to false message construction

9.2.15 Data Coding Scheme

Data Coding Scheme IE is sent from the RNC to the CN and identifies the alphabet or coding employed for the message characters and message handling at the UE (it is passed transparently from the CN to the UE).

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Data Coding Scheme	M		INTEGER (0..255)	

9.2.16 Recovery Indication

Recovery I*ndication* IE is used to indicate whether the CN related data was lost or is still available.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Recovery Indication	O		ENUMERATED (Available, Lost)	

9.2.17 Criticality Diagnostics

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Criticality Diagnostics				
>Procedure Code	O		INTEGER (0..255)	Procedure Code is to be used if Criticality Diagnostics is part of Error Indication procedure, and not within the response message of the same procedure that caused the error
>Triggering Message	O		ENUMERATED(initiating message, successful outcome, unsuccessful outcome, outcome)	The Triggering Message is used only if the Criticality Diagnostics is part of Error Indication procedure.
>Procedure Criticality	O		ENUMERATED(reject, ignore, notify)	This Procedure Criticality is used for reporting the Criticality of the Triggering message (Procedure). The value 'ignore' shall never be used.
Information Element Criticality Diagnostics		0 to <maxnoof errors>		
>IE Criticality	M		ENUMERATED(reject, ignore, notify)	The IE Criticality is used for reporting the criticality of the triggering IE. The value 'ignore' shall not be used.
>IE ID	M		INTEGER (0..65535)	The IE Id of the not understood or missing IE
>Repetition Number	O		INTEGER (1..256)	The repetition number of the not understood IE within the bottom most repetition level identified by the message structure IE, if applicable
>Message Structure	O		9.2.20	

Range bound	Explanation
Maxnooferrors	Maximum no. of IE errors allowed to be reported with a single message. The value for maxnooferrors is 256.

9.2.18 Available Bandwidth

Available Bandwidth IE is used to indicate the Bandwidth available for the broadcast of messages.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Available Bandwidth	O		INTEGER (0...20480)	The unit is: bit/second

9.2.19 Message Identifier

Message Identifier IE is set by the CN, transfer to the UE by the RNC.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and Reference	Semantics Description
Message Identifier	M		OCTET STRING (SIZE(2))	This IE is set by the CN, transfer to the UE by the RNC, the RNC needs not to understand what is the meaning of the value but shall treat it as a identifier of a message. The Message Identifier is defined in [11]

9.2.20 Message Structure

IE/Group Name	Presence	Range	IE type and reference	Semantics description	Criticality	Assigned Criticality
Message structure		1 to <maxnooflevels>		Information given per level with assigned criticality in an hierachical message structure. Given from top level down to the level above the reported level for the occured error (reported in the *Information Element Criticality Diagnostics* IE).	GLOBAL	ignore
>IE ID	M		INTEGER (0..65535)	The IE ID of this level's IE containing the not understood or missing IE.	-	
>Repetition Number	O		INTEGER (1..256)	The repetition number of this level's reported IE, if applicable	-	

Range bound	Explanation
maxnooflevels	Maximum no. of message levels to report. The value for maxnooflevels is 256.

9.3 Message and Information Element Abstract Syntax (with ASN.1)

9.3.0 General

SABP ASN.1 definition conforms with [7] and [8].

The ASN.1 definition specifies the structure and content of SABP messages. SABP messages can contain any IEs specified in the object set definitions for that message without the order or number of occurrence being restricted by ASN.1. However, for this version of the standard, a sending entity shall construct a SABP message according to the PDU definitions module and with the following additional rules (Note that in the following IE means an IE in the object

set with an explicit id. If one IE needed to appear more than once in one object set, then the different occurrences have different IE ids):

- IEs shall be ordered (in an IE container) in the order they appear in object set definitions.
- Object set definitions specify how many times IEs may appear. An IE shall appear exactly once if the presence field in an object has value "mandatory". An IE may appear at most once if the presence field in an object has value "optional" or "conditional". If in a tabular format there is multiplicity specified for an IE (i.e. an IE list) then in the corresponding ASN.1 definition the list definition is separated into two parts. The first part defines an IE container list where the list elements reside. The second part defines list elements. The IE container list appears as an IE of its own. For this version of the standard an IE container list may contain only one kind of list elements.

If a SABP message that is not constructed as defined above is received, this shall be considered as Abstract Syntax Error, and the message shall be handled as defined for Abstract Syntax error in Chapter 103.6.

9.3.1 Usage of protocol extension mechanism for non-standard use

The protocol extension mechanism for non-standard use may be used:

- for special operator- (and/or vendor) specific features considered not to be part of the basic functionality, i.e. the functionality required for a complete and high-quality specification in order to guarantee multivendor interoperability.
- by vendors for research purposes, e.g. to implement and evaluate new algorithms/features before such features are proposed for standardisation.

The extension mechanism shall not be used for basic functionality. Such functionality shall be standardised.

9.3.2 Elementary Procedure Definitions

```
-- **************************************************************
--
-- Elementary Procedure definitions
--
-- **************************************************************

SABP-PDU-Descriptions {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-PDU-Descriptions (0)}

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- **************************************************************
--
-- IE parameter types from other modules.
--
-- **************************************************************

IMPORTS
    Criticality,
    ProcedureCode
FROM SABP-CommonDataTypes

    Error-Indication,
    Failure,
    Kill,
    Kill-Complete,
    Kill-Failure,
    Load-Query,
    Load-Query-Complete,
    Load-Query-Failure,
    Reset,
    Reset-Complete,
    Reset-Failure,
    Restart,
    Message-Status-Query,
    Message-Status-Query-Complete,
    Message-Status-Query-Failure,
    Write-Replace,
    Write-Replace-Complete,
    Write-Replace-Failure
FROM SABP-PDU-Contents

    id-Error-Indication,
    id-Failure-Indication,
```

```
    id-Kill,
    id-Reset,
    id-Restart-Indication,
    id-Status-Load-Enquiry,
    id-Status-Message-Query,
    id-Write-Replace
FROM SABP-Constants;

-- **************************************************************
--
-- Interface Elementary Procedure Class
--
-- **************************************************************

SABP-ELEMENTARY-PROCEDURE ::= CLASS {
    &InitiatingMessage              ,
    &SuccessfulOutcome              OPTIONAL,
    &UnsuccessfulOutcome                OPTIONAL,
    &procedureCode          ProcedureCode   UNIQUE,
    &criticality            Criticality     DEFAULT ignore
}
WITH SYNTAX {
    INITIATING MESSAGE      &InitiatingMessage
    [SUCCESSFUL OUTCOME
```

```
&SuccessfulOutcome]
    [UNSUCCESSFUL OUTCOME       &UnsuccessfulOutcome]
    PROCEDURE CODE          &procedureCode
    [CRITICALITY            &criticality]
}

-- **************************************************************
--
-- Interface PDU Definition
--
-- **************************************************************

SABP-PDU ::= CHOICE {
    initiatingMessage   InitiatingMessage,
    successfulOutcome   SuccessfulOutcome,
    unsuccessfulOutcome UnsuccessfulOutcome,
    ...
}

InitiatingMessage ::= SEQUENCE {
    procedureCode   SABP-ELEMENTARY-PROCEDURE.&procedureCode    ({SABP-ELEMENTARY-PROCEDURES}),
    criticality SABP-ELEMENTARY-PROCEDURE.&criticality      ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value       SABP-ELEMENTARY-PROCEDURE.&InitiatingMessage    ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

SuccessfulOutcome ::= SEQUENCE {
    procedureCode   SABP-ELEMENTARY-PROCEDURE.&procedureCode    ({SABP-ELEMENTARY-PROCEDURES}),
    criticality SABP-ELEMENTARY-PROCEDURE.&criticality      ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value       SABP-ELEMENTARY-PROCEDURE.&SuccessfulOutcome    ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

UnsuccessfulOutcome ::= SEQUENCE {
    procedureCode   SABP-ELEMENTARY-PROCEDURE.&procedureCode    ({SABP-ELEMENTARY-PROCEDURES}),
    criticality SABP-ELEMENTARY-PROCEDURE.&criticality      ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode}),
    value       SABP-ELEMENTARY-PROCEDURE.&UnsuccessfulOutcome  ({SABP-ELEMENTARY-PROCEDURES}{@procedureCode})
}

-- **************************************************************
--
-- Interface Elementary Procedure List
--
-- **************************************************************

SABP-ELEMENTARY-PROCEDURES SABP-ELEMENTARY-PROCEDURE ::= {
    SABP-ELEMENTARY-PROCEDURES-CLASS-1  |
    SABP-ELEMENTARY-PROCEDURES-CLASS-2  ,
    ...
}

SABP-ELEMENTARY-PROCEDURES-CLASS-1 SABP-ELEMENTARY-PROCEDURE ::= {
    write-Replace       |
    kill            |
```

```
    status-Load-Enquiry |
    status-Message-Query    |
    reset           ,
    ...
}

SABP-ELEMENTARY-PROCEDURES-CLASS-2 SABP-ELEMENTARY-PROCEDURE ::= {
    restart-Indication  |
    failure-Indication  |
    error-Indication    ,
    ...
}

write-Replace SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Write-Replace
    SUCCESSFUL OUTCOME  Write-Replace-Complete
    UNSUCCESSFUL OUTCOME    Write-Replace-Failure
    PROCEDURE CODE      id-Write-Replace
}

kill SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Kill
    SUCCESSFUL OUTCOME  Kill-Complete
    UNSUCCESSFUL OUTCOME    Kill-Failure
    PROCEDURE CODE          id-Kill
}

status-Load-Enquiry SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Load-Query
    SUCCESSFUL OUTCOME  Load-Query-Complete
    UNSUCCESSFUL OUTCOME    Load-Query-Failure
    PROCEDURE CODE          id-Status-Load-Enquiry
}

status-Message-Query SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Message-Status-Query
    SUCCESSFUL OUTCOME  Message-Status-Query-Complete
    UNSUCCESSFUL OUTCOME    Message-Status-Query-Failure
    PROCEDURE CODE          id-Status-Message-Query
}

reset SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Reset
    SUCCESSFUL OUTCOME  Reset-Complete
    UNSUCCESSFUL OUTCOME    Reset-Failure
    PROCEDURE CODE          id-Reset
}

restart-Indication SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Restart
    PROCEDURE CODE          id-Restart-Indication
}
```

```
failure-Indication SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Failure
    PROCEDURE CODE          id-Failure-Indication
}

error-Indication SABP-ELEMENTARY-PROCEDURE ::= {
    INITIATING MESSAGE  Error-Indication
    PROCEDURE CODE          id-Error-Indication
}

END
```

9.3.3 PDU Definitions

```
-- **************************************************************
--
-- PDU definitions for SABP.
--
-- **************************************************************

SABP-PDU-Contents {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-PDU-Contents (1) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- **************************************************************
--
-- IE parameter types from other modules.
--
-- **************************************************************

IMPORTS
    Broadcast-Message-Content,
    Category,
    Cause,
Criticality-Diagnostics,
    Data-Coding-Scheme,
    Failure-List,
    Message-Identifier,
    New-Serial-Number,
    NoNumber-of-Broadcasts-Completed-List,
    NoNumber-of-Broadcasts-Requested,
    Old-Serial-Number,
    Radio-Resource-Loading-List,
    Recovery-Indication,
    Repetition-Period,
    Serial-Number ,
    Service-Areas-List
```

```
FROM SABP-IEs

    ProtocolExtensionContainer{},
    ProtocolIE-Container{},
    SABP-PROTOCOL-EXTENSION,
    SABP-PROTOCOL-IES
FROM SABP-Containers

    id-Broadcast-Message-Content,
    id-Category,
    id-Criticality-Diagnostics,
    id-Cause,
    id-Data-Coding-Scheme,
    id-Failure-List,
    id-Message-Identifier,
    id-New-Serial-Number,
    id-~~No~~Number-of-Broadcasts-Completed-List,
    id-~~No~~Number-of-Broadcasts-Requested,
    id-Old-Serial-Number,
    id-Radio-Resource-Loading-List,
    id-Recovery-Indication,
    id-Repetition-Period,
    id-Serial-Number,
    id-Service-Areas-List
FROM SABP-Constants;

-- **************************************************************
--
-- Write-Replace
--
-- **************************************************************

Write-Replace ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container      { {Write-Replace-IEs} },
    protocolExtensions      ProtocolExtensionContainer { {Write-Replace-Extensions} } OPTIONAL,
    ...
}

Write-Replace-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-New-Serial-Number   CRITICALITY reject  TYPE New-Serial-Number      PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY ignore  TYPE Old-Serial-Number      PRESENCE optional } |
    { ID id-Service-Areas-List  CRITICALITY reject  TYPE Service-Areas-List     PRESENCE mandatory } |
    { ID id-Category            CRITICALITY ignore  TYPE Category           PRESENCE optional  } |
    { ID id-Repetition-Period   CRITICALITY ignore  TYPE Repetition-Period      PRESENCE optional  } |
    { ID id-~~No~~Number-of-Broadcasts-Requested
                    CRITICALITY reject  TYPE ~~No~~Number-of-Broadcasts-Requested   PRESENCE mandatory } |
    { ID id-Data-Coding-Scheme  CRITICALITY reject  TYPE Data-Coding-Scheme     PRESENCE mandatory } |
    { ID id-Broadcast-Message-Content
                    CRITICALITY reject  TYPE Broadcast-Message-Content  PRESENCE mandatory } ,
    ...
}
```

```
Write-Replace-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Write-Replace-Complete
--
-- **************************************************************

Write-Replace-Complete ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {Write-Replace-Complete-IEs} },
    protocolExtensions      ProtocolExtensionContainer { {Write-Replace-Complete-Extensions} } OPTIONAL,
    ...
}

Write-Replace-Complete-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-New-Serial-Number   CRITICALITY reject  TYPE New-Serial-Number      PRESENCE mandatory } |
    { ID id-NoNumber-of-Broadcasts-Completed-List
                        CRITICALITY reject  TYPE NoNumber-of-Broadcasts-Completed-List
                                                    PRESENCE mandatory  }|
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics    PRESENCE optional },
    ...
}

Write-Replace-Complete-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Write-Replace-Failure
--
-- **************************************************************

Write-Replace-Failure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       { {Write-Replace-Failure-IEs} },
    protocolExtensions      ProtocolExtensionContainer { {Write-Replace-Failure-Extensions} } OPTIONAL,
    ...
}

Write-Replace-Failure-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-New-Serial-Number   CRITICALITY reject  TYPE New-Serial-Number      PRESENCE mandatory } |
    { ID id-Failure-List        CRITICALITY reject  TYPE Failure-List       PRESENCE mandatory } |
    { ID id-NoNumber-of-Broadcasts-Completed-List
                    CRITICALITY ignore  TYPE NoNumber-of-Broadcasts-Completed-List
                                            PRESENCE optional  } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
```

```
}
Write-Replace-Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Kill
--
-- **************************************************************

Kill ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Kill-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Kill-Extensions}}      OPTIONAL,
    ...
}

Kill-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY reject  TYPE Old-Serial-Number      PRESENCE mandatory } |
    { ID id-Service-Areas-List  CRITICALITY reject  TYPE Service-Areas-List     PRESENCE mandatory } ,
    ...
}

Kill-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Kill-Complete
--
-- **************************************************************

Kill-Complete ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Kill-Complete-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Kill-Complete-Extensions}}     OPTIONAL,
    ...
}

Kill-Complete-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY reject  TYPE Old-Serial-Number      PRESENCE mandatory } |
    { ID id-~~No~~Number-of-Broadcasts-Completed-List
                    CRITICALITY reject      TYPE ~~No~~Number-of-Broadcasts-Completed-List
                                                    PRESENCE mandatory }|
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Kill-Complete-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
```

```
}

-- **************************************************************
--
-- Kill-Failure
--
-- **************************************************************

Kill-Failure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Kill-Failure-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Kill-Failure-Extensions}}      OPTIONAL,
    ...
}

Kill-Failure-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY reject  TYPE Old-Serial-Number      PRESENCE mandatory } |
    { ID id-Failure-List        CRITICALITY reject  TYPE Failure-List       PRESENCE mandatory } |
    { ID id-NoNumber-of-Broadcasts-Completed-List
                        CRITICALITY ignore  TYPE NoNumber-of-Broadcasts-Completed-List
                                                    PRESENCE optional } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Kill-Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Load-Query
--
-- **************************************************************

Load-Query ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Load-Query-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Load-Query-Extensions}}    OPTIONAL,
    ...
}

Load-Query-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Service-Areas-List  CRITICALITY reject  TYPE Service-Areas-List     PRESENCE mandatory } ,
    ...
}

Load-Query-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
```

```
-- Load-Query-Complete
--
-- **************************************************************

Load-Query-Complete ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Load-Query-Complete-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Load-Query-Complete-Extensions}} OPTIONAL,
    ...
}

Load-Query-Complete-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Radio-Resource-Loading-List
                        CRITICALITY reject  TYPE Radio-Resource-Loading-List
                                                    PRESENCE mandatory }  |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Load-Query-Complete-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Load-Query-Failure
--
-- **************************************************************

Load-Query-Failure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Load-Query-Failure-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Load-Query-Failure-Extensions}} OPTIONAL,
    ...
}

Load-Query-Failure-IEs SABP-PROTOCOL-IES ::= {

    { ID id-Failure-List        CRITICALITY reject  TYPE Failure-List       PRESENCE mandatory } |
    { ID id-Radio-Resource-Loading-List
                        CRITICALITY ignore  TYPE Radio-Resource-Loading-List
                                            PRESENCE optional  } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Load-Query-Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Message-Status-Query
```

```
--
-- **************************************************************

Message-Status-Query ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Message-Status-Query-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Message-Status-Query-Extensions}} OPTIONAL,
    ...
}

Message-Status-Query-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY reject  TYPE Old-Serial-Number      PRESENCE mandatory } |
    { ID id-Service-Areas-List  CRITICALITY reject  TYPE Service-Areas-List     PRESENCE mandatory } ,
    ...
}

Message-Status-Query-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Message-Status-Query-Complete
--
-- **************************************************************

Message-Status-Query-Complete ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container       {{Message-Status-Query-Complete-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Message-Status-Query-Complete-Extensions}} OPTIONAL,
    ...
}

Message-Status-Query-Complete-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY reject  TYPE Old-Serial-Number      PRESENCE mandatory } |
    { ID id-NoNumber-of-Broadcasts-Completed-List
                        CRITICALITY reject  TYPE NoNumber-of-Broadcasts-Completed-List
                                                  PRESENCE mandatory } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Message-Status-Query-Complete-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Message-Status-Query-Failure
--
-- **************************************************************
```

```
Message-Status-Query-Failure ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container       {{Message-Status-Query-Failure-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Message-Status-Query-Failure-Extensions}} OPTIONAL,
    ...
}

Message-Status-Query-Failure-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Failure-List        CRITICALITY reject  TYPE Failure-List       PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY reject  TYPE Old-Serial-Number      PRESENCE mandatory } |

    { ID id-NoNumber-of-Broadcasts-Completed-List
                    CRITICALITY ignore  TYPE NoNumber-of-Broadcasts-Completed-List
                                                        PRESENCE optional  } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Message-Status-Query-Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Reset
--
-- **************************************************************

Reset ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Reset-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Reset-Extensions}}     OPTIONAL,
    ...
}

Reset-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Service-Areas-List  CRITICALITY reject  TYPE Service-Areas-List         PRESENCE mandatory } ,
    ...
}

Reset-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Reset-Complete
--
-- **************************************************************

Reset-Complete ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Reset-Complete-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Reset-Complete-Extensions}}    OPTIONAL,
```

```
    ...
}

Reset-Complete-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Service-Areas-List  CRITICALITY reject  TYPE Service-Areas-List     PRESENCE mandatory } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics        PRESENCE optional },
    ...
}

Reset-Complete-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Reset-Failure
--
-- **************************************************************

Reset-Failure ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container       {{Reset-Failure-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Reset-Failure-Extensions}}     OPTIONAL,
    ...
}

Reset-Failure-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Failure-List        CRITICALITY reject  TYPE Failure-List       PRESENCE mandatory } |
    { ID id-Service-Areas-List  CRITICALITY reject  TYPE Service-Areas-List     PRESENCE optional  } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics    PRESENCE optional } ,
    ...
}

Reset-Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Restart
--
-- **************************************************************

Restart ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container       {{Restart-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Restart-Extensions}}   OPTIONAL,
    ...
}

Restart-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Service-Areas-List  CRITICALITY ignore  TYPE Service-Areas-List     PRESENCE mandatory } |
    { ID id-Recovery-Indication     CRITICALITY ignore  TYPE Recovery-Indication    PRESENCE optional  } ,
```

```
    ...
}

Restart-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Failure
--
-- **************************************************************

Failure ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container       {{Failure-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Failure-Extensions}}   OPTIONAL,
    ...
}

Failure-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Service-Areas-List  CRITICALITY ignore  TYPE Service-Areas-List     PRESENCE mandatory } ,
    ...
}

Failure-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}

-- **************************************************************
--
-- Error-Indication
--
-- **************************************************************

Error-Indication ::= SEQUENCE {
    protocolIEs             ProtocolIE-Container       {{Error-Indication-IEs}},
    protocolExtensions      ProtocolExtensionContainer {{Error-Indication-Extensions}}  OPTIONAL,
    ...
}

Error-Indication-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY ignore  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-Serial-Number       CRITICALITY ignore  TYPE Serial-Number      PRESENCE optional  } |
    { ID id-Cause           CRITICALITY ignore  TYPE Cause              PRESENCE optional  } |
{ ID id-Criticality-Diagnostics
CRITICALITY ignore  TYPE Criticality-Diagnostics    PRESENCE optional },
    ...
}

Error-Indication-Extensions SABP-PROTOCOL-EXTENSION ::= {
    ...
}
```

```
END
```

9.3.4 Information Element Definitions

```
-- **************************************************************
--
-- Information Element Definitions
--
-- **************************************************************


SABP-IEs {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS
    maxRadio-Resource-Loading-List,
    maxFailure-List,
    maxNoNumber-of-Broadcasts-Completed-List,
    maxNrOfErrors,
    maxService-Areas-List,
    maxNrOfLevels,

    id-MessageStructure

FROM SABP-Constants

    Criticality,
    ProcedureCode,
    TriggeringMessage,
    ProtocolIE-ID
FROM SABP-CommonDataTypes

    ProtocolExtensionContainer{},

    SABP-PROTOCOL-EXTENSION
FROM SABP-Containers;


-- A

Available-Bandwidth         ::= INTEGER (0..20480)
-- bits/sec

-- B
```

```
Broadcast-Message-Content ::= OCTET STRING (SIZE (1246))
-- This IE is sent from the CN to the RNC containing user information i.e.
-- the message.

-- C

Category ::= ENUMERATED {
    high-priority,
    background-priority,
    normal-priority,
    default-priority,
    ...
}

Cause                   ::= INTEGER {
    parameter-not-recognised                            (0),
    parameter-value-invalid                             (1),
    valid-CN-message-not-identified                     (2),
    service-area-identity-not-valid                     (3),
    unrecognised-message                                (4),
    missing-mandatory-element                           (5),
    rNC-capacity-exceeded                               (6),
    rNC-memory-exceeded                                 (7),
    service-area-broadcast-not-supported                (8),
    service-area-broadcast-not-operational              (9),
    message-reference-already-used                      (10),
    unspecifed-error                                    (11),
    transfer-syntax-error                               (12),
    semantic-error                                      (13),
    message-not-compatible-with-receiver-state          (14),
    abstract-syntax-error-reject                        (15),
    abstract-syntax-error-ignore-and-notify             (16),
    abstract-syntax-error-falsely-constructed-message   (17)
} (0..255)

Criticality-Diagnostics         ::= SEQUENCE {
    procedureCode           ProcedureCode           OPTIONAL,
    triggeringMessage       TriggeringMessage       OPTIONAL,
    procedureCriticality        Criticality         OPTIONAL,
    iEsCriticalityDiagnostics       CriticalityDiagnostics-IE-List  OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { {CriticalityDiagnostics-ExtIEs} } OPTIONAL,
    ...
}

CriticalityDiagnostics-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

CriticalityDiagnostics-IE-List ::= SEQUENCE (SIZE (1..maxNrOfErrors)) OF
    SEQUENCE {
        iECriticality       Criticality,
        iE-ID               ProtocolIE-ID,
```

```
        repetitionNumber        RepetitionNumber        OPTIONAL,
        iE-Extensions           ProtocolExtensionContainer { {CriticalityDiagnostics-IE-List-ExtIEs} } OPTIONAL,
        ...
    }

CriticalityDiagnostics-IE-List-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    {   ID id-MessageStructure      CRITICALITY ignore      EXTENSION MessageStructure      PRESENCE optional },
    ...
}


MessageStructure ::= SEQUENCE (SIZE (1..maxNrOfLevels)) OF
    SEQUENCE {
        iE-ID                   ProtocolIE-ID,
        repetitionNumber        RepetitionNumber        OPTIONAL,
        iE-Extensions           ProtocolExtensionContainer { {MessageStructure-ExtIEs} } OPTIONAL,
        ...
    }


MessageStructure-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}


-- D

Data-Coding-Scheme          ::= INTEGER (0..255)

-- E

-- F

Failure-List ::= SEQUENCE (SIZE (1..maxFailure-List)) OF Failure-List-Item

Failure-List-Item ::= SEQUENCE {
    service-area-identifier     Service-Area-Identifier,
    cause                   Cause,
        iE-Extensions       ProtocolExtensionContainer { {FailureListItemIE-ExtIEs} } OPTIONAL,
        ...
}

FailureListItemIE-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
...
}

-- G

-- H

-- I

-- J
```

```
-- K

-- L

-- M

Message-Identifier ::= OCTET STRING (SIZE (2))

-- N

New-Serial-Number               ::= Serial-Number

NoNumber-of-Broadcasts-Completed-List ::=   SEQUENCE (SIZE (1..maxNoNumber-of-Broadcasts-Completed-List)) OF
    NoNumber-of-Broadcasts-Completed-List-Item

NoNumber-of-Broadcasts-Completed-List-Item ::= SEQUENCE {
    service-area-identifier     Service-Area-Identifier,
    nonumber-of-broadcasts-completed        INTEGER (0..65535),
    nonumber-of-broadcasts-completed-info   NoNumber-Of-Broadcasts-Completed-Info           OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {NoOfBroadcastsCompletedListItemIE-ExtIEs} } OPTIONAL,
        ...
}

NoOfBroadcastsCompletedListItemIE-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
...
}

NoNumber-Of-Broadcasts-Completed-Info       ::= ENUMERATED {
    overflow,
    unknown,
    ...
}

NoNumber-of-Broadcasts-Requested        ::= INTEGER {
    broadcast-indefinitely (0)
} (0..65535)

-- O

Old-Serial-Number               ::= Serial-Number

-- P

-- Q

-- R

Radio-Resource-Loading-List ::= SEQUENCE (SIZE (1..maxRadio-Resource-Loading-List)) OF
    Radio-Resource-Loading-List-Item

Radio-Resource-Loading-List-Item ::= SEQUENCE {
    service-area-identifier     Service-Area-Identifier,
```

```
    available-bandwidth     Available-Bandwidth,
    iE-Extensions       ProtocolExtensionContainer { {RadioResourceLoadingListItemIE-ExtIEs} } OPTIONAL,
        ...
}

RadioResourceLoadingListItemIE-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
...
}

Recovery-Indication ::= ENUMERATED {
    data-lost,
    data-available
}

RepetitionNumber            ::= INTEGER(1..256)

Repetition-Period           ::= INTEGER (1..4096)
-- Each unit represents a repetition of one second to a maximum of
-- once per 4096 seconds (~1 hour).


-- S

Serial-Number               ::= INTEGER (0..65535)


Service-Area-Identifier ::= SEQUENCE {
    plmn-id             OCTET STRING (SIZE (3))
                    -- Digits 0 to 9, two digits per octet.          --
                    -- Each octet encoded 0000 to 1001.              --
                    -- 1111 used as filler                          --
                    -- Bit 4 to 1 of octet n encoding digit 2n-1.    --
                    -- Bit 8 to 5 of octet n encoding digit 2n.      --
                    -- The PLMN-ID consists of 3 digits from MCC     --
                    -- followed by either a filler plus 2 digits     --
                    -- from MNC (in case of 2 digit MNC) or 3 digits --
                    -- from MNC (in case of 3 digit MNC).            -- ,
    lac             OCTET STRING (SIZE (2))
                    -- 0000 and FFFE not allowed                     -- ,
    sac             OCTET STRING (SIZE (2))
}

-- **TODO** The IE type for these parameters is not known as yet
Service-Areas-List ::= SEQUENCE (SIZE (1..maxService-Areas-List)) OF Service-Area-Identifier



-- T

-- U

-- V
```

```
-- W

-- X

-- Y

END
```

9.3.5 Common Definitions

```
-- **************************************************************
--
-- Common definitions
--
-- **************************************************************

SABP-CommonDataTypes {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-CommonDataTypes (3) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

Criticality     ::= ENUMERATED { reject, ignore, notify }

Presence        ::= ENUMERATED { optional, conditional, mandatory }

ProcedureCode       ::= INTEGER (0..255)

ProtocolExtensionID ::= INTEGER (0..65535)

ProtocolIE-ID       ::= INTEGER (0..65535)

TriggeringMessage       ::= ENUMERATED {initiating-message, successful-outcome, unsuccessful-outcome, outcome}

END
```

9.3.6 Constant Definitions

```
-- **************************************************************
--
-- Constant definitions
--
-- **************************************************************

SABP-Constants {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-Constants (4) }

DEFINITIONS AUTOMATIC TAGS ::=
```

```
BEGIN

-- **************************************************************
--
-- Elementary Procedures
--
-- **************************************************************

id-Write-Replace            INTEGER ::= 0
id-Kill                 INTEGER ::= 1
id-Status-Load-Enquiry          INTEGER ::= 2
id-Status-Message-Query         INTEGER ::= 3
id-Restart-Indication           INTEGER ::= 4
id-Reset                INTEGER ::= 5
id-Failure-Indication           INTEGER ::= 6
id-Error-Indication         INTEGER ::= 7

-- **************************************************************
--
-- IEs
--
-- **************************************************************

id-Broadcast-Message-Content        INTEGER ::= 0
id-Category                INTEGER ::= 1
id-Cause                INTEGER ::= 2
id-Criticality-Diagnostics  INTEGER ::=3
id-Data-Coding-Scheme           INTEGER ::= 4
id-Failure-List             INTEGER ::= 5
id-Message-Identifier           INTEGER ::= 6
id-New-Serial-Number            INTEGER ::= 7
id-~~No~~Number-of-Broadcasts-Completed-List    INTEGER ::= 8
id-~~No~~Number-of-Broadcasts-Requested         INTEGER ::= 9
id-Old-Serial-Number                INTEGER ::= 10
id-Radio-Resource-Loading-List      INTEGER ::= 11
id-Recovery-Indication          INTEGER ::= 12
id-Repetition-Period            INTEGER ::= 13
id-Serial-Number            INTEGER ::= 14
id-Service-Areas-List           INTEGER ::= 15
id-MessageStructure             INTEGER ::= 16


-- **************************************************************
--
-- Extension constants
--
-- **************************************************************

-- **************************************************************
--
-- Lists
--
```

```
-- **************************************************************

maxRadio-Resource-Loading-List  INTEGER ::= 65535
maxFailure-List             INTEGER ::= 65535
maxNoNumber-of-Broadcasts-Completed-List    INTEGER ::= 65535
maxNrOfErrors               INTEGER ::= 256
maxService-Areas-List           INTEGER ::= 65535

maxProtocolExtensions           INTEGER ::= 65535
maxProtocolIEs              INTEGER ::= 65535
maxNrOfLevels                       INTEGER ::= 256

END
```

9.3.7 Container Definitions

```
-- **************************************************************
--
-- Container definitions
--
-- **************************************************************

SABP-Containers {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-Containers (5) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- **************************************************************
--
-- IE parameter types from other modules.
--
-- **************************************************************

IMPORTS
    Criticality,
    Presence,
    ProtocolExtensionID,
    ProtocolIE-ID
FROM SABP-CommonDataTypes

    maxProtocolExtensions,
    maxProtocolIEs
FROM SABP-Constants;

-- **************************************************************
--
-- Class Definition for Protocol IEs
--
```

```
-- **************************************************************

SABP-PROTOCOL-IES ::= CLASS {
    &id             ProtocolIE-ID       UNIQUE,
    &criticality            Criticality     DEFAULT ignore,
    &Value,
    &presence           Presence
}
WITH SYNTAX {
    ID              &id
    CRITICALITY         &criticality
    TYPE                &Value
    PRESENCE            &presence
}

-- **************************************************************
--
-- Class Definition for Protocol Extensions
--
-- **************************************************************

SABP-PROTOCOL-EXTENSION ::= CLASS {
    &id             ProtocolExtensionID     UNIQUE,
    &criticality            Criticality     DEFAULT ignore,
    &Extension,
    &presence       Presence
}
WITH SYNTAX {
    ID              &id
    CRITICALITY         &criticality
    EXTENSION           &Extension
    PRESENCE            &presence
}

-- **************************************************************
--
-- Container for Protocol IEs
--
-- **************************************************************

ProtocolIE-Container {SABP-PROTOCOL-IES : IEsSetParam} ::=
    SEQUENCE (SIZE (0..maxProtocolIEs)) OF
    ProtocolIE-Field {{IEsSetParam}}

ProtocolIE-Field {SABP-PROTOCOL-IES : IEsSetParam} ::= SEQUENCE {
    id              SABP-PROTOCOL-IES.&id               ({IEsSetParam}),
    criticality         SABP-PROTOCOL-IES.&criticality          ({IEsSetParam}{@id}),
    value               SABP-PROTOCOL-IES.&Value                ({IEsSetParam}{@id})
}

-- **************************************************************
--
-- Container Lists for Protocol IE Containers
```

```
--
-- **********************************************************

ProtocolIE-ContainerList {INTEGER : lowerBound, INTEGER : upperBound, SABP-PROTOCOL-IES : IEsSetParam} ::=
    SEQUENCE (SIZE (lowerBound..upperBound)) OF
    ProtocolIE-Container {{IEsSetParam}}

-- **********************************************************
--
-- Container for Protocol Extensions
--
-- **********************************************************

ProtocolExtensionContainer {SABP-PROTOCOL-EXTENSION : ExtensionSetParam} ::=
    SEQUENCE (SIZE (1..maxProtocolExtensions)) OF
    ProtocolExtensionField {{ExtensionSetParam}}

ProtocolExtensionField {SABP-PROTOCOL-EXTENSION : ExtensionSetParam} ::= SEQUENCE {
    id              SABP-PROTOCOL-EXTENSION.&id         ({ExtensionSetParam}),
    criticality         SABP-PROTOCOL-EXTENSION.&criticality        ({ExtensionSetParam}{@id}),
    extensionValue          SABP-PROTOCOL-EXTENSION.&Extension      ({ExtensionSetParam}{@id})
}


END
```

Places with no impact are not shown

3GPP TSG-RAN WG3 Meeting #21
Busan, South Korea, 21st – 25th May, 2001

R3-011756

CR-Form-v3

CHANGE REQUEST

⌘ **25.419** **CR** **43** ⌘ rev **1** ⌘ Current version: **4.0.0** ⌘

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

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

Title:	⌘	Alignment of 25.419 (v4.0.0) with 23.041
Source:	⌘	R-WG3
Work item code:	⌘	TEI
Date:	⌘	21st May, 2001
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	It has been noticed that there are some small misalignments with the WRITE-REPLACE equivalent procedure in the 23.041 specification, and here it is hoped that this is resolved.
Summary of change:	⌘	'*Repetition Period*' IE is a Mandatory IE within the WRITE-REPLACE message, and should not be Optional, as has previously been defined.
Consequences if not approved:	⌘	The misalignment with 23.041 shall continue. The proposed change is not backwards compatible.

Clauses affected:	⌘	9.1.3, 9.3.3.		
Other specs affected:	⌘	**X** Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	25.419 R99 CR45
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

BEGINNING OF CHANGES

9.1.3 WRITE-REPLACE

This message is sent by the CN to the RNC.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
New Serial Number	M		9.2.5		yes	reject
Old Serial Number	O		9.2.4		yes	ignore
Service Areas List	M		9.2.6		ves	reject
Category	O		9.2.7		yes	ignore
Repetition Period	~~O~~M		9.2.8		yes	~~ignore~~reject
No of Broadcasts Requested	M		9.2.9		yes	reject
Data Coding Scheme	M		9.2.15		yes	reject
Broadcast Message Content	M		9.2.2		yes	reject

LOTS OF UNAFFECTED TEXT

NEXT CHANGE

9.3.3 PDU Definitions

```
-- **************************************************************
--
-- PDU definitions for SABP.
--
-- **************************************************************

SABP-PDU-Contents {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-PDU-Contents (1) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- **************************************************************
--
-- IE parameter types from other modules.
--
-- **************************************************************

IMPORTS
    Broadcast-Message-Content,
    Category,
    Cause,
Criticality-Diagnostics,
    Data-Coding-Scheme,
    Failure-List,
    Message-Identifier,
    New-Serial-Number,
    No-of-Broadcasts-Completed-List,
    No-of-Broadcasts-Requested,
    Old-Serial-Number,
    Radio-Resource-Loading-List,
    Recovery-Indication,
    Repetition-Period,
    Serial-Number ,
    Service-Areas-List
FROM SABP-IEs

    ProtocolExtensionContainer{},
    ProtocolIE-Container{},
    SABP-PROTOCOL-EXTENSION,
    SABP-PROTOCOL-IES
FROM SABP-Containers

    id-Broadcast-Message-Content,
    id-Category,
```

```
    id-Criticality-Diagnostics,
    id-Cause,
    id-Data-Coding-Scheme,
    id-Failure-List,
    id-Message-Identifier,
    id-New-Serial-Number,
    id-No-of-Broadcasts-Completed-List,
    id-No-of-Broadcasts-Requested,
    id-Old-Serial-Number,
    id-Radio-Resource-Loading-List,
    id-Recovery-Indication,
    id-Repetition-Period,
    id-Serial-Number,
    id-Service-Areas-List
FROM SABP-Constants;

-- **************************************************************
--
-- Write-Replace
--
-- **************************************************************

Write-Replace ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container      { {Write-Replace-IEs} },
    protocolExtensions      ProtocolExtensionContainer { {Write-Replace-Extensions} } OPTIONAL,
    ...
}

Write-Replace-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-New-Serial-Number   CRITICALITY reject  TYPE New-Serial-Number      PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY ignore  TYPE Old-Serial-Number      PRESENCE optional } |
    { ID id-Service-Areas-List  CRITICALITY reject  TYPE Service-Areas-List     PRESENCE mandatory } |
    { ID id-Category            CRITICALITY ignore  TYPE Category           PRESENCE optional  } |
    { ID id-Repetition-Period   CRITICALITY ignorereject    TYPE Repetition-Period      PRESENCE optional  mandatory  } |
    { ID id-No-of-Broadcasts-Requested
                    CRITICALITY reject  TYPE No-of-Broadcasts-Requested PRESENCE mandatory } |
    { ID id-Data-Coding-Scheme  CRITICALITY reject  TYPE Data-Coding-Scheme     PRESENCE mandatory } |
    { ID id-Broadcast-Message-Content
                    CRITICALITY reject  TYPE Broadcast-Message-Content  PRESENCE mandatory } ,
    ...
}
```

3GPP TSG-RAN WG3 Meeting #21
Busan, South Korea, 21st – 25th May, 2001

R3-011758

CR-Form-v3

CHANGE REQUEST

⌘ **25.419** **CR** **44** ⌘ rev **1** ⌘ Current version: **4.0.0** ⌘

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

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

Title:	⌘	Changing of '*Broadcast Message Content* ' IE maximum size.
Source:	⌘	R-WG3
Work item code:	⌘	TEI
Date:	⌘	21st May, 2001
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	It has been noticed that the '*Broadcast Message Content* ' IE is defined as being 1246 octets long. This may result in bandwidth being wasted in order to 'pad out' this IE to 1246 octets long.
Summary of change:	⌘	The '*Broadcast Message Content* ' IE is now changed to refer to an OCTET STRING of variable length: 1 to 1246 Octets.
Consequences if not approved:	⌘	Bandwidth will be wasted in ensuring that a parameter of 1246 octets is always broadcast. The proposed change is not backwards compatible.

Clauses affected:	⌘	9.2.2, 9.3.4.		
Other specs affected:	⌘	[X] Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	R99 25.419 CR 46
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

BEGINNING OF CHANGES

9.2.2 Broadcast Message Content

Broadcast Message Content IE is sent from the CN to the RNC containing user information i.e. the message, and will be broadcast over the radio interface.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Broadcast Message Content	M		OCTET STRING (1..1246)	

NEXT CHANGE

9.3.4 Information Element Definitions

```
-- **************************************************************
--
-- Information Element Definitions
--
-- **************************************************************


SABP-IEs {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS
    maxRadio-Resource-Loading-List,
    maxFailure-List,
    maxNo-of-Broadcasts-Completed-List,
    maxNrOfErrors,
    maxService-Areas-List,
    maxNrOfLevels,

    id-MessageStructure

FROM SABP-Constants

    Criticality,
    ProcedureCode,
    TriggeringMessage,
    ProtocolIE-ID
FROM SABP-CommonDataTypes

    ProtocolExtensionContainer{},

    SABP-PROTOCOL-EXTENSION
FROM SABP-Containers;


-- A

Available-Bandwidth         ::= INTEGER (0..20480)
-- bits/sec

-- B

Broadcast-Message-Content ::= OCTET STRING (SIZE (1..1246))
-- This IE is sent from the CN to the RNC containing user information i.e.
-- the message.
```

```
-- C

Category ::= ENUMERATED {
    high-priority,
    background-priority,
    normal-priority,
    default-priority,
    ...
}

Cause                   ::= INTEGER {
    parameter-not-recognised                            (0),
    parameter-value-invalid                             (1),
    valid-CN-message-not-identified                     (2),
    service-area-identity-not-valid                     (3),
    unrecognised-message                                (4),
    missing-mandatory-element                           (5),
    rNC-capacity-exceeded                               (6),
    rNC-memory-exceeded                                 (7),
    service-area-broadcast-not-supported                (8),
    service-area-broadcast-not-operational              (9),
    message-reference-already-used                      (10),
    unspecifed-error                                    (11),
    transfer-syntax-error                               (12),
    semantic-error                                      (13),
    message-not-compatible-with-receiver-state          (14),
    abstract-syntax-error-reject                        (15),
    abstract-syntax-error-ignore-and-notify             (16),
    abstract-syntax-error-falsely-constructed-message   (17)
} (0..255)

Criticality-Diagnostics         ::= SEQUENCE {
    procedureCode           ProcedureCode           OPTIONAL,
    triggeringMessage       TriggeringMessage       OPTIONAL,
    procedureCriticality        Criticality         OPTIONAL,
    iEsCriticalityDiagnostics       CriticalityDiagnostics-IE-List  OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { {CriticalityDiagnostics-ExtIEs} } OPTIONAL,
    ...
}

CriticalityDiagnostics-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

CriticalityDiagnostics-IE-List ::= SEQUENCE (SIZE (1..maxNrOfErrors)) OF
    SEQUENCE {
        iECriticality       Criticality,
        iE-ID               ProtocolIE-ID,
        repetitionNumber        RepetitionNumber        OPTIONAL,
        iE-Extensions           ProtocolExtensionContainer { {CriticalityDiagnostics-IE-List-ExtIEs} } OPTIONAL,
        ...
    }

CriticalityDiagnostics-IE-List-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
```

```
    {   ID id-MessageStructure      CRITICALITY ignore      EXTENSION MessageStructure      PRESENCE optional},
    ...
}


MessageStructure := SEQUENCE (SIZE (1..maxNrOfLevels)) OF
    SEQUENCE {
        iE-ID                   ProtocolIE-ID,
        repetitionNumber        RepetitionNumber        OPTIONAL,
        iE-Extensions           ProtocolExtensionContainer { {MessageStructure-ExtIEs} } OPTIONAL,
        ...
    }


MessageStructure-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

    ...
}


-- D

Data-Coding-Scheme          ::= INTEGER (0..255)

-- E

-- F

Failure-List ::= SEQUENCE (SIZE (1..maxFailure-List)) OF Failure-List-Item

Failure-List-Item ::= SEQUENCE {
    service-area-identifier     Service-Area-Identifier,
    cause                   Cause,
        iE-Extensions       ProtocolExtensionContainer { {FailureListItemIE-ExtIEs} } OPTIONAL,
        ...
}

FailureListItemIE-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
...
}

-- G

-- H

-- I

-- J

-- K

-- L
```

```
-- M

Message-Identifier ::= OCTET STRING (SIZE (2))

-- N

New-Serial-Number               ::= Serial-Number

No-of-Broadcasts-Completed-List ::= SEQUENCE (SIZE (1..maxNo-of-Broadcasts-Completed-List)) OF
    No-of-Broadcasts-Completed-List-Item

No-of-Broadcasts-Completed-List-Item ::= SEQUENCE {
    service-area-identifier     Service-Area-Identifier,
    no-of-broadcasts-compl      INTEGER (0..65535),
    no-of-broadcasts-compl-info No-Of-Broadcasts-Compl-Info         OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {NoOfBroadcastsCompletedListItemIE-ExtIEs} } OPTIONAL,
        ...
}

NoOfBroadcastsCompletedListItemIE-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
...
}

No-Of-Broadcasts-Compl-Info     ::= ENUMERATED {
    overflow,
    unknown,
    ...
}

No-of-Broadcasts-Requested      ::= INTEGER {
    broadcast-indefinitely (0)
} (0..65535)

-- O

Old-Serial-Number               ::= Serial-Number

-- P

-- Q

-- R

Radio-Resource-Loading-List ::= SEQUENCE (SIZE (1..maxRadio-Resource-Loading-List)) OF
    Radio-Resource-Loading-List-Item

Radio-Resource-Loading-List-Item ::= SEQUENCE {
    service-area-identifier     Service-Area-Identifier,
    available-bandwidth     Available-Bandwidth,
    iE-Extensions       ProtocolExtensionContainer { {RadioResourceLoadingListItemIE-ExtIEs} } OPTIONAL,
        ...
}

RadioResourceLoadingListItemIE-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
...
```

```
}

Recovery-Indication ::= ENUMERATED {
    data-lost,
    data-available
}

RepetitionNumber            ::= INTEGER(1..256)

Repetition-Period           ::= INTEGER (1..4096)
-- Each unit represents a repetition of one second to a maximum of
-- once per 4096 seconds (~1 hour).


-- S

Serial-Number               ::= INTEGER (0..65535)


Service-Area-Identifier ::= SEQUENCE {
    plmn-id             OCTET STRING (SIZE (3))
                    -- Digits 0 to 9, two digits per octet.          --
                    -- Each octet encoded 0000 to 1001.              --
                    -- 1111 used as filler                          --
                    -- Bit 4 to 1 of octet n encoding digit 2n-1.    --
                    -- Bit 8 to 5 of octet n encoding digit 2n.      --
                    -- The PLMN-ID consists of 3 digits from MCC     --
                    -- followed by either a filler plus 2 digits     --
                    -- from MNC (in case of 2 digit MNC) or 3 digits --
                    -- from MNC (in case of 3 digit MNC).            -- ,
    lac             OCTET STRING (SIZE (2))
                    -- 0000 and FFFE not allowed                     -- ,
    sac             OCTET STRING (SIZE (2))
}

-- **TODO** The IE type for these parameters is not known as yet
Service-Areas-List ::= SEQUENCE (SIZE (1..maxService-Areas-List)) OF Service-Area-Identifier



-- T

-- U

-- V

-- W

-- X

-- Y

END
```

END OF CHANGES

3GPP TSG-RAN WG3 Meeting #21
Busan, South Korea, 21st – 25th May, 2001

R3-011755

CR-Form-v3

CHANGE REQUEST

⌘ **25.419** **CR** **45** ⌘ rev **1** ⌘ Current version: **3.4.0** ⌘

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

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

Title:	⌘	Alignment of 25.419 (v3.4.0) with 23.041
Source:	⌘	R-WG3
Work item code:	⌘	TEI
Date:	⌘	21st May, 2001
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	It has been noticed that there are some small misalignments with the WRITE-REPLACE equivalent procedure in the 23.041 specification, and here it is hoped that this is resolved.
Summary of change:	⌘	'*Repetition Period*' IE is a Mandatory IE within the WRITE-REPLACE message, and should not be Optional, as has previously been defined.
Consequences if not approved:	⌘	The misalignment with 23.041 shall continue. The proposed change is not backwards compatible.

Clauses affected:	⌘	9.1.3, 9.3.3.		
Other specs affected:	⌘	**X** Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	25.419 REL-4 CR 43
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

BEGINNING OF CHANGES

9.1.3 WRITE-REPLACE

This message is sent by the CN to the RNC.

Direction: CN → RNC

PARAMETER	PRESENCE	RANGE	IE Type and Reference	Semantics Description	Criticality	Assigned Criticality
Message Type	M		9.2.1		yes	reject
Message Identifier	M		9.2.19		yes	reject
New Serial Number	M		9.2.5		yes	reject
Old Serial Number	O		9.2.4		yes	ignore
Service Areas List	M		9.2.6		ves	reject
Category	O		9.2.7		yes	ignore
Repetition Period	~~O~~M		9.2.8		yes	~~ignore~~reject
No of Broadcasts Requested	M		9.2.9		yes	reject
Data Coding Scheme	M		9.2.15		yes	reject
Broadcast Message Content	M		9.2.2		yes	reject

LOTS OF UNAFFECTED TEXT

NEXT CHANGE

9.3.3 PDU Definitions

```
-- **************************************************************
--
-- PDU definitions for SABP.
--
-- **************************************************************

SABP-PDU-Contents {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-PDU-Contents (1) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- **************************************************************
--
-- IE parameter types from other modules.
--
-- **************************************************************

IMPORTS
    Broadcast-Message-Content,
    Category,
    Cause,
Criticality-Diagnostics,
    Data-Coding-Scheme,
    Failure-List,
    Message-Identifier,
    New-Serial-Number,
    No-of-Broadcasts-Completed-List,
    No-of-Broadcasts-Requested,
    Old-Serial-Number,
    Radio-Resource-Loading-List,
    Recovery-Indication,
    Repetition-Period,
    Serial-Number ,
    Service-Areas-List
FROM SABP-IEs

    ProtocolExtensionContainer{},
    ProtocolIE-Container{},
    SABP-PROTOCOL-EXTENSION,
    SABP-PROTOCOL-IES
FROM SABP-Containers

    id-Broadcast-Message-Content,
    id-Category,
```

```
    id-Criticality-Diagnostics,
    id-Cause,
    id-Data-Coding-Scheme,
    id-Failure-List,
    id-Message-Identifier,
    id-New-Serial-Number,
    id-No-of-Broadcasts-Completed-List,
    id-No-of-Broadcasts-Requested,
    id-Old-Serial-Number,
    id-Radio-Resource-Loading-List,
    id-Recovery-Indication,
    id-Repetition-Period,
    id-Serial-Number,
    id-Service-Areas-List
FROM SABP-Constants;

-- **************************************************************
--
-- Write-Replace
--
-- **************************************************************

Write-Replace ::= SEQUENCE {
    protocolIEs         ProtocolIE-Container      { {Write-Replace-IEs} },
    protocolExtensions      ProtocolExtensionContainer { {Write-Replace-Extensions} } OPTIONAL,
    ...
}

Write-Replace-IEs SABP-PROTOCOL-IES ::= {
    { ID id-Message-Identifier  CRITICALITY reject  TYPE Message-Identifier     PRESENCE mandatory } |
    { ID id-New-Serial-Number   CRITICALITY reject  TYPE New-Serial-Number      PRESENCE mandatory } |
    { ID id-Old-Serial-Number   CRITICALITY ignore  TYPE Old-Serial-Number      PRESENCE optional } |
    { ID id-Service-Areas-List  CRITICALITY reject  TYPE Service-Areas-List     PRESENCE mandatory } |
    { ID id-Category            CRITICALITY ignore  TYPE Category           PRESENCE optional  } |
    { ID id-Repetition-Period   CRITICALITY ignorereject    TYPE Repetition-Period      PRESENCE optional  mandatory  } |
    { ID id-No-of-Broadcasts-Requested
                    CRITICALITY reject  TYPE No-of-Broadcasts-Requested PRESENCE mandatory } |
    { ID id-Data-Coding-Scheme  CRITICALITY reject  TYPE Data-Coding-Scheme     PRESENCE mandatory } |
    { ID id-Broadcast-Message-Content
                    CRITICALITY reject  TYPE Broadcast-Message-Content  PRESENCE mandatory } ,
    ...
}
```

3GPP TSG-RAN WG3 Meeting #21
Busan, South Korea, 21st – 25th May, 2001

R3-011757

CR-Form-v3

CHANGE REQUEST

⌘ **25.419** **CR** **46** ⌘ rev **1** ⌘ Current version: **3.4.0** ⌘

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

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

Title:	⌘	Changing of '*Broadcast Message Content* ' IE maximum size.
Source:	⌘	R-WG3
Work item code:	⌘	TEI
Date:	⌘	21st May, 2001
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change:	⌘	It has been noticed that the '*Broadcast Message Content* ' IE is defined as being 1246 octets long. This may result in bandwidth being wasted in order to 'pad out' this IE to 1246 octets long.
Summary of change:	⌘	The '*Broadcast Message Content* ' IE is now changed to refer to an OCTET STRING of variable length: 1 to 1246 Octets.
Consequences if not approved:	⌘	Bandwidth will be wasted in ensuring that a parameter of 1246 octets is always broadcast. The proposed change is not backwards compatible.

Clauses affected:	⌘	9.2.2, 9.3.4.		
Other specs affected:	⌘	**X** Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	25.419 REL-4 CR 44
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

BEGINNING OF CHANGES

9.2.2 Broadcast Message Content

Broadcast Message Content IE is sent from the CN to the RNC containing user information i.e. the message, and will be broadcast over the radio interface.

IE/GROUP NAME	PRESENCE	RANGE	IE Type and	Semantics Description
Broadcast Message Content	M		OCTET STRING (1..1246)	

NEXT CHANGE

9.3.4 Information Element Definitions

```
-- **************************************************************
--
-- Information Element Definitions
--
-- **************************************************************


SABP-IEs {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-IEs (2) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS
    maxRadio-Resource-Loading-List,
    maxFailure-List,
    maxNo-of-Broadcasts-Completed-List,
    maxNrOfErrors,
    maxService-Areas-List,
    maxNrOfLevels,

    id-MessageStructure

FROM SABP-Constants

    Criticality,
    ProcedureCode,
    TriggeringMessage,
    ProtocolIE-ID
FROM SABP-CommonDataTypes

    ProtocolExtensionContainer{},

    SABP-PROTOCOL-EXTENSION
FROM SABP-Containers;


-- A

Available-Bandwidth         ::= INTEGER (0..20480)
-- bits/sec

-- B

Broadcast-Message-Content ::= OCTET STRING (SIZE (1..1246))
-- This IE is sent from the CN to the RNC containing user information i.e.
-- the message.
```

```
-- C

Category ::= ENUMERATED {
    high-priority,
    background-priority,
    normal-priority,
    default-priority,
    ...
}

Cause                   ::= INTEGER {
    parameter-not-recognised                            (0),
    parameter-value-invalid                             (1),
    valid-CN-message-not-identified                     (2),
    service-area-identity-not-valid                     (3),
    unrecognised-message                                (4),
    missing-mandatory-element                           (5),
    rNC-capacity-exceeded                               (6),
    rNC-memory-exceeded                                 (7),
    service-area-broadcast-not-supported                (8),
    service-area-broadcast-not-operational              (9),
    message-reference-already-used                      (10),
    unspecifed-error                                    (11),
    transfer-syntax-error                               (12),
    semantic-error                                      (13),
    message-not-compatible-with-receiver-state          (14),
    abstract-syntax-error-reject                        (15),
    abstract-syntax-error-ignore-and-notify             (16),
    abstract-syntax-error-falsely-constructed-message   (17)
} (0..255)

Criticality-Diagnostics         ::= SEQUENCE {
    procedureCode           ProcedureCode           OPTIONAL,
    triggeringMessage       TriggeringMessage       OPTIONAL,
    procedureCriticality        Criticality         OPTIONAL,
    iEsCriticalityDiagnostics       CriticalityDiagnostics-IE-List  OPTIONAL,
    iE-Extensions           ProtocolExtensionContainer { {CriticalityDiagnostics-ExtIEs} } OPTIONAL,
    ...
}

CriticalityDiagnostics-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

CriticalityDiagnostics-IE-List ::= SEQUENCE (SIZE (1..maxNrOfErrors)) OF
    SEQUENCE {
        iECriticality       Criticality,
        iE-ID               ProtocolIE-ID,
        repetitionNumber        RepetitionNumber        OPTIONAL,
        iE-Extensions           ProtocolExtensionContainer { {CriticalityDiagnostics-IE-List-ExtIEs} } OPTIONAL,
        ...
    }

CriticalityDiagnostics-IE-List-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
```

```
    {   ID id-MessageStructure      CRITICALITY ignore      EXTENSION MessageStructure      PRESENCE optional},
    ...
}


MessageStructure := SEQUENCE (SIZE (1..maxNrOfLevels)) OF
    SEQUENCE {
        iE-ID                   ProtocolIE-ID,
        repetitionNumber        RepetitionNumber        OPTIONAL,
        iE-Extensions           ProtocolExtensionContainer { {MessageStructure-ExtIEs} } OPTIONAL,
        ...
    }


MessageStructure-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
    ...
}

    ...
}


-- D

Data-Coding-Scheme          ::= INTEGER (0..255)

-- E

-- F

Failure-List ::= SEQUENCE (SIZE (1..maxFailure-List)) OF Failure-List-Item

Failure-List-Item ::= SEQUENCE {
    service-area-identifier     Service-Area-Identifier,
    cause                   Cause,
        iE-Extensions       ProtocolExtensionContainer { {FailureListItemIE-ExtIEs} } OPTIONAL,
        ...
}

FailureListItemIE-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
...
}

-- G

-- H

-- I

-- J

-- K

-- L
```

```
-- M

Message-Identifier ::= OCTET STRING (SIZE (2))

-- N

New-Serial-Number               ::= Serial-Number

No-of-Broadcasts-Completed-List ::= SEQUENCE (SIZE (1..maxNo-of-Broadcasts-Completed-List)) OF
    No-of-Broadcasts-Completed-List-Item

No-of-Broadcasts-Completed-List-Item ::= SEQUENCE {
    service-area-identifier     Service-Area-Identifier,
    no-of-broadcasts-compl      INTEGER (0..65535),
    no-of-broadcasts-compl-info No-Of-Broadcasts-Compl-Info         OPTIONAL,
    iE-Extensions       ProtocolExtensionContainer { {NoOfBroadcastsCompletedListItemIE-ExtIEs} } OPTIONAL,
        ...
}

NoOfBroadcastsCompletedListItemIE-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
...
}

No-Of-Broadcasts-Compl-Info     ::= ENUMERATED {
    overflow,
    unknown,
    ...
}

No-of-Broadcasts-Requested      ::= INTEGER {
    broadcast-indefinitely (0)
} (0..65535)

-- O

Old-Serial-Number               ::= Serial-Number

-- P

-- Q

-- R

Radio-Resource-Loading-List ::= SEQUENCE (SIZE (1..maxRadio-Resource-Loading-List)) OF
    Radio-Resource-Loading-List-Item

Radio-Resource-Loading-List-Item ::= SEQUENCE {
    service-area-identifier     Service-Area-Identifier,
    available-bandwidth     Available-Bandwidth,
    iE-Extensions       ProtocolExtensionContainer { {RadioResourceLoadingListItemIE-ExtIEs} } OPTIONAL,
        ...
}

RadioResourceLoadingListItemIE-ExtIEs SABP-PROTOCOL-EXTENSION ::= {
...
```

```
}

Recovery-Indication ::= ENUMERATED {
    data-lost,
    data-available
}

RepetitionNumber            ::= INTEGER(1..256)

Repetition-Period           ::= INTEGER (1..4096)
-- Each unit represents a repetition of one second to a maximum of
-- once per 4096 seconds (~1 hour).


-- S

Serial-Number               ::= INTEGER (0..65535)


Service-Area-Identifier ::= SEQUENCE {
    plmn-id             OCTET STRING (SIZE (3))
                    -- Digits 0 to 9, two digits per octet.          --
                    -- Each octet encoded 0000 to 1001.              --
                    -- 1111 used as filler                          --
                    -- Bit 4 to 1 of octet n encoding digit 2n-1.    --
                    -- Bit 8 to 5 of octet n encoding digit 2n.      --
                    -- The PLMN-ID consists of 3 digits from MCC     --
                    -- followed by either a filler plus 2 digits     --
                    -- from MNC (in case of 2 digit MNC) or 3 digits --
                    -- from MNC (in case of 3 digit MNC).            -- ,
    lac             OCTET STRING (SIZE (2))
                    -- 0000 and FFFE not allowed                     -- ,
    sac             OCTET STRING (SIZE (2))
}

-- **TODO** The IE type for these parameters is not known as yet
Service-Areas-List ::= SEQUENCE (SIZE (1..maxService-Areas-List)) OF Service-Area-Identifier



-- T

-- U

-- V

-- W

-- X

-- Y

END
```

END OF CHANGES

3GPP TSG-RAN WG3 Meeting #21 ***R3-011670***
Busan, South Korea, 21st – 25th May, 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.419** **CR** **047** ⌘ ev **-** ⌘ Current version: **3.4.0** ⌘

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

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

Title:	⌘	Corrections in 25.419 due to terminology of PLMN Identity as requested by SA1
Source:	⌘	R-WG3
Work item code:	⌘	TEI
Date:	⌘	May 2001
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	According to LS TSGR3#21(01)1571, SA1 and CN1 decided that the correct term to refer to a MCC+MNC combination is PLMN identity. This is the only term currently appearing in the TR 21.905 (Vocabulary document) and should be used instead of “PLMN code”, “PLMN identifier” or “PLMN-ID”.
Summary of change:	⌘	All the terms that refer to MCC+MNC combination (“PLMN code”, “PLMN identifier” or “PLMN-ID”) are replaced by the right term "PLMN identity".
Consequences if not approved:	⌘	SABP specification will be not aligned with other specs. and then generates misunderstandings. The proposed changes are backwards compatible.

Clauses affected:	⌘	9.2.11 and 9.3.4
Other specs affected:	⌘	**X** Other core specifications ☐ Test specifications ☐ O&M Specifications
	⌘	TS 25.419 REL-4, mirror CR048
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.2.11 Service Area Identifier

Service Area Identifier IE is used to identify an area consisting of one or more cells belonging to the same Location Area. Such an area is called a Service Area. For this protocol, only a Service Area that is defined to be applicable to the BC domain shall be used.

IE/Group Name	Presence	Range	IE type and Reference	Semantics description
SAI				
>PLMN ~~ID~~ identity	M		OCTET STRING (SIZE (3))	- digits 0 to 9, two digits per octet, - each digit encoded 0000 to 1001, - 1111 used as filler - bit 4 to 1 of octet n encoding digit 2n-1 - bit 8 to 5 of octet n encoding digit 2n -The PLMN ~~-ID~~ identity consists of 3 digits from MCC followed by either -a filler plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>LAC	M		OCTET STRING (2)	0000 and FFFE not allowed.
>SAC	M		OCTET STRING (2)	

9.3.4 Information Element Definitions

```
-- **************************************************************
--
-- Information Element Definitions
--
-- **************************************************************


SABP-IEs {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-IEs (2) }
```

****** LOTS OF UNAFFECTED ASN.1 DESCRIPTION FROM SECTION 9.3.4 REMOVED ******

```
-- S

Serial-Number               ::= INTEGER (0..65535)


Service-Area-Identifier ::= SEQUENCE {
    plmn-idLMNidentity              OCTET STRING (SIZE (3))
                    -- Digits 0 to 9, two digits per octet.          --
                    -- Each octet encoded 0000 to 1001.              --
                    -- 1111 used as filler                          --
                    -- Bit 4 to 1 of octet n encoding digit 2n-1.    --
                    -- Bit 8 to 5 of octet n encoding digit 2n.      --
                    -- The PLMN-ID identity consists of 3 digits from MCC     --
                    -- followed by either a filler plus 2 digits     --
                    -- from MNC (in case of 2 digit MNC) or 3 digits --
                    -- from MNC (in case of 3 digit MNC).            -- ,
    lac             OCTET STRING (SIZE (2))
                    -- 0000 and FFFE not allowed                     -- ,
    sac             OCTET STRING (SIZE (2))
}
```

****** LOTS OF UNAFFECTED ASN.1 DESCRIPTION FROM SECTION 9.3.4 REMOVED ******

3GPP TSG-RAN WG3 Meeting #21 **R3-011671**
Busan, South Korea, 21st – 25th May, 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.419** **CR** **048** ⌘ ev **-** ⌘ Current version: **4.0.0** ⌘

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

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

Title:	⌘	Corrections in 25.419 due to terminology of PLMN Identity as requested by SA1
Source:	⌘	R-WG3
Work item code:	⌘	TEI
Date:	⌘	May 2001
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	According to LS TSGR3#21(01)1571, SA1 and CN1 decided that the correct term to refer to a MCC+MNC combination is PLMN identity. This is the only term currently appearing in the TR 21.905 (Vocabulary document) and should be used instead of “PLMN code”, “PLMN identifier” or “PLMN-ID”.
Summary of change:	⌘	All the terms that refer to MCC+MNC combination (“PLMN code”, “PLMN identifier” or “PLMN-ID”) are replaced by the right term "PLMN identity".
Consequences if not approved:	⌘	SABP specification will be not aligned with other specs. and then generates misunderstandings. The proposed changes are backwards compatible.

Clauses affected:	⌘	9.2.11 and 9.3.4		
Other specs affected:	⌘	[X] Other core specifications [ ] Test specifications [ ] O&M Specifications	⌘	TS 25.419 R99, initial CR047
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.2.11 Service Area Identifier

Service Area Identifier IE is used to identify an area consisting of one or more cells belonging to the same Location Area. Such an area is called a Service Area. For this protocol, only a Service Area that is defined to be applicable to the BC domain shall be used.

IE/Group Name	Presence	Range	IE type and Reference	Semantics description
SAI				
>PLMN ~~ID~~ identity	M		OCTET STRING (SIZE (3))	- digits 0 to 9, two digits per octet, - each digit encoded 0000 to 1001, - 1111 used as filler - bit 4 to 1 of octet n encoding digit 2n-1 - bit 8 to 5 of octet n encoding digit 2n -The PLMN ~~ID~~ identity consists of 3 digits from MCC followed by either -a filler plus 2 digits from MNC (in case of 2 digit MNC) or -3 digits from MNC (in case of a 3 digit MNC).
>LAC	M		OCTET STRING (2)	0000 and FFFE not allowed.
>SAC	M		OCTET STRING (2)	

9.3.4 Information Element Definitions

```
-- **************************************************************
--
-- Information Element Definitions
--
-- **************************************************************


SABP-IEs {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) sabp (3) version1 (1) sabp-IEs (2) }
```

****** LOTS OF UNAFFECTED ASN.1 DESCRIPTION FROM SECTION 9.3.4 REMOVED ******

```
-- S

Serial-Number               ::= INTEGER (0..65535)


Service-Area-Identifier ::= SEQUENCE {
    plmn-idLMNidentity              OCTET STRING (SIZE (3))
                    -- Digits 0 to 9, two digits per octet.          --
                    -- Each octet encoded 0000 to 1001.              --
                    -- 1111 used as filler                          --
                    -- Bit 4 to 1 of octet n encoding digit 2n-1.    --
                    -- Bit 8 to 5 of octet n encoding digit 2n.      --
                    -- The PLMN-ID identity consists of 3 digits from MCC     --
                    -- followed by either a filler plus 2 digits     --
                    -- from MNC (in case of 2 digit MNC) or 3 digits --
                    -- from MNC (in case of 3 digit MNC).            -- ,
    lac             OCTET STRING (SIZE (2))
                    -- 0000 and FFFE not allowed                     -- ,
    sac             OCTET STRING (SIZE (2))
}
```

****** LOTS OF UNAFFECTED ASN.1 DESCRIPTION FROM SECTION 9.3.4 REMOVED ******

3GPP TSG-RAN WG3 Meeting #21
Busan, Korea, May 21st – 25th, 2001

R3-011735

CR-Form-v3

CHANGE REQUEST

⌘ **25.419** **CR** **049** ⌘ rev **-** ⌘ Current version: **3.4.0** ⌘

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

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

Title:	⌘	Reference to superseded versions of ASN.1 documents
Source:	⌘	R-WG3
Work item code:	⌘	TEI
Date:	⌘	2001-05-23
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The 1994 versions of X.680, X.681 and X.691 are referred to in 25.419. These versions have, however, been superseded by the 1997 versions. It is thus proposed to refer to the 1997 versions instead.
Summary of change:	⌘	Version of ASN.1 specifications changed to 1997 version. 25.921 is also updated to state that even though version 1997 is referenced, the specifications will only make use of version 1994 functionality.
Consequences if not approved:	⌘	References are made to not maintained specification versions. The proposed changes are backward compatible.

Clauses affected:	⌘	2		
Other specs affected:	⌘	**X** Other core specifications	⌘	CR050 (25.419 V4.0.0), CRxxx (25.921 V3.3.0)
		☐ Test specifications		
		☐ O&M Specifications		
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 23.930: "Iu Principles".

[2] 3GPP TS 25.410: "UTRAN Iu Interface; General Aspects and Principles".

[3] 3GPP TS 25.401: "UTRAN Overall Description".

[4] 3GPP TS 25.931: "UTRAN Functions, Examples on Signalling Procedures".

[5] 3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".

[6] 3GPP TS 25.414: "UTRAN Iu Interface Data Transport and Transport Signalling".

[7] ITU-T Recommendation X.680 (12/~~94~~97): "Information Technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".

[8] ITU-T Recommendation X.681 (12/~~94~~97): "Information Technology - Abstract Syntax Notation One (ASN.1): Information object specification".

[9] ITU-T Recommendation X.691 (12/~~94~~97): "Information Technology - ASN.1 encoding rules - Specification of Packed Encoding Rules (PER)".

[10] 3GPP TR 25.921: "Guidelines and Principles for Protocol Description and Error Handling".

3GPP TSG-RAN WG3 Meeting #21
Busan, Korea, May 21st – 25th, 2001

R3-011736

CR-Form-v3

CHANGE REQUEST

⌘ **25.419** **CR** **050** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

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

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

Title:	⌘	Reference to superseded versions of ASN.1 documents
Source:	⌘	R-WG3
Work item code:	⌘	TEI
Date:	⌘	2001-05-23
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The 1994 versions of X.680, X.681 and X.691 are referred to in 25.419. These versions have, however, been superseded by the 1997 versions. It is thus proposed to refer to the 1997 versions instead.
Summary of change:	⌘	Version of ASN.1 specifications changed to 1997 version. 25.921 is also updated to state that even though version 1997 is referenced, the specifications will only make use of version 1994 functionality.
Consequences if not approved:	⌘	References are made to not maintained specification versions. The proposed changes are backwards compatible.

Clauses affected:	⌘	2		
Other specs affected:	⌘	**X** Other core specifications	⌘	CR049 (25.419 V3.4.0), CRxxx (25.921 V4.0.0)
		☐ Test specifications		
		☐ O&M Specifications		
Other comments:	⌘			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 23.930: "Iu Principles".

[2] 3GPP TS 25.410: "UTRAN Iu Interface; General Aspects and Principles".

[3] 3GPP TS 25.401: "UTRAN Overall Description".

[4] 3GPP TS 25.931: "UTRAN Functions, Examples on Signalling Procedures".

[5] 3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".

[6] 3GPP TS 25.414: "UTRAN Iu Interface Data Transport and Transport Signalling".

[7] ITU-T Recommendation X.680 (12/~~94~~97): "Information Technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".

[8] ITU-T Recommendation X.681 (12/~~94~~97): "Information Technology - Abstract Syntax Notation One (ASN.1): Information object specification".

[9] ITU-T Recommendation X.691 (12/~~94~~97): "Information Technology - ASN.1 encoding rules - Specification of Packed Encoding Rules (PER)".

[10] 3GPP TR 25.921: "Guidelines and Principles for Protocol Description and Error Handling".