TSG-RAN Meeting #19 ***RP-030103***
Birmingham, UK, 11 - 14 March 2003

Title: **CRs (Release '99 and Rel-4/Rel-5 category A) to TS 25.331 (1)**

Source: **TSG-RAN WG2**

Agenda item: **8.2.3**

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Doc-2nd-Level	Workitem
25.331	1811	-	R99	ASN.1 of the SRNS relocation Info	F	3.13.0	3.14.0	R2-030434	TEI
25.331	1812	-	Rel-4	ASN.1 of the SRNS relocation Info	A	4.8.0	4.9.0	R2-030435	TEI
25.331	1813	-	Rel-5	ASN.1 of the SRNS relocation Info	A	5.3.0	5.4.0	R2-030436	TEI
25.331	1814	-	R99	Correction to procedural text for Physical Shared Channel Allocation (TDD only)	F	3.13.0	3.14.0	R2-030437	TEI
25.331	1815	-	Rel-4	Correction to procedural text for Physical Shared Channel Allocation (TDD only)	A	4.8.0	4.9.0	R2-030438	TEI
25.331	1816	-	Rel-5	Correction to procedural text for Physical Shared Channel Allocation (TDD only)	A	5.3.0	5.4.0	R2-030439	TEI
25.331	1817	1	R99	CM and state transition related to measurements, additional measurements, virtual active set and periodic measurements	F	3.13.0	3.14.0	R2-030515	TEI
25.331	1818	1	Rel-4	CM and state transition related to measurements, additional measurements, virtual active set and periodic measurements	F	4.8.0	4.9.0	R2-030516	TEI
25.331	1819	1	Rel-5	CM and state transition related to measurements, additional measurements, virtual active set and periodic measurements	A	5.3.0	5.4.0	R2-030517	TEI
25.331	1820	-	R99	Physical channel failure and radio link re-establishment	F	3.13.0	3.14.0	R2-030443	TEI
25.331	1821	-	Rel-4	Physical channel failure and radio link re-establishment	F	4.8.0	4.9.0	R2-030444	TEI
25.331	1822	-	Rel-5	Physical channel failure and radio link re-establishment	A	5.3.0	5.4.0	R2-030445	TEI
25.331	1823	-	R99	Correction concerning bit numbering convention	F	3.13.0	3.14.0	R2-030446	TEI
25.331	1824	-	Rel-4	Correction concerning bit numbering convention	A	4.8.0	4.9.0	R2-030447	TEI
25.331	1825	-	Rel-5	Correction concerning bit numbering convention	A	5.3.0	5.4.0	R2-030448	TEI

NOTE: CRs 1826, 1827 and 1828 (variable duplex) are available in RP-030118 (as linked with 25.101 CRs 207, 208 and 209).

3GPP TSG-RAN2 Meeting #34
Sophia Antipolis, France, 17th-21st February 2003

Tdoc R2-030434

CR-Form-v7

CHANGE REQUEST

⌘ **25.331** **CR** **1811** ⌘ **rev** **-** ⌘ Current version: **3.13.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	ASN.1 of the SRNS relocation Info
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	17 Feb 2003
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)
Rel-6 (Release 6)

Reason for change:	⌘	The order of occurrence of the IE "Signalling radio bearer specific integrity protection information" in the "SRNS Relocation Info" IE is the same as in the IE "Signalling RB information list". But the range of the IE "RB Id" is from 1 to 32, so integrity protection information corresponding to SRB0 can't be encoded in the IE "SRNS Relocation info".
Summary of change:	⌘	It is specified that in the IE srb-SpecificIntegrityProtInfo, the first information listed corresponds to signalling radio bearer RB0 and after the order of occurrence is the same as the SRBs in the IE "Signalling RB information list".
Consequences if not approved:	⌘	Potential different encoding of the occurrence of the IE "Signalling radio bearer specific integrity protection information" in the "SRNS Relocation Info" IE between a Source RNC and a Target RNC belonging to different vendor leading to integrity failure after SRNS relocation. **This CR only impact the UTRAN** **If the CR is not implemented in the UTRAN:** Potential security failure after a inter-vendor SRNS relocation, in case they had different interpretation of the ASN.1 of the "SRNS Relocation info".

Clauses affected:	⌘	11.5			
		Y	**N**		
Other specs affected:	⌘		**X**	Other core specifications	⌘
			X	Test specifications	

	X	O&M Specifications

Other comments: ⌘

How to create CRs using this form:

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

11.5 RRC information between network nodes

```
Internode-definitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

    HandoverToUTRANCommand,
    MeasurementReport,
    PhysicalChannelReconfiguration,
    RadioBearerReconfiguration,
    RadioBearerRelease,
    RadioBearerSetup,
    RRC-FailureInfo,
    TransportChannelReconfiguration
FROM PDU-definitions

-- Core Network IEs :
    CN-DomainIdentity,
    CN-DomainInformationList,
    CN-DRX-CycleLengthCoefficient,
    NAS-SystemInformationGSM-MAP,
-- UTRAN Mobility IEs :
    CellIdentity,
    URA-Identity,
-- User Equipment IEs :
    C-RNTI,
    DL-PhysChCapabilityFDD-v380ext,
    FailureCauseWithProtErr,
    RRC-MessageSequenceNumber,
    STARTList,
    STARTSingle,
    START-Value,
    U-RNTI,
    UE-RadioAccessCapability,
    UE-RadioAccessCapability-v370ext,
    UE-RadioAccessCapability-v380ext,
    UE-RadioAccessCapability-v3a0ext,
    UESpecificBehaviourInformation1interRAT,
    UESpecificBehaviourInformation1idle,
-- Radio Bearer IEs :
    PredefinedConfigStatusList,
    PredefinedConfigValueTag,
    RAB-InformationSetupList,
    RB-Identity,
    SRB-InformationSetupList,
-- Transport Channel IEs :
    CPCH-SetID,
    DL-CommonTransChInfo,
    DL-AddReconfTransChInfoList,
    DRAC-StaticInformationList,
    UL-CommonTransChInfo,
    UL-AddReconfTransChInfoList,
-- Measurement IEs :
    MeasurementIdentity,
    MeasurementReportingMode,
    MeasurementType,
    AdditionalMeasurementID-List,
    PositionEstimate,
-- Other IEs :
    InterRAT-UE-RadioAccessCapabilityList
FROM InformationElements

    maxCNdomains,
    maxNoOfMeas,
    maxRB,
    maxSRBsetup
FROM Constant-definitions;


-- Part 1: Class definitions similar to what has been defined in 11.1 for RRC messages
-- Information that is tranferred in the same direction and across the same path is grouped

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

```
-- RRC information, to target RNC
--
-- **************************************************
-- RRC Information to target RNC sent either from source RNC or from another RAT

ToTargetRNC-Container ::= CHOICE {
    interRAThandover                    InterRATHandoverInfoWithInterRATCapabilities,
    srncRelocation                      SRNC-RelocationInfo,
    extension                           NULL
}

-- **************************************************
--
-- RRC information, target RNC to source RNC
--
-- **************************************************


TargetRNC-ToSourceRNC-Container::= CHOICE {
    radioBearerSetup                    RadioBearerSetup,
    radioBearerReconfiguration          RadioBearerReconfiguration,
    radioBearerRelease                  RadioBearerRelease,
    transportChannelReconfiguration     TransportChannelReconfiguration,
    physicalChannelReconfiguration      PhysicalChannelReconfiguration,
    rrc-FailureInfo                     RRC-FailureInfo,
    -- IE dl-DCCHmessage consists of an octet string that includes
    -- the IE DL-DCCH-Message
    dL-DCCHmessage                      OCTET STRING,
    extension                           NULL
}

-- Part2: Container definitions, similar to the PDU definitions in 11.2 for RRC messages
-- In alphabetical order


-- **************************************************
--
-- Handover to UTRAN information
--
-- **************************************************

InterRATHandoverInfoWithInterRATCapabilities ::= CHOICE {
    r3                              SEQUENCE {
        -- IE InterRATHandoverInfoWithInterRATCapabilities-r3-IEs also
        -- includes non critical extensions
        interRAThandoverInfo-r3         InterRATHandoverInfoWithInterRATCapabilities-r3-IEs,
        v390NonCriticalExtensions           SEQUENCE {
            interRATHandoverInfoWithInterRATCapabilities-v390ext
    InterRATHandoverInfoWithInterRATCapabilities-v390ext-IEs,
            -- Reserved for future non critical extension
            nonCriticalExtensions           SEQUENCE {} OPTIONAL
        }       OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

InterRATHandoverInfoWithInterRATCapabilities-r3-IEs::=      SEQUENCE {
        -- The order of the IEs may not reflect the tabular format
        -- but has been chosen to simplify the handling of the information in the BSC
    --  Other IEs
        ue-RATSpecificCapability        InterRAT-UE-RadioAccessCapabilityList   OPTIONAL,
        -- interRATHandoverInfo, Octet string is used to obtain 8 bit length field prior to
        -- actual information.  This makes it possible for BSS to transparently handle information
        -- received via GSM air interface even when it includes non critical extensions.
        -- The octet string shall include the InterRATHandoverInfo information
        -- The BSS can re-use the 04.18 length field received from the MS
        interRATHandoverInfo            OCTET STRING (SIZE (0..255))
}

InterRATHandoverInfoWithInterRATCapabilities-v390ext-IEs ::= SEQUENCE {
    -- User equipment IEs
        failureCauseWithProtErr             FailureCauseWithProtErr                 OPTIONAL
}

-- **************************************************
--
-- SRNC Relocation information
--
```

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

SRNC-RelocationInfo ::= CHOICE {
    r3                              SEQUENCE {
        sRNC-RelocationInfo-r3          SRNC-RelocationInfo-r3-IEs,
        v380NonCriticalExtensions           SEQUENCE {
            sRNC-RelocationInfo-v380ext SRNC-RelocationInfo-v380ext-IEs,
            -- Reserved for future non critical extension
            v390NonCriticalExtensions           SEQUENCE {
                sRNC-RelocationInfo-v390ext         SRNC-RelocationInfo-v390ext-IEs,
                v3a0NonCriticalExtensions           SEQUENCE {
                    sRNC-RelocationInfo-v3a0ext         SRNC-RelocationInfo-v3a0ext-IEs,
                    v3b0NonCriticalExtensions           SEQUENCE {
                        sRNC-RelocationInfo-v3b0ext         SRNC-RelocationInfo-v3b0ext-IEs,
                        v3c0NonCriticalExtensions           SEQUENCE {
                            sRNC-RelocationInfo-v3c0ext         SRNC-RelocationInfo-v3c0ext-IEs,
                            laterNonCriticalExtensions          SEQUENCE {
                                sRNC-RelocationInfo-v3d0ext         SRNC-RelocationInfo-v3d0ext-IEs,
                                -- Container for additional R99 extensions
                                sRNC-RelocationInfo-r3-add-ext      BIT STRING  OPTIONAL,
                                -- Reserved for future non critical extension
                                nonCriticalExtensions           SEQUENCE {} OPTIONAL
                            }       OPTIONAL
                        }       OPTIONAL
                    }       OPTIONAL
                }       OPTIONAL
            }       OPTIONAL
        }       OPTIONAL
    },
    criticalExtensions              SEQUENCE {}
}

SRNC-RelocationInfo-r3-IEs ::=              SEQUENCE {
    -- Non-RRC IEs
        stateOfRRC                      StateOfRRC,
        stateOfRRC-Procedure            StateOfRRC-Procedure,
    -- Ciphering related information IEs
    -- If the extension v380 is included use the extension for the ciphering status per CN domain
        cipheringStatus                 CipheringStatus,
        calculationTimeForCiphering     CalculationTimeForCiphering         OPTIONAL,
        -- The order of occurrence in the IE cipheringInfoPerRB-List is the
        -- same as the RBs in SRB-InformationSetupList the IE "Signalling RB information list" and
         in RAB-InformationSetupList the
        -- IE "RAB information list". The signalling RBs are supposed to be listed
        -- first. Only UM and AM RBs that are ciphered are listed here
        cipheringInfoPerRB-List         CipheringInfoPerRB-List             OPTIONAL,
        count-C-List                    COUNT-C-List                        OPTIONAL,
        integrityProtectionStatus       IntegrityProtectionStatus,
         -- In the IE srb-SpecificIntegrityProtInfo, the first information listed corresponds to
         -- signalling radio bearer RB0 and after the order of occurrence is the same as the SRBs in
         -- SRB-InformationSetupListthe IE "Signalling RB information list"
        -- The order of occurrence in the IE srb-SpecificIntegrityProtInfo is the
        -- same as the SRBs in the IE "Signalling RB information list"
        srb-SpecificIntegrityProtInfo   SRB-SpecificIntegrityProtInfoList,
        implementationSpecificParams    ImplementationSpecificParams        OPTIONAL,
    -- User equipment IEs
        u-RNTI                          U-RNTI,
        c-RNTI                          C-RNTI                              OPTIONAL,
        ue-RadioAccessCapability        UE-RadioAccessCapability,
        ue-Positioning-LastKnownPos     UE-Positioning-LastKnownPos         OPTIONAL,
    -- Other IEs
        ue-RATSpecificCapability        InterRAT-UE-RadioAccessCapabilityList   OPTIONAL,
    -- UTRAN mobility IEs
        ura-Identity                    URA-Identity                        OPTIONAL,
    -- Core network IEs
        cn-CommonGSM-MAP-NAS-SysInfo    NAS-SystemInformationGSM-MAP,
        cn-DomainInformationList        CN-DomainInformationList            OPTIONAL,
    -- Measurement IEs
        ongoingMeasRepList              OngoingMeasRepList                  OPTIONAL,
    -- Radio bearer IEs
        predefinedConfigStatusList      PredefinedConfigStatusList,
        srb-InformationList             SRB-InformationSetupList,
        rab-InformationList             RAB-InformationSetupList            OPTIONAL,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo                OPTIONAL,
        ul-TransChInfoList              UL-AddReconfTransChInfoList         OPTIONAL,
        modeSpecificInfo                CHOICE {
            fdd                             SEQUENCE {
```

```
                cpch-SetID                      CPCH-SetID                  OPTIONAL,
                transChDRAC-Info                DRAC-StaticInformationList  OPTIONAL
            },
            tdd                             NULL
        },
        dl-CommonTransChInfo            DL-CommonTransChInfo                OPTIONAL,
        dl-TransChInfoList              DL-AddReconfTransChInfoList         OPTIONAL,
    -- Measurement report
        measurementReport               MeasurementReport                   OPTIONAL
}

SRNC-RelocationInfo-v380ext-IEs ::= SEQUENCE {
    -- Ciphering related information IEs
        cn-DomainIdentity                   CN-DomainIdentity,
        cipheringStatusList                 CipheringStatusList
}

SRNC-RelocationInfo-v390ext-IEs ::= SEQUENCE {
        cn-DomainInformationList-v390ext    CN-DomainInformationList-v390ext        OPTIONAL,
        ue-RadioAccessCapability-v370ext    UE-RadioAccessCapability-v370ext        OPTIONAL,
        ue-RadioAccessCapability-v380ext    UE-RadioAccessCapability-v380ext        OPTIONAL,
        dl-PhysChCapabilityFDD-v380ext      DL-PhysChCapabilityFDD-v380ext,
        failureCauseWithProtErr             FailureCauseWithProtErr                 OPTIONAL
}

SRNC-RelocationInfo-v3a0ext-IEs ::= SEQUENCE {
        cipheringInfoForSRB1-v3a0ext        CipheringInfoPerRB-List-v3a0ext,
        ue-RadioAccessCapability-v3a0ext    UE-RadioAccessCapability-v3a0ext        OPTIONAL,
        -- cn-domain identity for IE startValueForCiphering-v3a0ext is specified
        -- in subsequent extension (SRNC-RelocationInfo-v3b0ext-IEs)
        startValueForCiphering-v3a0ext      START-Value
}

SRNC-RelocationInfo-v3b0ext-IEs ::= SEQUENCE {
        -- cn-domain identity for IE startValueForCiphering-v3a0ext included in previous extension
        cn-DomainIdentity               CN-DomainIdentity,
        -- the IE startValueForCiphering-v3b0ext contains the start values for each CN Domain. The
        -- value of start indicated by the IE startValueForCiphering-v3a0ext should be set to the
        -- same value as the start-Value for the corresponding cn-DomainIdentity in the IE
        -- startValueForCiphering-v3b0ext
        startValueForCiphering-v3b0ext      STARTList2                              OPTIONAL
}

SRNC-RelocationInfo-v3c0ext-IEs ::= SEQUENCE {
        -- IE rb-IdentityForHOMessage includes the identity of the RB used by the source SRNC
        -- to send the message contained in the IE "TargetRNC-ToSourceRNC-Container".
        -- Only included if type is "UE involved"
        rb-IdentityForHOMessage             RB-Identity         OPTIONAL
}

SRNC-RelocationInfo-v3d0ext-IEs ::= SEQUENCE {
    -- User equipment IEs
        uESpecificBehaviourInformation1idle     UESpecificBehaviourInformation1idle     OPTIONAL,
        uESpecificBehaviourInformation1interRAT     UESpecificBehaviourInformation1interRAT
    OPTIONAL
}

STARTList2 ::=                      SEQUENCE (SIZE (2..maxCNdomains)) OF
                                        STARTSingle

CipheringInfoPerRB-List-v3a0ext ::= SEQUENCE {
        dl-UM-SN                        BIT STRING (SIZE (7))
}

CipheringStatusList ::=             SEQUENCE (SIZE (1..maxCNdomains)) OF
                                        CipheringStatusCNdomain

CipheringStatusCNdomain ::=         SEQUENCE {
        cn-DomainIdentity               CN-DomainIdentity,
        cipheringStatus                 CipheringStatus
}

-- IE definitions

CalculationTimeForCiphering ::=     SEQUENCE {
    cell-Id                             CellIdentity,
    sfn                                 INTEGER (0..4095)
}
```

```
CipheringInfoPerRB ::=              SEQUENCE {
    dl-HFN                              BIT STRING (SIZE (20..25)),
    ul-HFN                              BIT STRING (SIZE (20..25))
}

-- TABULAR: CipheringInfoPerRB-List, multiplicity value numberOfRadioBearers
-- has been replaced with maxRB.
CipheringInfoPerRB-List ::=         SEQUENCE (SIZE (1..maxRB)) OF
                                        CipheringInfoPerRB

CipheringStatus ::=                 ENUMERATED {
                                        started, notStarted }

CN-DomainInformation-v390ext ::=        SEQUENCE {
    cn-DRX-CycleLengthCoeff             CN-DRX-CycleLengthCoefficient
}

CN-DomainInformationList-v390ext ::=    SEQUENCE (SIZE (1..maxCNdomains)) OF
                                        CN-DomainInformation-v390ext

COUNT-C-List ::=                        SEQUENCE (SIZE (1..maxCNdomains)) OF
                                        COUNT-CSingle

COUNT-CSingle ::=                       SEQUENCE {
    cn-DomainIdentity                   CN-DomainIdentity,
    count-C                             BIT STRING (SIZE (32))
}

ImplementationSpecificParams ::=    BIT STRING (SIZE (1..512))


IntegrityProtectionStatus ::=       ENUMERATED {
                                        started, notStarted }

MeasurementCommandWithType ::=      CHOICE {
    setup                               MeasurementType,
    modify                              NULL,
    release                             NULL
}

OngoingMeasRep ::=                  SEQUENCE {
    measurementIdentity         MeasurementIdentity,
    -- TABULAR: The CHOICE Measurement in the tabular description is included
    -- in MeasurementCommandWithType
    measurementCommandWithType          MeasurementCommandWithType,
    measurementReportingMode            MeasurementReportingMode            OPTIONAL,
    additionalMeasurementID-List        AdditionalMeasurementID-List        OPTIONAL
}

OngoingMeasRepList ::=              SEQUENCE (SIZE (1..maxNoOfMeas)) OF
                                        OngoingMeasRep

SRB-SpecificIntegrityProtInfo ::=   SEQUENCE {
    ul-RRC-HFN                          BIT STRING (SIZE (28)),
    dl-RRC-HFN                          BIT STRING (SIZE (28)),
    ul-RRC-SequenceNumber               RRC-MessageSequenceNumber,
    dl-RRC-SequenceNumber               RRC-MessageSequenceNumber
}

SRB-SpecificIntegrityProtInfoList ::= SEQUENCE (SIZE (4..maxSRBsetup)) OF
                                        SRB-SpecificIntegrityProtInfo

StateOfRRC ::=                      ENUMERATED {
                                        cell-DCH, cell-FACH,
                                        cell-PCH, ura-PCH }

StateOfRRC-Procedure ::=            ENUMERATED {
                                        awaitNoRRC-Message,
                                        awaitRB-ReleaseComplete,
                                        awaitRB-SetupComplete,
                                        awaitRB-ReconfigurationComplete,
                                        awaitTransportCH-ReconfigurationComplete,
                                        awaitPhysicalCH-ReconfigurationComplete,
                                        awaitActiveSetUpdateComplete,
                                        awaitHandoverComplete,
                                        sendCellUpdateConfirm,
                                        sendUraUpdateConfirm,
```

```
                                        -- dummy is not used in this version of specification
                                        -- It should not be sent
                                        dummy,
                                        otherStates
}

UE-Positioning-LastKnownPos ::=     SEQUENCE {
        sfn                             INTEGER (0..4095),
        cell-id                         CellIdentity,
        positionEstimate                PositionEstimate
}

END
```

3GPP TSG-RAN2 Meeting #34
Sophia Antipolis, France, 17th-21st February 2003

Tdoc R2-030435

CR-Form-v7

CHANGE REQUEST

⌘ **25.331** **CR** **1812** ⌘ **rev** **-** ⌘ Current version: **4.8.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	ASN.1 of the SRNS relocation Info
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	17 Feb 2003
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)*
Rel-6 *(Release 6)*

Reason for change:	⌘	The order of occurrence of the IE "Signalling radio bearer specific integrity protection information" in the "SRNS Relocation Info" IE is the same as in the IE "Signalling RB information list". But the range of the IE "RB Id" is from 1 to 32, so integrity protection information corresponding to SRB0 can't be encoded in the IE "SRNS Relocation info".
Summary of change:	⌘	It is specified that in the IE srb-SpecificIntegrityProtInfo, the first information listed corresponds to signalling radio bearer RB0 and after the order of occurrence is the same as the SRBs in the IE "Signalling RB information list".
Consequences if not approved:	⌘	Potential different encoding of the occurrence of the IE "Signalling radio bearer specific integrity protection information" in the "SRNS Relocation Info" IE between a Source RNC and a Target RNC belonging to different vendor leading to integrity failure after SRNS relocation. **This CR only impact the UTRAN** **If the CR is not implemented in the UTRAN:** Potential security failure after a inter-vendor SRNS relocation, in case they had different interpretation of the ASN.1 of the "SRNS Relocation info".

Clauses affected:	⌘	11.5			
		Y	**N**		
Other specs affected:	⌘		**X**	Other core specifications	⌘
			X	Test specifications	

	X	O&M Specifications

Other comments: ⌘

How to create CRs using this form:

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

11.5 RRC information between network nodes

```
-- **************************************************
--
-- SRNC Relocation information
--
-- **************************************************

SRNC-RelocationInfo-r3 ::= CHOICE {
    r3                              SEQUENCE {
        sRNC-RelocationInfo-r3          SRNC-RelocationInfo-r3-IEs,
            v380NonCriticalExtensions           SEQUENCE {
                sRNC-RelocationInfo-v380ext SRNC-RelocationInfo-v380ext-IEs,
                -- Reserved for future non critical extension
                v390NonCriticalExtensions           SEQUENCE {
                    sRNC-RelocationInfo-v390ext         SRNC-RelocationInfo-v390ext-IEs,
                    v3a0NonCriticalExtensions           SEQUENCE {
                        sRNC-RelocationInfo-v3a0ext         SRNC-RelocationInfo-v3a0ext-IEs,
                        v3b0NonCriticalExtensions           SEQUENCE {
                            sRNC-RelocationInfo-v3b0ext         SRNC-RelocationInfo-v3b0ext-IEs,
                            v3c0NonCriticalExtensions           SEQUENCE {
                                sRNC-RelocationInfo-v3c0ext         SRNC-RelocationInfo-v3c0ext-IEs,
                                laterNonCriticalExtensions      SEQUENCE {
                                    sRNC-RelocationInfo-v3d0ext     SRNC-RelocationInfo-v3d0ext-IEs,
                                    -- Container for additional R99 extensions
                                    sRNC-RelocationInfo-r3-add-ext      BIT STRING  OPTIONAL,
                                    v4xyNonCriticalExtensions           SEQUENCE {
                                        sRNC-RelocationInfo-v4xyext         SRNC-RelocationInfo-
v4xyext-IEs,
                                        -- Reserved for future non critical extension
                                        nonCriticalExtensions           SEQUENCE {} OPTIONAL
                                    }       OPTIONAL
                                }       OPTIONAL
                            }       OPTIONAL
                        }       OPTIONAL
                    }       OPTIONAL
                }       OPTIONAL
            }       OPTIONAL
    },
    later-than-r3                   CHOICE {
        r4                              SEQUENCE {
            sRNC-RelocationInfo-r4          SRNC-RelocationInfo-r4-IEs,
            nonCriticalExtensions           SEQUENCE {} OPTIONAL
            },
        criticalExtensions                  SEQUENCE {}
    }
}

SRNC-RelocationInfo-r3-IEs ::=      SEQUENCE {
    -- Non-RRC IEs
        stateOfRRC                      StateOfRRC,
        stateOfRRC-Procedure            StateOfRRC-Procedure,
    -- Ciphering related information IEs
    -- If the extension v380 is included use the extension for the ciphering status per CN domain
        cipheringStatus                 CipheringStatus,
        calculationTimeForCiphering     CalculationTimeForCiphering         OPTIONAL,
        -- The order of occurrence in the IE cipheringInfoPerRB-List is the
        -- same as the RBs in SRB-InformationSetupList ~~the IE "Signalling RB information list"~~ and
in RAB-InformationSetupList~~the~~
        -- ~~IE "RAB information list".~~ The signalling RBs are supposed to be listed
        -- first. Only UM and AM RBs that are ciphered are listed here
        cipheringInfoPerRB-List         CipheringInfoPerRB-List             OPTIONAL,
        count-C-List                    COUNT-C-List                        OPTIONAL,
        integrityProtectionStatus       IntegrityProtectionStatus,
         -- In the IE srb-SpecificIntegrityProtInfo, the first information listed corresponds to
         -- signalling radio bearer RB0 and after the order of occurrence is the same as the SRBs in
         -- SRB-InformationSetupList
        -- The order of occurrence in the IE srb-SpecificIntegrityProtInfo is the
        -- same as the SRBs in the IE "Signalling RB information list"
        srb-SpecificIntegrityProtInfo   SRB-SpecificIntegrityProtInfoList,
        implementationSpecificParams    ImplementationSpecificParams        OPTIONAL,
    -- User equipment IEs
        u-RNTI                          U-RNTI,
        c-RNTI                          C-RNTI                              OPTIONAL,
        ue-RadioAccessCapability        UE-RadioAccessCapability,
        ue-Positioning-LastKnownPos     UE-Positioning-LastKnownPos         OPTIONAL,
```

```
    -- Other IEs
        ue-RATSpecificCapability        InterRAT-UE-RadioAccessCapabilityList   OPTIONAL,
    -- UTRAN mobility IEs
        ura-Identity                    URA-Identity                            OPTIONAL,
    -- Core network IEs
        cn-CommonGSM-MAP-NAS-SysInfo    NAS-SystemInformationGSM-MAP,
        cn-DomainInformationList        CN-DomainInformationList                OPTIONAL,
    -- Measurement IEs
        ongoingMeasRepList              OngoingMeasRepList                      OPTIONAL,
    -- Radio bearer IEs
        predefinedConfigStatusList      PredefinedConfigStatusList,
        srb-InformationList             SRB-InformationSetupList,
        rab-InformationList             RAB-InformationSetupList                OPTIONAL,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo                    OPTIONAL,
        ul-TransChInfoList              UL-AddReconfTransChInfoList             OPTIONAL,
        modeSpecificInfo                CHOICE {
            fdd                             SEQUENCE {
                cpch-SetID                      CPCH-SetID                      OPTIONAL,
                transChDRAC-Info                DRAC-StaticInformationList      OPTIONAL
            },
            tdd                             NULL
        },
        dl-CommonTransChInfo            DL-CommonTransChInfo                    OPTIONAL,
        dl-TransChInfoList              DL-AddReconfTransChInfoList             OPTIONAL,
    -- Measurement report
        measurementReport               MeasurementReport                       OPTIONAL
}

SRNC-RelocationInfo-v380ext-IEs ::= SEQUENCE {
    -- Ciphering related information IEs
        cn-DomainIdentity                   CN-DomainIdentity,
        cipheringStatusList                 CipheringStatusList
}

SRNC-RelocationInfo-v390ext-IEs ::= SEQUENCE {
        cn-DomainInformationList-v390ext    CN-DomainInformationList-v390ext        OPTIONAL,
        ue-RadioAccessCapability-v370ext    UE-RadioAccessCapability-v370ext        OPTIONAL,
        ue-RadioAccessCapability-v380ext    UE-RadioAccessCapability-v380ext        OPTIONAL,
        dl-PhysChCapabilityFDD-v380ext      DL-PhysChCapabilityFDD-v380ext,
        failureCauseWithProtErr             FailureCauseWithProtErr                 OPTIONAL
}

SRNC-RelocationInfo-v3a0ext-IEs ::= SEQUENCE {
        -- cn-domain identity for IE startValueForCiphering-v3a0ext is specified
        -- in subsequent extension (SRNC-RelocationInfo-v3b0ext-IEs)
        startValueForCIphering-v3a0ext      START-Value,
        cipheringInfoForSRB1-v3a0ext        CipheringInfoForSRB1-v3a0ext,
        ue-RadioAccessCapability-v3a0ext    UE-RadioAccessCapability-v3a0ext        OPTIONAL
}

SRNC-RelocationInfo-v3b0ext-IEs ::= SEQUENCE {
        -- cn-domain identity for IE startValueForCiphering-v3a0ext included in previous extension
        cn-DomainIdentity               CN-DomainIdentity,
        -- the remaining start values are contained in IE startValueForCiphering-v3b0ext
        startValueForCiphering-v3b0ext      STARTList2                          OPTIONAL
}

SRNC-RelocationInfo-v3c0ext-IEs ::= SEQUENCE {
        -- IE rb-IdentityForHOMessage includes the identity of the RB used by the source SRNC
        -- to send the message contained in the IE "TargetRNC-ToSourceRNC-Container".
        -- Only included if type is "UE involved"
        rb-IdentityForHOMessage             RB-Identity         OPTIONAL
}
SRNC-RelocationInfo-v3d0ext-IEs ::= SEQUENCE {
    -- User equipment IEs
        uESpecificBehaviourInformation1idle     UESpecificBehaviourInformation1idle     OPTIONAL,
        uESpecificBehaviourInformation1interRAT     UESpecificBehaviourInformation1interRAT
    OPTIONAL
}


STARTList2 ::=                      SEQUENCE (SIZE (2..maxCNdomains)) OF
                                        STARTSingle


SRNC-RelocationInfo-v4xyext-IEs ::= SEQUENCE {
        ue-RadioAccessCapability-v4xyext    UE-RadioAccessCapability-v4xyext
```

```
}

CipheringInfoForSRB1-v3a0ext ::= SEQUENCE {
        dl-UM-SN                            BIT STRING (SIZE (7))
}

CipheringStatusList ::=         SEQUENCE (SIZE (1..maxCNdomains)) OF
                                        CipheringStatusCNdomain

CipheringStatusCNdomain ::=             SEQUENCE {
        cn-DomainIdentity               CN-DomainIdentity,
        cipheringStatus                 CipheringStatus
}

SRNC-RelocationInfo-r4-IEs ::=          SEQUENCE {
    -- Non-RRC IEs
        -- IE rb-IdentityForHOMessage includes the identity of the RB used by the source SRNC
        -- to send the message contained in the IE "TargetRNC-ToSourceRNC-Container".
        -- Only included if type is "UE involved"
        rb-IdentityForHOMessage         RB-Identity                         OPTIONAL,
        stateOfRRC                      StateOfRRC,
        stateOfRRC-Procedure            StateOfRRC-Procedure,
    -- Ciphering related information IEs
        cipheringStatusList             CipheringStatusList-r4,
        latestConfiguredCN-Domain       CN-DomainIdentity,
        calculationTimeForCiphering     CalculationTimeForCiphering         OPTIONAL,
        count-C-List                    COUNT-C-List                        OPTIONAL,
        cipheringInfoPerRB-List         CipheringInfoPerRB-List-r4          OPTIONAL,
    -- Integrity protection related information IEs
        integrityProtectionStatus       IntegrityProtectionStatus,
        srb-SpecificIntegrityProtInfo   SRB-SpecificIntegrityProtInfoList,
        implementationSpecificParams    ImplementationSpecificParams        OPTIONAL,
    -- User equipment IEs
        u-RNTI                          U-RNTI,
        c-RNTI                          C-RNTI                              OPTIONAL,
        ue-RadioAccessCapability        UE-RadioAccessCapability-r4,
        ue-RadioAccessCapability-ext    UE-RadioAccessCapabBandFDDList      OPTIONAL,
        ue-Positioning-LastKnownPos     UE-Positioning-LastKnownPos         OPTIONAL,
        uESpecificBehaviourInformation1idle     UESpecificBehaviourInformation1idle     OPTIONAL,
        uESpecificBehaviourInformation1interRAT     UESpecificBehaviourInformation1interRAT
    OPTIONAL,
    -- Other IEs
        ue-RATSpecificCapability        InterRAT-UE-RadioAccessCapabilityList   OPTIONAL,
    -- UTRAN mobility IEs
        ura-Identity                    URA-Identity                        OPTIONAL,
    -- Core network IEs
        cn-CommonGSM-MAP-NAS-SysInfo    NAS-SystemInformationGSM-MAP,
        cn-DomainInformationList        CN-DomainInformationListFull        OPTIONAL,
    -- Measurement IEs
        ongoingMeasRepList              OngoingMeasRepList-r4               OPTIONAL,
    -- Radio bearer IEs
        predefinedConfigStatusList      PredefinedConfigStatusList,
        srb-InformationList             SRB-InformationSetupList,
        rab-InformationList             RAB-InformationSetupList-r4         OPTIONAL,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo-r4             OPTIONAL,
        ul-TransChInfoList              UL-AddReconfTransChInfoList         OPTIONAL,
        modeSpecificInfo                CHOICE {
            fdd                             SEQUENCE {
                cpch-SetID                      CPCH-SetID                  OPTIONAL,
                transChDRAC-Info                DRAC-StaticInformationList  OPTIONAL
            },
            tdd                             NULL
        }                                                                   OPTIONAL,
        dl-CommonTransChInfo            DL-CommonTransChInfo-r4             OPTIONAL,
        dl-TransChInfoList              DL-AddReconfTransChInfoList-r4      OPTIONAL,
    -- Measurement report
        measurementReport               MeasurementReport                   OPTIONAL,
        failureCause                    FailureCauseWithProtErr             OPTIONAL
}

-- IE definitions

CalculationTimeForCiphering ::=     SEQUENCE {
    cell-Id                             CellIdentity,
    sfn                                 INTEGER (0..4095)
}
```

```
CipheringInfoPerRB ::=              SEQUENCE {
    dl-HFN                              BIT STRING (SIZE (20..25)),
    ul-HFN                              BIT STRING (SIZE (20..25))
}

CipheringInfoPerRB-r4 ::=           SEQUENCE {
    rb-Identity                         RB-Identity,
    dl-HFN                              BIT STRING (SIZE (20..25)),
    dl-UM-SN                            BIT STRING (SIZE (7))               OPTIONAL,
    ul-HFN                              BIT STRING (SIZE (20..25))
}

-- TABULAR: CipheringInfoPerRB-List, multiplicity value numberOfRadioBearers
-- has been replaced with maxRB.
CipheringInfoPerRB-List ::=         SEQUENCE (SIZE (1..maxRB)) OF
                                        CipheringInfoPerRB

CipheringInfoPerRB-List-r4 ::=      SEQUENCE (SIZE (1..maxRB)) OF
                                        CipheringInfoPerRB-r4

CipheringStatus ::=                 ENUMERATED {
                                        started, notStarted }

CipheringStatusList-r4 ::=          SEQUENCE (SIZE (1..maxCNdomains)) OF
                                        CipheringStatusCNdomain-r4

CipheringStatusCNdomain-r4 ::=      SEQUENCE {
        cn-DomainIdentity               CN-DomainIdentity,
        cipheringStatus                 CipheringStatus,
        start-Value                     START-Value
}

CN-DomainInformation-v390ext ::=        SEQUENCE {
    cn-DRX-CycleLengthCoeff             CN-DRX-CycleLengthCoefficient
}

CN-DomainInformationList-v390ext ::=    SEQUENCE (SIZE (1..maxCNdomains)) OF
                                        CN-DomainInformation-v390ext

CompressedModeMeasCapability-r4 ::= SEQUENCE {
    fdd-Measurements                    BOOLEAN,
    -- TABULAR: The IEs tdd-Measurements, gsm-Measurements and multiCarrierMeasurements
    -- are made optional since they are conditional based on another information element.
    -- Their absence corresponds to the case where the condition is not true.
    tdd384-Measurements                 BOOLEAN                             OPTIONAL,
    tdd128-Measurements                 BOOLEAN                             OPTIONAL,
    gsm-Measurements                    GSM-Measurements                    OPTIONAL,
    multiCarrierMeasurements            BOOLEAN                             OPTIONAL
}

COUNT-C-List ::=                        SEQUENCE (SIZE (1..maxCNdomains)) OF
                                        COUNT-CSingle

COUNT-CSingle ::=                       SEQUENCE {
    cn-DomainIdentity                   CN-DomainIdentity,
    count-C                             BIT STRING (SIZE (32))
}

DL-PhysChCapabilityFDD-r4 ::=       SEQUENCE {
    maxNoDPCH-PDSCH-Codes               INTEGER (1..8),
    maxNoPhysChBitsReceived             MaxNoPhysChBitsReceived,
    supportForSF-512                    BOOLEAN,
    supportOfPDSCH                      BOOLEAN,
    simultaneousSCCPCH-DPCH-Reception   SimultaneousSCCPCH-DPCH-Reception,
    supportOfDedicatedPilotsForChEstimation     SupportOfDedicatedPilotsForChEstimation     OPTIONAL
}

ImplementationSpecificParams ::=    BIT STRING (SIZE (1..512))


IntegrityProtectionStatus ::=       ENUMERATED {
                                        started, notStarted }

MeasurementCapability-r4 ::=        SEQUENCE {
    downlinkCompressedMode              CompressedModeMeasCapability-r4,
    uplinkCompressedMode                CompressedModeMeasCapability-r4
}
```

```
MeasurementCommandWithType ::=      CHOICE {
    setup                               MeasurementType,
    modify                              NULL,
    release                             NULL
}

MeasurementCommandWithType-r4 ::=   CHOICE {
    setup                               MeasurementType-r4,
    modify                              NULL,
    release                             NULL
}

OngoingMeasRep ::=                  SEQUENCE {
    measurementIdentity         MeasurementIdentity,
    -- TABULAR: The CHOICE Measurement in the tabular description is included
    -- in MeasurementCommandWithType
    measurementCommandWithType          MeasurementCommandWithType,
    measurementReportingMode            MeasurementReportingMode            OPTIONAL,
    additionalMeasurementID-List        AdditionalMeasurementID-List        OPTIONAL
}

OngoingMeasRep-r4 ::=               SEQUENCE {
    measurementIdentity         MeasurementIdentity,
    -- TABULAR: The CHOICE Measurement in the tabular description is included
    -- in MeasurementCommandWithType-r4.
    measurementCommandWithType          MeasurementCommandWithType-r4,
    measurementReportingMode            MeasurementReportingMode            OPTIONAL,
    additionalMeasurementID-List        AdditionalMeasurementID-List        OPTIONAL
}

OngoingMeasRepList ::=              SEQUENCE (SIZE (1..maxNoOfMeas)) OF
                                        OngoingMeasRep

OngoingMeasRepList-r4 ::=           SEQUENCE (SIZE (1..maxNoOfMeas)) OF
                                        OngoingMeasRep-r4

PDCP-Capability-r4 ::=              SEQUENCE {
    losslessSRNS-RelocationSupport      BOOLEAN,
    supportForRfc2507                   CHOICE {
        notSupported                        NULL,
        supported                           MaxHcContextSpace
    },
    supportForRfc3095                   CHOICE {
        notSupported                        NULL,
        supported                           SEQUENCE {
            maxROHC-ContextSessions             MaxROHC-ContextSessions-r4  DEFAULT s16,
            reverseCompressionDepth             INTEGER (0..65535)          DEFAULT 0
        }
    }
}

PhysicalChannelCapability-r4 ::=        SEQUENCE {
        fddPhysChCapability                 SEQUENCE {
            downlinkPhysChCapability            DL-PhysChCapabilityFDD-r4,
            uplinkPhysChCapability              UL-PhysChCapabilityFDD
        }                                           OPTIONAL,
        tdd384-PhysChCapability             SEQUENCE {
            downlinkPhysChCapability            DL-PhysChCapabilityTDD,
            uplinkPhysChCapability              UL-PhysChCapabilityTDD
        }                                           OPTIONAL,
        tdd128-PhysChCapability             SEQUENCE {
            downlinkPhysChCapability            DL-PhysChCapabilityTDD-LCR-r4,
            uplinkPhysChCapability              UL-PhysChCapabilityTDD-LCR-r4
        }                                           OPTIONAL
}

RF-Capability-r4 ::=                SEQUENCE {
        fddRF-Capability                    SEQUENCE {
            ue-PowerClass                       UE-PowerClass-v370,
            txRxFrequencySeparation             TxRxFrequencySeparation
        }                                                           OPTIONAL,
        tdd384-RF-Capability                SEQUENCE {
            ue-PowerClass                       UE-PowerClass-v370,
            radioFrequencyBandTDDList           RadioFrequencyBandTDDList,
            chipRateCapability                  ChipRateCapability
        }                                                           OPTIONAL,
        tdd128-RF-Capability                SEQUENCE {
            ue-PowerClass                       UE-PowerClass-v370,
```

```
            radioFrequencyBandTDDList       RadioFrequencyBandTDDList,
            chipRateCapability              ChipRateCapability
        }                                                               OPTIONAL
}

SRB-SpecificIntegrityProtInfo ::=   SEQUENCE {
    ul-RRC-HFN                          BIT STRING (SIZE (28)),
    dl-RRC-HFN                          BIT STRING (SIZE (28)),
    ul-RRC-SequenceNumber               RRC-MessageSequenceNumber,
    dl-RRC-SequenceNumber               RRC-MessageSequenceNumber
}

SRB-SpecificIntegrityProtInfoList ::= SEQUENCE (SIZE (4..maxSRBsetup)) OF
                                        SRB-SpecificIntegrityProtInfo

StateOfRRC ::=                      ENUMERATED {
                                        cell-DCH, cell-FACH,
                                        cell-PCH, ura-PCH }

StateOfRRC-Procedure ::=            ENUMERATED {
                                        awaitNoRRC-Message,
                                        awaitRB-ReleaseComplete,
                                        awaitRB-SetupComplete,
                                        awaitRB-ReconfigurationComplete,
                                        awaitTransportCH-ReconfigurationComplete,
                                        awaitPhysicalCH-ReconfigurationComplete,
                                        awaitActiveSetUpdateComplete,
                                        awaitHandoverComplete,
                                        sendCellUpdateConfirm,
                                        sendUraUpdateConfirm,
                                        -- dummy is not used in this version of specification
                                        -- It should not be sent
                                        dummy,
                                        otherStates
}

UE-Positioning-LastKnownPos ::=     SEQUENCE {
        sfn                             INTEGER (0..4095),
        cell-id                         CellIdentity,
        positionEstimate                PositionEstimate
}

UE-Positioning-Capability-r4 ::=    SEQUENCE {
    standaloneLocMethodsSupported           BOOLEAN,
    ue-BasedOTDOA-Supported                 BOOLEAN,
    networkAssistedGPS-Supported            NetworkAssistedGPS-Supported,
    supportForUE-GPS-TimingOfCellFrames     BOOLEAN,
    supportForIPDL                          BOOLEAN,
    rx-tx-TimeDifferenceType2Capable        BOOLEAN,
    validity-CellPCH-UraPCH                 ENUMERATED { true (0 ) }    OPTIONAL
}

UE-RadioAccessCapability-r4 ::=     SEQUENCE {
    accessStratumReleaseIndicator       AccessStratumReleaseIndicator,
    pdcp-Capability                     PDCP-Capability-r4,
    rlc-Capability                      RLC-Capability,
    transportChannelCapability          TransportChannelCapability,
    rf-Capability                       RF-Capability-r4,
    physicalChannelCapability           PhysicalChannelCapability-r4,
    ue-MultiModeRAT-Capability          UE-MultiModeRAT-Capability,
    securityCapability                  SecurityCapability,
    ue-positioning-Capability           UE-Positioning-Capability-r4,
    measurementCapability               MeasurementCapability-r4        OPTIONAL
}

END
```

3GPP TSG-RAN2 Meeting #34
Sophia Antipolis, France, 17th-21st February 2003

Tdoc R2-030436

CR-Form-v7

CHANGE REQUEST

⌘ **25.331** **CR** **1813** ⌘ **rev** **-** ⌘ Current version: **5.3.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	ASN.1 of the SRNS relocation Info
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	17 Feb 2003
Category:	⌘	**A**
Release:	⌘	Rel-5

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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The order of occurrence of the IE “Signalling radio bearer specific integrity protection information” in the “SRNS Relocation Info” IE is the same as in the IE “Signalling RB information list”. But the range of the IE “RB Id” is from 1 to 32, so integrity protection information corresponding to SRB0 can’t be encoded in the IE “SRNS Relocation info”.
Summary of change:	⌘	It is specified that in the IE srb-SpecificIntegrityProtInfo, the first information listed corresponds to signalling radio bearer RB0 and after the order of occurrence is the same as the SRBs in the IE "Signalling RB information list".
Consequences if not approved:	⌘	Potential different encoding of the occurrence of the IE “Signalling radio bearer specific integrity protection information” in the “SRNS Relocation Info” IE between a Source RNC and a Target RNC belonging to different vendor leading to integrity failure after SRNS relocation. **This CR only impact the UTRAN** **If the CR is not implemented in the UTRAN:** Potential security failure after a inter-vendor SRNS relocation, in case they had different interpretation of the ASN.1 of the "SRNS Relocation info".

Clauses affected:	⌘	11.5			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	

	X	O&M Specifications

Other comments: ⌘

How to create CRs using this form:

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

11.5 RRC information between network nodes

```
-- **************************************************
--
-- SRNC Relocation information
--
-- **************************************************
-- **************************************************
--
-- SRNC Relocation information
--
-- **************************************************

SRNC-RelocationInfo-r3 ::= CHOICE {
    r3                              SEQUENCE {
        sRNC-RelocationInfo-r3          SRNC-RelocationInfo-r3-IEs,
            v380NonCriticalExtensions           SEQUENCE {
                sRNC-RelocationInfo-v380ext SRNC-RelocationInfo-v380ext-IEs,
                -- Reserved for future non critical extension
                v390NonCriticalExtensions           SEQUENCE {
                    sRNC-RelocationInfo-v390ext         SRNC-RelocationInfo-v390ext-IEs,
                    v3a0NonCriticalExtensions           SEQUENCE {
                        sRNC-RelocationInfo-v3a0ext         SRNC-RelocationInfo-v3a0ext-IEs,
                        v3b0NonCriticalExtensions           SEQUENCE {
                            sRNC-RelocationInfo-v3b0ext         SRNC-RelocationInfo-v3b0ext-IEs,
                            v3c0NonCriticalExtensions           SEQUENCE {
                                sRNC-RelocationInfo-v3c0ext         SRNC-RelocationInfo-v3c0ext-IEs,
                                laterNonCriticalExtensions          SEQUENCE {
                                    sRNC-RelocationInfo-v3d0ext         SRNC-RelocationInfo-v3d0ext-
IEs,
                                    -- Container for additional R99 extensions
                                    sRNC-RelocationInfo-r3-add-ext      BIT STRING      OPTIONAL,
                                    v4xyNonCriticalExtensions           SEQUENCE {
                                        sRNC-RelocationInfo-v4xyext         SRNC-RelocationInfo-
v4xyext-IEs,
                                        -- Reserved for future non critical extension
                                        nonCriticalExtensions           SEQUENCE {} OPTIONAL
                                    }       OPTIONAL
                                }       OPTIONAL
                            }       OPTIONAL
                        }       OPTIONAL
                    }       OPTIONAL
                }       OPTIONAL
            }       OPTIONAL
    },
    later-than-r3                   CHOICE {
        r4                              SEQUENCE {
            sRNC-RelocationInfo-r4          SRNC-RelocationInfo-r4-IEs,
            nonCriticalExtensions           SEQUENCE {} OPTIONAL
            },
        criticalExtensions                  SEQUENCE {}
    }
}

SRNC-RelocationInfo-r3-IEs ::=      SEQUENCE {
    -- Non-RRC IEs
        stateOfRRC                      StateOfRRC,
        stateOfRRC-Procedure            StateOfRRC-Procedure,
    -- Ciphering related information IEs
    -- If the extension v380 is included use the extension for the ciphering status per CN domain
        cipheringStatus                 CipheringStatus,
        calculationTimeForCiphering     CalculationTimeForCiphering         OPTIONAL,
        -- The order of occurrence in the IE cipheringInfoPerRB-List is the
        -- same as the RBs in SRB-InformationSetupList ~~the IE "Signalling RB information list"~~ and
in RAB-InformationSetupList~~the~~
        -- ~~IE "RAB information list"~~. The signalling RBs are supposed to be listed
        -- first. Only UM and AM RBs that are ciphered are listed here
        cipheringInfoPerRB-List         CipheringInfoPerRB-List             OPTIONAL,
        count-C-List                    COUNT-C-List                        OPTIONAL,
        integrityProtectionStatus       IntegrityProtectionStatus,
      -- In the IE srb-SpecificIntegrityProtInfo, the first information listed corresponds to
      -- signalling radio bearer RB0 and after the order of occurrence is the same as the SRBs in
      -- SRB-InformationSetupList
    ~~-- The order of occurrence in the IE srb-SpecificIntegrityProtInfo is the~~
    ~~-- same as the SRBs in the IE "Signalling RB information list"~~
        srb-SpecificIntegrityProtInfo   SRB-SpecificIntegrityProtInfoList,
```

```
        implementationSpecificParams    ImplementationSpecificParams        OPTIONAL,
    -- User equipment IEs
        u-RNTI                          U-RNTI,
        c-RNTI                          C-RNTI                              OPTIONAL,
        ue-RadioAccessCapability        UE-RadioAccessCapability,
        ue-Positioning-LastKnownPos     UE-Positioning-LastKnownPos         OPTIONAL,
    -- Other IEs
        ue-RATSpecificCapability        InterRAT-UE-RadioAccessCapabilityList   OPTIONAL,
    -- UTRAN mobility IEs
        ura-Identity                    URA-Identity                        OPTIONAL,
    -- Core network IEs
        cn-CommonGSM-MAP-NAS-SysInfo    NAS-SystemInformationGSM-MAP,
        cn-DomainInformationList        CN-DomainInformationList            OPTIONAL,
    -- Measurement IEs
        ongoingMeasRepList              OngoingMeasRepList                  OPTIONAL,
    -- Radio bearer IEs
        predefinedConfigStatusList      PredefinedConfigStatusList,
        srb-InformationList             SRB-InformationSetupList,
        rab-InformationList             RAB-InformationSetupList            OPTIONAL,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo                OPTIONAL,
        ul-TransChInfoList              UL-AddReconfTransChInfoList         OPTIONAL,
        modeSpecificInfo                CHOICE {
            fdd                             SEQUENCE {
                cpch-SetID                      CPCH-SetID                  OPTIONAL,
                transChDRAC-Info                DRAC-StaticInformationList  OPTIONAL
            },
            tdd                             NULL
        },
        dl-CommonTransChInfo            DL-CommonTransChInfo                OPTIONAL,
        dl-TransChInfoList              DL-AddReconfTransChInfoList         OPTIONAL,
    -- Measurement report
        measurementReport               MeasurementReport                   OPTIONAL
}

SRNC-RelocationInfo-v380ext-IEs ::= SEQUENCE {
    -- Ciphering related information IEs
        cn-DomainIdentity                   CN-DomainIdentity,
        cipheringStatusList                 CipheringStatusList
}

SRNC-RelocationInfo-v390ext-IEs ::= SEQUENCE {
        cn-DomainInformationList-v390ext    CN-DomainInformationList-v390ext        OPTIONAL,
        ue-RadioAccessCapability-v370ext    UE-RadioAccessCapability-v370ext        OPTIONAL,
        ue-RadioAccessCapability-v380ext    UE-RadioAccessCapability-v380ext        OPTIONAL,
        dl-PhysChCapabilityFDD-v380ext      DL-PhysChCapabilityFDD-v380ext,
        failureCauseWithProtErr             FailureCauseWithProtErr                 OPTIONAL
}

SRNC-RelocationInfo-v3a0ext-IEs ::= SEQUENCE {
        -- cn-domain identity for IE startValueForCiphering-v3a0ext is specified
        -- in subsequent extension (SRNC-RelocationInfo-v3b0ext-IEs)
        startValueForCIphering-v3a0ext      START-Value,
        cipheringInfoForSRB1-v3a0ext        CipheringInfoForSRB1-v3a0ext,
        ue-RadioAccessCapability-v3a0ext    UE-RadioAccessCapability-v3a0ext        OPTIONAL
}

SRNC-RelocationInfo-v3b0ext-IEs ::= SEQUENCE {
        -- cn-domain identity for IE startValueForCiphering-v3a0ext included in previous extension
        cn-DomainIdentity               CN-DomainIdentity,
        -- the IE startValueForCiphering-v3b0ext contains the start values for each CN Domain. The
        -- value of start indicated by the IE startValueForCiphering-v3a0ext should be set to the
        -- same value as the start-Value for the corresponding cn-DomainIdentity in the IE
        -- startValueForCiphering-v3b0ext
        startValueForCiphering-v3b0ext      STARTList2                          OPTIONAL
}

SRNC-RelocationInfo-v3c0ext-IEs ::= SEQUENCE {
        -- IE rb-IdentityForHOMessage includes the identity of the RB used by the source SRNC
        -- to send the message contained in the IE “TargetRNC-ToSourceRNC-Container”.
        -- Only included if type is “UE involved”
        rb-IdentityForHOMessage             RB-Identity         OPTIONAL
}

SRNC-RelocationInfo-v3d0ext-IEs ::= SEQUENCE {
    -- User equipment IEs
        uESpecificBehaviourInformation1idle     UESpecificBehaviourInformation1idle     OPTIONAL,
```

```
        uESpecificBehaviourInformation1interRAT     UESpecificBehaviourInformation1interRAT
    OPTIONAL
}

STARTList2 ::=                      SEQUENCE (SIZE (2..maxCNdomains)) OF
                                        STARTSingle

SRNC-RelocationInfo-v4xyext-IEs ::= SEQUENCE {
        ue-RadioAccessCapability-v4xyext    UE-RadioAccessCapability-v4xyext
}

CipheringInfoForSRB1-v3a0ext ::= SEQUENCE {
        dl-UM-SN                            BIT STRING (SIZE (7))
}

CipheringStatusList ::=         SEQUENCE (SIZE (1..maxCNdomains)) OF
                                        CipheringStatusCNdomain

CipheringStatusCNdomain ::=             SEQUENCE {
        cn-DomainIdentity               CN-DomainIdentity,
        cipheringStatus                 CipheringStatus
}

SRNC-RelocationInfo-r4-IEs ::=          SEQUENCE {
    -- Non-RRC IEs
        -- IE rb-IdentityForHOMessage includes the identity of the RB used by the source SRNC
        -- to send the message contained in the IE “TargetRNC-ToSourceRNC-Container”.
        -- Only included if type is “UE involved”
        rb-IdentityForHOMessage         RB-Identity                         OPTIONAL,
        stateOfRRC                      StateOfRRC,
        stateOfRRC-Procedure            StateOfRRC-Procedure,
    -- Ciphering related information IEs
        cipheringStatusList             CipheringStatusList-r4,
        latestConfiguredCN-Domain       CN-DomainIdentity,
        calculationTimeForCiphering     CalculationTimeForCiphering         OPTIONAL,
        count-C-List                    COUNT-C-List                        OPTIONAL,
        cipheringInfoPerRB-List         CipheringInfoPerRB-List-r4          OPTIONAL,
    -- Integrity protection related information IEs
        integrityProtectionStatus       IntegrityProtectionStatus,
        srb-SpecificIntegrityProtInfo   SRB-SpecificIntegrityProtInfoList,
        implementationSpecificParams    ImplementationSpecificParams        OPTIONAL,
    -- User equipment IEs
        u-RNTI                          U-RNTI,
        c-RNTI                          C-RNTI                              OPTIONAL,
        ue-RadioAccessCapability        UE-RadioAccessCapability-r4,
        ue-RadioAccessCapability-ext    UE-RadioAccessCapabBandFDDList      OPTIONAL,
        ue-Positioning-LastKnownPos     UE-Positioning-LastKnownPos         OPTIONAL,
        uESpecificBehaviourInformation1idle     UESpecificBehaviourInformation1idle     OPTIONAL,
        uESpecificBehaviourInformation1interRAT     UESpecificBehaviourInformation1interRAT
    OPTIONAL,
    -- Other IEs
        ue-RATSpecificCapability        InterRAT-UE-RadioAccessCapabilityList   OPTIONAL,
    -- UTRAN mobility IEs
        ura-Identity                    URA-Identity                        OPTIONAL,
    -- Core network IEs
        cn-CommonGSM-MAP-NAS-SysInfo    NAS-SystemInformationGSM-MAP,
        cn-DomainInformationList        CN-DomainInformationListFull        OPTIONAL,
    -- Measurement IEs
        ongoingMeasRepList              OngoingMeasRepList-r4               OPTIONAL,
    -- Radio bearer IEs
        predefinedConfigStatusList      PredefinedConfigStatusList,
        srb-InformationList             SRB-InformationSetupList,
        rab-InformationList             RAB-InformationSetupList-r4         OPTIONAL,
    -- Transport channel IEs
        ul-CommonTransChInfo            UL-CommonTransChInfo-r4             OPTIONAL,
        ul-TransChInfoList              UL-AddReconfTransChInfoList         OPTIONAL,
        modeSpecificInfo                CHOICE {
            fdd                             SEQUENCE {
                cpch-SetID                      CPCH-SetID                  OPTIONAL,
                transChDRAC-Info                DRAC-StaticInformationList  OPTIONAL
            },
            tdd                             NULL
        }                                                                   OPTIONAL,
        dl-CommonTransChInfo            DL-CommonTransChInfo-r4             OPTIONAL,
        dl-TransChInfoList              DL-AddReconfTransChInfoList-r4      OPTIONAL,
    -- Measurement report
        measurementReport               MeasurementReport                   OPTIONAL,
        failureCause                    FailureCauseWithProtErr             OPTIONAL
```

```
}

-- IE definitions

CalculationTimeForCiphering ::=     SEQUENCE {
    cell-Id                             CellIdentity,
    sfn                                 INTEGER (0..4095)
}

CipheringInfoPerRB ::=              SEQUENCE {
    dl-HFN                              BIT STRING (SIZE (20..25)),
    ul-HFN                              BIT STRING (SIZE (20..25))
}

CipheringInfoPerRB-r4 ::=           SEQUENCE {
    rb-Identity                         RB-Identity,
    dl-HFN                              BIT STRING (SIZE (20..25)),
    dl-UM-SN                            BIT STRING (SIZE (7))               OPTIONAL,
    ul-HFN                              BIT STRING (SIZE (20..25))
}

-- TABULAR: CipheringInfoPerRB-List, multiplicity value numberOfRadioBearers
-- has been replaced with maxRB.
CipheringInfoPerRB-List ::=         SEQUENCE (SIZE (1..maxRB)) OF
                                        CipheringInfoPerRB

CipheringInfoPerRB-List-r4 ::=      SEQUENCE (SIZE (1..maxRB)) OF
                                        CipheringInfoPerRB-r4


CipheringStatus ::=                 ENUMERATED {
                                        started, notStarted }

CipheringStatusList-r4 ::=          SEQUENCE (SIZE (1..maxCNdomains)) OF
                                        CipheringStatusCNdomain-r4

CipheringStatusCNdomain-r4 ::=      SEQUENCE {
        cn-DomainIdentity               CN-DomainIdentity,
        cipheringStatus                 CipheringStatus,
        start-Value                     START-Value
}

CN-DomainInformation-v390ext ::=        SEQUENCE {
    cn-DRX-CycleLengthCoeff             CN-DRX-CycleLengthCoefficient
}

CN-DomainInformationList-v390ext ::=    SEQUENCE (SIZE (1..maxCNdomains)) OF
                                        CN-DomainInformation-v390ext

CompressedModeMeasCapability-r4 ::= SEQUENCE {
    fdd-Measurements                    BOOLEAN,
    -- TABULAR: The IEs tdd-Measurements, gsm-Measurements and multiCarrierMeasurements
    -- are made optional since they are conditional based on another information element.
    -- Their absence corresponds to the case where the condition is not true.
    tdd384-Measurements                 BOOLEAN                             OPTIONAL,
    tdd128-Measurements                 BOOLEAN                             OPTIONAL,
    gsm-Measurements                    GSM-Measurements                    OPTIONAL,
    multiCarrierMeasurements            BOOLEAN                             OPTIONAL
}

COUNT-C-List ::=                        SEQUENCE (SIZE (1..maxCNdomains)) OF
                                        COUNT-CSingle

COUNT-CSingle ::=                       SEQUENCE {
    cn-DomainIdentity                   CN-DomainIdentity,
    count-C                             BIT STRING (SIZE (32))
}

DL-PhysChCapabilityFDD-r4 ::=       SEQUENCE {
    maxNoDPCH-PDSCH-Codes               INTEGER (1..8),
    maxNoPhysChBitsReceived             MaxNoPhysChBitsReceived,
    supportForSF-512                    BOOLEAN,
    supportOfPDSCH                      BOOLEAN,
    simultaneousSCCPCH-DPCH-Reception   SimultaneousSCCPCH-DPCH-Reception,
    supportOfDedicatedPilotsForChEstimation     SupportOfDedicatedPilotsForChEstimation     OPTIONAL
}

DL-RFC3095-Context ::=              SEQUENCE {
```

```
    rfc3095-Context-Identity            INTEGER (0..16383),
    dl-mode                             ENUMERATED {u, o, r},
    dl-ref-ir                           OCTET STRING ( SIZE (1..3000)),
    dl-ref-time                         INTEGER (0..4294967295)     OPTIONAL,
    dl-curr-time                        INTEGER (0..4294967295)     OPTIONAL,
    dl-syn-offset-id                    INTEGER (0..65535)          OPTIONAL,
    dl-syn-slope-ts                     INTEGER (0..4294967295)     OPTIONAL,
    dl-dyn-changed                      BOOLEAN
}

ImplementationSpecificParams ::=    BIT STRING (SIZE (1..512))


IntegrityProtectionStatus ::=       ENUMERATED {
                                        started, notStarted }

MeasurementCapability-r4 ::=        SEQUENCE {
    downlinkCompressedMode              CompressedModeMeasCapability-r4,
    uplinkCompressedMode                CompressedModeMeasCapability-r4
}

MeasurementCommandWithType ::=      CHOICE {
    setup                               MeasurementType,
    modify                              NULL,
    release                             NULL
}

MeasurementCommandWithType-r4 ::=   CHOICE {
    setup                               MeasurementType-r4,
    modify                              NULL,
    release                             NULL
}

OngoingMeasRep ::=                  SEQUENCE {
    measurementIdentity         MeasurementIdentity,
    -- TABULAR: The CHOICE Measurement in the tabular description is included
    -- in MeasurementCommandWithType
    measurementCommandWithType          MeasurementCommandWithType,
    measurementReportingMode            MeasurementReportingMode            OPTIONAL,
    additionalMeasurementID-List        AdditionalMeasurementID-List        OPTIONAL
}

OngoingMeasRep-r4 ::=               SEQUENCE {
    measurementIdentity         MeasurementIdentity,
    -- TABULAR: The CHOICE Measurement in the tabular description is included
    -- in MeasurementCommandWithType-r4.
    measurementCommandWithType          MeasurementCommandWithType-r4,
    measurementReportingMode            MeasurementReportingMode            OPTIONAL,
    additionalMeasurementID-List        AdditionalMeasurementID-List        OPTIONAL
}

OngoingMeasRepList ::=              SEQUENCE (SIZE (1..maxNoOfMeas)) OF
                                        OngoingMeasRep

OngoingMeasRepList-r4 ::=           SEQUENCE (SIZE (1..maxNoOfMeas)) OF
                                        OngoingMeasRep-r4

PDCP-Capability-r4 ::=              SEQUENCE {
    losslessSRNS-RelocationSupport      BOOLEAN,
    supportForRfc2507                   CHOICE {
        notSupported                        NULL,
        supported                           MaxHcContextSpace
    },
    supportForRfc3095                   CHOICE {
        notSupported                        NULL,
        supported                           SEQUENCE {
            maxROHC-ContextSessions             MaxROHC-ContextSessions-r4  DEFAULT s16,
            reverseCompressionDepth             INTEGER (0..65535)          DEFAULT 0
        }
    }
}

PhysicalChannelCapability-r4 ::=    SEQUENCE {
        fddPhysChCapability             SEQUENCE {
            downlinkPhysChCapability        DL-PhysChCapabilityFDD-r4,
            uplinkPhysChCapability          UL-PhysChCapabilityFDD
        }                                       OPTIONAL,
        tdd384-PhysChCapability         SEQUENCE {
```

```
            downlinkPhysChCapability            DL-PhysChCapabilityTDD,
            uplinkPhysChCapability              UL-PhysChCapabilityTDD
        }                                           OPTIONAL,
        tdd128-PhysChCapability             SEQUENCE {
            downlinkPhysChCapability            DL-PhysChCapabilityTDD-LCR-r4,
            uplinkPhysChCapability              UL-PhysChCapabilityTDD-LCR-r4
        }                                           OPTIONAL
}

RF-Capability-r4 ::=                SEQUENCE {
        fddRF-Capability                SEQUENCE {
            ue-PowerClass                   UE-PowerClass-v370,
            txRxFrequencySeparation         TxRxFrequencySeparation
        }                                                           OPTIONAL,
        tdd384-RF-Capability            SEQUENCE {
            ue-PowerClass                   UE-PowerClass-v370,
            radioFrequencyBandTDDList       RadioFrequencyBandTDDList,
            chipRateCapability              ChipRateCapability
        }                                                           OPTIONAL,
        tdd128-RF-Capability            SEQUENCE {
            ue-PowerClass                   UE-PowerClass-v370,
            radioFrequencyBandTDDList       RadioFrequencyBandTDDList,
            chipRateCapability              ChipRateCapability
        }                                                           OPTIONAL
}

RFC3095-ContextInfo ::=             SEQUENCE {
    rb-Identity                         RB-Identity,
    rfc3095-Context-List                RFC3095-Context-List
}

RFC3095-Context-List ::=            SEQUENCE (SIZE (1..maxRFC3095-CID)) OF SEQUENCE {
    dl-RFC3095-Context                  DL-RFC3095-Context      OPTIONAL,
    ul-RFC3095-Context                  UL-RFC3095-Context      OPTIONAL
 }

SRB-SpecificIntegrityProtInfo ::=   SEQUENCE {
    ul-RRC-HFN                          BIT STRING (SIZE (28)),
    dl-RRC-HFN                          BIT STRING (SIZE (28)),
    ul-RRC-SequenceNumber               RRC-MessageSequenceNumber,
    dl-RRC-SequenceNumber               RRC-MessageSequenceNumber
}

SRB-SpecificIntegrityProtInfoList ::= SEQUENCE (SIZE (4..maxSRBsetup)) OF
                                        SRB-SpecificIntegrityProtInfo

StateOfRRC ::=                      ENUMERATED {
                                        cell-DCH, cell-FACH,
                                        cell-PCH, ura-PCH }

StateOfRRC-Procedure ::=            ENUMERATED {
                                        awaitNoRRC-Message,
                                        awaitRB-ReleaseComplete,
                                        awaitRB-SetupComplete,
                                        awaitRB-ReconfigurationComplete,
                                        awaitTransportCH-ReconfigurationComplete,
                                        awaitPhysicalCH-ReconfigurationComplete,
                                        awaitActiveSetUpdateComplete,
                                        awaitHandoverComplete,
                                        sendCellUpdateConfirm,
                                        sendUraUpdateConfirm,
                                        -- dummy is not used in this version of specification
                                        -- It should not be sent
                                        dummy,
                                        otherStates
}

UE-Positioning-Capability-r4 ::=    SEQUENCE {
    standaloneLocMethodsSupported           BOOLEAN,
    ue-BasedOTDOA-Supported                 BOOLEAN,
    networkAssistedGPS-Supported            NetworkAssistedGPS-Supported,
    supportForUE-GPS-TimingOfCellFrames     BOOLEAN,
    supportForIPDL                          BOOLEAN,
    rx-tx-TimeDifferenceType2Capable        BOOLEAN,
    validity-CellPCH-UraPCH                 ENUMERATED { true (0 ) }    OPTIONAL
}

UE-Positioning-LastKnownPos ::=     SEQUENCE {
```

```
        sfn                             INTEGER (0..4095),
        cell-id                         CellIdentity,
        positionEstimate                PositionEstimate
}

UE-RadioAccessCapability-r4 ::=     SEQUENCE {
    accessStratumReleaseIndicator       AccessStratumReleaseIndicator,
    pdcp-Capability                     PDCP-Capability-r4,
    rlc-Capability                      RLC-Capability,
    transportChannelCapability          TransportChannelCapability,
    rf-Capability                       RF-Capability-r4,
    physicalChannelCapability           PhysicalChannelCapability-r4,
    ue-MultiModeRAT-Capability          UE-MultiModeRAT-Capability,
    securityCapability                  SecurityCapability,
    ue-positioning-Capability           UE-Positioning-Capability-r4,
    measurementCapability               MeasurementCapability-r4        OPTIONAL
}

UL-RFC3095-Context ::=              SEQUENCE {
    rfc3095-Context-Identity            INTEGER (0..16383),
    ul-mode                             ENUMERATED {u, o, r},
    ul-ref-ir                           OCTET STRING ( SIZE (1..3000)),
    ul-ref-time                         INTEGER (0..4294967295)     OPTIONAL,
    ul-curr-time                        INTEGER (0..4294967295)     OPTIONAL,
    ul-syn-offset-id                    INTEGER (0..65535)          OPTIONAL,
    ul-syn-slope-ts                     INTEGER (0..4294967295)     OPTIONAL,
    ul-ref-sn-1                         INTEGER (0..65535)          OPTIONAL

}

END
```

3GPP TSG RAN2 Meeting #34 ***Tdoc ⌘R2-030437***
Sophia, France, 17-21 February 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.331** **CR** **1814** ⌘ **rev** **-** ⌘ Current version: **3.13.0** ⌘

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

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [ ]

Title:	⌘	Correction to procedural text for Physical Shared Channel Allocation (TDD only)
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	17/02/2003
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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The procedural text describing the actions of the UE following the receipt of a Physical Shared Channel Allocation message (TDD only) has some errors in the nesting of the text. It is beneficial to state that the SIR target signalled is to be applied to the uplink CCTrCH that is allocated resource.
Summary of change:	⌘	Numbering and indentation of actions are corrected. Text is added with respect to the SIR target.
Consequences if not approved:	⌘	The UE may not undertake the correct action sequence on decoding a Physical Shared Channel Allocation message. For example, the UE may not act on the PUSCH info unless a PDSCH allocation is included. This impacts TDD only. **Isolated impact analysis:** this CR corrects errors in the procedural text for resource allocation of shared channels in TDD (only). Without this change certain UE implementations may incorrectly interpret a Physical Shared Channel Allocation message.

Clauses affected:	⌘	8.2.7.3			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

8.2.7 Physical Shared Channel Allocation [TDD only]

Figure 8.2.7-1: Physical Shared Channel Allocation

8.2.7.1 General

The purpose of this procedure is to allocate radio resources to USCH and/or DSCH transport channels in TDD mode, for use by a UE. This procedure can also be used to indicate to the UE, that a PUSCH allocation is pending, in order to prevent further capacity requests from the UE.

UEs are not required to receive FACH and DSCH simultaneously, i.e. if resources are allocated to DSCH the FACH reception may be suspended.

8.2.7.2 Initiation

To initiate the Physical Shared Channel Allocation procedure, the UTRAN sends the "PHYSICAL SHARED CHANNEL ALLOCATION" message on the downlink SHCCH or on the downlink DCCH using UM RLC. The DSCH-RNTI shall be included for UE identification, if the message is sent on the SHCCH.

8.2.7.3 Reception of a PHYSICAL SHARED CHANNEL ALLOCATION message by the UE

Upon reception of a "PHYSICAL SHARED CHANNEL ALLOCATION" message, if the message is received on the downlink SHCCH the UE shall:

1> check the DSCH-RNTI to see if the UE is addressed by the message;

1> if the UE is addressed by the message, or if the message is received on the downlink DCCH:

2> perform the following actions.

1> otherwise:

2> ignore the message.

1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following:

1> if the IE "ISCP Timeslot list" is included:

2> store the timeslot numbers given there for future Timeslot ISCP measurements and reports in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION.

1> if the IE "PDSCH capacity allocation info" is included:

2> configure the physical resources used for the downlink CCTrCH given by the IE "TFCS ID" according to the following:

3> if the CHOICE "Configuration" has the value "Old configuration":

4> if the UE has stored a PDSCH configuration in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION with the identity given by the IE "PDSCH Identity":

5> configure the physical resources according to that configuration.

4> otherwise:

5> ignore the IE "PDSCH capacity allocation info".

3> if the CHOICE "Configuration" has the value "New configuration":

4> configure the physical resources according to the information given in IE "PDSCH Info". If IE "Common timeslot info" or IE "PDSCH timeslots and codes" IE are not present in IE "PDSCH Info":

5> reuse the configuration stored in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION for this CCTrCH.

4> if the IE "PDSCH Identity" is included:

5> store the new configuration in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION using that identity.

2> start using the new configuration at the CFN specified by the IE "Allocation activation time", and use that for the duration given by the IE "Allocation duration";

2> if the IE "Confirm request" has the value "Confirm PDSCH" and IE "PDSCH Identity" is included in IE "PDSCH capacity allocation info":

3> initiate the PUSCH CAPACITY REQUEST procedure as described in subclause 8.2.8.

1~~2~~> if the IE "PUSCH capacity allocation info" is included:

2> stop the timer T310, if running;

2> if the CHOICE "PUSCH allocation" has the value "PUSCH allocation pending":

3> start the timer T311.

2> if the CHOICE "PUSCH allocation" has the value "PUSCH allocation assignment":

3> stop the timer T311, if running;

3> configure the physical resources used for the uplink CCTrCH given by the IE "TFCS ID" according to the following:

4> if the CHOICE "Configuration" has the value "Old configuration":

5> if the UE has stored a PUSCH configuration with the identity given by the IE "PUSCH Identity" in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION:

~~5~~6> configure the physical resources according to that configuration.

5> otherwise:

6~~5~~> ignore the IE "PUSCH capacity allocation info".

4> if the CHOICE "Configuration" has the value "New configuration", the UE shall:

5> configure the physical resources according to the information given in IE "PUSCH Info". If IE "Common timeslot info" or IE "PUSCH timeslots and codes" is not present in IE "PUSCH Info":

6> reuse the configuration stored in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION for this CCTrCH.

5> if the IE "PUSCH Identity" is included:

6~~5~~> store the new configuration in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION using that identity.

3> start using the new configuration at the CFN specified by the IE "Allocation activation time", and use that for the duration given by the IE "Allocation duration";

3> if the “UL target SIR” is included

4> replace the SIR target for this CCTrCH with the signalled value

3> if the IE "Traffic volume report request " is included:

4> initiate the PUSCH CAPACITY REQUEST procedure as described in subclause 8.2.8 at the time indicated by the IE "Traffic volume report request".

3> if the IE "Confirm request" has the value "Confirm PUSCH" and IE "PUSCH Identity" is included in IE "PUSCH capacity allocation info":

4> initiate the PUSCH CAPACITY REQUEST procedure as described in subclause 8.2.8.

~~1~~3> determine the TFCS subset and hence the TFCI values which are possible given the PUSCH allocation for that CCTrCH;

3~~1~~> configure the MAC-c/sh in the UE with this TFCS restriction if necessary;

3~~1~~> transmit USCH Transport Block Sets as required, within the TFCS limits given by the PUSCH allocation.

NOTE: If the UE has just entered a new cell and System Information Block Type 6has not yet been scheduled, PUSCH/PDSCH information should be specified in the allocation message.

The UE shall:

1> clear the entry for the PHYSICAL SHARED CHANNEL ALLOCATION message in the table "Accepted transactions" in the variable TRANSACTIONS;

1> and the procedure ends.

3GPP TSG RAN2 Meeting #34 ***Tdoc ⌘R2-030438***

Sophia, France, 17-21 February 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.331** **CR** **1815** ⌘**rev** **-** ⌘ Current version: **4.8.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction to procedural text for Physical Shared Channel Allocation (TDD only)
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	17/02/2003
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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The procedural text describing the actions of the UE following the receipt of a Physical Shared Channel Allocation message (TDD only) has some errors in the nesting of the text. It is beneficial to state that the SIR target signalled is to be applied to the uplink CCTrCH that is allocated resource.
Summary of change:	⌘	Numbering and indentation of actions are corrected. Text is added with respect to the SIR target.
Consequences if not approved:	⌘	The UE may not undertake the correct action sequence on decoding a Physical Shared Channel Allocation message. For example, the UE may not act on the PUSCH info unless a PDSCH allocation is included. This impacts TDD only. **Isolated impact analysis:** this CR corrects errors in the procedural text for resource allocation of shared channels in TDD (only). Without this change certain UE implementations may incorrectly interpret a Physical Shared Channel Allocation message.

Clauses affected:	⌘	8.2.7.3

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		X	Test specifications	
		X	O&M Specifications	

Other comments:	⌘	

How to create CRs using this form:

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

8.2.7 Physical Shared Channel Allocation [TDD only]

Figure 8.2.7-1: Physical Shared Channel Allocation

8.2.7.1 General

The purpose of this procedure is to allocate radio resources to USCH and/or DSCH transport channels in TDD mode, for use by a UE. This procedure can also be used to indicate to the UE, that a PUSCH allocation is pending, in order to prevent further capacity requests from the UE.

UEs are not required to receive FACH and DSCH simultaneously, i.e. if resources are allocated to DSCH the FACH reception may be suspended.

8.2.7.2 Initiation

To initiate the Physical Shared Channel Allocation procedure, the UTRAN sends the "PHYSICAL SHARED CHANNEL ALLOCATION" message on the downlink SHCCH or on the downlink DCCH using UM RLC. The DSCH-RNTI shall be included for UE identification, if the message is sent on the SHCCH.

8.2.7.3 Reception of a PHYSICAL SHARED CHANNEL ALLOCATION message by the UE

Upon reception of a "PHYSICAL SHARED CHANNEL ALLOCATION" message, if the message is received on the downlink SHCCH the UE shall:

1> check the DSCH-RNTI to see if the UE is addressed by the message;

1> if the UE is addressed by the message, or if the message is received on the downlink DCCH:

2> perform the following actions.

1> otherwise:

2> ignore the message.

1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following:

1> if the IE "ISCP Timeslot list" is included:

2> store the timeslot numbers given there for future Timeslot ISCP measurements and reports in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION.

1> if the IE "PDSCH capacity allocation info" is included:

2> configure the physical resources used for the downlink CCTrCH given by the IE "TFCS ID" according to the following:

3> if the CHOICE "Configuration" has the value "Old configuration":

4> if the UE has stored a PDSCH configuration in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION with the identity given by the IE "PDSCH Identity":

5> configure the physical resources according to that configuration.

4> otherwise:

5> ignore the IE "PDSCH capacity allocation info".

3> if the CHOICE "Configuration" has the value "New configuration":

4> configure the physical resources according to the information given in IE "PDSCH Info". If IE "Common timeslot info" or IE "PDSCH timeslots and codes" IE are not present in IE "PDSCH Info":

5> reuse the configuration stored in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION for this CCTrCH.

4> if the IE "PDSCH Identity" is included:

5> store the new configuration in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION using that identity.

2> start using the new configuration at the CFN specified by the IE "Allocation activation time", and use that for the duration given by the IE "Allocation duration";

2> if the IE "Confirm request" has the value "Confirm PDSCH" and IE "PDSCH Identity" is included in IE "PDSCH capacity allocation info":

3> initiate the PUSCH CAPACITY REQUEST procedure as described in subclause 8.2.8.

1~~2~~> if the IE "PUSCH capacity allocation info" is included:

2> stop the timer T310, if running;

2> if the CHOICE "PUSCH allocation" has the value "PUSCH allocation pending":

3> start the timer T311.

2> if the CHOICE "PUSCH allocation" has the value "PUSCH allocation assignment":

3> stop the timer T311, if running;

3> configure the physical resources used for the uplink CCTrCH given by the IE "TFCS ID" according to the following:

4> if the CHOICE "Configuration" has the value "Old configuration":

5> if the UE has stored a PUSCH configuration with the identity given by the IE "PUSCH Identity" in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION:

~~5~~6> configure the physical resources according to that configuration.

5> otherwise:

6~~5~~> ignore the IE "PUSCH capacity allocation info".

4> if the CHOICE "Configuration" has the value "New configuration", the UE shall:

5> configure the physical resources according to the information given in IE "PUSCH Info". If IE "Common timeslot info" or IE "PUSCH timeslots and codes" is not present in IE "PUSCH Info":

6> reuse the configuration stored in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION for this CCTrCH.

5> if the IE "PUSCH Identity" is included:

6~~5~~> store the new configuration in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION using that identity.

3> start using the new configuration at the CFN specified by the IE "Allocation activation time", and use that for the duration given by the IE "Allocation duration";

3> if the “UL target SIR” is included

4> replace the SIR target for this CCTrCH with the signalled value

3> if the IE "Traffic volume report request " is included:

4> initiate the PUSCH CAPACITY REQUEST procedure as described in subclause 8.2.8 at the time indicated by the IE "Traffic volume report request".

3> if the IE "Confirm request" has the value "Confirm PUSCH" and IE "PUSCH Identity" is included in IE "PUSCH capacity allocation info":

4> initiate the PUSCH CAPACITY REQUEST procedure as described in subclause 8.2.8.

~~1~~3> determine the TFCS subset and hence the TFCI values which are possible given the PUSCH allocation for that CCTrCH;

3~~1~~> configure the MAC-c/sh in the UE with this TFCS restriction if necessary;

3~~1~~> transmit USCH Transport Block Sets as required, within the TFCS limits given by the PUSCH allocation.

NOTE: If the UE has just entered a new cell and System Information Block Type 6has not yet been scheduled, PUSCH/PDSCH information should be specified in the allocation message.

The UE shall:

1> clear the entry for the PHYSICAL SHARED CHANNEL ALLOCATION message in the table "Accepted transactions" in the variable TRANSACTIONS;

1> and the procedure ends.

3GPP TSG RAN2 Meeting #34 ***Tdoc ⌘R2-030439***
Sophia, France, 17-21 February 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.331** **CR** **1816** ⌘ **rev** **-** ⌘ Current version: **5.3.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Correction to procedural text for Physical Shared Channel Allocation (TDD only)
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	17/02/2003
Category:	⌘	**A**
Release:	⌘	Rel-5

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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The procedural text describing the actions of the UE following the receipt of a Physical Shared Channel Allocation message (TDD only) has some errors in the nesting of the text. It is beneficial to state the SIR target signalled is to be applied to the uplink CCTrCH that is allocated resource.
Summary of change:	⌘	Numbering and indentation of actions are corrected. Text is added with respect to the SIR target.
Consequences if not approved:	⌘	The UE may not undertake the correct action sequence on decoding a Physical Shared Channel Allocation message. For example, the UE may not act on the PUSCH info unless a PDSCH allocation is included. This impacts TDD only. **Isolated impact analysis:** this CR corrects errors in the procedural text for resource allocation of shared channels in TDD (only). Without this change certain UE implementations may incorrectly interpret a Physical Shared Channel Allocation message.

Clauses affected:	⌘	8.2.7.3			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

8.2.7 Physical Shared Channel Allocation [TDD only]

Figure 8.2.7-1: Physical Shared Channel Allocation

8.2.7.1 General

The purpose of this procedure is to allocate radio resources to USCH and/or DSCH transport channels in TDD mode, for use by a UE. This procedure can also be used to indicate to the UE, that a PUSCH allocation is pending, in order to prevent further capacity requests from the UE.

UEs are not required to receive FACH and DSCH simultaneously, i.e. if resources are allocated to DSCH the FACH reception may be suspended.

8.2.7.2 Initiation

To initiate the Physical Shared Channel Allocation procedure, the UTRAN sends the "PHYSICAL SHARED CHANNEL ALLOCATION" message on the downlink SHCCH or on the downlink DCCH using UM RLC. The DSCH-RNTI shall be included for UE identification, if the message is sent on the SHCCH.

8.2.7.3 Reception of a PHYSICAL SHARED CHANNEL ALLOCATION message by the UE

Upon reception of a "PHYSICAL SHARED CHANNEL ALLOCATION" message, if the message is received on the downlink SHCCH the UE shall:

1> check the DSCH-RNTI to see if the UE is addressed by the message;

1> if the UE is addressed by the message, or if the message is received on the downlink DCCH:

2> perform the following actions.

1> otherwise:

2> ignore the message.

1> act upon all received information elements as specified in subclause 8.6, unless specified otherwise in the following:

1> if the IE "ISCP Timeslot list" is included:

2> store the timeslot numbers given there for future Timeslot ISCP measurements and reports in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION.

1> if the IE "PDSCH capacity allocation info" is included:

2> configure the physical resources used for the downlink CCTrCH given by the IE "TFCS ID" according to the following:

3> if the CHOICE "Configuration" has the value "Old configuration":

4> if the UE has stored a PDSCH configuration in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION with the identity given by the IE "PDSCH Identity":

5> configure the physical resources according to that configuration.

4> otherwise:

5> ignore the IE "PDSCH capacity allocation info".

3> if the CHOICE "Configuration" has the value "New configuration":

4> configure the physical resources according to the information given in IE "PDSCH Info". If IE "Common timeslot info" or IE "PDSCH timeslots and codes" IE are not present in IE "PDSCH Info":

5> reuse the configuration stored in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION for this CCTrCH.

4> if the IE "PDSCH Identity" is included:

5> store the new configuration in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION using that identity.

2> start using the new configuration at the CFN specified by the IE "Allocation activation time", and use that for the duration given by the IE "Allocation duration";

2> if the IE "Confirm request" has the value "Confirm PDSCH" and IE "PDSCH Identity" is included in IE "PDSCH capacity allocation info":

3> initiate the PUSCH CAPACITY REQUEST procedure as described in subclause 8.2.8.

1~~2~~> if the IE "PUSCH capacity allocation info" is included:

2> stop the timer T310, if running;

2> if the CHOICE "PUSCH allocation" has the value "PUSCH allocation pending":

3> start the timer T311.

2> if the CHOICE "PUSCH allocation" has the value "PUSCH allocation assignment":

3> stop the timer T311, if running;

3> configure the physical resources used for the uplink CCTrCH given by the IE "TFCS ID" according to the following:

4> if the CHOICE "Configuration" has the value "Old configuration":

5> if the UE has stored a PUSCH configuration with the identity given by the IE "PUSCH Identity" in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION:

~~5~~6> configure the physical resources according to that configuration.

5> otherwise:

6~~5~~> ignore the IE "PUSCH capacity allocation info".

4> if the CHOICE "Configuration" has the value "New configuration", the UE shall:

5> configure the physical resources according to the information given in IE "PUSCH Info". If IE "Common timeslot info" or IE "PUSCH timeslots and codes" is not present in IE "PUSCH Info":

6> reuse the configuration stored in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION for this CCTrCH.

5> if the IE "PUSCH Identity" is included:

6~~5~~> store the new configuration in the variable PHYSICAL_SHARED_CHANNEL_CONFIGURATION using that identity.

3> start using the new configuration at the CFN specified by the IE "Allocation activation time", and use that for the duration given by the IE "Allocation duration";

3> if the “UL target SIR” is included

4> replace the SIR target for this CCTrCH with the signalled value

3> if the IE "Traffic volume report request " is included:

4> initiate the PUSCH CAPACITY REQUEST procedure as described in subclause 8.2.8 at the time indicated by the IE "Traffic volume report request".

3> if the IE "Confirm request" has the value "Confirm PUSCH" and IE "PUSCH Identity" is included in IE "PUSCH capacity allocation info":

4> initiate the PUSCH CAPACITY REQUEST procedure as described in subclause 8.2.8.

~~1~~3> determine the TFCS subset and hence the TFCI values which are possible given the PUSCH allocation for that CCTrCH;

3~~1~~> configure the MAC-c/sh in the UE with this TFCS restriction if necessary;

3~~1~~> transmit USCH Transport Block Sets as required, within the TFCS limits given by the PUSCH allocation.

NOTE: If the UE has just entered a new cell and System Information Block Type 6has not yet been scheduled, PUSCH/PDSCH information should be specified in the allocation message.

The UE shall:

1> clear the entry for the PHYSICAL SHARED CHANNEL ALLOCATION message in the table "Accepted transactions" in the variable TRANSACTIONS;

1> and the procedure ends.

TSG-RAN Working Group 2 meeting #34 **R2-030515**
Sophia-Antipolis, France 17th – 21rd February 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.331** **CR** **1817** ⌘ **rev** **1** ⌘ Current version: **3.13.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☒ Core Network ☐

Title:	⌘	CM and state transition related to measurements, additional measurements, virtual active set and periodic measurements
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	January 2003
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)*
Rel-6	*(Release 6)*

Reason for change: ⌘

1) It is unclear how the UE should handle referenced additional measurements which are not existing.

2) It is not specified how the UE shall update the VAS in case no concerning measurements are included.

3) Inconsistency in CM status flag setting and CM activation.

4) It is unclear if the UE is required to support measurement configurations which include multiple identical event identities for the same object.

5) In case of periodic measurement reporting, there is an inconsistency regarding when to sent the first MEASUREMENT REPORT message, and regarding what contents to have in subsequent MEASUREMENT REPORT messages.

6) It is not completely clear which uplink transport channels shall be taken into account for traffic volume measurement reporting and triggering.

7) Several confusing pictures incorrectly suggesting that the reporting range is limited in both the upward and downward direction.

See for more background on the proposed changes Tdoc R2-030135.

Summary of change: ⌘

Changes to R1 of this CR:

- The issue related to reading of SIB11/12 has been moved to a separate CR.

Additional changes in R0 of this CR:

1) The note added in 8.6.7.22 has been slightly reworded.

2) In section 8.1.1.1.2, a new paragraph is added to clarify that a UE implementation always ignoring SIB11/12 is not allowed.

3) Sections 8.4.2.2 and 8.6.7.8 are updated to reflect a freedom regarding when to sent the first report.

Changes proposed in original version of the CR:

1) Section 8.6.7.22: It is clarified that references to non-existing additional measurements should(R99)/shall(Rel4/5) be removed by the UE.

2) Section 14.11.2: It is specified for the concerning cases that the VAS should (R99)/shall(Rel4/5) consist of all cells on frequency F_i considered in that inter-frequency measurement.

3) Section 8.4.1.6.2: It is specified that the setting of the concerning CM status flags should be set in correspondance with the actual situation.

4) Sections 14.1.2, 14.2.1, 14.3.1, 14.4.2, 14.5.2, 14.6.2 and 14.7.3: It is clarified that the UE behaviour is undefined when the UE receives a measurement configuration with multiple identical event identies for the same object.

5) Sections 8.4.2.2 and 8.6.7.8 are proposed to be updated in order to consistently indicate when the first MEASUREMENT REPORT message shall be sent, and what the contents shall be of subsequent MEASUREMENT REPORT messages.

6) Section 8.4.1.10.1: it is clarified that the traffic volume measurement reporting and triggering is only relevant for transport channels applicable to the current RRC state.

7) Section 14.1.4.1, 14.1.5.2, 14.1.5.3. and 14.1.5.4: the confusing pictures are updated, showing a limit in one direction only.

8) Several smaller corrections have been made.

T1 impact:
No impact on T1 specifications is foreseen (the behaviour clarified in issue 5 is in line with the behaviour specified in two T1 test cases).

Backward compatibility:
1) Since the indicated behaviour is optional for R99, there is no impact on R99 UE's. Rel4/5 UE's not complying to the specified behaviour might include unintended additional measurement results in the reporting.

2) Since the indicated behaviour is optional for R99, there is no impact on R99 UE's. Rel4/5 UE's not complying to the specified behaviour might include incorrect cells in the VAS. A UTRAN should anyway not rely on the indicated behaviour before this CR is agreed.

3) The specified behaviour is considered a correction to an inconsistency in the specification. UE's not implementing this behaviour already will have an inconsistency in their internal bookkeeping, which is however not expected to lead to serious misbehaviour (e.g. the UE will anyway not have sufficient information to start the CM patterns automatically).

4) Since the proposed change limits UE functionality, it will not have any impact on the UE. A UTRAN implementation using the removed functionality was relying on not clearly specified behaviour.

5) The proposed changes are assumed to reflect RAN2 understanding. A UE not implementing the proposed behaviour might sent MEASUREMENT REPORT messages at the wrong instance and with incorrect contents, thus resulting in degraded UTRAN

		performance. 6) A UE not implementing this CR will report on unnecessary transport channels. 7) Issue concerns an informative section, so is not expected to effect UE or UTRAN implementations.
Consequences if not approved:	⌘	The indicated unclarities/incorrections will remain in the specification: 1) Unintended additional measurement inclusion; 2) Incorrect cells included in the VAS; 3) Incorrect internal UE bookkeeping w.r.t CM; 4) Unnessary UE complexity; 5) Unclarities w.r.t. periodic reporting will remain; 6) Reporting on unintended transport channels; 7) Confusion regarding reporting range will remain.

Clauses affected:	⌘	8.4.1.6.2; 8.4.1.10.1; 8.4.2.2; 8.6.7.22; 8.6.7.8;10.3.6.53; 11.3; 14.1.2; 14.1.4.1; 14.1.5.2; 14.1.5.3; 14.1.5.4; 14.2.1; 14.3.1; 14.4.2; 14.5.2; 14.6.2; 14.7.3; 14.11.2			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

8.4.1.6.2 Inter-frequency measurement

Upon transition from CELL_DCH to CELL_FACH/ CELL_PCH/URA_PCH state, the UE shall:

1> stop the inter-frequency type measurement reporting assigned in a MEASUREMENT CONTROL message;

1> if the transition is due to a reconfiguration message which included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selects a cell other than that indicated by this IE on the current frequency (in case the IE "Frequency info" is not received) or other than that indicated by this IE on the frequency indicated by the IE "Frequency info" (when the IE "Frequency info" is included); or

1> if the transition is due to a reconfiguration message which does not include the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD); or

1> if the transition is not due to a reconfiguration message:

2> delete the measurements of type inter-frequency associated with the variable MEASUREMENT_IDENTITY and delete the corresponding compressed mode pattern.

1> for remaining compressed mode patterns, set the IE “TGPS Status Flag” to “deactivate” and the IE “Current TGPS Status Flag” to “inactive”in the variable TGPS_IDENTITY.

1> begin monitoring cells listed in the IE "inter-frequency cell info list" received in System Information Block type 12 (or System Information Block type 11, according to subclause 8.1.1.6.11);

1> in CELL_FACH state:

2> perform measurements on other frequencies according to the IE "FACH measurement occasion info".

8.4.1.10.1 Traffic volume measurement

When performing traffic volume event evaluation or reporting related to a certain transport channel, the UE shall consider all RBs which are mapped to the concerning transport channel e.g. if an additional RB is established on a transport channel used for event triggering or reporting, the new RB shall be taken into account.

NOTE: In this section, an “existing” uplink transport channel refers to a configured uplink transport channel applicable in the current RRC state.

The UE shall:

1> if the IE "Traffic volume measurement object" is included for this measurement:

2> while a transport channel that is referenced in the IE "Traffic volume measurement object" does not exist:

3> not perform any reporting related to this transport channel.

1> else:

2> report on all existing uplink transport channels; e.g. if an additional transport channel is established while the measurement is ongoing, this new transport channel shall be taken into account in the traffic volume measurement reporting.

For every traffic volume event, the UE shall:

1> if the IE "Uplink transport channel type" is not included in the IE "Traffic volume measurement reporting criteria", or the "Uplink transport channel type" has the value "DCH" or "USCH" and the IE "UL transport channel id" is not included in the IE "Traffic volume measurement reporting criteria":

2> if the IE "Traffic volume measurement object" is not included:

3> take all existing UL transport channels into account for event triggering; e.g. if an additional transport channel is established while the measurement is ongoing, this new transport channel shall be taken into account in the traffic volume event triggering.

2> else:

3> while a transport channel that is referenced in the IE "Traffic Volume Measurement object" does not exist:

4> not take this transport channel identity into account in the traffic volume measurement triggering.

1> else:

2> while a transport channel that is referenced in the IE "Traffic Volume Measurement Reporting Criteria" does not exist:

3> not take this transport channel identity into account in the traffic volume event triggering.

8.4.2.2 Initiation

In CELL_DCH state, the UE shall:

1> transmit a MEASUREMENT REPORT message on the uplink DCCH when the reporting criteria stored in variable MEASUREMENT_IDENTITY are met for any ongoing measurements that are being performed in the UE.

In CELL_FACH state, the UE shall:

1> transmit a MEASUREMENT REPORT message on the uplink DCCH when the reporting criteria stored in variable MEASUREMENT_IDENTITY are met for any ongoing traffic volume measurement or UE positioning measurement that is being performed in the UE;

1> include a measurement report in the IE "Measured results on RACH", as specified in the IE "Intra-frequency reporting quantity for RACH reporting" and the IE "Maximum number of reported cells on RACH" in System Information Block type 12 (or "System Information Block Type 11" if "System Information Block Type 12" is not being broadcast);

1> include in the IE "Measured results on RACH" all requested reporting quantities for cells for which measurements are reported.

In TDD, if the Radio Bearer associated with the MEASUREMENT_IDENTITY fulfilling the reporting criteria for an ongoing traffic volume measurement is mapped on transport channel of type USCH, the UE shall:

1> initiate the "PUSCH CAPACITY REQUEST" procedure instead of transmitting a MEASUREMENT REPORT (TDD Only).

In CELL_PCH or URA_PCH state, the UE shall:

1> first perform the cell update procedure according to subclause 8.3.1, using the cause "uplink data transmission", in order to transit to CELL_FACH state; and then

1> transmit a MEASUREMENT REPORT message on the uplink DCCH when the reporting criteria stored in variable MEASUREMENT_IDENTITY are fulfilled for any ongoing traffic volume measurement or UE positioning measurement which is being performed in the UE.

The reporting criteria are fulfilled if either:

- a periodic MEASUREMENT REPORT message shall be sent according to the IE “Periodical Reporting Criteria”; or ~~the first measurement has been completed according to the requirements set in [19] or [20] for a newly initiated measurement with periodic reporting; or~~

- ~~the time period indicated in the stored IE "Periodical reporting criteria" has elapsed since the last measurement report was submitted to lower layers for a given measurement; or~~

- an event in stored IE "Measurement reporting criteria" was triggered. Events and triggering of reports for different measurement types are described in detail in clause 14.

For the measurement, which triggered the MEASUREMENT REPORT message, the UE shall:

1> set the IE "measurement identity" to the measurement identity, which is associated with that measurement in variable MEASUREMENT_IDENTITY;

1> set the IE "measured results" to include measurements according to the IE "reporting quantity" of that measurement stored in variable MEASUREMENT_IDENTITY; and

2> if all the reporting quantities are set to "false":

3> not set the IE "measured results".

1> set the IE "Measured results" in the IE "Additional measured results" according to the IE "reporting quantity" for all measurements associated with the measurement identities included in the "Additional measurements list" stored in variable MEASUREMENT_IDENTITY of the measurement that triggered the measurement report; and

2> if more than one additional measured results are to be included:

3> sort them in ascending order according to their IE "measurement identity" in the MEASUREMENT REPORT message.

1> if the MEASUREMENT REPORT message was triggered by an event (i.e. not a periodical report):

2> set the IE "Event results" according to the event that triggered the report.

The UE shall:

1> transmit the MEASUREMENT REPORT message on the uplink DCCH using either AM or UM RLC according to the stored IE "measurement reporting mode" associated with the measurement identity that triggered the report.

When the MEASUREMENT REPORT message has been submitted to lower layers for transmission:

1> the procedure ends.

8.6.7.22 Additional Measurement List

If the IE "Additional Measurement List" is received in a MEASUREMENT CONTROL message, the UE shall:

1> if the received measurement configuration in this MEASUREMENT CONTROL message, or any measurement referenced in the "Additional Measurement List" do not all have the same validity:

2> set the variable CONFIGURATION_INCOMPLETE to TRUE.

1> if any of the measurements referenced in the "Additional Measurement List" is an intra-frequency, inter-frequence or inter-RAT measurement, and this measurement is configured with event based reporting:

2> the UE behaviour is not specified.

If, at any time during the life-time of a measurement, any measurement referenced in the Additional Measurement List does not exist, the UE should remove this measurement identity from the Additional Measurement List.

Note: A measurement referenced in the Additional Measurement List which is updated with a measurement command set to “modify”, or replaced with a measurement command set to “setup”, continues to exist.

If the measurement configured with the MEASUREMENT CONTROL message triggers a measurement report, the UE shall also include the reporting quantities for the measurements referenced by the additional measurement identities. The contents of the IE "Additional Measured results" is completely determined by the measurement configuration of the referenced additional measurement.

8.6.7.8 Periodical Reporting Criteria

If the IE "Periodical Reporting Criteria" is received by the UE, the UE shall:

1> store the contents of the IE "Amount of Reporting" and IE "Reporting interval" in the variable MEASUREMENT_IDENTITY.

For the first MEASUREMENT REPORT message, the UE shall:

1> send the MEASUREMENT REPORT as soon as all requested reporting quantities are available according to the requirements and the measurement capabilities set in [19] and [20] for at least one measurement object stored in the variable MEASUREMENT_IDENTITY, but never later than one reporting interval after measurement initiation; or

1> send the MEASUREMENT REPORT at the end of the first reporting interval in which all requested reporting quantities are available according to the requirements and the measurement capabilities set in [19] and [20] for at least one measurement object stored in the variable MEASUREMENT_IDENTITY.

Following the first MEASUREMENT REPORT message, the UE shall:

1> send ~~subsequent~~ a MEASUREMENT REPORT message one r~~with intervals specified by the IE "R~~eporting interval~~"~~ after the previous MEASUREMENT REPORT message;

~~1> omit measurement results that were reported in a previous MEASUREMENT REPORT and for which new measurement results are not available in the present reporting interval.~~

The first and subsequent periodic MEASUREMENT REPORT messages shall only include measured results for reporting quantities that are available according to the requirements and the measurement capabilities set in [19] and [20] i.e if no measured results are available, the IE “Measured Results”shall not be included in the MEASUREMENT REPORT message.

After the UE has sent a total number of MEASUREMENT REPORT messages, which equal the value indicated in the IE "Amount of reporting", the UE shall:

1> terminate measurement reporting; and

1> delete all measurement information linked with the "Measurement identity" of the ongoing measurement from the variable MEASUREMENT_IDENTITY.

10.3.6.53 PRACH partitioning

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Access Service class	MP	1 to maxASC		If only "NumASC+1" (with, NumASC+1 < maxASC) ASCs are listed, the remaining (NumASC+2 through maxASC) ASCs are unspecified.
>ASC Setting	MD		ASC setting 10.3.6.6	The default values are same as the previous ASC. If the "default" is used for the first ASC, the default values are all available signatures and "all available sub-channels" for FDD and "all available channelisation codes" and "all available subchannels" with "subchannel size=Size 1" in TDD.

10.3.7.53 Periodical reporting criteria

Contains the periodical reporting criteria information. It is necessary only in the periodical reporting mode.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Amount of reporting	MD		Integer(1, 2, 4, 8, 16, 32, 64, Infinity)	The default value is infinity.
Reporting interval	MP		Integer(250, 500, 1000, 2000, 3000, 4000, 6000, 8000, 12000, 16000, 20000, 24000, 28000, 32000, 64000)	Indicates the interval of periodical report. Interval in milliseconds

11.3 Information element definitions

…….

```
PeriodicalReportingCriteria ::=     SEQUENCE {
    reportingAmount                     ReportingAmount                 DEFAULT ra-Infinity,
    reportingInterval                   ReportingIntervalLong
}
```

……

```
ReportingIntervalLong ::=           ENUMERATED {
                                        ril0, ril0-25, ril0-5, ril1,
                                        ril2, ril3, ril4, ril6, ril8,
                                        ril12, ril16, ril20, ril24,
                                        ril28, ril32, ril64 }
                                    -- When the value “ril0” is used, the UE behaviour is not
                                    -- defined.
```

……

14.1.2 Intra-frequency reporting events for FDD

Within the measurement reporting criteria field in the Measurement Control message the UTRAN notifies the UE which events should trigger a measurement report. The listed events are the toolbox from which the UTRAN can choose the reporting events that are needed for the implemented handover evaluation function, or other radio network functions.

All the specified events are measured with respect to any of the measurement quantities given in subclause 14.1.1. The measurement quantities are measured on the monitored primary common pilot channels (CPICH) of the cell defined in the measurement object.

Special mechanisms for the events are illustrated in subclause 14.1.4 and 14.1.5.

NOTE: The events below are numbered 1A, 1B, 1C,… since all intra-frequency reporting events would be labelled 1X, inter-frequency reporting events would be labelled 2X, and so on for the other measurement types.

When one intra-frequency measurement identity corresponds to multiple intra-frequency events with identical event identities, the UE behaviour is not specified.

14.1.4 Event-triggered periodic intra-frequency measurement reports (informative)

14.1.4.1 Cell addition failure (FDD only)

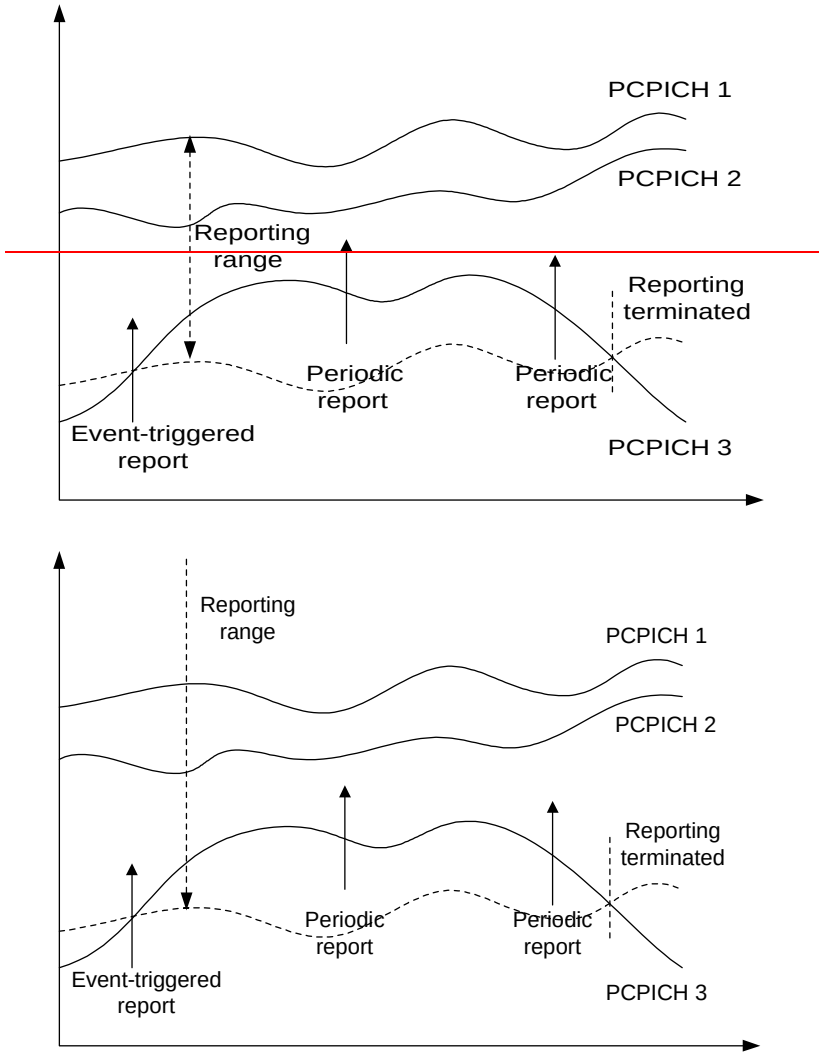

Figure 14.1.4.1-1: Periodic reporting triggered by event 1A

When a cell enters the reporting range and triggers event 1A, the UE shall transmit a MEASUREMENT REPORT to the UTRAN and typically this may result in an update of the active set. However, in some situations the UTRAN may be unable to add a strong cell to the active set typically due to capacity shortage for example.

The UE shall continue reporting after the initial report by reverting to periodical measurement reporting if the reported cell is not added to the active set. This is illustrated in Figure 14.1.4.1-1. During periodic reporting the UE shall transmit MEASUREMENT REPORT messages to the UTRAN at predefined intervals. The reports shall include reporting information of the cells in the current active set and of the monitored cell(s) in the reporting range.

Event-triggered periodic measurement reporting shall be terminated if:

1> there are no longer any monitored cell(s) within the reporting range; or

1> the UTRAN has added cells to the active set so that it includes the maximum number of cells (defined by the **reporting deactivation threshold** parameter), which are allowed for event 1A to be triggered; or

1> the UE has sent the maximum number of MEASUREMENT REPORT messages (defined by the **amount of reporting** parameter).

The reporting period is assigned by the UTRAN (with the **Reporting interval** parameter). If the reporting interval is set to zero event-triggered periodic measurement reporting shall not be applied.

14.1.5.2 Time-to-trigger

To limit the measurement signalling load, a time-to-trigger parameter could be connected with each reporting event given above. The value of the time-to-trigger is given to the UE in the Reporting criteria field of the Measurement Control message.

The effect of the time-to-trigger is that the report is triggered only after the conditions for the event have existed for the specified time-to-trigger. In the following FDD example in Figure 14.1.5.2-1, the use of time-to-trigger means that the event (primary CPICH 3 enters the reporting range) is not reported until is has been within the range for the time given by the time-to-trigger parameter.

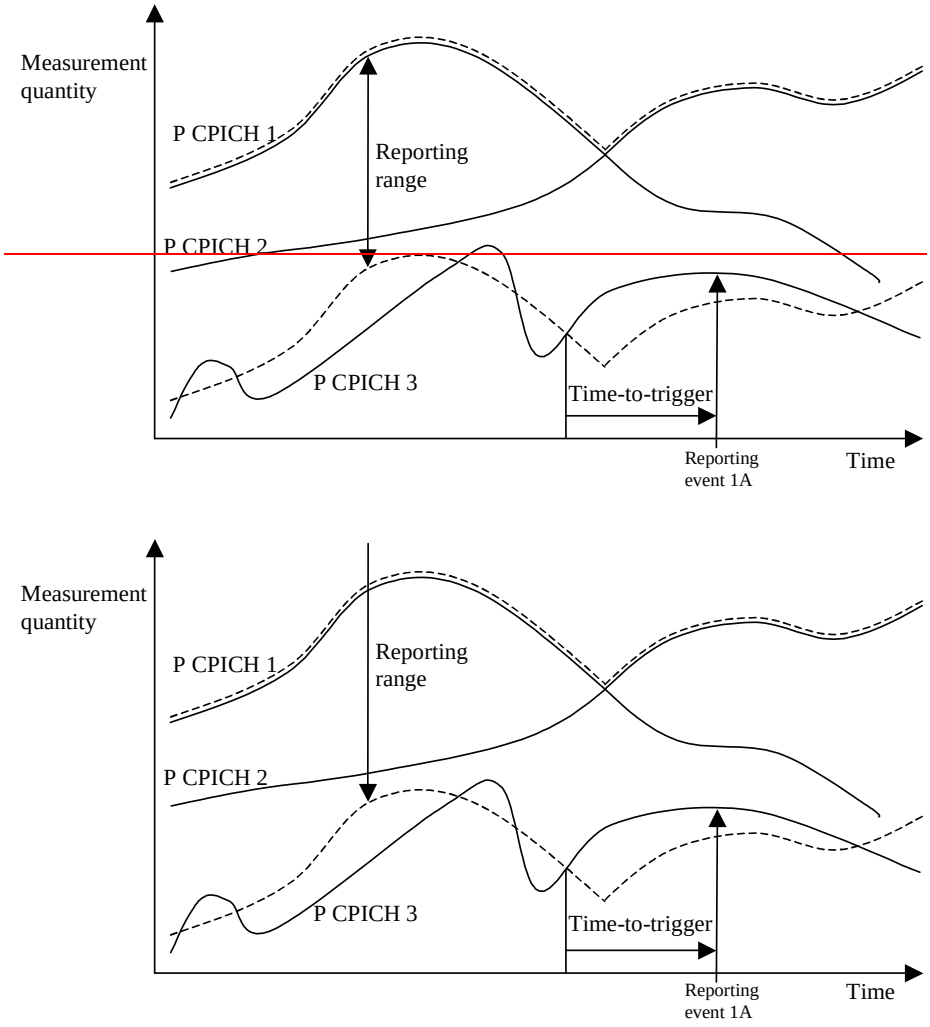

Figure 14.1.5.2-1: Time-to-trigger limits the amount of measurement reports

In the following TDD example in Figure 14.1.5.2-2, the use of time-to-trigger means that the event (Timeslot ISCP upon certain threshold) is not reported until it has been upon the threshold for the time given by the time-to trigger parameter.

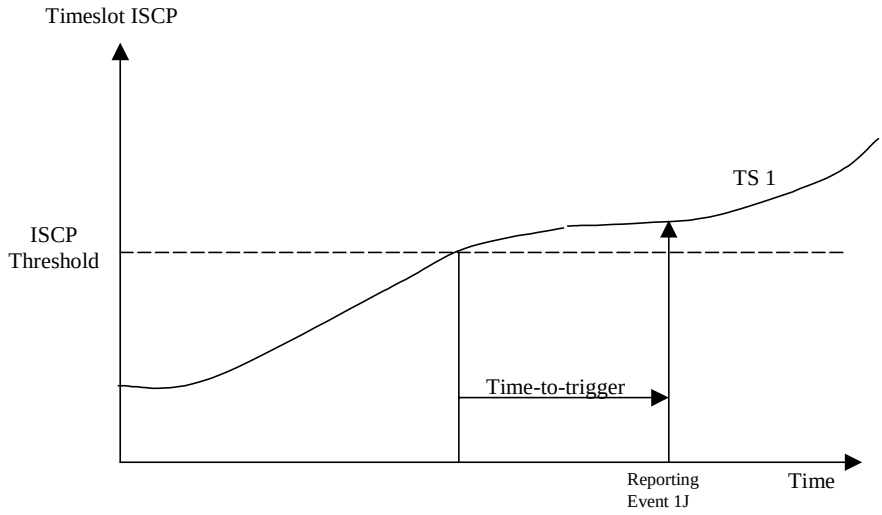

Figure 14.1.5.2-2: Time-to-trigger limits the amount of measurement reports

NOTE: The time-to-trigger could be combined with hysteresis, i.e. a hysteresis value is added to the measurement quantity before evaluating if the time-to-trigger timer should be started.

14.1.5.3 Cell individual offsets

For each cell that is monitored, an offset can be assigned with inband signalling. The offset can be either positive or negative. The offset is added to the measurement quantity before the UE evaluates if an event has occurred. The UE receives the cell individual offsets for each primary CPICH(FDD)/CCPCH(TDD) in the IE "Cell individual offset" included in the IE "Cell info" associated with each measurement object included in the MEASUREMENT CONTROL message.

For the FDD example, in Figure 14.1.5.3-1, since an offset is added to primary CPICH 3, it is the dotted curve that is used to evaluate if an event occurs. Hence, this means that measurement reports from UE to UTRAN are triggered when primary CPICH plus the corresponding offset, i.e. the dotted curve, leaves and enters the reporting range and when it gets better than primary CPICH 1 (if these events have been ordered by UTRAN). This offset mechanism provides the network with an efficient tool to change the reporting of an individual primary CPICH.

By applying a positive offset, as in Figure 14.1.5.3-1, the UE will send measurement reports as if the primary CPICH is offset *x* dB better than what it really is. This could be useful if the operator knows that a specific cell is interesting to monitor more carefully, even though it is not so good for the moment. In the example in Figure 14.1.5.3-1, the operator might know by experience that in this area primary CPICH 3 can become good very quickly (e.g. due to street corners) and therefore that it is worth reporting more intensively. Depending on the implemented handover evaluation algorithm, this may result in the cell with primary CPICH 3 being included in the active set earlier than would have been the case without the positive offset.

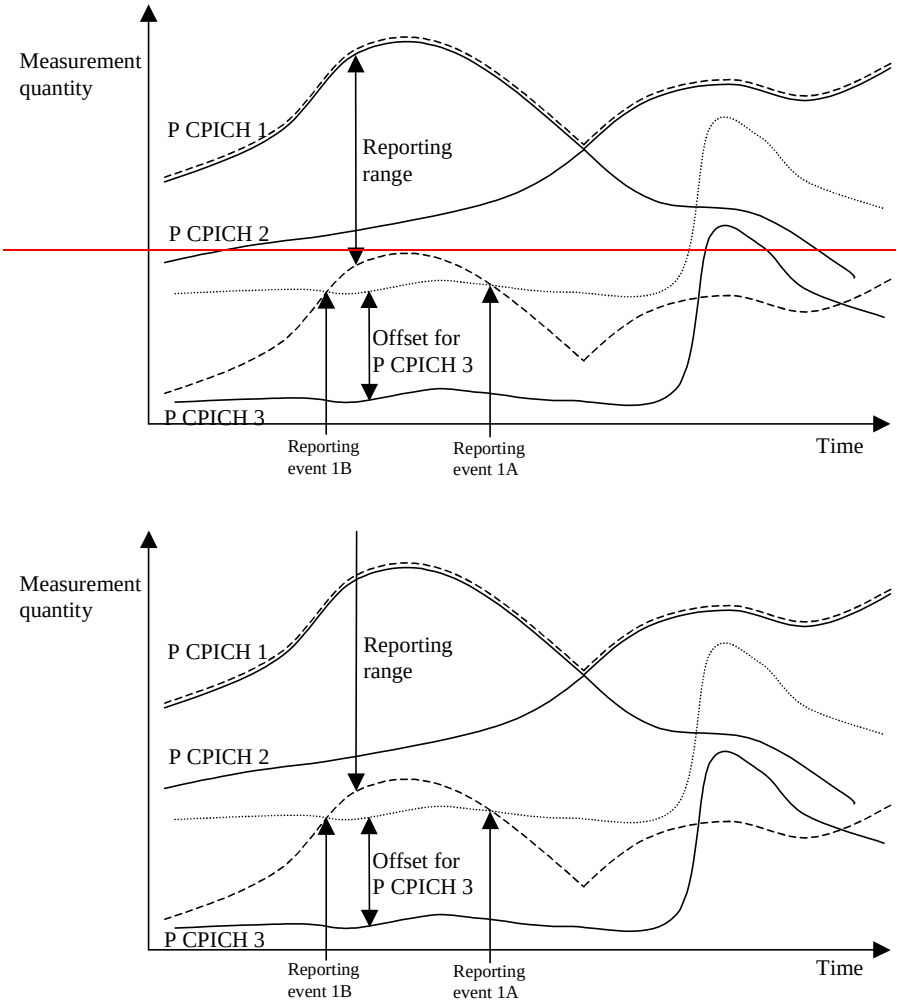

Figure 14.1.5.3-1: A positive offset is applied to primary CPICH 3 before event evaluation in the UE

For the TDD example, in Figure 14.1.5.3-2, an offset is added to primary CCPCH2, it is the dotted curve that is used to evaluate if the primary CCPCH2 becomes better than primary CCPCH1 (ordered by the UTRAN).

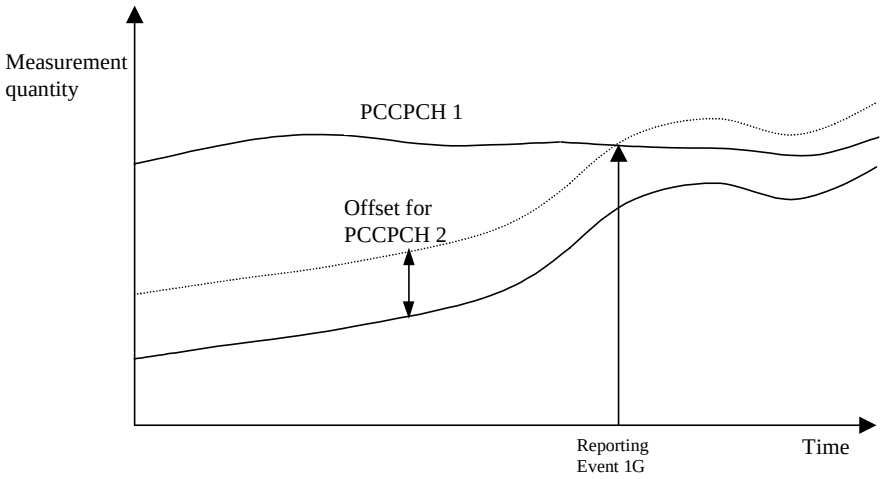

Figure 14.1.5.3-2: A positive offset is applied to primary CCPCH 2

Correspondingly, the operator can choose to apply a negative offset to a primary CCPCH. Then the reporting on that primary CCPCH is limited and the corresponding cell may be, at least temporarily excluded from the active set or as a target cell for handover.

It is important to note that the offset is added before triggering events, i.e. the offset is added by the UE before evaluating if a measurement report should be sent as opposed to offsets that are applied in the network and used for the actual handover evaluation. It should also be noted that the cell individual offset is not used in all measurement reporting events, and that it is not applied to all events in the same way.

14.1.5.4 Forbid a Primary CPICH to affect the reporting range (FDD only)

The reporting range affects the reporting events 1A and 1B presented above. The reporting range is defined as a function of all the Primary CPICHs in the active set (see 14.1.2.1 and 14.1.2.2). If the parameter W is set to 0, the reporting range is defined relative to the best Primary CPICH. However, there could be cases where it is good to forbid a specific Primary CPICH to affect the reporting range. For example in Figure 14.1.5.4-1 the network has requested the UE to not let Primary CPICH 3 affect the reporting range. This mechanism could be effective if the operator knows by experience that the quality of Primary CPICH 3 is very unstable in a specific area and therefore should not affect the reporting of the other Primary CPICHs.

The UE shall ignore that a Primary CPICH is forbidden to affect the reporting range if all of the following conditions are fulfilled:

- the Primary CPICH is included in active set; and
- all cells in active set are defined as Primary CPICHs forbidden to affect the reporting range.

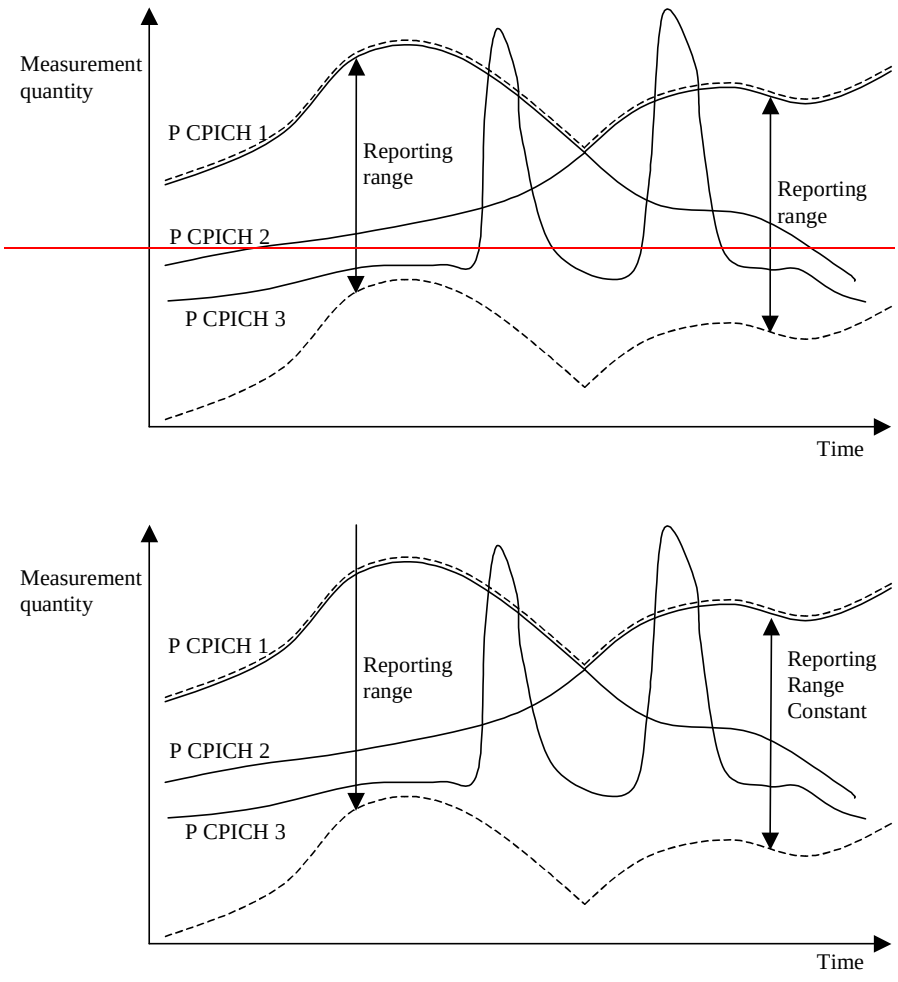

Figure 14.1.5.4-1: Primary CPICH 3 is forbidden to affect the reporting range

14.2.1 Inter-frequency reporting events

Within the measurement reporting criteria field in the MEASUREMENT CONTROL message UTRAN notifies the UE which events should trigger the UE to send a MEASUREMENT REPORT message. The listed events are the toolbox from which the UTRAN can choose the reporting events that are needed for the implemented handover evaluation function, or other radio network functions.

All events are evaluated with respect to one of the measurement quantities given in subclause 14.2.0a. The measurement quantities are measured on the monitored primary common pilot channels (CPICH) in FDD mode and the monitored primary common control channels (PCCPCH) in TDD mode of the cell defined in the measurement object. A "non-used frequency" is a frequency that the UE has been ordered to measure upon but is not used for the connection. A "used frequency" is a frequency that the UE has been ordered to measure upon and is also currently used for the connection.

The "monitored set on non-used frequency" consists of cells in "cells for measurement" (or all cells in CELL_INFO_LIST if "cells for measurement" is not present) that are not part of the virtual active set on that non-used frequency.

When one inter-frequency measurement identity corresponds to multiple intra-frequency or inter-frequency events with identical event identities, the UE behaviour is not specified.

14.3.1 Inter-RAT reporting events

Within the measurement reporting criteria field in the MEASUREMENT CONTROL message the UTRAN notifies the UE which events should trigger the UE to send a MEASUREMENT REPORT message. The listed events are the toolbox from which the UTRAN can choose the reporting events that are needed for the implemented handover evaluation function, or other radio network functions.

All events are measured with respect to one of the measurement quantities given in subclause 14.3.0a, and of the frequency quality estimate given in subclause 14.3.0b. For UTRAN the measurement quantities are measured on the monitored primary common pilot channels (CPICH) in FDD mode and the monitored primary common control channels (PCCPCH) in TDD mode of the cell defined in the measurement object. For other RATs the measurement quantities are system-specific. A "used UTRAN frequency" is a frequency that the UE have been ordered to measure upon and is also currently used for the connection to UTRAN. "Other system" is e.g. GSM.

In the text below describing the events:

- "The BCCH ARFCN and BSIC combinations considered in that inter-RAT measurement" shall be understood as the BCCH ARFCN and BSIC combinations of the inter-RAT cells pointed at in the IE "Cells for measurement" if it has been received for that inter-RAT measurement, or otherwise of the cells included in the "inter-RAT cell info" part of the variable CELL_INFO LIST.
- "The BCCH ARFCNs considered in that inter-RAT measurement" shall be understood as the BCCH ARFCNs of the inter-RAT cells pointed at in the IE "Cells for measurement" if it has been received for that inter-RAT measurement, or otherwise of the cells included in the "inter-RAT cell info" part of the variable CELL_INFO LIST.

When one inter-RAT measurement identity corresponds to multiple inter-RAT events with identical event identities, the UE behaviour is not specified.

14.4.2 Traffic Volume reporting triggers

Traffic volume measurement reports can be triggered using two different mechanisms, periodical and event triggered. The reporting criteria are specified in the measurement control message.

All the specified events are evaluated with respect to the Transport Channel Traffic Volume (TCTV). This quantity is equal to the sum of the Buffer Occupancy for all logical channels mapped onto a transport channel. The events on a given transport channel shall be evaluated at least at every TTI (may be more often) as described in [15].

When one traffic volume measurement identity corresponds to multiple traffic volume events with identical event identities for the same transport channel, the UE behaviour is not specified.

When a traffic volume measurement is set up, the UE shall:

// Rest of section is omitted //

14.5.2 Quality reporting events

When one measurement identity corresponds to multiple quality events for the same transport channel, the UE behaviour is not specified.

14.6.2 UE internal measurement reporting events

In the Measurement reporting criteria field in the Measurement Control messages, the UTRAN notifies the UE of which events should trigger a measurement report. UE internal measurement reporting events that can trigger a report are given below. The reporting events are marked with vertical arrows in the figures below. All events can be combined with time-to-trigger.

NOTE: The reporting events are numbered 6A, 6B, 6C,.. where 6 denotes that the event belongs to the type UE internal measurements.

When one measurement identity corresponds to multiple internal events with identical event identities, the UE behaviour is not defined.

14.7.3 UE positioning reporting events

In the IE "UE positioning reporting criteria" in the Measurement Control messages, the UTRAN notifies the UE of which events should trigger a measurement report. UE positioning reporting events that can trigger a report are given below. The content of the measurement report is dependant on the positioning method and method type requested in the IE "UE positioning reporting quantity" of the Measurement Control message and is described in detail in [18].

When one measurement identity corresponds to multiple positioning events with identical event identities, the UE behaviour is not defined.

14.11.2 Virtual active set update during an inter-frequency measurement

If the IE "Intra-frequency measurement reporting criteria" is stored for an inter-frequency measurement, the UE shall:

1> if Event 1a is configured in that IE, when this event is triggered by a cell for a non-used frequency considered in that measurement (according to the criteria described in subclause 14.1.2.1):

2> if the "Reporting deactivation threshold" is equal to 0, or if the "Reporting deactivation threshold" is different from 0 and the number of cells included in the virtual active set for that frequency is less than or equal to the "Reporting deactivation threshold":

3> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting":

4> add the primary CPICH that enters the reporting range to the "virtual active set".

3> if the IE "UE autonomous update mode" is set to "on" or "off":

4> send a measurement report with IEs set as below:

5> set the Measurement identity to the identity of the inter-frequency measurement;

5> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1a, and in "Cell measurement event results" the CPICH info of the cell that triggered the event;

5> do not include the IEs "measured results" or "additional measured results".

1> if Event 1b was configured, when this event is triggered by a cell for a non-used frequency considered in that measurement (according to the criteria described in subclause 14.1.2.2):

2> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting" and if the number of cells included in the virtual active set is greater than 1:

3> remove the primary CPICH that leaves the reporting range from the "virtual active set".

2> if the IE "UE autonomous update mode" is set to "on" or "off":

3> send a measurement report with IEs set as below:

4> set the Measurement identity to the identity of the inter-frequency measurement;

4> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1b, and in "Cell measurement event results" the CPICH info of the cell that triggered the event;

4> do not include the IEs "measured results" or "additional measured results".

1> if Event 1c was configured, when this event is triggered by a cell for a non-used frequency considered in that measurement (according to the criteria described in subclause 14.1.2.3):

2> if the "Reporting activation threshold" is equal to 0, or if the "Reporting activation threshold" is different from 0 and the number of cells included in the virtual active set for that frequency is greater than or equal to the "Reporting activation threshold":

3> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting":

4> rank all active and non-active primary CPICHs and take the *n* best cells to create a new "virtual active set", where *n* is the number of active primary CPICHs in the "virtual active set".

3> if the IE "UE autonomous update mode" is set to "on" or "off":

4> send a measurement report with IEs set as below:

5> set the Measurement identity to the identity of the inter-frequency measurement;

5> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1c, and in "Cell measurement event results" include the CPICH info of all the cells that satisfy the event, and the rest of the entries as the cells that were in the virtual active set before the event occurred and that are worse than the best cell that triggered the event, in the order of their measured value (best one first);

5> do not include the IEs "measured results" or "additional measured results".

If the IE "Intra-frequency measurement reporting criteria" is stored for an inter-frequency measurement, the IE "UE autonomous update mode" is set to "on" or "on with no reporting", but none of the Events 1a, 1b or 1c are configured:

1> the UE should continuously update the virtual active set to consist of all cells on frequency F_i considered in that inter-frequency measurement, without sending any corresponding measurement report.

If the IE "Intra-frequency measurement reporting criteria" is not stored for that inter-frequency measurement, the UE shall:

1> apply the events of type 1a, 1b and 1c that were defined for the used frequency in other stored measurements of type "intra-frequency" at the time the inter-frequency measurement was set up; and

1> update the virtual active set for the non-used frequencies considered in that measurement according to the following rules:

2> if several events of type 1a (resp. 1b,1c) were defined for the used frequency when the inter-frequency measurement was set up, only the first 1a event (resp 1b, 1c) that was defined in the measurement with the lowest measurement identity shall apply to the non-used frequencies;

2> all the cells considered in the inter-frequency measurements shall be able to affect the reporting range for event 1a and 1b. (i.e. the IE "Cells forbidden to affect reporting range" possibly stored for the intra-frequency measurements on the used frequency does not apply to the non-used frequencies considered in the inter-frequency measurement);

2> the IEs "amount of reporting" and "reporting interval" that were stored for the intra-frequency measurements on the used frequency shall not be considered if reports of the virtual active set updates are needed.

1> if event 1a is applicable to the non-used frequencies considered in the inter-frequency measurement, when this event is triggered (according to the criteria described in subclause 14.1.2.1) by a cell for a non-used frequency considered in that measurement:

2> if the "Reporting deactivation threshold" is equal to 0, or if the "Reporting deactivation threshold" is different from 0 and the number of cells included in the virtual active set for that frequency is less than or equal to the "Reporting deactivation threshold":

3> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting":

4> add the primary CPICH that enters the reporting range to the "virtual active set".

3> if the IE "UE autonomous update mode" is set to "on" or "off":

4> send a measurement report with IEs set as below:

5> set the Measurement identity to the identity of the inter-frequency measurement;

5> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1a, and in "Cell measurement event results" the CPICH info of the cell that triggered the event;

5> do not include the IEs "measured results" or "additional measured results".

1> if event 1b is applicable for the non-used frequencies considered in that inter-frequency measurement, when this event is triggered (according to the criteria described in subclause 14.1.2.2) by a cell for a non-used frequency considered in that measurement:

2> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting" and if the number of cells included in the virtual active set is greater than 1:

3> remove the primary CPICH that leaves the reporting range from the "virtual active set".

2> if the IE "UE autonomous update mode" is set to "on" or "off", send a measurement report with IEs set as below:

3> set the Measurement identity to the identity of the inter-frequency measurement;

3> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1b, and in "Cell measurement event results" the CPICH info of the cell that triggered the event;

3> do not include the IEs "measured results" or "additional measured results".

1> if event 1c is applicable for the non-used frequencies considered in that inter-frequency measurement, when this event is triggered (according to the criteria described in subclause 14.1.2.3) by a cell for a non-used frequency considered in that measurement:

2> if the "Reporting activation threshold" is equal to 0, or if the "Reporting activation threshold" is different from 0 and the number of cells included in the virtual active set for that frequency is greater than or equal to the "Reporting activation threshold":

3> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting":

4> rank all active and non-active primary CPICHs and take the *n* best cells to create a new "virtual active set", where *n* is the number of active primary CPICHs in the "virtual active set".

3> if the IE "UE autonomous update mode" is set to "on" or "off":

4> send a measurement report with IEs set as below:

5> set the Measurement identity to the identity of the inter-frequency measurement.

5> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1c, and in "Cell measurement event results" include the CPICH info of all the non-active cells which satisfy the event, and the rest of the entries as the cells that were in the virtual active set before the event occurred and that are worse than the best cell that triggered the event, in the order of their measured value (best one first);

5> do not include the IEs "measured results" or "additional measured results".

If the IE "Intra-frequency measurement reporting criteria" is not stored for an inter-frequency measurement, the IE "UE autonomous update mode" is set to "on" or "on with no reporting", but none of the Events 1a, 1b or 1c are defined for the used frequency in other stored measurements of type "intra-frequency" at the time the inter-frequency measurement was set up:

1> the UE should continuously update the virtual active set to consist of all cells on frequency F_i considered in that inter-frequency measurement, without sending any corresponding measurement report.

TSG-RAN Working Group 2 meeting #34 **R2-030516**
Sophia-Antipolis, France 17th – 21rd February 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.331** **CR** **1818** ⌘ **rev** **1** ⌘ Current version: **4.8.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☒ Core Network ☐

Title:	⌘	CM and state transition related to measurements, additional measurements, virtual active set and periodic measurements
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	January 2003
Category:	⌘	**F**
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)
Rel-6 (Release 6)

Reason for change: ⌘

1) It is unclear how the UE should handle referenced additional measurements which are not existing.

2) It is not specified how the UE shall update the VAS in case no concerning measurements are included.

3) Inconsistency in CM status flag setting and CM activation.

4) It is unclear if the UE is required to support measurement configurations which include multiple identical event identities for the same object.

5) In case of periodic measurement reporting, there is an inconsistency regarding when to sent the first MEASUREMENT REPORT message, and regarding what contents to have in subsequent MEASUREMENT REPORT messages.

6) It is not completely clear which uplink transport channels shall be taken into account for traffic volume measurement reporting and triggering.

7) Several confusing pictures incorrectly suggesting that the reporting range is limited in both the upward and downward direction.

See for more background on the proposed changes Tdoc R2-030135.

Summary of change: ⌘

Changes to R1 of this CR:

- The issue related to reading of SIB11/12 has been moved to a separate CR.

Additional changes in R0 of this CR:

1) The note added in 8.6.7.22 has been slightly reworded.

2) In section 8.1.1.1.2, a new paragraph is added to clarify that a UE implementation always ignoring SIB11/12 is not allowed.

3) Sections 8.4.2.2 and 8.6.7.8 are updated to reflect a freedom regarding when to sent the first report.

Changes proposed in original version of the CR:

1) Section 8.6.7.22: It is clarified that references to non-existing additional measurements should(R99)/shall(Rel4/5) be removed by the UE.

2) Section 14.11.2: It is specified for the concerning cases that the VAS should (R99)/shall(Rel4/5) consist of all cells on frequency F_i considered in that inter-frequency measurement.

3) Section 8.4.1.6.2: It is specified that the setting of the concerning CM status flags should be set in correspondance with the actual situation.

4) Sections 14.1.2, 14.2.1, 14.3.1, 14.4.2, 14.5.2, 14.6.2 and 14.7.3: It is clarified that the UE behaviour is undefined when the UE receives a measurement configuration with multiple identical event identies for the same object.

5) Sections 8.4.2.2 and 8.6.7.8 are proposed to be updated in order to consistently indicate when the first MEASUREMENT REPORT message shall be sent, and what the contents shall be of subsequent MEASUREMENT REPORT messages.

6) Section 8.4.1.10.1: it is clarified that the traffic volume measurement reporting and triggering is only relevant for transport channels applicable to the current RRC state.

7) Section 14.1.4.1, 14.1.5.2, 14.1.5.3. and 14.1.5.4: the confusing pictures are updated, showing a limit in one direction only.

8) Several smaller corrections have been made.

T1 impact:
No impact on T1 specifications is foreseen (the behaviour clarified in issue 6 is in line with the behaviour specified in two T1 test cases).

Backward compatibility:
1) Since the indicated behaviour is optional for R99, there is no impact on R99 UE's. Rel4/5 UE's not complying to the specified behaviour might include unintended additional measurement results in the reporting.

2) Since the indicated behaviour is optional for R99, there is no impact on R99 UE's. Rel4/5 UE's not complying to the specified behaviour might include incorrect cells in the VAS. A UTRAN should anyway not rely on the indicated behaviour before this CR is agreed.

3) The specified behaviour is considered a correction to an inconsistency in the specification. UE's not implementing this behaviour already will have an inconsistency in their internal bookkeeping, which is however not expected to lead to serious misbehaviour (e.g. the UE will anyway not have sufficient information to start the CM patterns automatically).

4) Since the proposed change limits UE functionality, it will not have any impact on the UE. A UTRAN implementation using the removed functionality was relying on not clearly specified behaviour.

5) The proposed changes are assumed to reflect RAN2 understanding. A UE not implementing the proposed behaviour might sent MEASUREMENT REPORT messages at the wrong instance and with incorrect contents, thus resulting in degraded UTRAN

		performance. 6) A UE not implementing this CR will report on unnecessary transport channels. 7) Issue concerns an informative section, so is not expected to effect UE or UTRAN implementations.
Consequences if not approved:	⌘	The indicated unclarities/incorrections will remain in the specification: 1) Unintended additional measurement inclusion; 2) Incorrect cells included in the VAS; 3) Incorrect internal UE bookkeeping w.r.t CM; 4) Unnessary UE complexity; 5) Unclarities w.r.t. periodic reporting will remain; 6) Reporting on unintended transport channels; 7) Confusion regarding reporting range will remain.

Clauses affected:	⌘	8.4.1.6.2; 8.4.1.10.1; 8.4.2.2; 8.6.7.8; 8.6.7.22; 10.3.6.53; 11.3; 14.1.2; 14.1.4.1; 14.1.5.2; 14.1.5.3; 14.1.5.4; 14.2.1; 14.3.1; 14.4.2; 14.5.2; 14.6.2; 14.7.3; 14.11.2			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

8.4.1.6.2 Inter-frequency measurement

Upon transition from CELL_DCH to CELL_FACH/ CELL_PCH/URA_PCH state, the UE shall:

1> stop the inter-frequency type measurement reporting assigned in a MEASUREMENT CONTROL message;

1> if the transition is due to a reconfiguration message which included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selects a cell other than that indicated by this IE on the current frequency (in case the IE "Frequency info" is not received) or other than that indicated by this IE on the frequency indicated by the IE "Frequency info" (when the IE "Frequency info" is included); or

1> if the transition is due to a reconfiguration message which does not include the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD); or

1> if the transition is not due to a reconfiguration message:

2> delete the measurements of type inter-frequency associated with the variable MEASUREMENT_IDENTITY and delete the corresponding compressed mode pattern.

1> for remaining compressed mode patterns, set the IE “TGPS Status Flag” to “deactivate” and the IE “Current TGPS Status Flag” to “inactive”in the variable TGPS_IDENTITY.

1> begin monitoring cells listed in the IE "inter-frequency cell info list" received in System Information Block type 12 (or System Information Block type 11, according to subclause 8.1.1.6.11);

1> in CELL_FACH state:

2> perform measurements on other frequencies according to the IE "FACH measurement occasion info".

8.4.1.10.1 Traffic volume measurement

When performing traffic volume event evaluation or reporting related to a certain transport channel, the UE shall consider all RBs which are mapped to the concerning transport channel e.g. if an additional RB is established on a transport channel used for event triggering or reporting, the new RB shall be taken into account.

NOTE: In this section, an “existing” uplink transport channel refers to a configured uplink transport channel applicable in the current RRC state.

The UE shall:

1> if the IE "Traffic volume measurement object" is included for this measurement:

2> while a transport channel that is referenced in the IE "Traffic volume measurement object" does not exist:

3> not perform any reporting related to this transport channel.

1> else:

2> report on all existing uplink transport channels; e.g. if an additional transport channel is established while the measurement is ongoing, this new transport channel shall be taken into account in the traffic volume measurement reporting.

For every traffic volume event, the UE shall:

1> if the IE "Uplink transport channel type" is not included in the IE "Traffic volume measurement reporting criteria", or the "Uplink transport channel type" has the value "DCH" or "USCH" and the IE "UL transport channel id" is not included in the IE "Traffic volume measurement reporting criteria":

2> if the IE "Traffic volume measurement object" is not included:

3> take all existing UL transport channels into account for event triggering; e.g. if an additional transport channel is established while the measurement is ongoing, this new transport channel shall be taken into account in the traffic volume event triggering.

2> else:

3> while a transport channel that is referenced in the IE "Traffic Volume Measurement object" does not exist:

4> not take this transport channel identity into account in the traffic volume measurement triggering.

1> else:

2> while a transport channel that is referenced in the IE "Traffic Volume Measurement Reporting Criteria" does not exist:

3> not take this transport channel identity into account in the traffic volume event triggering.

8.4.2.2 Initiation

In CELL_DCH state, the UE shall:

1> transmit a MEASUREMENT REPORT message on the uplink DCCH when the reporting criteria stored in variable MEASUREMENT_IDENTITY are met for any ongoing measurements that are being performed in the UE.

In CELL_FACH state, the UE shall:

1> transmit a MEASUREMENT REPORT message on the uplink DCCH when the reporting criteria stored in variable MEASUREMENT_IDENTITY are met for any ongoing traffic volume measurement or UE positioning measurement that is being performed in the UE;

1> include a measurement report in the IE "Measured results on RACH", as specified in the IE "Intra-frequency reporting quantity for RACH reporting" and the IE "Maximum number of reported cells on RACH" in System Information Block type 12 (or "System Information Block Type 11" if "System Information Block Type 12" is not being broadcast);

1> include in the IE "Measured results on RACH" all requested reporting quantities for cells for which measurements are reported.

In TDD, if the Radio Bearer associated with the MEASUREMENT_IDENTITY fulfilling the reporting criteria for an ongoing traffic volume measurement is mapped on transport channel of type USCH, the UE shall:

1> initiate the "PUSCH CAPACITY REQUEST" procedure instead of transmitting a MEASUREMENT REPORT (TDD Only).

In CELL_PCH or URA_PCH state, the UE shall:

1> first perform the cell update procedure according to subclause 8.3.1, using the cause "uplink data transmission", in order to transit to CELL_FACH state; and then

1> transmit a MEASUREMENT REPORT message on the uplink DCCH when the reporting criteria stored in variable MEASUREMENT_IDENTITY are fulfilled for any ongoing traffic volume measurement or UE positioning measurement which is being performed in the UE.

The reporting criteria are fulfilled if either:

- a periodic MEASUREMENT REPORT message shall be sent according to the IE “Periodical Reporting Criteria”; or~~ the first measurement has been completed according to the requirements set in [19] or [20] for a newly initiated measurement with periodic reporting; or~~

~~- the time period indicated in the stored IE "Periodical reporting criteria" has elapsed since the last measurement report was submitted to lower layers for a given measurement; or~~

- an event in stored IE "Measurement reporting criteria" was triggered. Events and triggering of reports for different measurement types are described in detail in clause 14.

For the measurement, which triggered the MEASUREMENT REPORT message, the UE shall:

1> set the IE "measurement identity" to the measurement identity, which is associated with that measurement in variable MEASUREMENT_IDENTITY;

1> set the IE "measured results" to include measurements according to the IE "reporting quantity" of that measurement stored in variable MEASUREMENT_IDENTITY; and

2> if all the reporting quantities are set to "false":

3> not set the IE "measured results".

1> set the IE "Measured results" in the IE "Additional measured results" according to the IE "reporting quantity" for all measurements associated with the measurement identities included in the "Additional measurements list" stored in variable MEASUREMENT_IDENTITY of the measurement that triggered the measurement report; and

2> if more than one additional measured results are to be included:

3> sort them in ascending order according to their IE "measurement identity" in the MEASUREMENT REPORT message.

1> if the MEASUREMENT REPORT message was triggered by an event (i.e. not a periodical report):

2> set the IE "Event results" according to the event that triggered the report.

1> if the observed time difference for one or more GSM cells is included in the MEASUREMENT REPORT message:

2> set the IE "GSM OTD reference cell" to the primary CPICH info of the active set cell that was used as reference for the measurement.

The UE shall:

1> transmit the MEASUREMENT REPORT message on the uplink DCCH using either AM or UM RLC according to the stored IE "measurement reporting mode" associated with the measurement identity that triggered the report.

When the MEASUREMENT REPORT message has been submitted to lower layers for transmission:

1> the procedure ends.

8.6.7.8 Periodical Reporting Criteria

If the IE "Periodical Reporting Criteria" is received by the UE, the UE shall:

1> store the contents of the IE "Amount of Reporting" and IE "Reporting interval" in the variable MEASUREMENT_IDENTITY.

For the first MEASUREMENT REPORT message, the UE shall:

1> send the MEASUREMENT REPORT as soon as ~~at the end of the first reporting interval in which~~ all requested reporting quantities are available according to the requirements and the measurement capabilities set in [19] and [20] for at least one measurement object stored in the variable MEASUREMENT_IDENTITY, but never later than one reporting interval after measurement initiation.

Following the first MEASUREMENT REPORT message, the UE shall:

1> send a ~~subsequent~~ MEASUREMENT REPORT message one ~~with intervals specified by the IE "R~~reporting interval ~~"~~after the previous MEASUREMENT REPORT message;

~~1> omit measurement results that were reported in a previous MEASUREMENT REPORT and for which new measurement results are not available in the present reporting interval.~~

The first and subsequent periodic MEASUREMENT REPORT messages shall only include measured results for reporting quantities that are available according to the requirements and the measurement capabilities set in [19] and [20]i.e if no measured results are available, the IE “Measured Results”shall not be included in the MEASUREMENT REPORT message.

After the UE has sent a total number of MEASUREMENT REPORT messages, which equal the value indicated in the IE "Amount of reporting", the UE shall:

1> terminate measurement reporting; and

1> delete all measurement information linked with the "Measurement identity" of the ongoing measurement from the variable MEASUREMENT_IDENTITY.

8.6.7.22 Additional Measurement List

If the IE "Additional Measurement List" is received in a MEASUREMENT CONTROL message, the UE shall:

1> if the received measurement configuration in this MEASUREMENT CONTROL message, or any measurement referenced in the "Additional Measurement List" do not all have the same validity:

2> set the variable CONFIGURATION_INCOMPLETE to TRUE.

1> if any of the measurements referenced in the "Additional Measurement List" is an intra-frequency, inter-frequence or inter-RAT measurement, and this measurement is configured with event based reporting:

2> the UE behaviour is not specified.

If, at any time during the life-time of a measurement, any measurement referenced in the Additional Measurement List does not exist, the UE shall remove this measurement identity from the Additional Measurement List.

Note: A measurement referenced in the Additional Measurement List which is updated with a measurement command set to “modify”, or replaced with a measurement command set to “setup”, continues to exist.

If the measurement configured with the MEASUREMENT CONTROL message triggers a measurement report, the UE shall also include the reporting quantities for the measurements referenced by the additional measurement identities. The contents of the IE "Additional Measured results" is completely determined by the measurement configuration of the referenced additional measurement.

10.3.6.53 PRACH partitioning

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Access Service class	MP	1 to maxASC		If only "NumASC+1" (with, NumASC+1 < maxASC) ASCs are listed, the remaining (NumASC+2 through maxASC) ASCs are unspecified.
>ASC Setting	MD		ASC setting 10.3.6.6	The default values are same as the previous ASC. If the "default" is used for the first ASC, the default values are all available signatures and "all available sub-channels" for FDD and "all available channelisation codes" and "all available subchannels" with "subchannel size=Size 1" in TDD.

11.3 Information element definitions

…….

```
PeriodicalReportingCriteria ::=     SEQUENCE {
    reportingAmount                     ReportingAmount                 DEFAULT ra-Infinity,
    reportingInterval                   ReportingIntervalLong
}
```

……

```
ReportingIntervalLong ::=           ENUMERATED {
                                        ril0, ril0-25, ril0-5, ril1,
                                        ril2, ril3, ril4, ril6, ril8,
                                        ril12, ril16, ril20, ril24,
                                        ril28, ril32, ril64 }
                                    -- When the value “ril0” is used, the UE behaviour is not
                                    -- defined.
```

……

14.1.2 Intra-frequency reporting events for FDD

Within the measurement reporting criteria field in the Measurement Control message the UTRAN notifies the UE which events should trigger a measurement report. The listed events are the toolbox from which the UTRAN can choose the reporting events that are needed for the implemented handover evaluation function, or other radio network functions.

All the specified events are measured with respect to any of the measurement quantities given in subclause 14.1.1. The measurement quantities are measured on the monitored primary common pilot channels (CPICH) of the cell defined in the measurement object.

Special mechanisms for the events are illustrated in subclause 14.1.4 and 14.1.5.

NOTE: The events below are numbered 1A, 1B, 1C,… since all intra-frequency reporting events would be labelled 1X, inter-frequency reporting events would be labelled 2X, and so on for the other measurement types.

When one intra-frequency measurement identity corresponds to multiple intra-frequency events with identical event identities, the UE behaviour is not specified.

14.1.4 Event-triggered periodic intra-frequency measurement reports (informative)

14.1.4.1 Cell addition failure (FDD only)

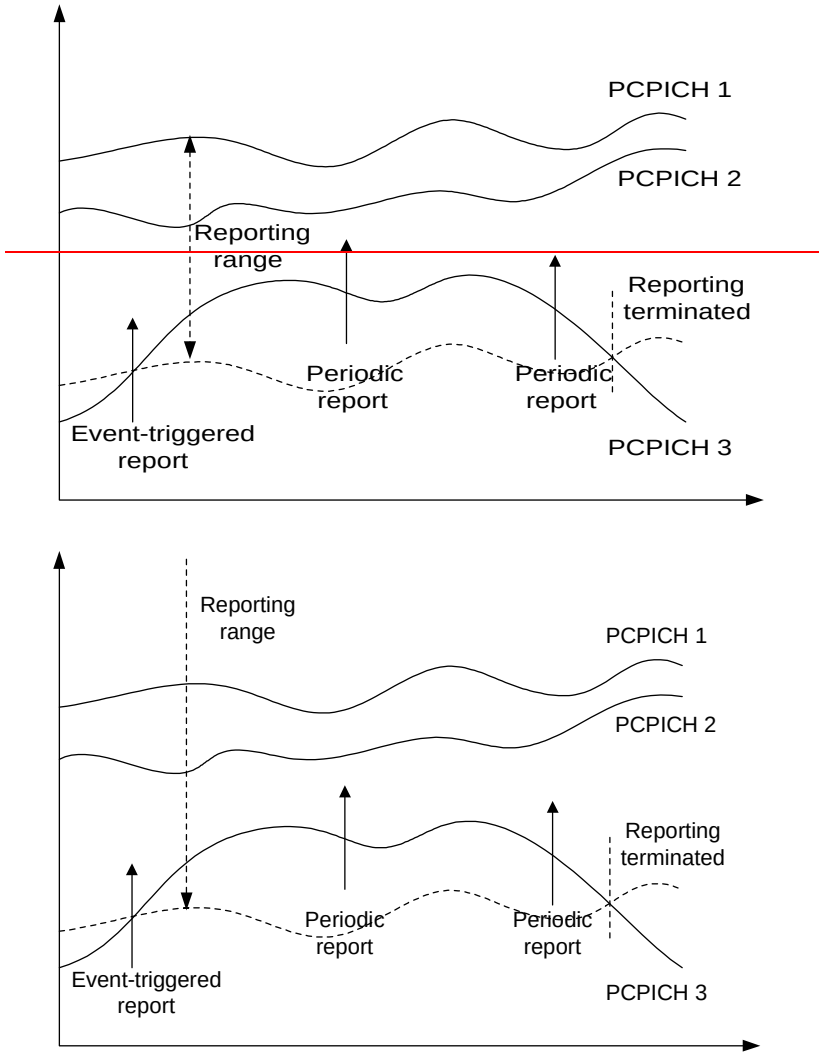

Figure 14.1.4.1-1: Periodic reporting triggered by event 1A

When a cell enters the reporting range and triggers event 1A, the UE shall transmit a MEASUREMENT REPORT to the UTRAN and typically this may result in an update of the active set. However, in some situations the UTRAN may be unable to add a strong cell to the active set typically due to capacity shortage for example.

The UE shall continue reporting after the initial report by reverting to periodical measurement reporting if the reported cell is not added to the active set. This is illustrated in Figure 14.1.4.1-1. During periodic reporting the UE shall transmit MEASUREMENT REPORT messages to the UTRAN at predefined intervals. The reports shall include reporting information of the cells in the current active set and of the monitored cell(s) in the reporting range.

Event-triggered periodic measurement reporting shall be terminated if:

1> there are no longer any monitored cell(s) within the reporting range; or

1> the UTRAN has added cells to the active set so that it includes the maximum number of cells (defined by the **reporting deactivation threshold** parameter), which are allowed for event 1A to be triggered; or

1> the UE has sent the maximum number of MEASUREMENT REPORT messages (defined by the **amount of reporting** parameter).

The reporting period is assigned by the UTRAN (with the **Reporting interval** parameter). If the reporting interval is set to zero event-triggered periodic measurement reporting shall not be applied.

14.1.5.2 Time-to-trigger

To limit the measurement signalling load, a time-to-trigger parameter could be connected with each reporting event given above. The value of the time-to-trigger is given to the UE in the Reporting criteria field of the Measurement Control message.

The effect of the time-to-trigger is that the report is triggered only after the conditions for the event have existed for the specified time-to-trigger. In the following FDD example in Figure 14.1.5.2-1, the use of time-to-trigger means that the event (primary CPICH 3 enters the reporting range) is not reported until is has been within the range for the time given by the time-to-trigger parameter.

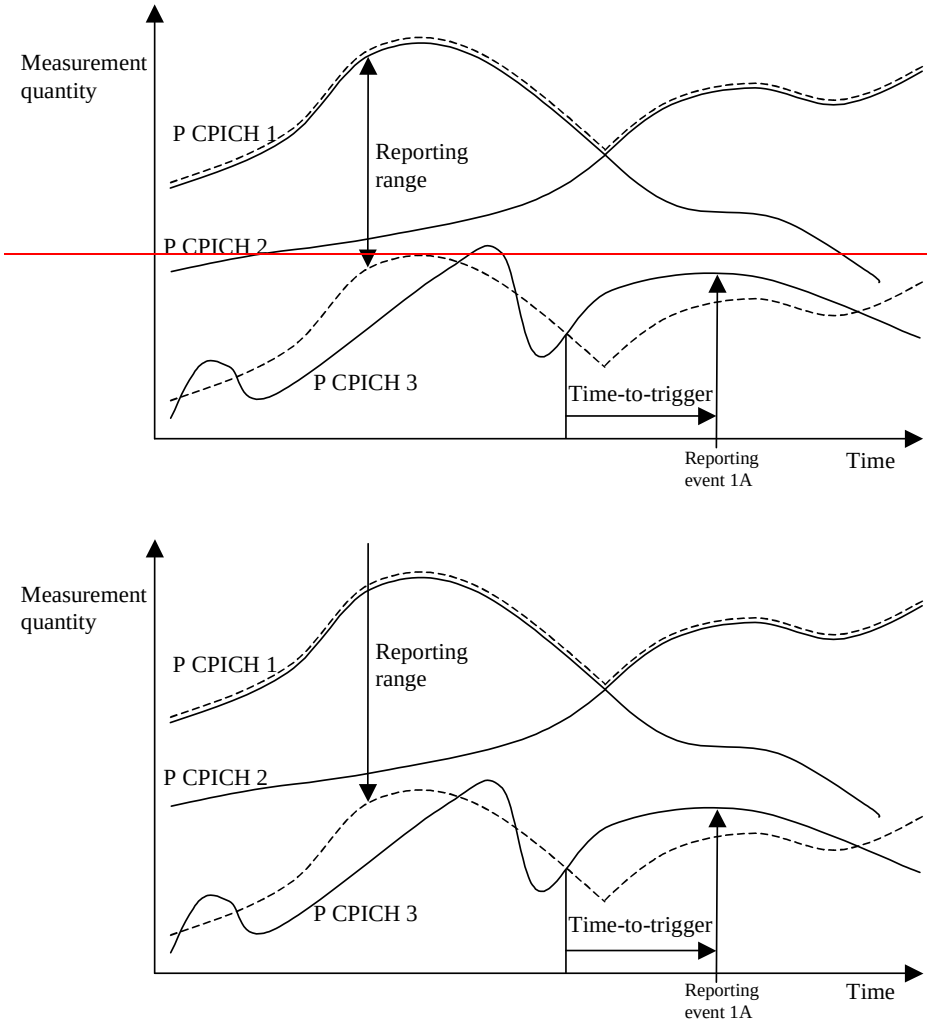

Figure 14.1.5.2-1: Time-to-trigger limits the amount of measurement reports

In the following TDD example in Figure 14.1.5.2-2, the use of time-to-trigger means that the event (Timeslot ISCP upon certain threshold) is not reported until it has been upon the threshold for the time given by the time-to trigger parameter.

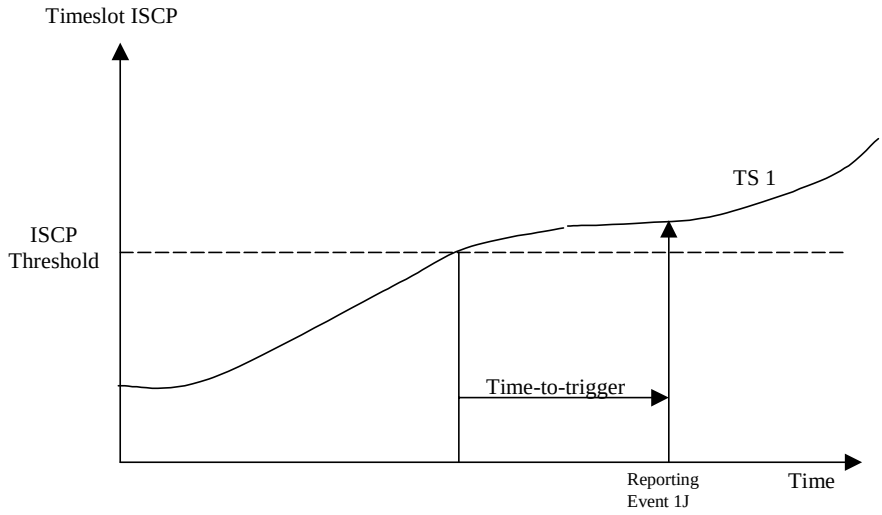

Figure 14.1.5.2-2: Time-to-trigger limits the amount of measurement reports

NOTE: The time-to-trigger could be combined with hysteresis, i.e. a hysteresis value is added to the measurement quantity before evaluating if the time-to-trigger timer should be started.

14.1.5.3 Cell individual offsets

For each cell that is monitored, an offset can be assigned with inband signalling. The offset can be either positive or negative. The offset is added to the measurement quantity before the UE evaluates if an event has occurred. The UE receives the cell individual offsets for each primary CPICH(FDD)/CCPCH(TDD) in the IE "Cell individual offset" included in the IE "Cell info" associated with each measurement object included in the MEASUREMENT CONTROL message.

For the FDD example, in Figure 14.1.5.3-1, since an offset is added to primary CPICH 3, it is the dotted curve that is used to evaluate if an event occurs. Hence, this means that measurement reports from UE to UTRAN are triggered when primary CPICH plus the corresponding offset, i.e. the dotted curve, leaves and enters the reporting range and when it gets better than primary CPICH 1 (if these events have been ordered by UTRAN). This offset mechanism provides the network with an efficient tool to change the reporting of an individual primary CPICH.

By applying a positive offset, as in Figure 14.1.5.3-1, the UE will send measurement reports as if the primary CPICH is offset *x* dB better than what it really is. This could be useful if the operator knows that a specific cell is interesting to monitor more carefully, even though it is not so good for the moment. In the example in Figure 14.1.5.3-1, the operator might know by experience that in this area primary CPICH 3 can become good very quickly (e.g. due to street corners) and therefore that it is worth reporting more intensively. Depending on the implemented handover evaluation algorithm, this may result in the cell with primary CPICH 3 being included in the active set earlier than would have been the case without the positive offset.

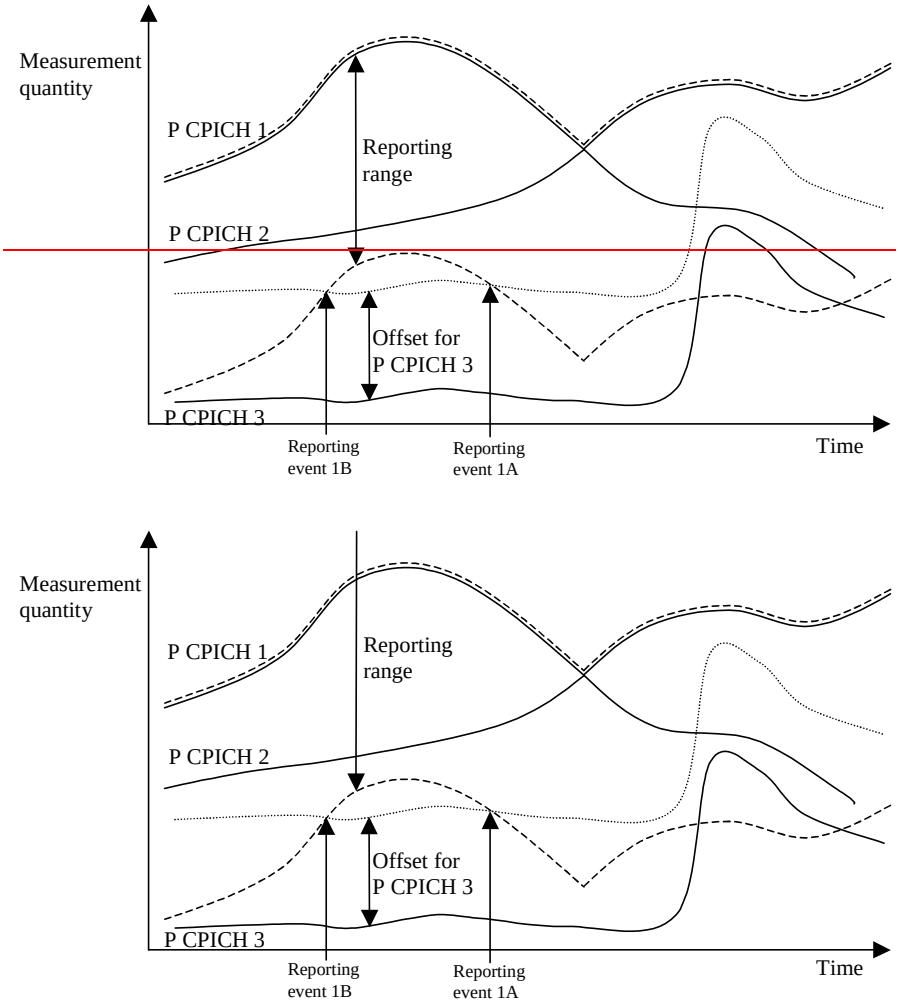

Figure 14.1.5.3-1: A positive offset is applied to primary CPICH 3 before event evaluation in the UE

For the TDD example, in Figure 14.1.5.3-2, an offset is added to primary CCPCH2, it is the dotted curve that is used to evaluate if the primary CCPCH2 becomes better than primary CCPCH1 (ordered by the UTRAN).

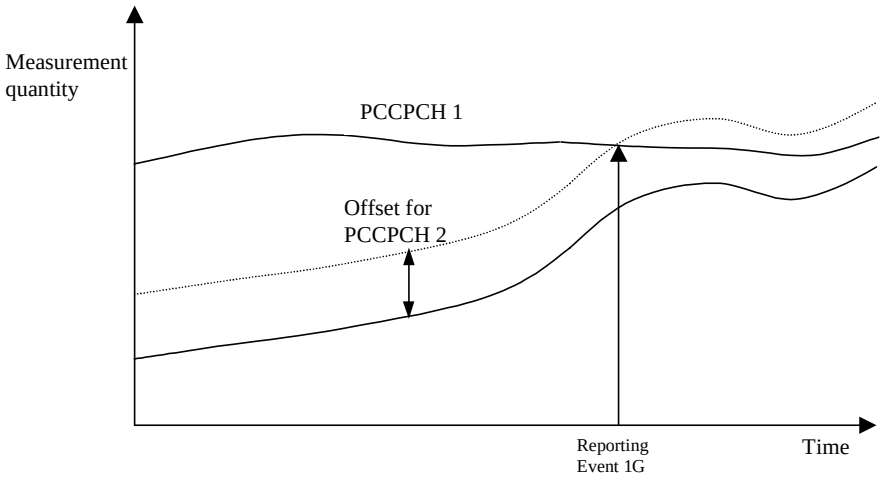

Figure 14.1.5.3-2: A positive offset is applied to primary CCPCH 2

Correspondingly, the operator can choose to apply a negative offset to a primary CCPCH. Then the reporting on that primary CCPCH is limited and the corresponding cell may be, at least temporarily excluded from the active set or as a target cell for handover.

It is important to note that the offset is added before triggering events, i.e. the offset is added by the UE before evaluating if a measurement report should be sent as opposed to offsets that are applied in the network and used for the actual handover evaluation. It should also be noted that the cell individual offset is not used in all measurement reporting events, and that it is not applied to all events in the same way.

14.1.5.4 Forbid a Primary CPICH to affect the reporting range (FDD only)

The reporting range affects the reporting events 1A and 1B presented above. The reporting range is defined as a function of all the Primary CPICHs in the active set (see 14.1.2.1 and 14.1.2.2). If the parameter W is set to 0, the reporting range is defined relative to the best Primary CPICH. However, there could be cases where it is good to forbid a specific Primary CPICH to affect the reporting range. For example in Figure 14.1.5.4-1 the network has requested the UE to not let Primary CPICH 3 affect the reporting range. This mechanism could be effective if the operator knows by experience that the quality of Primary CPICH 3 is very unstable in a specific area and therefore should not affect the reporting of the other Primary CPICHs.

The UE shall ignore that a Primary CPICH is forbidden to affect the reporting range if all of the following conditions are fulfilled:

- the Primary CPICH is included in active set; and
- all cells in active set are defined as Primary CPICHs forbidden to affect the reporting range.

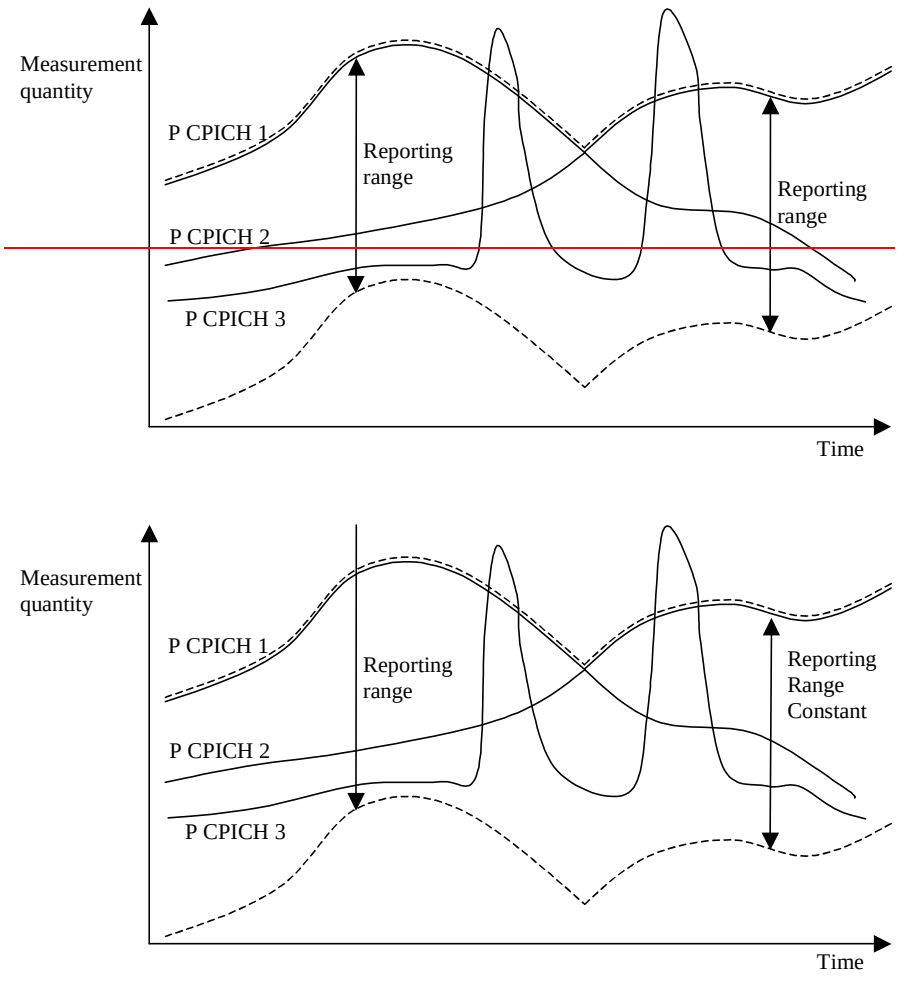

Figure 14.1.5.4-1: Primary CPICH 3 is forbidden to affect the reporting range

14.2.1 Inter-frequency reporting events

Within the measurement reporting criteria field in the MEASUREMENT CONTROL message UTRAN notifies the UE which events should trigger the UE to send a MEASUREMENT REPORT message. The listed events are the toolbox from which the UTRAN can choose the reporting events that are needed for the implemented handover evaluation function, or other radio network functions.

All events are evaluated with respect to one of the measurement quantities given in subclause 14.2.0a. The measurement quantities are measured on the monitored primary common pilot channels (CPICH) in FDD mode and the monitored primary common control channels (PCCPCH) in TDD mode of the cell defined in the measurement object. A "non-used frequency" is a frequency that the UE has been ordered to measure upon but is not used for the connection. A "used frequency" is a frequency that the UE has been ordered to measure upon and is also currently used for the connection.

The "monitored set on non-used frequency" consists of cells in "cells for measurement" (or all cells in CELL_INFO_LIST if "cells for measurement" is not present) that are not part of the virtual active set on that non-used frequency.

When one inter-frequency measurement identity corresponds to multiple intra-frequency or inter-frequency events with identical event identities, the UE behaviour is not specified.

14.3.1 Inter-RAT reporting events

Within the measurement reporting criteria field in the MEASUREMENT CONTROL message the UTRAN notifies the UE which events should trigger the UE to send a MEASUREMENT REPORT message. The listed events are the toolbox from which the UTRAN can choose the reporting events that are needed for the implemented handover evaluation function, or other radio network functions.

All events are measured with respect to one of the measurement quantities given in subclause 14.3.0a, and of the frequency quality estimate given in subclause 14.3.0b. For UTRAN the measurement quantities are measured on the monitored primary common pilot channels (CPICH) in FDD mode and the monitored primary common control channels (PCCPCH) in TDD mode of the cell defined in the measurement object. For other RATs the measurement quantities are system-specific. A "used UTRAN frequency" is a frequency that the UE have been ordered to measure upon and is also currently used for the connection to UTRAN. "Other system" is e.g. GSM.

In the text below describing the events:

- "The BCCH ARFCN and BSIC combinations considered in that inter-RAT measurement" shall be understood as the BCCH ARFCN and BSIC combinations of the inter-RAT cells pointed at in the IE "Cells for measurement" if it has been received for that inter-RAT measurement, or otherwise of the cells included in the "inter-RAT cell info" part of the variable CELL_INFO LIST.
- "The BCCH ARFCNs considered in that inter-RAT measurement" shall be understood as the BCCH ARFCNs of the inter-RAT cells pointed at in the IE "Cells for measurement" if it has been received for that inter-RAT measurement, or otherwise of the cells included in the "inter-RAT cell info" part of the variable CELL_INFO LIST.

When one inter-RAT measurement identity corresponds to multiple inter-RAT events with identical event identities, the UE behaviour is not specified.

14.4.2 Traffic Volume reporting triggers

Traffic volume measurement reports can be triggered using two different mechanisms, periodical and event triggered. The reporting criteria are specified in the measurement control message.

All the specified events are evaluated with respect to the Transport Channel Traffic Volume (TCTV). This quantity is equal to the sum of the Buffer Occupancy for all logical channels mapped onto a transport channel. The events on a given transport channel shall be evaluated at least at every TTI (may be more often) as described in [15].

When one traffic volume measurement identity corresponds to multiple traffic volume events with identical event identities for the same transport channel, the UE behaviour is not specified.

When a traffic volume measurement is set up, the UE shall:

// Rest of section is omitted //

14.5.2 Quality reporting events

When one measurement identity corresponds to multiple quality events for the same transport channel, the UE behaviour is not specified.

14.6.2 UE internal measurement reporting events

In the Measurement reporting criteria field in the Measurement Control messages, the UTRAN notifies the UE of which events should trigger a measurement report. UE internal measurement reporting events that can trigger a report are given below. The reporting events are marked with vertical arrows in the figures below. All events can be combined with time-to-trigger.

NOTE: The reporting events are numbered 6A, 6B, 6C,.. where 6 denotes that the event belongs to the type UE internal measurements.

When one measurement identity corresponds to multiple internal events with identical event identities, the UE behaviour is not defined.

14.7.3 UE positioning reporting events

In the IE "UE positioning reporting criteria" in the Measurement Control messages, the UTRAN notifies the UE of which events should trigger a measurement report. UE positioning reporting events that can trigger a report are given below. The content of the measurement report is dependant on the positioning method and method type requested in the IE "UE positioning reporting quantity" of the Measurement Control message and is described in detail in [18].

When one measurement identity corresponds to multiple positioning events with identical event identities, the UE behaviour is not defined.

14.11.2 Virtual active set update during an inter-frequency measurement

If the IE "Intra-frequency measurement reporting criteria" is stored for an inter-frequency measurement, the UE shall:

1> if Event 1a is configured in that IE, when this event is triggered by a cell for a non-used frequency considered in that measurement (according to the criteria described in subclause 14.1.2.1):

2> if the "Reporting deactivation threshold" is equal to 0, or if the "Reporting deactivation threshold" is different from 0 and the number of cells included in the virtual active set for that frequency is less than or equal to the "Reporting deactivation threshold":

3> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting":

4> add the primary CPICH that enters the reporting range to the "virtual active set".

3> if the IE "UE autonomous update mode" is set to "on" or "off":

4> send a measurement report with IEs set as below:

5> set the Measurement identity to the identity of the inter-frequency measurement;

5> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1a, and in "Cell measurement event results" the CPICH info of the cell that triggered the event;

5> do not include the IEs "measured results" or "additional measured results".

1> if Event 1b was configured, when this event is triggered by a cell for a non-used frequency considered in that measurement (according to the criteria described in subclause 14.1.2.2):

2> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting" and if the number of cells included in the virtual active set is greater than 1:

3> remove the primary CPICH that leaves the reporting range from the "virtual active set".

2> if the IE "UE autonomous update mode" is set to "on" or "off":

3> send a measurement report with IEs set as below:

4> set the Measurement identity to the identity of the inter-frequency measurement;

4> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1b, and in "Cell measurement event results" the CPICH info of the cell that triggered the event;

4> do not include the IEs "measured results" or "additional measured results".

1> if Event 1c was configured, when this event is triggered by a cell for a non-used frequency considered in that measurement (according to the criteria described in subclause 14.1.2.3):

2> if the "Reporting activation threshold" is equal to 0, or if the "Reporting activation threshold" is different from 0 and the number of cells included in the virtual active set for that frequency is greater than or equal to the "Reporting activation threshold":

3> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting":

4> rank all active and non-active primary CPICHs and take the *n* best cells to create a new "virtual active set", where *n* is the number of active primary CPICHs in the "virtual active set".

3> if the IE "UE autonomous update mode" is set to "on" or "off":

4> send a measurement report with IEs set as below:

5> set the Measurement identity to the identity of the inter-frequency measurement;

5> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1c, and in "Cell measurement event results" include the CPICH

info of all the cells that satisfy the event, and the rest of the entries as the cells that were in the virtual active set before the event occurred and that are worse than the best cell that triggered the event, in the order of their measured value (best one first);

5> do not include the IEs "measured results" or "additional measured results".

If the IE "Intra-frequency measurement reporting criteria" is stored for an inter-frequency measurement, the IE "UE autonomous update mode" is set to "on" or "on with no reporting", but none of the Events 1a, 1b or 1c are configured:

1> the UE shall continuously update the virtual active set to consist of all cells on frequency F_i considered in that inter-frequency measurement, without sending any corresponding measurement report.

If the IE "Intra-frequency measurement reporting criteria" is not stored for that inter-frequency measurement, the UE shall:

1> apply the events of type 1a, 1b and 1c that were defined for the used frequency in other stored measurements of type "intra-frequency" at the time the inter-frequency measurement was set up; and

1> update the virtual active set for the non-used frequencies considered in that measurement according to the following rules:

2> if several events of type 1a (resp. 1b,1c) were defined for the used frequency when the inter-frequency measurement was set up, only the first 1a event (resp 1b, 1c) that was defined in the measurement with the lowest measurement identity shall apply to the non-used frequencies;

2> all the cells considered in the inter-frequency measurements shall be able to affect the reporting range for event 1a and 1b. (i.e. the IE "Cells forbidden to affect reporting range" possibly stored for the intra-frequency measurements on the used frequency does not apply to the non-used frequencies considered in the inter-frequency measurement);

2> the IEs "amount of reporting" and "reporting interval" that were stored for the intra-frequency measurements on the used frequency shall not be considered if reports of the virtual active set updates are needed.

1> if event 1a is applicable to the non-used frequencies considered in the inter-frequency measurement, when this event is triggered (according to the criteria described in subclause 14.1.2.1) by a cell for a non-used frequency considered in that measurement:

2> if the "Reporting deactivation threshold" is equal to 0, or if the "Reporting deactivation threshold" is different from 0 and the number of cells included in the virtual active set for that frequency is less than or equal to the "Reporting deactivation threshold":

3> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting":

4> add the primary CPICH that enters the reporting range to the "virtual active set".

3> if the IE "UE autonomous update mode" is set to "on" or "off":

4> send a measurement report with IEs set as below:

5> set the Measurement identity to the identity of the inter-frequency measurement;

5> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1a, and in "Cell measurement event results" the CPICH info of the cell that triggered the event;

5> do not include the IEs "measured results" or "additional measured results".

1> if event 1b is applicable for the non-used frequencies considered in that inter-frequency measurement, when this event is triggered (according to the criteria described in subclause 14.1.2.2) by a cell for a non-used frequency considered in that measurement:

2> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting" and if the number of cells included in the virtual active set is greater than 1:

3> remove the primary CPICH that leaves the reporting range from the "virtual active set".

2> if the IE "UE autonomous update mode" is set to "on" or "off", send a measurement report with IEs set as below:

3> set the Measurement identity to the identity of the inter-frequency measurement;

3> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1b, and in "Cell measurement event results" the CPICH info of the cell that triggered the event;

3> do not include the IEs "measured results" or "additional measured results".

1> if event 1c is applicable for the non-used frequencies considered in that inter-frequency measurement, when this event is triggered (according to the criteria described in subclause 14.1.2.3) by a cell for a non-used frequency considered in that measurement:

2> if the "Reporting activation threshold" is equal to 0, or if the "Reporting activation threshold" is different from 0 and the number of cells included in the virtual active set for that frequency is greater than or equal to the "Reporting activation threshold":

3> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting":

4> rank all active and non-active primary CPICHs and take the *n* best cells to create a new "virtual active set", where *n* is the number of active primary CPICHs in the "virtual active set".

3> if the IE "UE autonomous update mode" is set to "on" or "off":

4> send a measurement report with IEs set as below:

5> set the Measurement identity to the identity of the inter-frequency measurement.

5> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1c, and in "Cell measurement event results" include the CPICH info of all the non-active cells which satisfy the event, and the rest of the entries as the cells that were in the virtual active set before the event occurred and that are worse than the best cell that triggered the event, in the order of their measured value (best one first);

5> do not include the IEs "measured results" or "additional measured results".

If the IE "Intra-frequency measurement reporting criteria" is not stored for an inter-frequency measurement, the IE "UE autonomous update mode" is set to "on" or "on with no reporting", but none of the Events 1a, 1b or 1c are defined for the used frequency in other stored measurements of type "intra-frequency" at the time the inter-frequency measurement was set up:

1> the UE shall continuously update the virtual active set to consist of all cells on frequency F_i considered in that inter-frequency measurement, without sending any corresponding measurement report.

TSG-RAN Working Group 2 meeting #34 **R2-030517**
Sophia-Antipolis, France 17th – 21rd February 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.331** **CR** **1819** ⌘ **rev** **1** ⌘ Current version: **5.3.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☒ Core Network ☐

Title:	⌘	CM and state transition related to measurements, additional measurements, virtual active set and periodic measurements
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	January 2003
Category:	⌘	**A**
Release:	⌘	Rel-5

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)*
Rel-6	*(Release 6)*

Reason for change: ⌘

1) It is unclear how the UE should handle referenced additional measurements which are not existing.

2) It is not specified how the UE shall update the VAS in case no concerning measurements are included.

3) Inconsistency in CM status flag setting and CM activation.

4) It is unclear if the UE is required to support measurement configurations which include multiple identical event identities for the same object.

5) In case of periodic measurement reporting, there is an inconsistency regarding when to sent the first MEASUREMENT REPORT message, and regarding what contents to have in subsequent MEASUREMENT REPORT messages.

6) It is not completely clear which uplink transport channels shall be taken into account for traffic volume measurement reporting and triggering.

7) Several confusing pictures incorrectly suggesting that the reporting range is limited in both the upward and downward direction.

See for more background on the proposed changes Tdoc R2-030135.

Summary of change: ⌘

Changes to R1 of this CR:

- The issue related to reading of SIB11/12 has been moved to a separate CR.

Additional changes in R0 of this CR:

1) The note added in 8.6.7.22 has been slightly reworded.

2) In section 8.1.1.1.2, a new paragraph is added to clarify that a UE implementation always ignoring SIB11/12 is not allowed.

3) Sections 8.4.2.2 and 8.6.7.8 are updated to reflect a freedom regarding when to sent the first report.

Changes proposed in original version of the CR:

1) Section 8.6.7.22: It is clarified that references to non-existing additional measurements should(R99)/shall(Rel4/5) be removed by the UE.

2) Section 14.11.2: It is specified for the concerning cases that the VAS should (R99)/shall(Rel4/5) consist of all cells on frequency F_i considered in that inter-frequency measurement.

3) Section 8.4.1.6.2: It is specified that the setting of the concerning CM status flags should be set in correspondance with the actual situation.

4) Sections 14.1.2, 14.2.1, 14.3.1, 14.4.2, 14.5.2, 14.6.2 and 14.7.3: It is clarified that the UE behaviour is undefined when the UE receives a measurement configuration with multiple identical event identies for the same object.

5) Sections 8.4.2.2 and 8.6.7.8 are proposed to be updated in order to consistently indicate when the first MEASUREMENT REPORT message shall be sent, and what the contents shall be of subsequent MEASUREMENT REPORT messages.

6) Section 8.4.1.10.1: it is clarified that the traffic volume measurement reporting and triggering is only relevant for transport channels applicable to the current RRC state.

7) Section 14.1.4.1, 14.1.5.2, 14.1.5.3. and 14.1.5.4: the confusing pictures are updated, showing a limit in one direction only.

8) Several smaller corrections have been made.

T1 impact:
No impact on T1 specifications is foreseen (the behaviour clarified in issue 6 is in line with the behaviour specified in two T1 test cases).

Backward compatibility:
1) Since the indicated behaviour is optional for R99, there is no impact on R99 UE's. Rel4/5 UE's not complying to the specified behaviour might include unintended additional measurement results in the reporting.

2) Since the indicated behaviour is optional for R99, there is no impact on R99 UE's. Rel4/5 UE's not complying to the specified behaviour might include incorrect cells in the VAS. A UTRAN should anyway not rely on the indicated behaviour before this CR is agreed.

3) The specified behaviour is considered a correction to an inconsistency in the specification. UE's not implementing this behaviour already will have an inconsistency in their internal bookkeeping, which is however not expected to lead to serious misbehaviour (e.g. the UE will anyway not have sufficient information to start the CM patterns automatically).

4) Since the proposed change limits UE functionality, it will not have any impact on the UE. A UTRAN implementation using the removed functionality was relying on not clearly specified behaviour.

5) The proposed changes are assumed to reflect RAN2 understanding. A UE not implementing the proposed behaviour might sent MEASUREMENT REPORT messages at the wrong instance and with incorrect contents, thus resulting in degraded UTRAN

		performance. 6) A UE not implementing this CR will report on unnecessary transport channels. 7) Issue concerns an informative section, so is not expected to effect UE or UTRAN implementations.
Consequences if not approved:	⌘	The indicated unclarities/incorrections will remain in the specification: 1) Unintended additional measurement inclusion; 2) Incorrect cells included in the VAS; 3) Incorrect internal UE bookkeeping w.r.t CM; 4) Unnessary UE complexity; 5) Unclarities w.r.t. periodic reporting will remain; 6) Reporting on unintended transport channels; 7) Confusion regarding reporting range will remain.

Clauses affected:	⌘	8.4.1.6.2; 8.4.1.10.1; 8.4.2.2; 8.6.7.8; 8.6.7.22; 10.3.6.53; 11.3; 14.1.2; 14.1.4.1; 14.1.5.2; 14.1.5.3; 14.1.5.4; 14.2.1; 14.3.1; 14.4.2; 14.5.2; 14.6.2; 14.7.3; 14.11.2			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

8.4.1.6.2 Inter-frequency measurement

Upon transition from CELL_DCH to CELL_FACH/ CELL_PCH/URA_PCH state, the UE shall:

1> stop the inter-frequency type measurement reporting assigned in a MEASUREMENT CONTROL message;

1> if the transition is due to a reconfiguration message which included the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD), and the UE selects a cell other than that indicated by this IE on the current frequency (in case the IE "Frequency info" is not received) or other than that indicated by this IE on the frequency indicated by the IE "Frequency info" (when the IE "Frequency info" is included); or

1> if the transition is due to a reconfiguration message which does not include the IE "Primary CPICH info" (for FDD) or "Primary CCPCH info" (for TDD); or

1> if the transition is not due to a reconfiguration message:

2> delete the measurements of type inter-frequency associated with the variable MEASUREMENT_IDENTITY and delete the corresponding compressed mode pattern.

1> for remaining compressed mode patterns, set the IE “TGPS Status Flag” to “deactivate” and the IE “Current TGPS Status Flag” to “inactive”in the variable TGPS_IDENTITY.

1> begin monitoring cells listed in the IE "inter-frequency cell info list" received in System Information Block type 12 (or System Information Block type 11, according to subclause 8.1.1.6.11);

1> in CELL_FACH state:

2> perform measurements on other frequencies according to the IE "FACH measurement occasion info".

8.4.1.10.1 Traffic volume measurement

When performing traffic volume event evaluation or reporting related to a certain transport channel, the UE shall consider all RBs which are mapped to the concerning transport channel e.g. if an additional RB is established on a transport channel used for event triggering or reporting, the new RB shall be taken into account.

NOTE: In this section, an “existing” uplink transport channel refers to a configured uplink transport channel applicable in the current RRC state.

The UE shall:

1> if the IE "Traffic volume measurement object" is included for this measurement:

2> while a transport channel that is referenced in the IE "Traffic volume measurement object" does not exist:

3> not perform any reporting related to this transport channel.

1> else:

2> report on all existing uplink transport channels; e.g. if an additional transport channel is established while the measurement is ongoing, this new transport channel shall be taken into account in the traffic volume measurement reporting.

For every traffic volume event, the UE shall:

1> if the IE "Uplink transport channel type" is not included in the IE "Traffic volume measurement reporting criteria", or the "Uplink transport channel type" has the value "DCH" or "USCH" and the IE "UL transport channel id" is not included in the IE "Traffic volume measurement reporting criteria":

2> if the IE "Traffic volume measurement object" is not included:

3> take all existing UL transport channels into account for event triggering; e.g. if an additional transport channel is established while the measurement is ongoing, this new transport channel shall be taken into account in the traffic volume event triggering.

2> else:

3> while a transport channel that is referenced in the IE "Traffic Volume Measurement object" does not exist:

4> not take this transport channel identity into account in the traffic volume measurement triggering.

1> else:

2> while a transport channel that is referenced in the IE "Traffic Volume Measurement Reporting Criteria" does not exist:

3> not take this transport channel identity into account in the traffic volume event triggering.

8.4.2.2 Initiation

In CELL_DCH state, the UE shall:

1> transmit a MEASUREMENT REPORT message on the uplink DCCH when the reporting criteria stored in variable MEASUREMENT_IDENTITY are met for any ongoing measurements that are being performed in the UE.

In CELL_FACH state, the UE shall:

1> transmit a MEASUREMENT REPORT message on the uplink DCCH when the reporting criteria stored in variable MEASUREMENT_IDENTITY are met for any ongoing traffic volume measurement or UE positioning measurement that is being performed in the UE;

1> include a measurement report in the IE "Measured results on RACH", as specified in the IE "Intra-frequency reporting quantity for RACH reporting" and the IE "Maximum number of reported cells on RACH" in System Information Block type 12 (or "System Information Block Type 11" if "System Information Block Type 12" is not being broadcast);

1> include in the IE "Measured results on RACH" all requested reporting quantities for cells for which measurements are reported.

In TDD, if the Radio Bearer associated with the MEASUREMENT_IDENTITY fulfilling the reporting criteria for an ongoing traffic volume measurement is mapped on transport channel of type USCH, the UE shall:

1> initiate the "PUSCH CAPACITY REQUEST" procedure instead of transmitting a MEASUREMENT REPORT (TDD Only).

In CELL_PCH or URA_PCH state, the UE shall:

1> first perform the cell update procedure according to subclause 8.3.1, using the cause "uplink data transmission", in order to transit to CELL_FACH state; and then

1> transmit a MEASUREMENT REPORT message on the uplink DCCH when the reporting criteria stored in variable MEASUREMENT_IDENTITY are fulfilled for any ongoing traffic volume measurement or UE positioning measurement which is being performed in the UE.

The reporting criteria are fulfilled if either:

- a periodic MEASUREMENT REPORT message shall be sent according to the IE “Periodical Reporting Criteria”; or~~ the first measurement has been completed according to the requirements set in [19] or [20] for a newly initiated measurement with periodic reporting; or~~

~~- the time period indicated in the stored IE "Periodical reporting criteria" has elapsed since the last measurement report was submitted to lower layers for a given measurement; or~~

- an event in stored IE "Measurement reporting criteria" was triggered. Events and triggering of reports for different measurement types are described in detail in clause 14.

For the measurement, which triggered the MEASUREMENT REPORT message, the UE shall:

1> set the IE "measurement identity" to the measurement identity, which is associated with that measurement in variable MEASUREMENT_IDENTITY;

1> set the IE "measured results" to include measurements according to the IE "reporting quantity" of that measurement stored in variable MEASUREMENT_IDENTITY; and

2> if all the reporting quantities are set to "false":

3> not set the IE "measured results".

1> set the IE "Measured results" in the IE "Additional measured results" according to the IE "reporting quantity" for all measurements associated with the measurement identities included in the "Additional measurements list" stored in variable MEASUREMENT_IDENTITY of the measurement that triggered the measurement report; and

2> if more than one additional measured results are to be included:

3> sort them in ascending order according to their IE "measurement identity" in the MEASUREMENT REPORT message.

1> if the MEASUREMENT REPORT message was triggered by an event (i.e. not a periodical report):

2> set the IE "Event results" according to the event that triggered the report.

1> if the observed time difference for one or more GSM cells is included in the MEASUREMENT REPORT message:

2> set the IE "GSM OTD reference cell" to the primary CPICH info of the active set cell that was used as reference for the measurement.

The UE shall:

1> transmit the MEASUREMENT REPORT message on the uplink DCCH using either AM or UM RLC according to the stored IE "measurement reporting mode" associated with the measurement identity that triggered the report.

When the MEASUREMENT REPORT message has been submitted to lower layers for transmission:

1> the procedure ends.

8.6.7.8 Periodical Reporting Criteria

If the IE "Periodical Reporting Criteria" is received by the UE, the UE shall:

1> store the contents of the IE "Amount of Reporting" and IE "Reporting interval" in the variable MEASUREMENT_IDENTITY.

For the first MEASUREMENT REPORT message, the UE shall:

1> send the MEASUREMENT REPORT as soon as ~~at the end of the first reporting interval in which~~ all requested reporting quantities are available according to the requirements and the measurement capabilities set in [19] and [20] for at least one measurement object stored in the variable MEASUREMENT_IDENTITY, but never later than one reporting interval after measurement initiation.

Following the first MEASUREMENT REPORT message, the UE shall:

1> send a ~~subsequent~~ MEASUREMENT REPORT message one ~~with intervals specified by the IE "R~~reporting interval~~"~~ after the previous MEASUREMENT REPORT message;

~~1> omit measurement results that were reported in a previous MEASUREMENT REPORT and for which new measurement results are not available in the present reporting interval.~~

The first and subsequent periodic MEASUREMENT REPORT messages shall only include measured results for reporting quantities that are available according to the requirements and the measurement capabilities set in [19] and [20]i.e if no measured results are available, the IE “Measured Results”shall not be included in the MEASUREMENT REPORT message.

After the UE has sent a total number of MEASUREMENT REPORT messages, which equal the value indicated in the IE "Amount of reporting", the UE shall:

1> terminate measurement reporting; and

1> delete all measurement information linked with the "Measurement identity" of the ongoing measurement from the variable MEASUREMENT_IDENTITY.

8.6.7.22 Additional Measurement List

If the IE "Additional Measurement List" is received in a MEASUREMENT CONTROL message, the UE shall:

1> if the received measurement configuration in this MEASUREMENT CONTROL message, or any measurement referenced in the "Additional Measurement List" do not all have the same validity:

2> set the variable CONFIGURATION_INCOMPLETE to TRUE.

1> if any of the measurements referenced in the "Additional Measurement List" is an intra-frequency, inter-frequence or inter-RAT measurement, and this measurement is configured with event based reporting:

2> the UE behaviour is not specified.

If, at any time during the life-time of a measurement, any measurement referenced in the Additional Measurement List does not exist, the UE shall remove this measurement identity from the Additional Measurement List.

Note: A measurement referenced in the Additional Measurement List which is updated with a measurement command set to “modify”, or replaced with a measurement command set to “setup”, continues to exist.

If the measurement configured with the MEASUREMENT CONTROL message triggers a measurement report, the UE shall also include the reporting quantities for the measurements referenced by the additional measurement identities. The contents of the IE "Additional Measured results" is completely determined by the measurement configuration of the referenced additional measurement.

10.3.6.53 PRACH partitioning

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Access Service class	MP	1 to maxASC		If only "NumASC+1" (with, NumASC+1 < maxASC) ASCs are listed, the remaining (NumASC+2 through maxASC) ASCs are unspecified.
>ASC Setting	MD		ASC setting 10.3.6.6	The default values are same as the previous ASC. If the "default" is used for the first ASC, the default values are all available signatures and "all available sub-channels" for FDD and "all available channelisation codes" and "all available subchannels" with "subchannel size=Size 1" in TDD.

11.3 Information element definitions

…….

```
PeriodicalReportingCriteria ::=     SEQUENCE {
    reportingAmount                     ReportingAmount                 DEFAULT ra-Infinity,
    reportingInterval                   ReportingIntervalLong
}
```

……

```
ReportingIntervalLong ::=           ENUMERATED {
                                        ril0, ril0-25, ril0-5, ril1,
                                        ril2, ril3, ril4, ril6, ril8,
                                        ril12, ril16, ril20, ril24,
                                        ril28, ril32, ril64 }
                                    -- When the value “ril0” is used, the UE behaviour is not
                                    -- defined.
```

……

14.1.2 Intra-frequency reporting events for FDD

Within the measurement reporting criteria field in the Measurement Control message the UTRAN notifies the UE which events should trigger a measurement report. The listed events are the toolbox from which the UTRAN can choose the reporting events that are needed for the implemented handover evaluation function, or other radio network functions.

All the specified events are measured with respect to any of the measurement quantities given in subclause 14.1.1. The measurement quantities are measured on the monitored primary common pilot channels (CPICH) of the cell defined in the measurement object.

Special mechanisms for the events are illustrated in subclause 14.1.4 and 14.1.5.

NOTE: The events below are numbered 1A, 1B, 1C,… since all intra-frequency reporting events would be labelled 1X, inter-frequency reporting events would be labelled 2X, and so on for the other measurement types.

When one intra-frequency measurement identity corresponds to multiple intra-frequency events with identical event identities, the UE behaviour is not specified.

14.1.4 Event-triggered periodic intra-frequency measurement reports (informative)

14.1.4.1 Cell addition failure (FDD only)

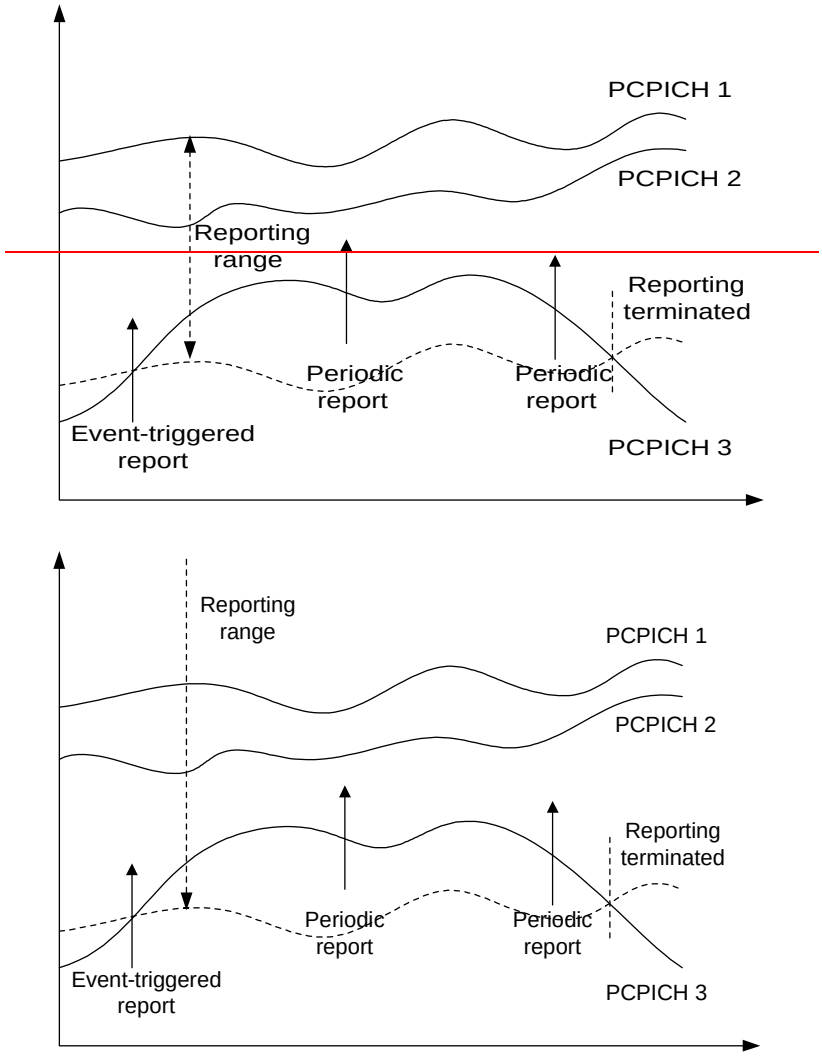

Figure 14.1.4.1-1: Periodic reporting triggered by event 1A

When a cell enters the reporting range and triggers event 1A, the UE shall transmit a MEASUREMENT REPORT to the UTRAN and typically this may result in an update of the active set. However, in some situations the UTRAN may be unable to add a strong cell to the active set typically due to capacity shortage for example.

The UE shall continue reporting after the initial report by reverting to periodical measurement reporting if the reported cell is not added to the active set. This is illustrated in Figure 14.1.4.1-1. During periodic reporting the UE shall transmit MEASUREMENT REPORT messages to the UTRAN at predefined intervals. The reports shall include reporting information of the cells in the current active set and of the monitored cell(s) in the reporting range.

Event-triggered periodic measurement reporting shall be terminated if:

1> there are no longer any monitored cell(s) within the reporting range; or

1> the UTRAN has added cells to the active set so that it includes the maximum number of cells (defined by the **reporting deactivation threshold** parameter), which are allowed for event 1A to be triggered; or

1> the UE has sent the maximum number of MEASUREMENT REPORT messages (defined by the **amount of reporting** parameter).

The reporting period is assigned by the UTRAN (with the **Reporting interval** parameter). If the reporting interval is set to zero event-triggered periodic measurement reporting shall not be applied.

14.1.5.2 Time-to-trigger

To limit the measurement signalling load, a time-to-trigger parameter could be connected with each reporting event given above. The value of the time-to-trigger is given to the UE in the Reporting criteria field of the Measurement Control message.

The effect of the time-to-trigger is that the report is triggered only after the conditions for the event have existed for the specified time-to-trigger. In the following FDD example in Figure 14.1.5.2-1, the use of time-to-trigger means that the event (primary CPICH 3 enters the reporting range) is not reported until is has been within the range for the time given by the time-to-trigger parameter.

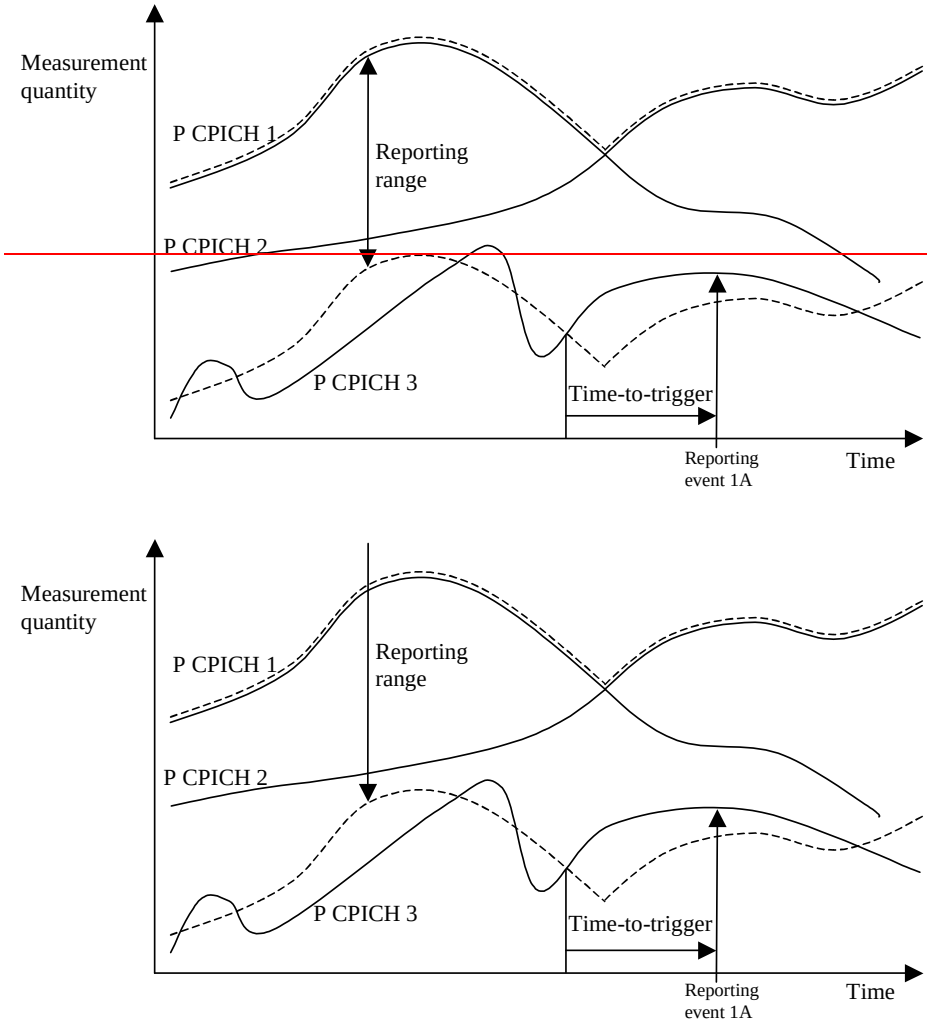

Figure 14.1.5.2-1: Time-to-trigger limits the amount of measurement reports

In the following TDD example in Figure 14.1.5.2-2, the use of time-to-trigger means that the event (Timeslot ISCP upon certain threshold) is not reported until it has been upon the threshold for the time given by the time-to trigger parameter.

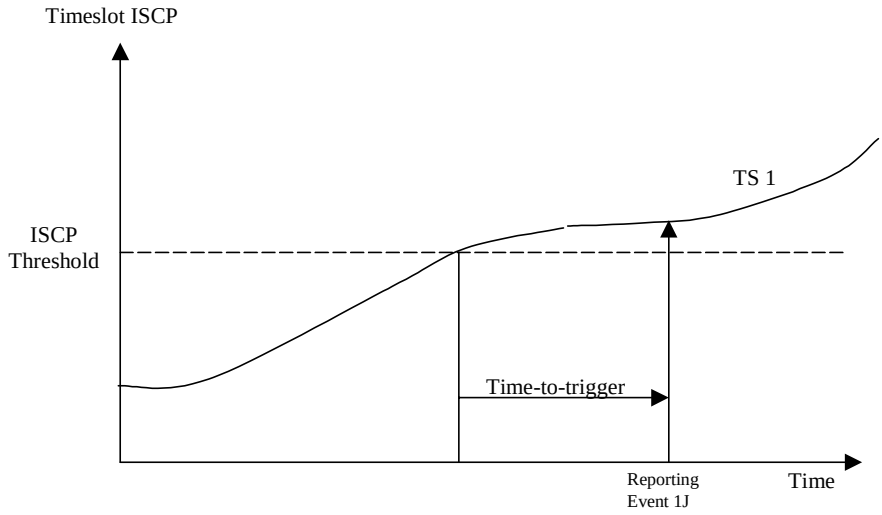

Figure 14.1.5.2-2: Time-to-trigger limits the amount of measurement reports

NOTE: The time-to-trigger could be combined with hysteresis, i.e. a hysteresis value is added to the measurement quantity before evaluating if the time-to-trigger timer should be started.

14.1.5.3 Cell individual offsets

For each cell that is monitored, an offset can be assigned with inband signalling. The offset can be either positive or negative. The offset is added to the measurement quantity before the UE evaluates if an event has occurred. The UE receives the cell individual offsets for each primary CPICH(FDD)/CCPCH(TDD) in the IE "Cell individual offset" included in the IE "Cell info" associated with each measurement object included in the MEASUREMENT CONTROL message.

For the FDD example, in Figure 14.1.5.3-1, since an offset is added to primary CPICH 3, it is the dotted curve that is used to evaluate if an event occurs. Hence, this means that measurement reports from UE to UTRAN are triggered when primary CPICH plus the corresponding offset, i.e. the dotted curve, leaves and enters the reporting range and when it gets better than primary CPICH 1 (if these events have been ordered by UTRAN). This offset mechanism provides the network with an efficient tool to change the reporting of an individual primary CPICH.

By applying a positive offset, as in Figure 14.1.5.3-1, the UE will send measurement reports as if the primary CPICH is offset *x* dB better than what it really is. This could be useful if the operator knows that a specific cell is interesting to monitor more carefully, even though it is not so good for the moment. In the example in Figure 14.1.5.3-1, the operator might know by experience that in this area primary CPICH 3 can become good very quickly (e.g. due to street corners) and therefore that it is worth reporting more intensively. Depending on the implemented handover evaluation algorithm, this may result in the cell with primary CPICH 3 being included in the active set earlier than would have been the case without the positive offset.

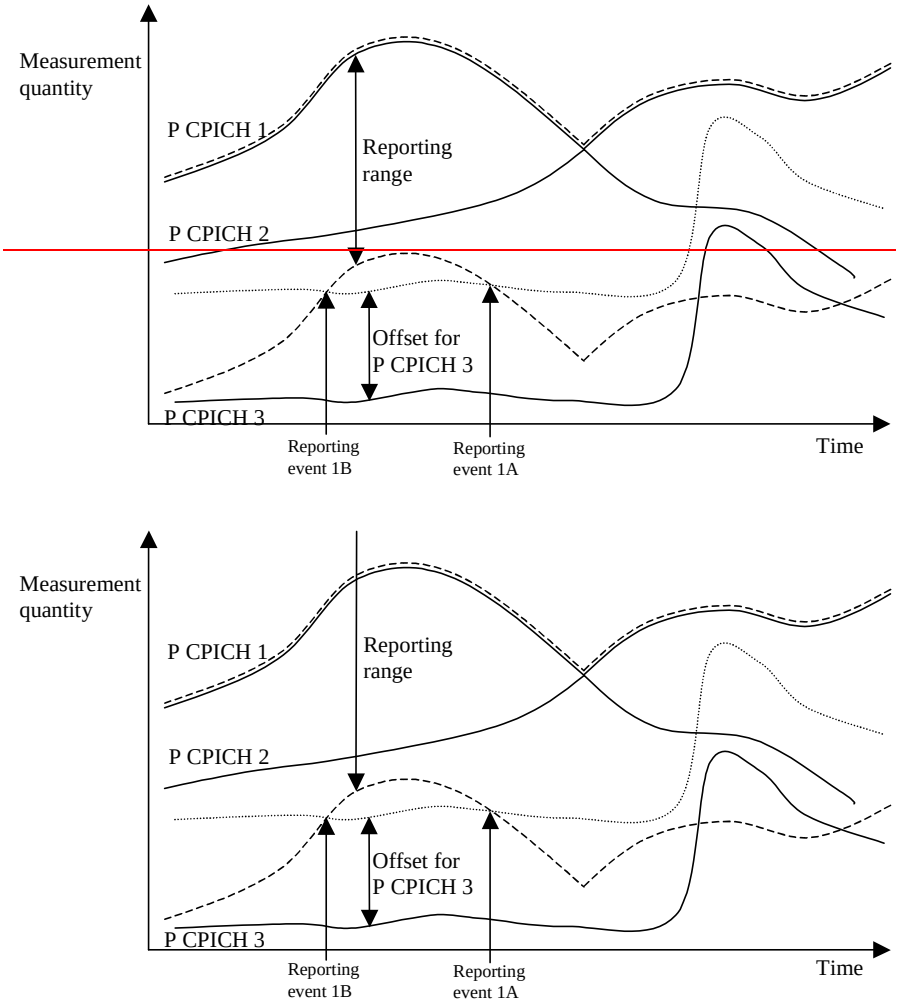

Figure 14.1.5.3-1: A positive offset is applied to primary CPICH 3 before event evaluation in the UE

For the TDD example, in Figure 14.1.5.3-2, an offset is added to primary CCPCH2, it is the dotted curve that is used to evaluate if the primary CCPCH2 becomes better than primary CCPCH1 (ordered by the UTRAN).

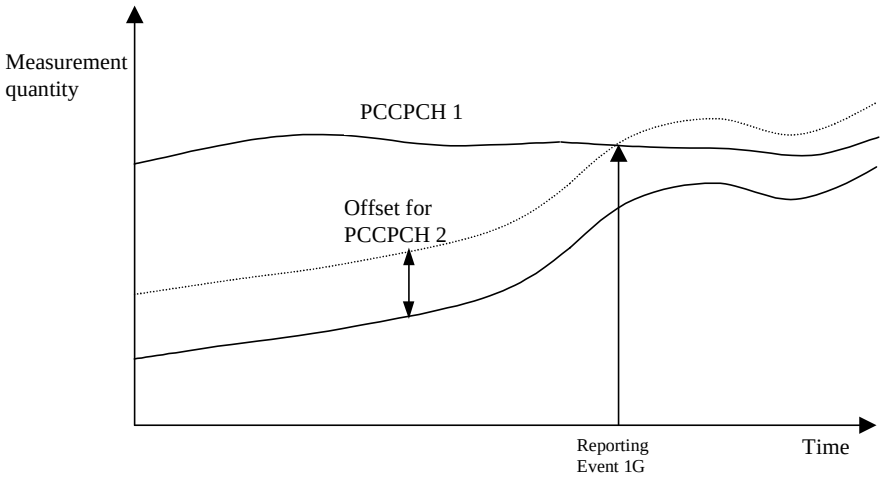

Figure 14.1.5.3-2: A positive offset is applied to primary CCPCH 2

Correspondingly, the operator can choose to apply a negative offset to a primary CCPCH. Then the reporting on that primary CCPCH is limited and the corresponding cell may be, at least temporarily excluded from the active set or as a target cell for handover.

It is important to note that the offset is added before triggering events, i.e. the offset is added by the UE before evaluating if a measurement report should be sent as opposed to offsets that are applied in the network and used for the actual handover evaluation. It should also be noted that the cell individual offset is not used in all measurement reporting events, and that it is not applied to all events in the same way.

14.1.5.4 Forbid a Primary CPICH to affect the reporting range (FDD only)

The reporting range affects the reporting events 1A and 1B presented above. The reporting range is defined as a function of all the Primary CPICHs in the active set (see 14.1.2.1 and 14.1.2.2). If the parameter W is set to 0, the reporting range is defined relative to the best Primary CPICH. However, there could be cases where it is good to forbid a specific Primary CPICH to affect the reporting range. For example in Figure 14.1.5.4-1 the network has requested the UE to not let Primary CPICH 3 affect the reporting range. This mechanism could be effective if the operator knows by experience that the quality of Primary CPICH 3 is very unstable in a specific area and therefore should not affect the reporting of the other Primary CPICHs.

The UE shall ignore that a Primary CPICH is forbidden to affect the reporting range if all of the following conditions are fulfilled:

- the Primary CPICH is included in active set; and
- all cells in active set are defined as Primary CPICHs forbidden to affect the reporting range.

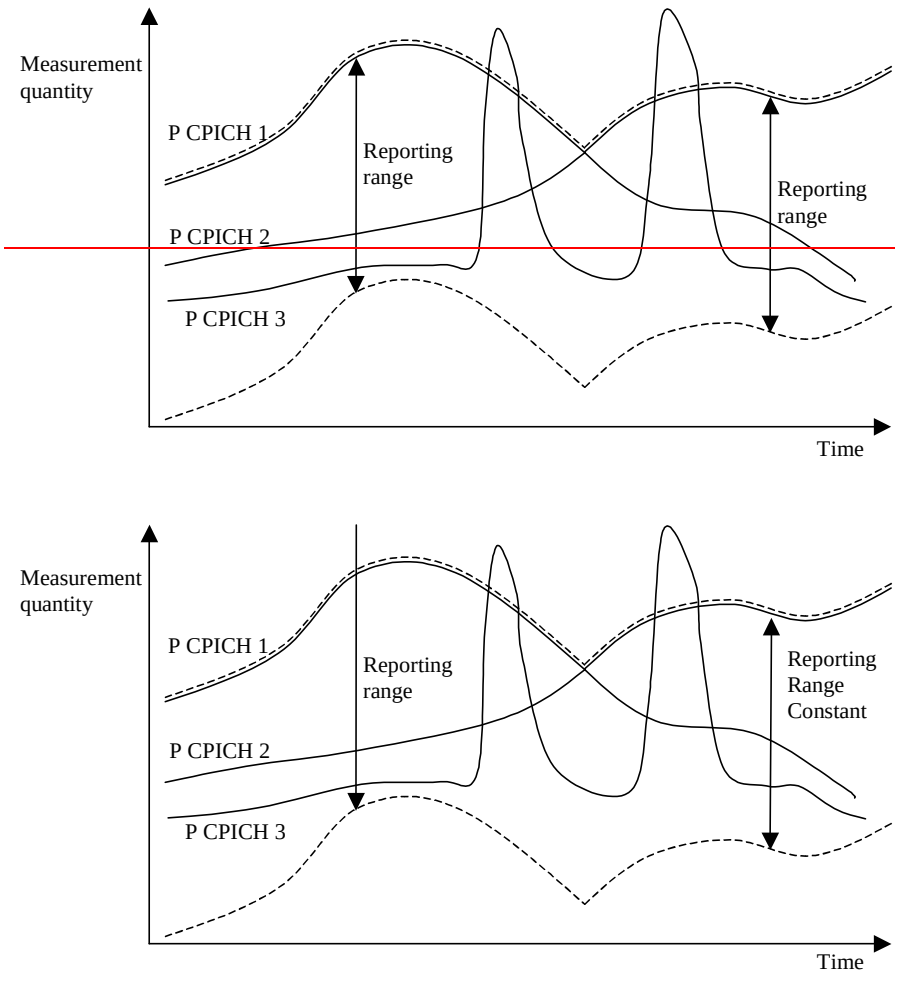

Figure 14.1.5.4-1: Primary CPICH 3 is forbidden to affect the reporting range

14.2.1 Inter-frequency reporting events

Within the measurement reporting criteria field in the MEASUREMENT CONTROL message UTRAN notifies the UE which events should trigger the UE to send a MEASUREMENT REPORT message. The listed events are the toolbox from which the UTRAN can choose the reporting events that are needed for the implemented handover evaluation function, or other radio network functions.

All events are evaluated with respect to one of the measurement quantities given in subclause 14.2.0a. The measurement quantities are measured on the monitored primary common pilot channels (CPICH) in FDD mode and the monitored primary common control channels (PCCPCH) in TDD mode of the cell defined in the measurement object. A "non-used frequency" is a frequency that the UE has been ordered to measure upon but is not used for the connection. A "used frequency" is a frequency that the UE has been ordered to measure upon and is also currently used for the connection.

The "monitored set on non-used frequency" consists of cells in "cells for measurement" (or all cells in CELL_INFO_LIST if "cells for measurement" is not present) that are not part of the virtual active set on that non-used frequency.

When one inter-frequency measurement identity corresponds to multiple intra-frequency or inter-frequency events with identical event identities, the UE behaviour is not specified.

14.3.1 Inter-RAT reporting events

Within the measurement reporting criteria field in the MEASUREMENT CONTROL message the UTRAN notifies the UE which events should trigger the UE to send a MEASUREMENT REPORT message. The listed events are the toolbox from which the UTRAN can choose the reporting events that are needed for the implemented handover evaluation function, or other radio network functions.

All events are measured with respect to one of the measurement quantities given in subclause 14.3.0a, and of the frequency quality estimate given in subclause 14.3.0b. For UTRAN the measurement quantities are measured on the monitored primary common pilot channels (CPICH) in FDD mode and the monitored primary common control channels (PCCPCH) in TDD mode of the cell defined in the measurement object. For other RATs the measurement quantities are system-specific. A "used UTRAN frequency" is a frequency that the UE have been ordered to measure upon and is also currently used for the connection to UTRAN. "Other system" is e.g. GSM.

In the text below describing the events:

- "The BCCH ARFCN and BSIC combinations considered in that inter-RAT measurement" shall be understood as the BCCH ARFCN and BSIC combinations of the inter-RAT cells pointed at in the IE "Cells for measurement" if it has been received for that inter-RAT measurement, or otherwise of the cells included in the "inter-RAT cell info" part of the variable CELL_INFO LIST.
- "The BCCH ARFCNs considered in that inter-RAT measurement" shall be understood as the BCCH ARFCNs of the inter-RAT cells pointed at in the IE "Cells for measurement" if it has been received for that inter-RAT measurement, or otherwise of the cells included in the "inter-RAT cell info" part of the variable CELL_INFO LIST.

When one inter-RAT measurement identity corresponds to multiple inter-RAT events with identical event identities, the UE behaviour is not specified.

14.4.2 Traffic Volume reporting triggers

Traffic volume measurement reports can be triggered using two different mechanisms, periodical and event triggered. The reporting criteria are specified in the measurement control message.

All the specified events are evaluated with respect to the Transport Channel Traffic Volume (TCTV). This quantity is equal to the sum of the Buffer Occupancy for all logical channels mapped onto a transport channel. The events on a given transport channel shall be evaluated at least at every TTI (may be more often) as described in [15].

When one traffic volume measurement identity corresponds to multiple traffic volume events with identical event identities for the same transport channel, the UE behaviour is not specified.

When a traffic volume measurement is set up, the UE shall:

// Rest of section is omitted //

14.5.2 Quality reporting events

When one measurement identity corresponds to multiple quality events for the same transport channel, the UE behaviour is not specified.

14.6.2 UE internal measurement reporting events

In the Measurement reporting criteria field in the Measurement Control messages, the UTRAN notifies the UE of which events should trigger a measurement report. UE internal measurement reporting events that can trigger a report are given below. The reporting events are marked with vertical arrows in the figures below. All events can be combined with time-to-trigger.

NOTE: The reporting events are numbered 6A, 6B, 6C,.. where 6 denotes that the event belongs to the type UE internal measurements.

When one measurement identity corresponds to multiple internal events with identical event identities, the UE behaviour is not defined.

14.7.3 UE positioning reporting events

In the IE "UE positioning reporting criteria" in the Measurement Control messages, the UTRAN notifies the UE of which events should trigger a measurement report. UE positioning reporting events that can trigger a report are given below. The content of the measurement report is dependant on the positioning method and method type requested in the IE "UE positioning reporting quantity" of the Measurement Control message and is described in detail in [18].

When one measurement identity corresponds to multiple positioning events with identical event identities, the UE behaviour is not defined.

14.11.2 Virtual active set update during an inter-frequency measurement

If the IE "Intra-frequency measurement reporting criteria" is stored for an inter-frequency measurement, the UE shall:

1> if Event 1a is configured in that IE, when this event is triggered by a cell for a non-used frequency considered in that measurement (according to the criteria described in subclause 14.1.2.1):

2> if the "Reporting deactivation threshold" is equal to 0, or if the "Reporting deactivation threshold" is different from 0 and the number of cells included in the virtual active set for that frequency is less than or equal to the "Reporting deactivation threshold":

3> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting":

4> add the primary CPICH that enters the reporting range to the "virtual active set".

3> if the IE "UE autonomous update mode" is set to "on" or "off":

4> send a measurement report with IEs set as below:

5> set the Measurement identity to the identity of the inter-frequency measurement;

5> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1a, and in "Cell measurement event results" the CPICH info of the cell that triggered the event;

5> do not include the IEs "measured results" or "additional measured results".

1> if Event 1b was configured, when this event is triggered by a cell for a non-used frequency considered in that measurement (according to the criteria described in subclause 14.1.2.2):

2> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting" and if the number of cells included in the virtual active set is greater than 1:

3> remove the primary CPICH that leaves the reporting range from the "virtual active set".

2> if the IE "UE autonomous update mode" is set to "on" or "off":

3> send a measurement report with IEs set as below:

4> set the Measurement identity to the identity of the inter-frequency measurement;

4> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1b, and in "Cell measurement event results" the CPICH info of the cell that triggered the event;

4> do not include the IEs "measured results" or "additional measured results".

1> if Event 1c was configured, when this event is triggered by a cell for a non-used frequency considered in that measurement (according to the criteria described in subclause 14.1.2.3):

2> if the "Reporting activation threshold" is equal to 0, or if the "Reporting activation threshold" is different from 0 and the number of cells included in the virtual active set for that frequency is greater than or equal to the "Reporting activation threshold":

3> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting":

4> rank all active and non-active primary CPICHs and take the *n* best cells to create a new "virtual active set", where *n* is the number of active primary CPICHs in the "virtual active set".

3> if the IE "UE autonomous update mode" is set to "on" or "off":

4> send a measurement report with IEs set as below:

5> set the Measurement identity to the identity of the inter-frequency measurement;

5> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1c, and in "Cell measurement event results" include the CPICH

info of all the cells that satisfy the event, and the rest of the entries as the cells that were in the virtual active set before the event occurred and that are worse than the best cell that triggered the event, in the order of their measured value (best one first);

5> do not include the IEs "measured results" or "additional measured results".

If the IE "Intra-frequency measurement reporting criteria" is stored for an inter-frequency measurement, the IE "UE autonomous update mode" is set to "on" or "on with no reporting", but none of the Events 1a, 1b or 1c are configured:

1> the UE shall continuously update the virtual active set to consist of all cells on frequency F_i considered in that inter-frequency measurement, without sending any corresponding measurement report.

If the IE "Intra-frequency measurement reporting criteria" is not stored for that inter-frequency measurement, the UE shall:

1> apply the events of type 1a, 1b and 1c that were defined for the used frequency in other stored measurements of type "intra-frequency" at the time the inter-frequency measurement was set up; and

1> update the virtual active set for the non-used frequencies considered in that measurement according to the following rules:

2> if several events of type 1a (resp. 1b,1c) were defined for the used frequency when the inter-frequency measurement was set up, only the first 1a event (resp 1b, 1c) that was defined in the measurement with the lowest measurement identity shall apply to the non-used frequencies;

2> all the cells considered in the inter-frequency measurements shall be able to affect the reporting range for event 1a and 1b. (i.e. the IE "Cells forbidden to affect reporting range" possibly stored for the intra-frequency measurements on the used frequency does not apply to the non-used frequencies considered in the inter-frequency measurement);

2> the IEs "amount of reporting" and "reporting interval" that were stored for the intra-frequency measurements on the used frequency shall not be considered if reports of the virtual active set updates are needed.

1> if event 1a is applicable to the non-used frequencies considered in the inter-frequency measurement, when this event is triggered (according to the criteria described in subclause 14.1.2.1) by a cell for a non-used frequency considered in that measurement:

2> if the "Reporting deactivation threshold" is equal to 0, or if the "Reporting deactivation threshold" is different from 0 and the number of cells included in the virtual active set for that frequency is less than or equal to the "Reporting deactivation threshold":

3> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting":

4> add the primary CPICH that enters the reporting range to the "virtual active set".

3> if the IE "UE autonomous update mode" is set to "on" or "off":

4> send a measurement report with IEs set as below:

5> set the Measurement identity to the identity of the inter-frequency measurement;

5> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1a, and in "Cell measurement event results" the CPICH info of the cell that triggered the event;

5> do not include the IEs "measured results" or "additional measured results".

1> if event 1b is applicable for the non-used frequencies considered in that inter-frequency measurement, when this event is triggered (according to the criteria described in subclause 14.1.2.2) by a cell for a non-used frequency considered in that measurement:

2> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting" and if the number of cells included in the virtual active set is greater than 1:

3> remove the primary CPICH that leaves the reporting range from the "virtual active set".

2> if the IE "UE autonomous update mode" is set to "on" or "off", send a measurement report with IEs set as below:

3> set the Measurement identity to the identity of the inter-frequency measurement;

3> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1b, and in "Cell measurement event results" the CPICH info of the cell that triggered the event;

3> do not include the IEs "measured results" or "additional measured results".

1> if event 1c is applicable for the non-used frequencies considered in that inter-frequency measurement, when this event is triggered (according to the criteria described in subclause 14.1.2.3) by a cell for a non-used frequency considered in that measurement:

2> if the "Reporting activation threshold" is equal to 0, or if the "Reporting activation threshold" is different from 0 and the number of cells included in the virtual active set for that frequency is greater than or equal to the "Reporting activation threshold":

3> if the IE "UE autonomous update mode" is set to "on" or "on with no reporting":

4> rank all active and non-active primary CPICHs and take the *n* best cells to create a new "virtual active set", where *n* is the number of active primary CPICHs in the "virtual active set".

3> if the IE "UE autonomous update mode" is set to "on" or "off":

4> send a measurement report with IEs set as below:

5> set the Measurement identity to the identity of the inter-frequency measurement.

5> set the CHOICE event result in the IE Event results to Intra-frequency measurement event results, Intra-frequency event identity to 1c, and in "Cell measurement event results" include the CPICH info of all the non-active cells which satisfy the event, and the rest of the entries as the cells that were in the virtual active set before the event occurred and that are worse than the best cell that triggered the event, in the order of their measured value (best one first);

5> do not include the IEs "measured results" or "additional measured results".

If the IE "Intra-frequency measurement reporting criteria" is not stored for an inter-frequency measurement, the IE "UE autonomous update mode" is set to "on" or "on with no reporting", but none of the Events 1a, 1b or 1c are defined for the used frequency in other stored measurements of type "intra-frequency" at the time the inter-frequency measurement was set up:

1> the UE shall continuously update the virtual active set to consist of all cells on frequency F_i considered in that inter-frequency measurement, without sending any corresponding measurement report.

3GPP TSG-RAN WG2 Meeting #34
Sophia Antipolis, France, 17th- 21st February 2003

Tdoc ⌘R2-030443

CR-Form-v7

CHANGE REQUEST

⌘ **25.331** **CR** **1820** ⌘ **rev** **-** ⌘ Current version: **3.13.0** ⌘

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

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [ ]

Title:	⌘	Physical channel failure and radio link re-establishment
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	20/02/2003
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)*
Rel-6 *(Release 6)*

Reason for change: ⌘

The changes in the original version of this CR are introduced for the following reasons:

Physical channel failure
Subclause 8.2.2.7 is somewhat ambigous as to when physical channel failure applies. The current text does not clearly specify that the criteria defined in 8.5.4 only apply in case there is a real establishment including synchronisation procedure A. In case of e.g. a change of spreading factor, the subclause concerning radio link failure should not apply.

Note Synchronisation procedure A is performed when the reconfiguration makes the UE enter CELL_DCH, perform hard handover. In R99 the UE is not required to perform synchronisation when IE "Frequency info" is included but set to the current frequency (but the UE should).

Note RRC connection establishment and cell update (re- establishment) with final state CELL_DCH always include synchronisation, so for those case clarification is not needed.

Note This issue was discovered when reviewing package 4 of the T1 test cases, which includes several failure test cases e.g. 8.2.1.4.

Invalid RB mapping info upon state transitions during re- establishment
Subclause 8.5.21 specifies checks on RB mapping info that the UE shall perform upon cell reselection and state transitions. If the check fails, the UE shall set the variable INVALID_CONFIGURATION to TRUE. However, the UE action when this variable is set is specifed only for the case the checks are performed as part of a UTRAN initiated procedure.

	One typical example is the case of a RL failure while the UE is engaged in a speech call. In this case the UE should perform re- establishment. However, when the UE initiates the CELL UPDATE message it temporarily moves to CELL_FACH. When the UE checks the RB mapping upon this state change, it will detect that for the RBs carrying speech no mapping option for CELL_FACH is defined. Consequently, the UE behaviour upon upon re- establishment is not specified completely. Note This issue was discovered when reviewing package 4 of the T1 test case 8.2.1.5.
Summary of change: ⌘	This CR includes the following changes: Physical channel failure Clarification is added that the radio link failure procedures only applies in case the reconfiguration involves synchronisation procedure A and not e.g. in case of a spreading factor change Invalid RB mapping info upon state transitions during re- establishment Clarification is added that upon moving to CELL_FACH after detecting radio link failure the UE should only perform the RB mapping actions for signalling radio bearers. Furthermore, clarification is added that if these actions results in an invalid configuration upon cell re- selection and upon moving to CELL_FACH after detecting radio link failure, the UE should perform a local release and move to idle. The same error behaviour applies in case checking of RB mapping info upon cell re- selection results in an invalid configuration. A should is proposed in R99 and a shall for later releases.
Consequences if not approved: ⌘	The consequences if this CR is not approved is covered by the isolated impact statement for each of the issues corrected by this CR. **Impact analysis, physical channel failure:** Impacted functionality: Reconfiguration procedures not involving synchronisation procedure A and re- establishment after radio link failure Correction type: Clarification of a function where the specification is somewhat ambiguous. The clarification corresponds with most likely interpretation and is expected not to affect most implementations. However, this correction affects implementations supporting the corrected functionality otherwise Interoperability: • Isolated impact: the impact is isolated; only the corrected functionality is affected • CR implemented only by UTRAN or only by the UE: no significant interoperability problems are foreseen **Impact analysis, re- establishment:** Impacted functionality: Re- establishment after radio link failure Correction type: Clarification of a function where the specification is incomplete Interoperability: • Isolated impact: the impact is isolated; only the corrected functionality is affected • CR implemented only by UTRAN: in case of radio link failure for a UE engaged in a speech call, the UE behaviour is not completely specified. Upon initiating re- establishment, UEs following the specification strictly will consider the configuration invalid. The UE behaviour upon detecting this is not specified, meaning the UE may not be able to re- establish

	• CR implemented only by the UE: If UTRAN does not configure for SRBs a mapping option for CELL_FACH or does not apply a consistent RACH configuration (RLC size indices) re- establishment will fail

Clauses affected:	⌘	8.2.2.7, 8.5.4, 8.5.21			
Other specs affected:	⌘	**Y** / **N** / **X** **X** / / **X**	Other core specifications Test specifications O&M Specifications	⌘	TS 34.123-1, several reconfiguration failure TCs
Other comments:	⌘				

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

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8.2.2.7 Physical channel failure

~~A physical channel failure occurs in case the criteria defined in subclause 8.5.4 are not fulfilled.~~

If the received message caused the UE to be in CELL_DCH state and the UE according to subclause 8.5.4 failed to establish the dedicated physical channel(s) indicated in the received message the UE shall:

1> revert to the configuration prior to the reception of the message (old configuration);

1> if the old configuration includes dedicated physical channels (CELL_DCH state) and the UE is unable to revert to the old configuration:

2> initiate a cell update procedure according to subclause 8.3.1, using the cause "radio link failure";

2> after the cell update procedure has completed successfully:

3> proceed as below.

1> if the old configuration does not include dedicated physical channels (CELL_FACH state):

2> select a suitable UTRA cell according to [4];

2> if the UE selects another cell than the cell the UE camped on upon reception of the reconfiguration message:

3> initiate a cell update procedure according to subclause 8.3.1, using the cause "Cell reselection";

3> after the cell update procedure has completed successfully:

4> proceed as below.

1> transmit a failure response message as specified in subclause 8.2.2.9, setting the information elements as specified below:

2> include the IE "RRC transaction identifier"; and

2> set it to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and

2> clear that entry;

2> set the IE "failure cause" to "physical channel failure".

1> set the variable ORDERED_RECONFIGURATION to FALSE;

1> continue with any ongoing processes and procedures as if the reconfiguration message was not received.

The procedure ends.

8.5.4 Physical channel establishment criteria

When a physical dedicated channel establishment is initiated by the UE, the UE shall start a timer T312 and wait for layer 1 to indicate N312 "in sync" indications. On receiving N312 "in sync" indications, the physical channel is considered established and the timer T312 is stopped and reset.

If the timer T312 expires before the physical channel is established, the UE shall consider this as a "physical channel ~~establishment~~ failure".

Note The criteria defined in this section only apply in case the UE performs synchronisation procedure A (FDD only).

8.5.21 Actions related to Radio Bearer mapping

When the UE receives the IE "RB mapping info" and/or the IE "Transport format set", when the UE performs a cell reselection or a state transition, or when the UE releases a RB, the UE shall for each of the configured Radio Bearers:

1> upon moving to CELL_FACH after detecting a radio link failure (see 8.5.6) and upon subsequent cell reselections until the first successfully completed cell update procedure, the UE shall perform the actions defined in the remainder of this subclause only for signalling radio bearers;

1> configure the MAC with the appropriate transport format set (with computed transport block sizes) for the transport channel used by that RB;

1> determine the sets of RLC sizes that apply to the logical channels used by that RB, based on the IEs "RLC size list" and/or the IEs "Logical Channel List" included in the applicable "Transport format set" (either the ones received in the same message or the ones stored if none were received);

1> in case the selected multiplexing option is a multiplexing option on RACH:

2> ignore the RLC size indexes that do not correspond to any RLC size within the Transport Format Set stored for RACH.

2> if there is no remaining RLC size index corresponding to an RLC size within the Transport Format Set stored for RACH:

3> set the variable INVALID_CONFIGURATION to TRUE;

1> if RACH is the transport channel to be used on the uplink, if that RB has a multiplexing option on RACH and if it is using AM:

2> apply the largest size amongst the ones derived according to the previous bullet for the RLC size (or RLC sizes in case the RB is realised using two logical channels) for the corresponding RLC entity.

NOTE: The IE "RB mapping info" is only included in the IE "Predefined RB configurations" in system information when used for Inter-RAT handover to UTRAN and there is no AM RLC size change involved in this case.

1> if that RB is using AM and the RLC size applicable to the logical channel transporting data PDUs is different from the one derived from the previously stored configuration:

2> re-establish the corresponding RLC entity;

2> configure the corresponding RLC entity with the new RLC size;

2> for each AM RLC radio bearer in the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS whose RLC size is changed; and

2> for each AM RLC signalling radio bearer in the CN domain as indicated in the IE "CN domain identity" in the variable LATEST_CONFIGURED_CN_DOMAIN whose RLC size is changed:

3> if the IE "Status" in the variable CIPHERING_STATUS of this CN domain is set to "Started":

4> if the information causing the RLC re-establishment was included in system information:

5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" for this CN domain that will be included in the CELL UPDATE message following cell reselection.

NOTE: Since the UE cannot predict the START value at the time of the next CELL UPDATE transmission in the future, UTRAN should desist from changing the RLC size for a signalling radio bearer within a cell. Other than this case the change in RLC size for a signalling radio bearer is known to the UE when reading system information following cell reselection.

4> if the RLC re-establishment is caused by a CELL UPDATE CONFIRM:

5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" included in the latest transmitted CELL UPDATE message for this CN domain.

4> if the RLC re-establishment is caused by a reconfiguration message:

5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" that will be included in the reconfiguration complete message for this CN domain.

1> if that RB is using UM:

2> indicate the largest applicable RLC size to the corresponding RLC entity.

1> configure MAC multiplexing according to the selected multiplexing option (MAC multiplexing shall only be configured for a logical channel if the transport channel it is mapped on according to the selected multiplexing option is the same as the transport channel another logical channel is mapped on according to the multiplexing option selected for it);

1> configure the MAC with the logical channel priorities according to selected multiplexing option;

1> configure the MAC with the set of applicable RLC Sizes for each of the logical channels used for that RB;

1> if there is no multiplexing option applicable for the transport channels to be used:

2> set the variable INVALID_CONFIGURATION to TRUE.

1> if there is more than one multiplexing option applicable for the transport channels to be used:

2> set the variable INVALID_CONFIGURATION to TRUE.

If upon cell re- selection or upon moving to CELL_FACH after detecting a radio link failure the UE set variable INVALID_CONFIGURATION to TRUE as a result of the actions defined in this subclause, the UE should:

1> move to idle mode;

1> release (locally) the established signalling connections (as stored in the variable ESTABLISHED_SIGNALLING_CONNECTIONS) and the established radio access bearers (as stored in the variable ESTABLISHED_RABS) and indicate this to upper layers;

1> perform other actions when entering idle mode from connected mode as specified in subclause 8.5.2.

3GPP TSG-RAN WG2 Meeting #34
Sophia Antipolis, France, 17th- 21st February 2003

Tdoc ⌘R2-030444

CR-Form-v7

CHANGE REQUEST

⌘ **25.331** **CR** **1821** ⌘**rev** **-** ⌘ Current version: **4.8.0** ⌘

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

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [ ]

Title:	⌘	Physical channel failure and radio link re-establishment
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	20/02/2003
Category:	⌘	**F**
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)*
Rel-6 *(Release 6)*

Reason for change: ⌘

The changes in the original version of this CR are introduced for the following reasons:

Physical channel failure
Subclause 8.2.2.7 is somewhat ambigous as to when physical channel failure applies. The current text does not clearly specify that the criteria defined in 8.5.4 only apply in case there is a real establishment including synchronisation procedure A. In case of e.g. a change of spreading factor, the subclause concerning radio link failure should not apply.

Note Synchronisation procedure A is performed when the reconfiguration makes the UE enter CELL_DCH, perform hard handover. In R99 the UE is not required to perform synchronisation when IE “Frequency info” is included but set to the current frequency (but the UE should).

Note RRC connection establishment and cell update (re- establishment) with final state CELL_DCH always include synchronisation, so for those case clarification is not needed.

Note This issue was discovered when reviewing package 4 of the T1 test cases, which includes several failure test cases e.g. 8.2.1.4.

Invalid RB mapping info upon state transitions during re- establishment
Subclause 8.5.21 specifies checks on RB mapping info that the UE shall perform upon cell reselection and state transitions. If the check fails, the UE shall set the variable INVALID_CONFIGURATION to TRUE. However, the UE action when this variable is set is specifed only for the case the checks are performed as part of a UTRAN initiated procedure.

	One typical example is the case of a RL failure while the UE is engaged in a speech call. In this case the UE should perform re- establishment. However, when the UE initiates the CELL UPDATE message it temporarily moves to CELL_FACH. When the UE checks the RB mapping upon this state change, it will detect that for the RBs carrying speech no mapping option for CELL_FACH is defined. Consequently, the UE behaviour upon upon re- establishment is not specified completely. Note This issue was discovered when reviewing package 4 of the T1 test case 8.2.1.5.
Summary of change: ⌘	This CR includes the following changes: <u>Physical channel failure</u> Clarification is added that the radio link failure procedures only applies in case the reconfiguration involves synchronisation procedure A and not e.g. in case of a spreading factor change <u>Invalid RB mapping info upon state transitions during re- establishment</u> Clarification is added that upon moving to CELL_FACH after detecting radio link failure the UE should only perform the RB mapping actions for signalling radio bearers. Furthermore, clarification is added that if these actions results in an invalid configuration upon cell re- selection and upon moving to CELL_FACH after detecting radio link failure, the UE should perform a local release and move to idle. The same error behaviour applies in case checking of RB mapping info upon cell re- selection results in an invalid configuration. A should is proposed in R99 and a shall for later releases.
Consequences if not approved: ⌘	The inconsistency remains which is likely to result in a failure of the re-establishment

Clauses affected:	⌘	8.2.2.7, 8.5.4, 8.5.21			
Other specs affected:	⌘	**Y** / **N**		⌘	
			X Other core specifications		
		X	Test specifications		TS 34.123-1, several reconfiguration failure TCs
			X O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:

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

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8.2.2.7 Physical channel failure

~~A physical channel failure occurs in case the criteria defined in subclause 8.5.4 are not fulfilled.~~

If the received message caused the UE to be in CELL_DCH state and the according to subclause 8.5.4 UE failed to establish the dedicated physical channel(s) indicated in the received message the UE shall:

1> revert to the configuration prior to the reception of the message (old configuration);

1> if the old configuration includes dedicated physical channels (CELL_DCH state) and the UE is unable to revert to the old configuration:

2> initiate a cell update procedure according to subclause 8.3.1, using the cause "radio link failure";

2> after the cell update procedure has completed successfully:

3> proceed as below.

1> if the old configuration does not include dedicated physical channels (CELL_FACH state):

2> select a suitable UTRA cell according to [4];

2> if the UE selects another cell than the cell the UE camped on upon reception of the reconfiguration message:

3> initiate a cell update procedure according to subclause 8.3.1, using the cause "Cell reselection";

3> after the cell update procedure has completed successfully:

4> proceed as below.

1> transmit a failure response message as specified in subclause 8.2.2.9, setting the information elements as specified below:

2> include the IE "RRC transaction identifier"; and

2> set it to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and

2> clear that entry;

2> set the IE "failure cause" to "physical channel failure".

1> set the variable ORDERED_RECONFIGURATION to FALSE;

1> continue with any ongoing processes and procedures as if the reconfiguration message was not received.

The procedure ends.

8.5.4 Physical channel establishment criteria

When a physical dedicated channel establishment is initiated by the UE, the UE shall start a timer T312 and wait for layer 1 to indicate N312 "in sync" indications. On receiving N312 "in sync" indications, the physical channel is considered established and the timer T312 is stopped and reset.

If the timer T312 expires before the physical channel is established, the UE shall consider this as a "physical channel ~~establishment~~ failure".

Note The criteria defined in this section only apply in case the UE is required to perform synchronisation procedure A (FDD only).

8.5.21 Actions related to Radio Bearer mapping

When the UE receives the IE "RB mapping info" and/or the IE "Transport format set", when the UE performs a cell reselection or a state transition, or when the UE releases a RB, the UE shall for each of the configured Radio Bearers:

1> upon moving to CELL_FACH after detecting a radio link failure (see 8.5.6) and upon subsequent cell reselections until the first successfully completed cell update procedure, the UE shall perform the actions defined in the remainder of this subclause only for signalling radio bearers;

1> configure the MAC with the appropriate transport format set (with computed transport block sizes) for the transport channel used by that RB;

1> determine the sets of RLC sizes that apply to the logical channels used by that RB, based on the IEs "RLC size list" and/or the IEs "Logical Channel List" included in the applicable "Transport format set" (either the ones received in the same message or the ones stored if none were received);

1> in case the selected multiplexing option is a multiplexing option on RACH:

2> ignore the RLC size indexes that do not correspond to any RLC size within the Transport Format Set stored for RACH.

2> if there is no remaining RLC size index corresponding to an RLC size within the Transport Format Set stored for RACH:

3> set the variable INVALID_CONFIGURATION to TRUE;

1> if RACH is the transport channel to be used on the uplink, if that RB has a multiplexing option on RACH and if it is using AM:

2> apply the largest size amongst the ones derived according to the previous bullet for the RLC size (or RLC sizes in case the RB is realised using two logical channels) for the corresponding RLC entity.

NOTE: The IE "RB mapping info" is only included in the IE "Predefined RB configurations" in system information when used for Inter-RAT handover to UTRAN and there is no AM RLC size change involved in this case.

1> if that RB is using AM and the RLC size applicable to the logical channel transporting data PDUs is different from the one derived from the previously stored configuration:

2> re-establish the corresponding RLC entity;

2> configure the corresponding RLC entity with the new RLC size;

2> for each AM RLC radio bearer in the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS whose RLC size is changed; and

2> for each AM RLC signalling radio bearer in the CN domain as indicated in the IE "CN domain identity" in the variable LATEST_CONFIGURED_CN_DOMAIN whose RLC size is changed:

3> if the IE "Status" in the variable CIPHERING_STATUS of this CN domain is set to "Started":

4> if the information causing the RLC re-establishment was included in system information:

5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" for this CN domain that will be included in the CELL UPDATE message following cell reselection.

NOTE: Since the UE cannot predict the START value at the time of the next CELL UPDATE transmission in the future, UTRAN should desist from changing the RLC size for a signalling radio bearer within a cell. Other than this case the change in RLC size for a signalling radio bearer is known to the UE when reading system information following cell reselection.

4> if the RLC re-establishment is caused by a CELL UPDATE CONFIRM:

5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" included in the latest transmitted CELL UPDATE message for this CN domain.

4> if the RLC re-establishment is caused by a reconfiguration message:

5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" that will be included in the reconfiguration complete message for this CN domain.

1> if that RB is using UM:

2> indicate the largest applicable RLC size to the corresponding RLC entity.

1> configure MAC multiplexing according to the selected multiplexing option (MAC multiplexing shall only be configured for a logical channel if the transport channel it is mapped on according to the selected multiplexing option is the same as the transport channel another logical channel is mapped on according to the multiplexing option selected for it);

1> configure the MAC with the logical channel priorities according to selected multiplexing option;

1> configure the MAC with the set of applicable RLC Sizes for each of the logical channels used for that RB;

1> if there is no multiplexing option applicable for the transport channels to be used:

2> set the variable INVALID_CONFIGURATION to TRUE.

1> if there is more than one multiplexing option applicable for the transport channels to be used:

2> set the variable INVALID_CONFIGURATION to TRUE.

If upon cell re- selection or upon moving to CELL_FACH after detecting a radio link failure the UE set variable INVALID_CONFIGURATION to TRUE as a result of the actions defined in this subclause, the UE should:

1> move to idle mode;

1> release (locally) the established signalling connections (as stored in the variable ESTABLISHED_SIGNALLING_CONNECTIONS) and the established radio access bearers (as stored in the variable ESTABLISHED_RABS) and indicate this to upper layers;

1> perform other actions when entering idle mode from connected mode as specified in subclause 8.5.2.

3GPP TSG-RAN WG2 Meeting #34
Sophia Antipolis, France, 17th- 21st February 2003

Tdoc ⌘R2-030445

CR-Form-v7

CHANGE REQUEST

⌘ **25.331** **CR** **1822** ⌘ **rev** **-** ⌘ Current version: **5.3.0** ⌘

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

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [ ]

Title:	⌘	Physical channel failure and radio link re-establishment
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	20/02/2003
Category:	⌘	**A**
Release:	⌘	REL-5

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)*
Rel-6 *(Release 6)*

Reason for change: ⌘

The changes in the original version of this CR are introduced for the following reasons:

Physical channel failure
Subclause 8.2.2.7 is somewhat ambigous as to when physical channel failure applies. The current text does not clearly specify that the criteria defined in 8.5.4 only apply in case there is a real establishment including synchronisation procedure A. In case of e.g. a change of spreading factor, the subclause concerning radio link failure should not apply.

Note Synchronisation procedure A is performed when the reconfiguration makes the UE enter CELL_DCH, perform hard handover. In R99 the UE is not required to perform synchronisation when IE “Frequency info” is included but set to the current frequency (but the UE should).

Note RRC connection establishment and cell update (re- establishment) with final state CELL_DCH always include synchronisation, so for those case clarification is not needed.

Note This issue was discovered when reviewing package 4 of the T1 test cases, which includes several failure test cases e.g. 8.2.1.4.

Invalid RB mapping info upon state transitions during re- establishment
Subclause 8.5.21 specifies checks on RB mapping info that the UE shall perform upon cell reselection and state transitions. If the check fails, the UE shall set the variable INVALID_CONFIGURATION to TRUE. However, the UE action when this variable is set is specifed only for the case the checks are performed as part of a UTRAN initiated procedure.

	One typical example is the case of a RL failure while the UE is engaged in a speech call. In this case the UE should perform re- establishment. However, when the UE initiates the CELL UPDATE message it temporarily moves to CELL_FACH. When the UE checks the RB mapping upon this state change, it will detect that for the RBs carrying speech no mapping option for CELL_FACH is defined. Consequently, the UE behaviour upon upon re- establishment is not specified completely. Note This issue was discovered when reviewing package 4 of the T1 test case 8.2.1.5.
Summary of change: ⌘	This CR includes the following changes: <u>Physical channel failure</u> Clarification is added that the radio link failure procedures only applies in case the reconfiguration involves synchronisation procedure A and not e.g. in case of a spreading factor change <u>Invalid RB mapping info upon state transitions during re- establishment</u> Clarification is added that upon moving to CELL_FACH after detecting radio link failure the UE should only perform the RB mapping actions for signalling radio bearers. Furthermore, clarification is added that if these actions results in an invalid configuration upon cell re- selection and upon moving to CELL_FACH after detecting radio link failure, the UE should perform a local release and move to idle. The same error behaviour applies in case checking of RB mapping info upon cell re- selection results in an invalid configuration. A should is proposed in R99 and a shall for later releases.
Consequences if not approved: ⌘	The inconsistency remains which is likely to result in a failure of the re-establishment

Clauses affected:	⌘	8.2.2.7, 8.5.4, 8.5.21			
Other specs affected:	⌘	**Y** / **N**		⌘	
			X Other core specifications		
		X	Test specifications		TS 34.123-1, several reconfiguration failure TCs
			X O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:

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

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8.2.2.7 Physical channel failure

~~A physical channel failure occurs in case the criteria defined in subclause 8.5.4 are not fulfilled.~~

If the received message caused the UE to be in CELL_DCH state and the UE according to subclause 8.5.4 failed to establish the dedicated physical channel(s) indicated in the received message the UE shall:

1> for HS-DSCH remove existing HS-PDSCH configurations;

1> otherwise revert to the configuration prior to the reception of the message (old configuration);

1> if the old configuration includes dedicated physical channels (CELL_DCH state) and the UE is unable to revert to the old configuration:

2> initiate a cell update procedure according to subclause 8.3.1, using the cause "radio link failure";

2> after the cell update procedure has completed successfully:

3> proceed as below.

1> if the old configuration does not include dedicated physical channels (CELL_FACH state):

2> select a suitable UTRA cell according to [4];

2> if the UE selects another cell than the cell the UE camped on upon reception of the reconfiguration message:

3> initiate a cell update procedure according to subclause 8.3.1, using the cause "Cell reselection";

3> after the cell update procedure has completed successfully:

4> proceed as below.

1> transmit a failure response message as specified in subclause 8.2.2.9, setting the information elements as specified below:

2> include the IE "RRC transaction identifier"; and

2> set it to the value of "RRC transaction identifier" in the entry for the received message in the table "Accepted transactions" in the variable TRANSACTIONS; and

2> clear that entry;

2> set the IE "failure cause" to "physical channel failure".

1> set the variable ORDERED_RECONFIGURATION to FALSE;

1> continue with any ongoing processes and procedures as if the reconfiguration message was not received.

The procedure ends.

8.5.4 Physical channel establishment criteria

When a physical dedicated channel establishment is initiated by the UE, the UE shall start a timer T312 and wait for layer 1 to indicate N312 "in sync" indications. On receiving N312 "in sync" indications, the physical channel is considered established and the timer T312 is stopped and reset.

If the timer T312 expires before the physical channel is established, the UE shall consider this as a "physical channel ~~establishment~~ failure".

Note The criteria defined in this section only apply in case the UE is required to perform synchronisation procedure A (FDD only).

8.5.21 Actions related to Radio Bearer mapping

When the UE receives the IE "RB mapping info" and/or the IE "Transport format set", when the UE performs a cell reselection or a state transition, or when the UE releases a RB, the UE shall for each of the configured Radio Bearers:

1> upon moving to CELL_FACH after detecting a radio link failure (see 8.5.6) and upon subsequent cell reselections until the first successfully completed cell update procedure, the UE shall perform the actions defined in the remainder of this subclause only for signalling radio bearers;

1> configure the MAC with the appropriate transport format set (with computed transport block sizes) for the transport channel used by that RB;

1> determine the sets of RLC sizes that apply to the logical channels used by that RB, based on the IEs "RLC size list" and/or the IEs "Logical Channel List" included in the applicable "Transport format set" (either the ones received in the same message or the ones stored if none were received);

1> in case the selected multiplexing option is a multiplexing option on RACH:

2> ignore the RLC size indexes that do not correspond to any RLC size within the Transport Format Set stored for RACH.

2> if there is no remaining RLC size index corresponding to an RLC size within the Transport Format Set stored for RACH:

3> set the variable INVALID_CONFIGURATION to TRUE;

1> if RACH is the transport channel to be used on the uplink, if that RB has a multiplexing option on RACH and if it is using AM:

2> apply the largest size amongst the ones derived according to the previous bullet for the RLC size (or RLC sizes in case the RB is realised using two logical channels) for the corresponding RLC entity.

NOTE: The IE "RB mapping info" is only included in the IE "Predefined RB configurations" in system information when used for Inter-RAT handover to UTRAN and there is no AM RLC size change involved in this case.

1> if that RB is using AM and the RLC size applicable to the logical channel transporting data PDUs is different from the one derived from the previously stored configuration:

2> re-establish the corresponding RLC entity;

2> configure the corresponding RLC entity with the new RLC size;

2> for each AM RLC radio bearer in the CN domain as indicated in the IE "CN domain identity" in the IE "RAB info" in the variable ESTABLISHED_RABS whose RLC size is changed; and

2> for each AM RLC signalling radio bearer in the CN domain as indicated in the IE "CN domain identity" in the variable LATEST_CONFIGURED_CN_DOMAIN whose RLC size is changed:

3> if the IE "Status" in the variable CIPHERING_STATUS of this CN domain is set to "Started":

4> if the information causing the RLC re-establishment was included in system information:

5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" for this CN domain that will be included in the CELL UPDATE message following cell reselection.

NOTE: Since the UE cannot predict the START value at the time of the next CELL UPDATE transmission in the future, UTRAN should desist from changing the RLC size for a signalling radio bearer within a cell. Other than this case the change in RLC size for a signalling radio bearer is known to the UE when reading system information following cell reselection.

4> if the RLC re-establishment is caused by a CELL UPDATE CONFIRM:

5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" included in the latest transmitted CELL UPDATE message for this CN domain.

4> if the RLC re-establishment is caused by a reconfiguration message:

5> set the HFN values for the corresponding RLC entity equal to the value of the IE "START" that will be included in the reconfiguration complete message for this CN domain.

1> if that RB is using UM:

2> indicate the largest applicable RLC size to the corresponding RLC entity.

1> configure MAC multiplexing according to the selected multiplexing option (MAC multiplexing shall only be configured for a logical channel if the transport channel it is mapped on according to the selected multiplexing option is the same as the transport channel another logical channel is mapped on according to the multiplexing option selected for it);

1> configure the MAC with the logical channel priorities according to selected multiplexing option;

1> configure the MAC with the set of applicable RLC Sizes for each of the logical channels used for that RB;

1> if there is no multiplexing option applicable for the transport channels to be used:

2> set the variable INVALID_CONFIGURATION to TRUE.

1> if there is more than one multiplexing option applicable for the transport channels to be used:

2> set the variable INVALID_CONFIGURATION to TRUE.

If upon cell re- selection or upon moving to CELL_FACH after detecting a radio link failure the UE set variable INVALID_CONFIGURATION to TRUE as a result of the actions defined in this subclause, the UE should:

1> move to idle mode;

1> release (locally) the established signalling connections (as stored in the variable ESTABLISHED_SIGNALLING_CONNECTIONS) and the established radio access bearers (as stored in the variable ESTABLISHED_RABS) and indicate this to upper layers;

1> perform other actions when entering idle mode from connected mode as specified in subclause 8.5.2.

3GPP TSG-RAN WG2 Meeting #34 **Tdoc ⌘R2-030446**
Sophia Antipolis, France, 17th- 21st February 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.331** **CR** **1823** ⌘**rev** **-** ⌘ Current version: **3.13.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☒ Core Network ☐

Title:	⌘	Correction concerning bit numbering convention
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	18/02/2003
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)*
Rel-6 *(Release 6)*

Reason for change: ⌘

Alignment of bit numbering with ASN.1 convention, as reflected in clause 11.0:

The bits in the ASN.1 bit string shall represent the semantics of the functional IE definition in decreasing order of bit significance;
- with the first (or leftmost) bit in the bit string representing the most significant bit

together with clause 12 on the transfer syntax:

- When a bit string value is placed in a bit-field as specified in 15.6 to 15.11 in [11], the leading bit of the bit string value shall be placed in the leading bit of the bit-field, and the trailing bit of the bit string value shall be placed in the trailing bit of the bit-field.

this implies that the first and least significant bit is transmitted first

Currently in the semantics description, there are statements like “the bits are numbered b0 to bn where b0 is least significant. This does not ambigously specify how the mapping is done to the bit string is done

Example: LAC

24.008 states that bit 8 of octet 5 is the most significant bit and bit 1 of octet 6 the least significant bit. This is illustrated as follows, with bit numbering according to 24.008:

oct5: msb b14 b13 b12 b11 b10 b09 b08
oct6: b07 b06 b05 b04 b03 b02 b01 lsb

Current statement in the semantics description

The LAC bits are numbered b0-b15, where b0 is the least significant bit

The assumption is that the correct interpretation of this statement is as follows:

- b0 is the bit number of the information element specified in 24.008 (and NOT the first bit of the ASN.1 bit string)
- the significance is maintained when mapping the information onto the RRC information element; the LSB of the information element is mapped to the least significant bit of the bit string

The above assumptions imply that b15 of the 24.008 information element is mapped onto the first bit of the bit string and is transmitted first (while bit 8 is transmitted first in GSM). This assumption does not involve bit swapping !

The main ambiguity is that one could assume that:

- b0 is the first bit of the bit string
- the LSB of the LAC information is mapped onto the first bit of the bit string

In this case b0 of the LAC is mapped to the first bit of the bitstring, which involves bitswapping.

The ambiguity in the current specification resulted in a discussion in T1 related to test case TC 8.1.2.1. In the end it was agreed that setting the RRC bitstring to '0001'H corresponds with a LAC value set to '0001'H (and no bitswapping)

Summary of change: ⌘

The original version of this CR included the following changes:

- **General case**: This CR proposes to replace the following text (LAC example):

  The LAC bits are numbered b0-b15, where b0 is the least significant bit

  with the following text:

  The first/ leftmost bit of the bit string contains the most significant bit (b3) of the LAC"

- **Handover from UTRAN**: This CR proposes to replace the following text:

  The first bit of the bit string contains the first bit of the GSM message

  with the following text:

  The first/ leftmost/ most significant bit of the bit string contains bit 8 of the first octet of the GSM message"

Consequences if not approved: ⌘

The ambiguity remains, as a result of which the sender and receiver may apply a different value for several information elements. This occurs if the sender and receiver apply different assumptions concerning the bit order

Impact analysis:

Impacted functionality: This CR affects several functions including cell change order, handover from UTRAN, broadcast of complete system information blocks, routing of signalling connections, location/ routing area handling, initial access, integrity and ciphering

Correction type: Clarification of a function where the specification is ambiguous. The clarification corresponds with most likely interpretation and is expected not to affect most implementations. However, this correction affects implementations

	supporting the corrected functionality otherwise Interoperability: • Isolated impact: this CR concerns the way several parameters are signalled and hence it affects several functions • CR implemented only by UTRAN or only by the UE: The two sides may apply different values for parameters which most likely will result in a failure of the concerned functions (see list above)

Clauses affected:	⌘	10.2.5, 10.2.15, 10.2.16, 10.2.48.6, 10.3.1.6, 10.3.1.7, 10.3.1.13, 10.3.1.14, 10.3.1.15, 10.3.1.17, 10.3.3.16, 10.3.3.19, 10.3.3.38, 10.3.4.12, 10.3.6.6, 10.3.7.26, 10.3.8.2, 10.3.8.7, 10.3.8.15, 10.3.9.8, 10.3.9.9, 10.3.9.10, 10.3.9.11			
		Y	**N**		
Other specs affected:	⌘		**X**	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

10.2.5 CELL CHANGE ORDER FROM UTRAN

This message is used to order a cell change from UTRA to another radio access technology, e.g., GSM.

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36	
Integrity check info	CH		Integrity check info 10.3.3.16	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
RB Information elements				
RAB information list	OP	1 to <maxRABsetup>		This IE should not be included in this version of the protocol.
>RAB info	MP		RAB info 10.3.4.8	
Other information elements				
Target cell description	MP			
>CHOICE *Radio Access Technology*	MP			Two spare values are needed.
>>GSM				
>>>BSIC	MP		BSIC 10.3.8.2	
>>>Band Indicator	MP		Enumerated (DCS 1800 band used, PCS 1900 band used)	Indicates how to interpret the BCCH ARFCN
>>>BCCH ARFCN	MP		Integer (0..1023)	[45]
>>>NC mode	OP		Bit string(3)	Includes bits b1-b3 of the NC mode IE specified in [43]. ~~b1 is the least significant bit.~~*The first/ leftmost/ most significant bit of the bit string contains the most significant bit (b3) of NC mode* NOTE: The Bit string should be extended to 4 bits in a later version of the message.
>>IS-2000				

10.2.15 HANDOVER FROM UTRAN COMMAND

This message is used for handover from UMTS to another system e.g. GSM. One or several messages from the other system can be included in the Inter-RAT message information element in this message. These messages are structured and coded according to that systems specification.

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36	
Integrity check info	CH		Integrity check info 10.3.3.16	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
RB information elements				
RAB information list	OP	1 to <maxRABsetup>		For each RAB to be handed over. In this version, the maximum size of the list of 1 shall be applied for all system types.
>RAB info	MP		RAB info 10.3.4.8	
Other information elements				
CHOICE *System type*	MP			This IE indicates which specification to apply, to decode the transported messages
>GSM				
>>Frequency band	MP		Enumerated (GSM/DCS 1800 band used), GSM/PCS 1900 band used)	
>>GSM message				
>>>Single GSM message	MP		Bit string (no explicit size constraint)	Formatted and coded according to GSM specifications The first/ *leftmost/ most significant* bit of the bit string contains ~~the first~~ bit 8 of the first octet of the GSM message.
>>>GSM message List	MP	1.to.<maxInterSysMessages>	Bit string (1..512)	Formatted and coded according to GSM specifications. The first/ *leftmost/ most significant* bit of the bit string contains ~~the first~~ bit 8 of the first octet of the GSM message.
>cdma2000				
>>cdma2000MessageList	MP	1.to.<maxInterSysMessages>		
>>>MSG_TYPE(s)	MP		Bit string (8)	Formatted and coded according to cdma2000 specifications. The MSG_TYPE bits are numbered b0 to b7.~~,~~ The first/ *leftmost/ most significant* bit of the bit string contains bit 7 of the MSG_TYPE~~where b0 is the least significant bit~~.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>>cdma2000Messagepayload(s)	MP		Bit string (1..512)	Formatted and coded according to cdma2000 specifications. The first/ *leftmost/ most significant* bit of the bit string contains the ~~first~~ bit 7 of the first octet of the cdma2000 message.

10.2.16 HANDOVER FROM UTRAN FAILURE

This message is sent on the RRC connection used before the Inter-RAT Handover was executed. The message indicates that the UE has failed to seize the new channel in the other system.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36	
Integrity check info	CH		Integrity check info 10.3.3.16	
Other information elements				
Inter-RAT handover failure	OP		Inter-RAT handover failure 10.3.8.6	
CHOICE *System type*	OP			This IE indicates which specification to apply to decode the transported messages
>GSM				
>GSM message List	MP	1.to.<maxInterSysMessages>	Bit string (1..512)	Formatted and coded according to GSM specifications. The first/ leftmost// *most significant* bit of the bit string contains bit 8 of the first octet~~bit~~ of the GSM message.
>cdma2000				
>>cdma2000MessageList	MP	1.to.<maxInterSysMessages>		
>>>MSG_TYPE(s)	MP		Bit string (8)	Formatted and coded according to cdma2000 specifications. The MSG_TYPE bits are numbered b0 to b7.~~,~~ The first/ *leftmost/ most significant* bit of the bit string contains bit 7 of the MSG_TYPE~~where b0 is the least significant bit~~.
>>>cdma2000Messagepayload(s)	MP		Bit string (1..512)	Formatted and coded according to cdma2000 specifications. The first/

Information Element/Group name	Need	Multi	Type and reference	Semantics description
				leftmost/ most significant bit of the bit string contains bit 7 of the the first octet ~~bit~~ of the cdma2000 message.

10.2.48.6 Complete SIB

This segment type is used to transfer a non-segmented system information block. The IE is used when the complete SIB has a length, excluding length denominator, from 215 through 226 (Combination 10).

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Other information elements				
SIB type	MP		SIB Type, 10.3.8.21	
SIB data fixed	MP		Bit string (226)	The first/ l*eftmost/ most significant* bit of the bit string contains the first bit of the segment. In case the SIB data is less than 226 bits, padding shall be used. The same padding bits shall be used as defined in clause 12.1

10.3.1.6 Intra Domain NAS Node Selector

This IE carries information to be used to route the establishment of a signalling connection to a CN node within a CN domain.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *version*	MP			
>R99				
>>CHOICE *CN type*	MP			
>>>GSM-MAP				
>>>>CHOICE *Routing basis*	MP			
>>>>>local (P)TMSI				TMSI allocated in the current LA or PTMSI allocated in the current RA
>>>>>>Routing parameter	MP		Bit string (10)	The TMSI/ PTMSI consists of 4 octets (32bits). This~~e~~ can be represented by a string of bits ~~are~~ numbered from b0 to b31, with bit b0 being the least significant The "Routing parameter" bit string consists of bits b14 through b23 of the TMSI/ PTMSI ~~where bit b14 is the least significant~~. The first/ leftmost/ most significant bit of the bit string contains bit b23 of the TMSI/ PTMSI
>>>>>(P)TMSI of same PLMN, different (RA)LA				TMSI allocated in another LA of this PLMN or PTMSI allocated in another RA this PLMN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>>>>>Routing parameter	MP		Bit string (10)	The TMSI/ PTMSI consists of 4 octets (32bits). This~~e~~ can be represented by a string of bits ~~are~~ numbered from b0 to b31, with bit b0 being the least significant The "Routing parameter" bit string consists of bits b14 through b23 of the TMSI/ PTMSI ~~where bit b14 is the least significant~~. The first/ leftmost/ most significant bit of the bit string contains bit b23 of the TMSI/ PTMSI
>>>>>(P)TMSI of different PLMN				TMSI or a PTMSI allocated in another PLMN
>>>>>>Routing parameter	MP		Bit string (10)	The TMSI/ PTMSI consists of 4 octets (32bits). This~~e~~ can be represented by a string of bits ~~are~~ numbered from b0 to b31, with bit b0 being the least significant The "Routing parameter" bit string consists of bits b14 through b23 of the TMSI/ PTMSI ~~where bit b14 is the least significant~~. The first/ leftmost/ most significant bit of the bit string contains bit b23 of the TMSI/ PTMSI
>>>>>IMSI(response to IMSI paging)				NAS identity is IMSI
>>>>>>Routing parameter	MP		Bit string (10)	The "Routing parameter" bit string consists of DecimalToBinary [(IMSI div 10) mod 1000]. ~~The bits of the result are numbered from b0 to b9, with bit b0 being the least significant.~~ The first/ leftmost bit of the bit string contains the most significant bit of the result.
>>>>>IMSI(cause UE initiated event)				NAS identity is IMSI
>>>>>>Routing parameter	MP		Bit string (10)	The "Routing parameter" bit string consists of DecimalToBinary [(IMSI div 10) mod 1000]. ~~The bits of the result are numbered from b0 to b9, with bit b0 being the least significant.~~ The first/ leftmost bit of the bit string contains the most significant bit of the result.
>>>>>IMEI				NAS parameter is IMEI

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>>>>>Routing parameter	MP		Bit string (10)	The "Routing parameter" bit string consists of DecimalToBinary [(IMEI div 10) mod 1000]. ~~The bits of the result are numbered from b0 to b9, with bit b0 being the least significant.~~ The first/ leftmost bit of the bit string contains the most significant bit of the result.
>>>>>Spare 1			Bit string (10)	This choice shall not be used in this version
>>>>>Spare 2			Bit string (10)	This choice shall not be used in this version
>>>>Entered parameter	MP		Boolean	Entered parameter shall be set to TRUE if the most significant byte of the current LAI/RAI is different compared to the most significant byte of the LAI/RAI stored on the SIM; Entered parameter shall be set to FALSE otherwise
>>>ANSI-41			Bit string (14)	All bits shall be set to 0
>Later			Bit string(15)	This bit string shall not be sent by mobiles that are compliant to this version of the protocol.

10.3.1.7 Location Area Identification

Identifies uniquely a location area for a GSM-MAP type of PLMN. Setting specified in [5].

Information Element/Group name	Need	Multi	Type and reference	Semantics description
PLMN identity	MP		PLMN identity 10.3.1.11	
LAC	MP		Bit string(16)	~~The LAC bits are numbered b0-b15, where b0 is the least significant bit~~. The first/ leftmost bit of the bit string contains the most significant bit of the LAC.

10.3.1.13 P-TMSI (GSM-MAP)

This IE contains a Packet Temporary Mobile Subscriber Identity, used towards a GSM-MAP type of PLMN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
P-TMSI	MP		Bit string (32)	Setting specified in [11]. ~~The P-TMSI bits are numbered b0-b31, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the P-TMSI.

10.3.1.14 RAB identity

This information element uniquely identifies a radio access bearer within a CN domain.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *RAB identity type*	MP			
>RAB identity (GSM-MAP)			Bit string (8)	Formatted according to [5]. ~~The bits are numbered b1-b8, where b1 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the RAB identity.
>RAB identity (ANSI-41)			Bit string (8)	~~The bits are numbered b1-b8, where b1 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the RAB identity.

CHOICE *NAS binding info type*	**Condition under which the given *RAB identity type* is chosen**
RAB identity (GSM-MAP)	PLMN is of type GSM-MAP
RAB identity (ANSI-41)	PLMN is of type ANSI-41

10.3.1.15 Routing Area Code

Identifies a routing area within a location area for a GSM-MAP type of PLMN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Routing Area Code	MP		Bit string(8)	Setting specified in [11]. ~~The Routing Area Code bits are numbered b0 to b7, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the Routing Area Code.

10.3.1.17 TMSI (GSM-MAP)

This IE contains a Temporary Mobile Subscriber Identity, used towards a GSM-MAP type of PLMN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
TMSI (GSM-MAP)	MP		Bit string (32)	Setting specified in [11]. ~~The TMSI bits are numbered b0-b31, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the TMSI.

10.3.3.16 Integrity check info

The Integrity check info contains the RRC message sequence number needed in the calculation of XMAC-I [40] and the calculated MAC-I.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message authentication code	MP		bit string(32)	MAC-I [40]. ~~The Message Authentication Code bits are numbered b0-b31, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I. The 27 MSB of the IE shall be set to zero and the 5 LSB of the IE shall be set to the value of the IE "RB identity" for the used signalling radio bearer when the encoded RRC message is used as the MESSAGE parameter in the integrity protection algorithm.
RRC Message sequence number	MP		Integer (0..15)	The local RRC hyper frame number (RRC HFN) is concatenated with the RRC message sequence number to form the input parameter COUNT-I for the integrity protection algorithm. The IE value shall be set to zero when the encoded RRC message is used as the MESSAGE parameter in the integrity protection algorithm.

10.3.3.19 Integrity protection mode info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Integrity protection mode command	MP		Enumerated(start, modify)	
Downlink integrity protection activation info	CV-*modify*		Integrity protection activation info 10.3.3.17	
Integrity protection algorithm	OP		Integrity protection algorithm 10.3.3.18	
Integrity protection initialisation number	CV-*start*		Bit string(32)	FRESH [40]. The first/ leftmost bit of the bit string contains the most significant bit of the FRESH.

Condition	Explanation
Start	The IE is mandatory present if the IE "Integrity protection mode command" has the value "start ", otherwise it is not needed in the message.
Modify	The IE is mandatory present if the IE "Integrity protection mode command" has the value "modify" and not needed otherwise.

10.3.3.38 START

There is a START value per CN domain. The START is used to initialise the 20 MSBs of all hyper frame numbers (MAC-d HFN, RLC UM HFN, RLC AM HFN, RRC HFN) for a CN domain.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
START	MP		Bit string (20)	~~The~~ START [40]. ~~bits are numbered b0-b19, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the START.

10.3.4.12 NAS Synchronization indicator

A container for non-access stratum information to be transferred transparently through UTRAN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
NAS Synchronization indicator	MP		Bit string(4)	~~The bits are numbered b1-b4, where b1 is the least significant bit.~~The first/ leftmost bit of the bit string contains the most significant bit of the NAS Synchronization indicator.

10.3.6.6 ASC setting

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *mode*	MP			
>FDD				
>>Available signature Start Index	MP		Integer(0..15)	
>>Available signature End Index	MP		Integer(0..15)	
>>Assigned Sub-Channel Number	MP		Bit string(4)	This IE defines the subchannel assignment as specified in 8.6.6.29. ~~The bits are numbered b0 to b3, where b0 is the least significant bit.~~The first/ leftmost bit of the bit string contains the most significant bit of the Assigned Sub-Channel Number.
>TDD				
>>Available Channelisation codes indices	MD		Bit string(8)	Each bit indicates availability of a channelisation code index, where the channelisation code indices are numbered "channelisation code index 0" to "channelisation code index 7". The value 1 of a bit indicates that the channelisation code index is available for the ASC this IE is associated to. The value 0 of a bit indicates that the channelisation code index is not available for the ASC this IE is associated to. Default is that all channelisation codes defined in PRACH Info are available.
>>CHOICE *subchannel size*	MP			
>>>Size1				
>>>>Available Subchannels	MP		null	Indicates that all Subchannels are available.
>>>Size2				
>>>>Available Subchannels	MD		Bit string (2)	NOTE
>>>Size4				
>>>>Available Subchannels	MD		Bit string (4)	NOTE
>>>Size8				
>>>>Available Subchannels	MD		Bit string (8)	NOTE

NOTE: Each bit indicates availability of a subchannel, where the subchannels are numbered subchannel 0, subchannel 1 etc. The value 1 of a bit indicates that the subchannel is available for the ASC this IE is associated with. The value 0 of a bit indicates that the subchannel is not available for the ASC this IE is associated with. Default value of the IE is that all subchannels within the size are available for the ASC this IE is associated with.

10.3.7.26 Inter-RAT measured results list

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Inter-RAT measurement results	OP	1 to <maxOtherRAT-16>		
>CHOICE *system*	MP			One spare value is needed.
>>GSM				
>>>Measured GSM cells	MP	1 to <maxReportedGSMCells>		
>>>>GSM carrier RSSI	OP		bit string(6)	RXLEV is mapped to a value between 0 and 63, [46]. ~~The RSSI bits are numbered b0 to b5, where b0 is the least significant bit.~~When mapping the RXLEV value to the RSSI bit string, the first/ leftmost bit of the bit string contains the most significant bit.
>>>>CHOICE *BSIC*	MP			
>>>>>Verified BSIC				
>>>>>>inter-RAT cell id	MP		Integer(0..<maxCellMeas>-1)	
>>>>>Non verified BSIC				
>>>>>>BCCH ARFCN	MP		Integer (0..1023)	[45]
>>>>Observed time difference to GSM cell	OP		Observed time difference to GSM cell 10.3.7.52	

10.3.8.2 BSIC

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Base transceiver Station Identity Code (BSIC)	MP			[11]
>Network Colour Code (NCC)	MP		bit string(3)	The first/ leftmost bit of the bit string contains the most significant bit of the NCC.
>Base Station Colour Code (BCC)	MP		bit string(3)	The first/ leftmost bit of the bit string contains the most significant bit of the BCC.

10.3.8.7 Inter-RAT UE radio access capability

This Information Element contains the inter-RAT UE radio access capability that is structured and coded according to the specification used for the corresponding system type.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *system*	MP			
>GSM				
>>Mobile Station Classmark 2	MP		Octet string (5)	This IE is formatted as 'TLV' and is coded in the same way as the *Mobile Station Classmark 2* information element in [5]. The first octet is the *Mobile station classmark 2*

Information Element/Group name	Need	Multi	Type and reference	Semantics description
				IEI and its value shall be set to 33H. The second octet is the *Length of mobile station classmark 2* and its value shall be set to 3. The octet 3 contains the first octet of the value part of the *Mobile Station Classmark 2* information element, the octet 4 contains the second octet of the value part of the *Mobile Station Classmark 2* information element and so on. For each of these octets, the first/ leftmost/ most significant bit of the octet contains b8 of the corresponding octet of the *Mobile Station Classmark 2.* In this version of the protocol the first two octets of the Mobile Station Classmark 2 IE containing the *Mobile station classmark 2 IEI* and the *Length of mobile station classmark 2 contents* should be ignored by the receiver.
>>Mobile Station Classmark 3	MP		Octet string (1..32)	This IE is formatted as 'V' and is coded in the same way as the value part in the *Mobile station classmark 3* information element in [5]. The first octet contains octet 1 of the value part of *Mobile station classmark 3*, the second octet contains octet 2 of the value part of *Mobile station classmark 3* and so on. See NOTE 1.
>cdma2000				
>>cdma2000Message	MP	1.to.<maxInterSysMessages>		
>>>MSG_TYPE(s)	MP		Bit string (8)	Formatted and coded according to cdma2000 specifications. The first/ leftmost/ most significant bit of the bit string contains bit 7 of the MSG_TYPE.
>>>cdma2000Messagepayload(s)	MP		Bit string (1..512)	Formatted and coded according to cdma2000 specifications. The first/ leftmost/ most significant bit of the bit string contains bit 7 of the first octet of the cdma200 message.

NOTE 1: The value part is specified by means of CSN.1, which encoding results in a bit string, to which final padding may be appended upto the next octet boundary [5]. The first/ leftmost bit of the CSN.1 bit string is placed in the first/ leftmost/ most significant bit of the first octet. This continues until the last bit of the CSN.1 bit string, which is placed in the last/ rightmost/ least significant bit of the last octet.

10.3.8.15 Rplmn information

Contains information to provide faster RPLMN selection in the UE.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
GSM BA Range	OP	1 to maxNumGSMFreqRanges		GSM BA Range
>GSM Lower Range (UARFCN)	MP		Integer(0..16383)	Lower bound for range of GSM BA freqs
>GSM Upper Range (UARFCN)	MP		Integer(0..16383)	Upper bound for range of GSM BA freqs
FDD UMTS Frequency list	OP	1 to maxNumFDDFreqs		
>UARFCN (Nlow)	MP		Integer(0..16383)	[21]
>UARFCN (Nupper)	OP		Integer(0..16383)	[21] This IE is only needed when the FDD frequency list is specifying a range.
TDD UMTS Frequency list	OP	1 to maxNumTDDFreqs		
>UARFCN	MP		Integer(0..16383)	[22]
CDMA2000 UMTS Frequency list	OP	1 to maxNumCDMA200Freqs		
>BAND_CLASS	MP		Bit string(5 bits)	TIA/EIA/IS-2000. ~~The BAND_CLASS bits are numbered b0 to b4, where b0 is the least significant bit.~~When mapping the BAND_CLASS to the bit string, the first/ leftmost bit of the bit string contains the most significant bit.
>CDMA_FREQ	MP		Bit string (11 bits)	TIA/EIA/IS-2000. ~~The CDMA_FREQ bits are numbered b0 to b10, where b0 is the least significant bit.~~When mapping the CDMA_FREQ to the bit string, the first/ leftmost bit of the bit string contains the most significant bit.

10.3.9.8 MIN_P_REV

This Information Element contains minimum protocol revision level.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
MIN_P_REV	MP		Bit string (8)	Minimum protocol revision level. ~~The MIN_P_REV bits are numbered b0 to b7, where b0 is the least significant bit.~~The first/ leftmost bit of the bit string contains the most significant bit of the MIN_P_REV.

10.3.9.9 NID

This Information Element contains Network identification.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
NID	MP		Bit string (16)	Network identification. ~~The NID bits are numbered b0 to b15, where b0 is the least significant bit.~~The first/ leftmost bit of the bit string contains the most significant bit of the NID.

10.3.9.10 P_REV

This Information Element contains protocol revision level.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
P_REV	MP		Bit string (8)	Protocol revision level. ~~The P_REV bits are numbered b0 to b7, where b0 is the least significant bit.~~The first/ leftmost bit of the bit string contains the most significant bit of the P_REV.

10.3.9.11 SID

This Information Element contains System identification.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
SID	MP		Bit string (15)	System identification. ~~The SID bits are numbered b0 to b14, where b0 is the least significant bit.~~The first/ leftmost bit of the bit string contains the most significant bit of the SID.

3GPP TSG-RAN WG2 Meeting #34 **Tdoc ⌘R2-030447**
Sophia Antipolis, France, 17th- 21st February 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.331** **CR** **1824** ⌘**rev** **-** ⌘ Current version: **4.8.0** ⌘

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

Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [X] Core Network [ ]

Title:	⌘	Correction concerning bit numbering convention
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	18/02/2003
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)*
Rel-6 *(Release 6)*

Reason for change: ⌘

Alignment of bit numbering with ASN.1 convention, as reflected in clause 11.0:

The bits in the ASN.1 bit string shall represent the semantics of the functional IE definition in decreasing order of bit significance;
- with the first (or leftmost) bit in the bit string representing the most significant bit

together with clause 12 on the transfer syntax:

- When a bit string value is placed in a bit-field as specified in 15.6 to 15.11 in [11], the leading bit of the bit string value shall be placed in the leading bit of the bit-field, and the trailing bit of the bit string value shall be placed in the trailing bit of the bit-field.

this implies that the first and least significant bit is transmitted first

Currently in the semantics description, there are statements like “the bits are numbered b0 to bn where b0 is least significant. This does not ambigously specify how the mapping is done to the bit string is done

Example: LAC

24.008 states that bit 8 of octet 5 is the most significant bit and bit 1 of octet 6 the least significant bit. This is illustrated as follows, with bit numbering according to 24.008:

oct5: msb b14 b13 b12 b11 b10 b09 b08
oct6: b07 b06 b05 b04 b03 b02 b01 lsb

Current statement in the semantics description

The LAC bits are numbered b0-b15, where b0 is the least significant bit

The assumption is that the correct interpretation of this statement is as follows:

- b0 is the bit number of the information element specified in 24.008 (and NOT the first bit of the ASN.1 bit string)
- the significance is maintained when mapping the information onto the RRC information element; the LSB of the information element is mapped to the least significant bit of the bit string

The above assumptions imply that b15 of the 24.008 information element is mapped onto the first bit of the bit string and is transmitted first (while bit 8 is transmitted first in GSM). This assumption does not involve bit swapping !

The main ambiguity is that one could assume that:

- b0 is the first bit of the bit string
- the LSB of the LAC information is mapped onto the first bit of the bit string

In this case b0 of the LAC is mapped to the first bit of the bitstring, which involves bitswapping.

The ambiguity in the current specification resulted in a discussion in T1 related to test case TC 8.1.2.1. In the end it was agreed that setting the RRC bitstring to '0001'H corresponds with a LAC value set to '0001'H (and no bitswapping)

Summary of change: ⌘ The original version of this CR included the following changes:

- **General case**: This CR proposes to replace the following text (LAC example):

  The LAC bits are numbered b0-b15, where b0 is the least significant bit

  with the following text:

  The first/ leftmost bit of the bit string contains the most significant bit (b3) of the LAC"

- **Handover from UTRAN**: This CR proposes to replace the following text:

  The first bit of the bit string contains the first bit of the GSM message

  with the following text:

  The first/ leftmost/ most significant bit of the bit string contains bit 8 of the first octet of the GSM message"

Consequences if not approved: ⌘ The ambiguity remains, as a result of which the sender and receiver may apply different values for the concerned parameters. Most likely this will result in a failure of the concerned function

This would affect several functions including cell change order, handover from UTRAN, broadcast of complete system information blocks, routing of signalling connections, location/ routing area handling, initial access, integrity and ciphering

Clauses affected: ⌘ 10.2.5, 10.2.15, 10.2.16, 10.2.48.6, 10.3.1.6, 10.3.1.7, 10.3.1.13, 10.3.1.14, 10.3.1.15, 10.3.1.17, 10.3.3.16, 10.3.3.19, 10.3.3.38, 10.3.4.12, 10.3.6.6, 10.3.7.26, 10.3.8.2, 10.3.8.7, 10.3.8.15, 10.3.9.8, 10.3.9.9, 10.3.9.10, 10.3.9.11

Y | **N**

Other specs affected:	⌘		**X**	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

10.2.5 CELL CHANGE ORDER FROM UTRAN

This message is used to order a cell change from UTRA to another radio access technology, e.g., GSM.

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36	
Integrity check info	CH		Integrity check info 10.3.3.16	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
RB Information elements				
RAB information list	OP	1 to <maxRABsetup>		This IE should not be included in this version of the protocol.
>RAB info	MP		RAB info 10.3.4.8	
Other information elements				
Target cell description	MP			
>CHOICE *Radio Access Technology*	MP			Two spare values are needed.
>>GSM				
>>>BSIC	MP		BSIC 10.3.8.2	
>>>Band Indicator	MP		Enumerated (DCS 1800 band used, PCS 1900 band used)	Indicates how to interpret the BCCH ARFCN
>>>BCCH ARFCN	MP		Integer (0..1023)	[45]
>>>NC mode	OP		Bit string(3)	Includes bits b1-b3 of the NC mode IE specified in [43]. ~~b1 is the least significant bit.~~ The first/ leftmost/ most significant bit of the bit string contains the most significant bit (b3) of NC mode. NOTE: The Bit string should be extended to 4 bits in a later version of the message.
>>IS-2000				

10.2.15 HANDOVER FROM UTRAN COMMAND

This message is used for handover from UMTS to another system e.g. GSM. One or several messages from the other system can be included in the Inter-RAT message information element in this message. These messages are structured and coded according to that systems specification.

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36	
Integrity check info	CH		Integrity check info 10.3.3.16	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
RB information elements				
RAB information list	OP	1 to <maxRABsetup>		For each RAB to be handed over. In this version, the maximum size of the list of 1 shall be applied for all system types.
>RAB info	MP		RAB info 10.3.4.8	
Other information elements				
CHOICE *System type*	MP			This IE indicates which specification to apply, to decode the transported messages
>GSM				
>>Frequency band	MP		Enumerated (GSM/DCS 1800 band used), GSM/PCS 1900 band used)	
>>GSM message				
>>>Single GSM message	MP		Bit string (no explicit size constraint)	Formatted and coded according to GSM specifications The first/ leftmost/ most significant bit of the bit string contains ~~the first~~ bit 8 of the first octet of the GSM message.
>>>GSM message List	MP	1.to.<maxInterSysMessages>	Bit string (1..512)	Formatted and coded according to GSM specifications. The first/ leftmost/ most significant bit of the bit string contains ~~the first~~ bit 8 of the first octet of the GSM message.
>cdma2000				
>>cdma2000MessageList	MP	1.to.<maxInterSysMessages>		
>>>MSG_TYPE(s)	MP		Bit string (8)	Formatted and coded according to cdma2000 specifications. The MSG_TYPE bits are numbered b0 to b7~~, where b0 is the least significant bit~~. The first/ leftmost/ most significant bit of the bit string contains bit 7 of the MSG_TYPE.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>>cdma2000Messagepayload(s)	MP		Bit string (1..512)	Formatted and coded according to cdma2000 specifications. The first/ leftmost/ most significant bit of the bit string contains ~~the first~~ bit 7 of the first octet of the cdma2000 message.

10.2.16 HANDOVER FROM UTRAN FAILURE

This message is sent on the RRC connection used before the Inter-RAT Handover was executed. The message indicates that the UE has failed to seize the new channel in the other system.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36	
Integrity check info	CH		Integrity check info 10.3.3.16	
Other information elements				
Inter-RAT handover failure	OP		Inter-RAT handover failure 10.3.8.6	
CHOICE *System type*	OP			This IE indicates which specification to apply to decode the transported messages
>GSM				
>GSM message List	MP	1.to.<maxInterSysMessages>	Bit string (1..512)	Formatted and coded according to GSM specifications. The first/ leftmost// most significant bit of the bit string contains bit 8 of the first octet~~bit~~ of the GSM message.
>cdma2000				
>>cdma2000MessageList	MP	1.to.<maxInterSysMessages>		
>>>MSG_TYPE(s)	MP		Bit string (8)	Formatted and coded according to cdma2000 specifications. The MSG_TYPE bits are numbered b0 to b7~~, where b0 is the least significant bit~~. The first/ leftmost/ most significant bit of the bit string contains bit 7 of the MSG_TYPE.
>>>cdma2000Messagepayload(s)	MP		Bit string (1..512)	Formatted and coded according to cdma2000 specifications. The first/

Information Element/Group name	Need	Multi	Type and reference	Semantics description
				leftmost/ most significant bit of the bit string contains bit 7 of the first ~~bit~~ octet of the cdma2000 message.

10.2.48.6 Complete SIB

This segment type is used to transfer a non-segmented system information block. The IE is used when the complete SIB has a length, excluding length denominator, from 215 through 226 (Combination 10).

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Other information elements				
SIB type	MP		SIB Type, 10.3.8.21	
SIB data fixed	MP		Bit string (226)	The first/ leftmost/ most significant bit of the bit string contains the first bit of the segment. In case the SIB data is less than 226 bits, padding shall be used. The same padding bits shall be used as defined in clause 12.1

10.3.1.6 Intra Domain NAS Node Selector

This IE carries information to be used to route the establishment of a signalling connection to a CN node within a CN domain.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *version*	MP			
>R99				This choice shall also be used by mobiles that are compliant to this version of the protocol
>>CHOICE *CN type*	MP			
>>>GSM-MAP				
>>>>CHOICE *Routing basis*	MP			
>>>>>local (P)TMSI				TMSI allocated in the current LA or PTMSI allocated in the current RA
>>>>>>Routing parameter	MP		Bit string (10)	The TMSI/ PTMSI consists of 4 octets (32bits). This~~e~~ can be represented by a string of bits ~~are~~ numbered from b0 to b31, with bit b0 being the least significant The "Routing parameter" bit string consists of bits b14 through b23 of the TMSI/ PTMSI ~~where bit b14 is the least significant~~. The first/ leftmost/ most significant bit of the bit string contains bit b23 of the TMSI/ PTMSI.
>>>>>(P)TMSI of same PLMN, different (RA)LA				TMSI allocated in another LA of this PLMN or PTMSI allocated in another RA this PLMN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>>>>>Routing parameter	MP		Bit string (10)	The TMSI/ PTMSI consists of 4 octets (32bits). This~~e~~ can be represented by a string of bits ~~are~~ numbered from b0 to b31, with bit b0 being the least significant The "Routing parameter" bit string consists of bits b14 through b23 of the TMSI/ PTMSI ~~where bit b14 is the least significant~~. The first/ leftmost/ most significant bit of the bit string contains bit b23 of the TMSI/ PTMSI.
>>>>>(P)TMSI of different PLMN				TMSI or a PTMSI allocated in another PLMN
>>>>>>Routing parameter	MP		Bit string (10)	The TMSI/ PTMSI consists of 4 octets (32bits). This~~e~~ can be represented by a string of bits ~~are~~ numbered from b0 to b31, with bit b0 being the least significant The "Routing parameter" bit string consists of bits b14 through b23 of the TMSI/ PTMSI ~~where bit b14 is the least significant~~. The first/ leftmost/ most significant bit of the bit string contains bit b23 of the TMSI/ PTMSI
>>>>>IMSI(response to IMSI paging)				NAS identity is IMSI
>>>>>>Routing parameter	MP		Bit string (10)	The "Routing parameter" bit string consists of DecimalToBinary [(IMSI div 10) mod 1000]. ~~The bits of the result are numbered from b0 to b9, with bit b0 being the least significant.~~ The first/ leftmost bit of the bit string contains the most significant bit of the result.
>>>>>IMSI(cause UE initiated event)				NAS identity is IMSI
>>>>>>Routing parameter	MP		Bit string (10)	The "Routing parameter" bit string consists of DecimalToBinary [(IMSI div 10) mod 1000]. ~~The bits of the result are numbered from b0 to b9, with bit b0 being the least significant.~~ The first/ leftmost bit of the bit string contains the most significant bit of the result.
>>>>>IMEI				NAS parameter is IMEI

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>>>>>Routing parameter	MP		Bit string (10)	The "Routing parameter" bit string consists of DecimalToBinary [(IMEI div 10) mod 1000]. ~~The bits of the result are numbered from b0 to b9, with bit b0 being the least significant.~~ The first/ leftmost bit of the bit string contains the most significant bit of the result.
>>>>>Spare 1			Bit string (10)	This choice shall not be used in this version
>>>>>Spare 2			Bit string (10)	This choice shall not be used in this version
>>>>Entered parameter	MP		Boolean	Entered parameter shall be set to TRUE if the most significant byte of the current LAI/RAI is different compared to the most significant byte of the LAI/RAI stored on the SIM; Entered parameter shall be set to FALSE otherwise
>>>ANSI-41			Bit string (14)	All bits shall be set to 0
>Later			Bit string(15)	This bit string shall not be sent by mobiles that are compliant to this version of the protocol.

10.3.1.7 Location Area Identification

Identifies uniquely a location area for a GSM-MAP type of PLMN. Setting specified in [5].

Information Element/Group name	Need	Multi	Type and reference	Semantics description
PLMN identity	MP		PLMN identity 10.3.1.11	
LAC	MP		Bit string(16)	~~The LAC bits are numbered b0-b15, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the LAC.

10.3.1.13 P-TMSI (GSM-MAP)

This IE contains a Packet Temporary Mobile Subscriber Identity, used towards a GSM-MAP type of PLMN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
P-TMSI	MP		Bit string (32)	Setting specified in [11]. ~~The P-TMSI bits are numbered b0-b31, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the P-TMSI.

10.3.1.14 RAB identity

This information element uniquely identifies a radio access bearer within a CN domain.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *RAB identity type*	MP			
>RAB identity (GSM-MAP)			Bit string (8)	Formatted according to [5]. ~~The bits are numbered b1-b8, where b1 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the RAB identity.
>RAB identity (ANSI-41)			Bit string (8)	~~The bits are numbered b1-b8, where b1 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the RAB identity.

CHOICE *NAS binding info type*	**Condition under which the given *RAB identity type* is chosen**
RAB identity (GSM-MAP)	PLMN is of type GSM-MAP
RAB identity (ANSI-41)	PLMN is of type ANSI-41

10.3.1.15 Routing Area Code

Identifies a routing area within a location area for a GSM-MAP type of PLMN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Routing Area Code	MP		Bit string(8)	Setting specified in [11]. ~~The Routing Area Code bits are numbered b0 to b7, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the Routing Area Code.

10.3.1.17 TMSI (GSM-MAP)

This IE contains a Temporary Mobile Subscriber Identity, used towards a GSM-MAP type of PLMN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
TMSI (GSM-MAP)	MP		Bit string (32)	Setting specified in [11]. ~~The TMSI bits are numbered b0-b31, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the TMSI.

10.3.3.16 Integrity check info

The Integrity check info contains the RRC message sequence number needed in the calculation of XMAC-I [40] and the calculated MAC-I.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message authentication code	MP		bit string(32)	MAC-I [40]. ~~The Message Authentication Code bits are numbered b0-b31, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I.The 27 MSB of the IE shall be set to zero and the 5 LSB of the IE shall be set to the value of the IE "RB identity" for the used signalling radio bearer when the encoded RRC message is used as the MESSAGE parameter in the integrity protection algorithm.
RRC Message sequence number	MP		Integer (0..15)	The local RRC hyper frame number (RRC HFN) is concatenated with the RRC message sequence number to form the input parameter COUNT-I for the integrity protection algorithm. The IE value shall be set to zero when the encoded RRC message is used as the MESSAGE parameter in the integrity protection algorithm.

10.3.3.19 Integrity protection mode info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Integrity protection mode command	MP		Enumerated(start, modify)	
Downlink integrity protection activation info	CV-*modify*		Integrity protection activation info 10.3.3.17	
Integrity protection algorithm	OP		Integrity protection algorithm 10.3.3.18	
Integrity protection initialisation number	CV-*start*		Bit string(32)	FRESH [40]. The first/ leftmost bit of the bit string contains the most significant bit of the FRESH.

Condition	Explanation
Start	The IE is mandatory present if the IE "Integrity protection mode command" has the value "start ", otherwise it is not needed in the message.
Modify	The IE is mandatory present if the IE "Integrity protection mode command" has the value "modify" and not needed otherwise.

10.3.3.38 START

There is a START value per CN domain. The START is used to initialise the 20 MSBs of all hyper frame numbers (MAC-d HFN, RLC UM HFN, RLC AM HFN, RRC HFN) for a CN domain.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
START	MP		Bit string (20)	~~The~~ START [40]. ~~bits are numbered b0-b19, where b0 is the least significant bit~~. The first/ leftmost bit of the bit string contains the most significant bit of the START.

10.3.4.12 NAS Synchronization indicator

A container for non-access stratum information to be transferred transparently through UTRAN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
NAS Synchronization indicator	MP		Bit string(4)	~~The bits are numbered b1-b4, where b1 is the least significant bit.~~The first/ leftmost bit of the bit string contains the most significant bit of the NAS Synchronization indicator.

10.3.6.6 ASC setting

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
CHOICE *mode*	MP				
>FDD					
>>Available signature Start Index	MP		Integer(0..15)		
>>Available signature End Index	MP		Integer(0..15)		
>>Assigned Sub-Channel Number	MP		Bit string(4)	This IE defines the subchannel assignment as specified in 8.6.6.29. ~~The bits are numbered b0 to b3, where b0 is the least significant bit.~~The first/ leftmost bit of the bit string contains the most significant bit of the Assigned Sub-Channel Number.	
>TDD					
>>CHOICE *TDD option*	MP				REL-4
>>>3.84 Mcps TDD					REL-4
>>>>Available Channelisation codes indices	MD		Bit string(8)	Each bit indicates availability of a channelisation code index, where the channelisation code indices are numbered "channelisation code index 0" to "channelisation code index 7". The value 1 of a bit indicates that	

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
				the channelisation code index is available for the ASC this IE is associated to. The value 0 of a bit indicates that the channelisation code index is not available for the ASC this IE is associated to. Default is that all channelisation codes defined in PRACH Info are available.	
>>>1.28 Mcps TDD					REL-4
>>>>Available SYNC_UL codes indices	MD		Bit string(8)	Each bit indicates availability of a SYNC_UL code index, where the SYNC_UL code indices are numbered "SYNC_UL code index 0" to "SYNC_UL code index 7". The value 1 of a bit indicates that the SYNC_UL code index is available for the ASC this IE is associated to. The value 0 of a bit indicates that the SYNC_UL code index is not available for the ASC this IE is associated to. Default is that all SYNC_UL codes defined in SYNC_UL Info are available.	REL-4
>>CHOICE *subchannel size*	MP				
>>>Size1					
>>>>Available Subchannels	MP		null	Indicates that all Subchannels are available	
>>>Size2					
>>>>Available Subchannels	MD		Bit string (2)	NOTE	
>>>Size4					
>>>>Available Subchannels	MD		Bit string (4)	NOTE	
>>>Size8					
>>>>Available Subchannels	MD		Bit string (8)	NOTE	

NOTE: Each bit indicates availability of a subchannel, where the subchannels are numbered subchannel 0, subchannel 1 etc. The value 1 of a bit indicates that the subchannel is available for the ASC this IE is associated with. The value 0 of a bit indicates that the subchannel is not available for the ASC this IE is associated with. Default value of the IE is that all subchannels within the size are available for the ASC this IE is associated with.

10.3.7.26 Inter-RAT measured results list

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Inter-RAT measurement results	OP	1 to <maxOtherRAT-16>		
>CHOICE *system*	MP			One spare value is needed.
>>GSM				
>>>Measured GSM cells	MP	1 to <maxReportedGSMCells>		
>>>>GSM carrier RSSI	OP		bit string(6)	RXLEV is mapped to a value between 0 and 63, [46]. ~~The RSSI bits are numbered b0 to b5, where b0 is the least significant bit.~~ When mapping the RXLEV value to the RSSI bit string, the first/ leftmost bit of the bit string contains the most significant bit.
>>>>CHOICE *BSIC*	MP			
>>>>>Verified BSIC				
>>>>>>inter-RAT cell id	MP		Integer(0..<maxCellMeas>-1)	
>>>>>Non verified BSIC				
>>>>>>BCCH ARFCN	MP		Integer (0..1023)	[45]
>>>>Observed time difference to GSM cell	OP		Observed time difference to GSM cell 10.3.7.52	

10.3.8.2 BSIC

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Base transceiver Station Identity Code (BSIC)	MP			[11]
>Network Colour Code (NCC)	MP		bit string(3)	The first/ leftmost bit of the bit string contains the most significant bit of the NCC.
>Base Station Colour Code (BCC)	MP		bit string(3)	The first/ leftmost bit of the bit string contains the most significant bit of the BCC.

10.3.8.7 Inter-RAT UE radio access capability

This Information Element contains the inter-RAT UE radio access capability that is structured and coded according to the specification used for the corresponding system type.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *system*	MP			
>GSM				
>>Mobile Station Classmark 2	MP		Octet string (5)	This IE is formatted as 'TLV' and is coded in the same way as the *Mobile Station Classmark 2* information element in [5]. The first octet is the *Mobile station classmark 2*

Information Element/Group name	Need	Multi	Type and reference	Semantics description
				IEI and its value shall be set to 33H. The second octet is the *Length of mobile station classmark 2* and its value shall be set to 3. The octet 3 contains the first octet of the value part of the *Mobile Station Classmark 2* information element, the octet 4 contains the second octet of the value part of the *Mobile Station Classmark 2* information element and so on. For each of these octets, the first/ leftmost/ most significant bit of the octet contains b8 of the corresponding octet of the *Mobile Station Classmark 2.* In this version of the protocol the first two octets of the Mobile Station Classmark 2 IE containing the *Mobile station classmark 2 IEI* and the *Length of mobile station classmark 2 contents* should be ignored by the receiver.
>>Mobile Station Classmark 3	MP		Octet string (1..32)	This IE is formatted as 'V' and is coded in the same way as the value part in the *Mobile station classmark 3* information element in [5]. The first octet contains octet 1 of the value part of *Mobile station classmark 3*, the second octet contains octet 2 of the value part of *Mobile station classmark 3* and so on. See NOTE 1.
>cdma2000				
>>cdma2000Message	MP	1.to.<maxInterSysMessages>		
>>>MSG_TYPE(s)	MP		Bit string (8)	Formatted and coded according to cdma2000 specifications. The first/ leftmost/ most significant bit of the bit string contains bit 7 of the MSG_TYPE.
>>>cdma2000Messagepayload(s)	MP		Bit string (1..512)	Formatted and coded according to cdma2000 specifications. The first/ leftmost/ most significant bit of the bit string contains bit 7 of the first octet of the cdma200 message.

NOTE 1: The value part is specified by means of CSN.1, which encoding results in a bit string, to which final padding may be appended upto the next octet boundary [5]. The first/ leftmost bit of the CSN.1 bit string is placed in the first/ leftmost/ most significant bit of the first octet. This continues until the last bit of the CSN.1 bit string, which is placed in the last/ rightmost/ least significant bit of the last octet.

10.3.8.15 Rplmn information

Contains information to provide faster RPLMN selection in the UE.

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
GSM BA Range	OP	1 to maxNumGSMFreqRanges		GSM BA Range	
>GSM Lower Range (UARFCN)	MP		Integer(0..16383)	Lower bound for range of GSM BA freqs	
>GSM Upper Range (UARFCN)	MP		Integer(0..16383)	Upper bound for range of GSM BA freqs	
FDD UMTS Frequency list	OP	1 to maxNumFDDFreqs			
>UARFCN (Nlow)	MP		Integer(0..16383)	[21]	
>UARFCN (Nupper)	OP		Integer(0..16383)	[21] This IE is only needed when the FDD frequency list is specifying a range.	
3.84 Mcps TDD UMTS Frequency list	OP	1 to maxNumTDDFreqs			
>UARFCN	MP		Integer(0..16383)	[22]	
1.28 Mcps TDD UMTS Frequency list	OP	1 to maxNumTDDFreqs			REL-4
>UARFCN	MP		Integer(0..16383)	[22]	REL-4
CDMA2000 UMTS Frequency list	OP	1 to maxNumCDMA200Freqs			
>BAND_CLASS	MP		Bit string(5 bits)	TIA/EIA/IS-2000 ~~The BAND_CLASS bits are numbered b0 to b4, where b0 is the least significant bit.~~ When mapping the BAND_CLASS to the bit string, the first/ leftmost bit of the bit string contains the most significant bit.	
>CDMA_FREQ	MP		Bit string (11 bits)	TIA/EIA/IS-2000 ~~The CDMA_FREQ bits are numbered b0 to b10, where b0 is the least significant bit.~~ When mapping the CDMA_FREQ to the bit string, the first/ leftmost bit of the bit string contains the most significant bit.	

10.3.9.8 MIN_P_REV

This Information Element contains minimum protocol revision level.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
MIN_P_REV	MP		Bit string (8)	Minimum protocol revision level. ~~The MIN_P_REV bits are numbered b0 to b7, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the MIN_P_REV.

10.3.9.9 NID

This Information Element contains Network identification.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
NID	MP		Bit string (16)	Network identification. ~~The NID bits are numbered b0 to b15, where b0 is the least significant bit.~~The first/ leftmost bit of the bit string contains the most significant bit of the NID.

10.3.9.10 P_REV

This Information Element contains protocol revision level.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
P_REV	MP		Bit string (8)	Protocol revision level. ~~The P_REV bits are numbered b0 to b7, where b0 is the least significant bit.~~The first/ leftmost bit of the bit string contains the most significant bit of the P_REV.

10.3.9.11 SID

This Information Element contains System identification.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
SID	MP		Bit string (15)	System identification. ~~The SID bits are numbered b0 to b14, where b0 is the least significant bit.~~The first/ leftmost bit of the bit string contains the most significant bit of the SID.

3GPP TSG-RAN WG2 Meeting #34 **Tdoc ⌘R2-030448**
Sophia Antipolis, France, 17th- 21st February 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.331** **CR** **1825** ⌘**rev** **-** ⌘ Current version: **5.3.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☒ Core Network ☐

Title:	⌘	Correction concerning bit numbering convention	
Source:	⌘	TSG-RAN WG2	
Work item code:	⌘	TEI	***Date:*** ⌘ 18/02/2003
Category:	⌘	**A**	***Release:*** ⌘ Rel-5

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)*
Rel-6 *(Release 6)*

Reason for change: ⌘

Alignment of bit numbering with ASN.1 convention, as reflected in clause 11.0:

The bits in the ASN.1 bit string shall represent the semantics of the functional IE definition in decreasing order of bit significance;
- with the first (or leftmost) bit in the bit string representing the most significant bit

together with clause 12 on the transfer syntax:

- When a bit string value is placed in a bit-field as specified in 15.6 to 15.11 in [11], the leading bit of the bit string value shall be placed in the leading bit of the bit-field, and the trailing bit of the bit string value shall be placed in the trailing bit of the bit-field.

this implies that the first and least significant bit is transmitted first

Currently in the semantics description, there are statements like “the bits are numbered b0 to bn where b0 is least significant. This does not ambigously specify how the mapping is done to the bit string is done

Example: LAC

24.008 states that bit 8 of octet 5 is the most significant bit and bit 1 of octet 6 the least significant bit. This is illustrated as follows, with bit numbering according to 24.008:

oct5: msb b14 b13 b12 b11 b10 b09 b08
oct6: b07 b06 b05 b04 b03 b02 b01 lsb

Current statement in the semantics description

The LAC bits are numbered b0-b15, where b0 is the least significant bit

The assumption is that the correct interpretation of this statement is as follows:

- b0 is the bit number of the information element specified in 24.008 (and NOT the first bit of the ASN.1 bit string)
- the significance is maintained when mapping the information onto the RRC information element; the LSB of the information element is mapped to the least significant bit of the bit string

The above assumptions imply that b15 of the 24.008 information element is mapped onto the first bit of the bit string and is transmitted first (while bit 8 is transmitted first in GSM). This assumption does not involve bit swapping !

The main ambiguity is that one could assume that:

- b0 is the first bit of the bit string
- the LSB of the LAC information is mapped onto the first bit of the bit string

In this case b0 of the LAC is mapped to the first bit of the bitstring, which involves bitswapping.

The ambiguity in the current specification resulted in a discussion in T1 related to test case TC 8.1.2.1. In the end it was agreed that setting the RRC bitstring to '0001'H corresponds with a LAC value set to '0001'H (and no bitswapping)

Summary of change: ⌘ The original version of this CR included the following changes:

- **General case**: This CR proposes to replace the following text (LAC example):

  The LAC bits are numbered b0-b15, where b0 is the least significant bit

  with the following text:

  The first/ leftmost bit of the bit string contains the most significant bit (b3) of the LAC"

- **Handover from UTRAN**: This CR proposes to replace the following text:

  The first bit of the bit string contains the first bit of the GSM message

  with the following text:

  The first/ leftmost/ most significant bit of the bit string contains bit 8 of the first octet of the GSM message"

Consequences if not approved: ⌘ The ambiguity remains, as a result of which the sender and receiver may apply different values for the concerned parameters. Most likely this will result in a failure of the concerned function

This would affect several functions including cell change order, handover from UTRAN, broadcast of complete system information blocks, routing of signalling connections, location/ routing area handling, initial access, integrity and ciphering

Clauses affected: ⌘ 10.2.5, 10.2.15, 10.2.16, 10.2.48.6, 10.3.1.6, 10.3.1.7, 10.3.1.13, 10.3.1.14, 10.3.1.15, 10.3.1.17, 10.3.3.16, 10.3.3.19, 10.3.3.38, 10.3.4.12, 10.3.6.6, 10.3.7.26, 10.3.8.2, 10.3.8.7, 10.3.8.15, 10.3.9.8, 10.3.9.9, 10.3.9.10, 10.3.9.11

Y | **N**

Other specs affected:	⌘		**X**	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:

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

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

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

10.2.5 CELL CHANGE ORDER FROM UTRAN

This message is used to order a cell change from UTRA to another radio access technology, e.g., GSM.

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36	
Integrity check info	CH		Integrity check info 10.3.3.16	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
RB Information elements				
RAB information list	OP	1 to <maxRABsetup>		This IE should not be included in this version of the protocol.
>RAB info	MP		RAB info 10.3.4.8	
Other information elements				
Target cell description	MP			
>CHOICE *Radio Access Technology*	MP			Two spare values are needed.
>>GSM				
>>>BSIC	MP		BSIC 10.3.8.2	
>>>Band Indicator	MP		Enumerated (DCS 1800 band used, PCS 1900 band used)	Indicates how to interpret the BCCH ARFCN
>>>BCCH ARFCN	MP		Integer (0..1023)	[45]
>>>NC mode	OP		Bit string(3)	Includes bits b1-b3 of the NC mode IE specified in [43]. ~~b1 is the least significant bit.~~ The first/ leftmost/ most significant bit of the bit string contains the most significant bit (b3) of NC mode. NOTE: The Bit string should be extended to 4 bits in a later version of the message.
>>IS-2000				

10.2.15 HANDOVER FROM UTRAN COMMAND

This message is used for handover from UMTS to another system e.g. GSM. One or several messages from the other system can be included in the Inter-RAT message information element in this message. These messages are structured and coded according to that systems specification.

RLC-SAP: AM

Logical channel: DCCH

Direction: UTRAN→UE

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36	
Integrity check info	CH		Integrity check info 10.3.3.16	
Activation time	MD		Activation time 10.3.3.1	Default value is "now"
RB information elements				
RAB information list	OP	1 to <maxRABsetup>		For each RAB to be handed over. In this version, the maximum size of the list of 1 shall be applied for all system types.
>RAB info	MP		RAB info 10.3.4.8	
Other information elements				
CHOICE *System type*	MP			This IE indicates which specification to apply, to decode the transported messages
>GSM				
>>Frequency band	MP		Enumerated (GSM/DCS 1800 band used), GSM/PCS 1900 band used)	
>>GSM message				
>>>Single GSM message	MP		Bit string (no explicit size constraint)	Formatted and coded according to GSM specifications The first/ leftmost/ most significant bit of the bit string contains bit 8 of the first ~~bit~~ octet of the GSM message.
>>>GSM message List	MP	1.to.<maxInterSysMessages>	Bit string (1..512)	Formatted and coded according to GSM specifications. The first/ leftmost/ most significant bit of the bit string contains bit 8 of the first ~~bit~~ octet of the GSM message.
>cdma2000				
>>cdma2000MessageList	MP	1.to.<maxInterSysMessages>		
>>>MSG_TYPE(s)	MP		Bit string (8)	Formatted and coded according to cdma2000 specifications. The MSG_TYPE bits are numbered b0 to b7~~, where b0 is the least significant bit~~. The first/ leftmost/ most significant bit of the bit string contains bit 7 of the MSG_TYPE.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>>cdma2000Messagepayload(s)	MP		Bit string (1..512)	Formatted and coded according to cdma2000 specifications. The first/ leftmost/ most significant bit of the bit string contains bit 7 of the first ~~bit~~ octet of the cdma2000 message.

10.2.16 HANDOVER FROM UTRAN FAILURE

This message is sent on the RRC connection used before the Inter-RAT Handover was executed. The message indicates that the UE has failed to seize the new channel in the other system.

RLC-SAP: AM

Logical channel: DCCH

Direction: UE→UTRAN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message Type	MP		Message Type	
UE information elements				
RRC transaction identifier	MP		RRC transaction identifier 10.3.3.36	
Integrity check info	CH		Integrity check info 10.3.3.16	
Other information elements				
Inter-RAT handover failure	OP		Inter-RAT handover failure 10.3.8.6	
CHOICE *System type*	OP			This IE indicates which specification to apply to decode the transported messages
>GSM				
>GSM message List	MP	1.to.<maxInterSysMessages>	Bit string (1..512)	Formatted and coded according to GSM specifications. The first/ leftmost/ most significant bit of the bit string contains bit 8 of the first ~~bit~~ octet of the GSM message.
>cdma2000				
>>cdma2000MessageList	MP	1.to.<maxInterSysMessages>		
>>>MSG_TYPE(s)	MP		Bit string (8)	Formatted and coded according to cdma2000 specifications. The MSG_TYPE bits are numbered b0 to b7~~, where b0 is the least significant bit~~. The first/ leftmost/ most significant bit of the bit string contains bit 7 of the MSG_TYPE.
>>>cdma2000Messagepayload(s)	MP		Bit string (1..512)	Formatted and coded according to cdma2000 specifications. The first/

Information Element/Group name	Need	Multi	Type and reference	Semantics description
				leftmost/ most significant bit of the bit string contains bit 7 of the first ~~bit~~ octet of the cdma2000 message.

10.2.48.6 Complete SIB

This segment type is used to transfer a non-segmented system information block. The IE is used when the complete SIB has a length, excluding length denominator, from 215 through 226 (Combination 10).

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Other information elements				
SIB type	MP		SIB Type, 10.3.8.21	
SIB data fixed	MP		Bit string (226)	The first/ leftmost/ most significant bit of the bit string contains the first bit of the segment. In case the SIB data is less than 226 bits, padding shall be used. The same padding bits shall be used as defined in clause 12.1

10.3.1.6 Intra Domain NAS Node Selector

This IE carries information to be used to route the establishment of a signalling connection to a CN node within a CN domain.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *version*	MP			
>R99				This choice shall also be used by mobiles that are compliant to this version of the protocol
>>CHOICE *CN type*	MP			
>>>GSM-MAP				
>>>>CHOICE *Routing basis*	MP			
>>>>>local (P)TMSI				TMSI allocated in the current LA or PTMSI allocated in the current RA
>>>>>>Routing parameter	MP		Bit string (10)	The TMSI/ PTMSI consists of 4 octets (32bits). This~~e~~ can be represented by a string of bits ~~are~~ numbered from b0 to b31, with bit b0 being the least significant The "Routing parameter" bit string consists of bits b14 through b23 of the TMSI/ PTMSI ~~where bit b14 is the least significant~~. The first/ leftmost/ most significant bit of the bit string contains bit b23 of the TMSI/ PTMSI.
>>>>>(P)TMSI of same PLMN, different (RA)LA				TMSI allocated in another LA of this PLMN or PTMSI allocated in another RA this PLMN

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>>>>>Routing parameter	MP		Bit string (10)	The TMSI/ PTMSI consists of 4 octets (32bits). This~~e~~ can be represented by a string of bits are numbered from b0 to b31, with bit b0 being the least significant The "Routing parameter" bit string consists of bits b14 through b23 of the TMSI/ PTMSI~~ where bit b14 is the least significant~~. The first/ leftmost/ most significant bit of the bit string contains bit b23 of the TMSI/ PTMSI.
>>>>>(P)TMSI of different PLMN				TMSI or a PTMSI allocated in another PLMN
>>>>>>Routing parameter	MP		Bit string (10)	The TMSI/ PTMSI consists of 4 octets (32bits). This~~e~~ can be represented by a string of bits are numbered from b0 to b31, with bit b0 being the least significant The "Routing parameter" bit string consists of bits b14 through b23 of the TMSI/ PTMSI~~ where bit b14 is the least significant~~. The first/ leftmost/ most significant bit of the bit string contains bit b23 of the TMSI/ PTMSI.
>>>>>IMSI(response to IMSI paging)				NAS identity is IMSI
>>>>>>Routing parameter	MP		Bit string (10)	The "Routing parameter" bit string consists of DecimalToBinary [(IMSI div 10) mod 1000]. ~~The bits of the result are numbered from b0 to b9, with bit b0 being the least significant.~~ The first/ leftmost bit of the bit string contains the most significant bit of the result.
>>>>>IMSI(cause UE initiated event)				NAS identity is IMSI
>>>>>>Routing parameter	MP		Bit string (10)	The "Routing parameter" bit string consists of DecimalToBinary [(IMSI div 10) mod 1000]. ~~The bits of the result are numbered from b0 to b9, with bit b0 being the least significant.~~ The first/ leftmost bit of the bit string contains the most significant bit of the result.
>>>>>IMEI				NAS parameter is IMEI
>>>>>>Routing parameter	MP		Bit string (10)	The "Routing parameter" bit string consists of DecimalToBinary [(IMEI div 10) mod 1000]. ~~The bits of the result are numbered from b0 to b9, with bit b0 being the least significant.~~ The first/ leftmost bit of the bit string contains the most significant bit of the result.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
>>>>>Spare 1			Bit string (10)	This choice shall not be used in this version
>>>>>Spare 2			Bit string (10)	This choice shall not be used in this version
>>>>Entered parameter	MP		Boolean	Entered parameter shall be set to TRUE if the most significant byte of the current LAI/RAI is different compared to the most significant byte of the LAI/RAI stored on the SIM; Entered parameter shall be set to FALSE otherwise
>>>ANSI-41			Bit string (14)	All bits shall be set to 0
>Later			Bit string(15)	This bit string shall not be sent by mobiles that are compliant to this version of the protocol.

10.3.1.7 Location Area Identification

Identifies uniquely a location area for a GSM-MAP type of PLMN. Setting specified in [5].

Information Element/Group name	Need	Multi	Type and reference	Semantics description
PLMN identity	MP		PLMN identity 10.3.1.11	
LAC	MP		Bit string(16)	~~The LAC bits are numbered b0-b15, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the LAC.

10.3.1.13 P-TMSI (GSM-MAP)

This IE contains a Packet Temporary Mobile Subscriber Identity, used towards a GSM-MAP type of PLMN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
P-TMSI	MP		Bit string (32)	Setting specified in [11]. ~~The P-TMSI bits are numbered b0-b31, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the P-TMSI.

10.3.1.14 RAB identity

This information element uniquely identifies a radio access bearer within a CN domain.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *RAB identity type*	MP			
>RAB identity (GSM-MAP)			Bit string (8)	Formatted according to [5]. ~~The bits are numbered b1-b8, where b1 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the RAB identity.
>RAB identity (ANSI-41)			Bit string (8)	~~The bits are numbered b1-b8, where b1 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the RAB identity.

CHOICE *NAS binding info type*	**Condition under which the given *RAB identity type* is chosen**
RAB identity (GSM-MAP)	PLMN is of type GSM-MAP
RAB identity (ANSI-41)	PLMN is of type ANSI-41

10.3.1.15 Routing Area Code

Identifies a routing area within a location area for a GSM-MAP type of PLMN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Routing Area Code	MP		Bit string(8)	Setting specified in [11]. ~~The Routing Area Code bits are numbered b0 to b7, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the Routing Area Code.

10.3.1.17 TMSI (GSM-MAP)

This IE contains a Temporary Mobile Subscriber Identity, used towards a GSM-MAP type of PLMN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
TMSI (GSM-MAP)	MP		Bit string (32)	Setting specified in [11]. ~~The TMSI bits are numbered b0-b31, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the TMSI.

10.3.3.16 Integrity check info

The Integrity check info contains the RRC message sequence number needed in the calculation of XMAC-I [40] and the calculated MAC-I.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Message authentication code	MP		bit string(32)	MAC-I [40]. ~~The Message Authentication Code bits are numbered b0-b31, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the MAC-I.The 27 MSB of the IE shall be set to zero and the 5 LSB of the IE shall be set to the value of the IE "RB identity" for the used signalling radio bearer when the encoded RRC message is used as the MESSAGE parameter in the integrity protection algorithm.
RRC Message sequence number	MP		Integer (0..15)	The local RRC hyper frame number (RRC HFN) is concatenated with the RRC message sequence number to form the input parameter COUNT-I for the integrity protection algorithm. The IE value shall be set to zero when the encoded RRC message is used as the MESSAGE parameter in the integrity protection algorithm.

10.3.3.19 Integrity protection mode info

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Integrity protection mode command	MP		Enumerated(start, modify)	
Downlink integrity protection activation info	CV-*modify*		Integrity protection activation info 10.3.3.17	
Integrity protection algorithm	OP		Integrity protection algorithm 10.3.3.18	
Integrity protection initialisation number	CV-*start*		Bit string(32)	FRESH [40]. The first/ leftmost bit of the bit string contains the most significant bit of the FRESH.

Condition	Explanation
Start	The IE is mandatory present if the IE "Integrity protection mode command" has the value "start ", otherwise it is not needed in the message.
Modify	The IE is mandatory present if the IE "Integrity protection mode command" has the value "modify" and not needed otherwise.

10.3.3.38 START

There is a START value per CN domain. The START is used to initialise the 20 MSBs of all hyper frame numbers (MAC-d HFN, RLC UM HFN, RLC AM HFN, RRC HFN) for a CN domain.

Information Element/Group name	Need	Multi	Type and Reference	Semantics description
START	MP		Bit string (20)	~~The~~ START [40]. ~~bits are numbered b0-b19, where b0 is the least significant bit.~~ The first/ leftmost bit of the bit string contains the most significant bit of the START.

10.3.4.12 NAS Synchronization indicator

A container for non-access stratum information to be transferred transparently through UTRAN.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
NAS Synchronization indicator	MP		Bit string(4)	~~The bits are numbered b1-b4, where b1 is the least significant bit.~~The first/ leftmost bit of the bit string contains the most significant bit of the NAS Synchronization indicator.

10.3.6.6 ASC setting

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
CHOICE *mode*	MP				
>FDD					
>>Available signature Start Index	MP		Integer(0..15)		
>>Available signature End Index	MP		Integer(0..15)		
>>Assigned Sub-Channel Number	MP		Bit string(4)	This IE defines the subchannel assignment as specified in 8.6.6.29. ~~The bits are numbered b0 to b3, where b0 is the least significant bit.~~The first/ leftmost bit of the bit string contains the most significant bit of the Assigned Sub-Channel Number.	
>TDD					
>>CHOICE *TDD option*	MP				REL-4
>>>3.84 Mcps TDD					REL-4
>>>>Available Channelisation codes indices	MD		Bit string(8)	Each bit indicates availability of a channelisation code index, where the channelisation code indices are numbered "channelisation code index 0" to "channelisation code index 7". The value 1 of a bit indicates that	

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
				the channelisation code index is available for the ASC this IE is associated to. The value 0 of a bit indicates that the channelisation code index is not available for the ASC this IE is associated to. Default is that all channelisation codes defined in PRACH Info are available.	
>>>1.28 Mcps TDD					REL-4
>>>>Available SYNC_UL codes indices	MD		Bit string(8)	Each bit indicates availability of a SYNC_UL code index, where the SYNC_UL code indices are numbered "SYNC_UL code index 0" to "SYNC_UL code index 7". The value 1 of a bit indicates that the SYNC_UL code index is available for the ASC this IE is associated to. The value 0 of a bit indicates that the SYNC_UL code index is not available for the ASC this IE is associated to. Default is that all SYNC_UL codes defined in SYNC_UL Info are available.	REL-4
>>CHOICE *subchannel size*	MP				
>>>Size1					
>>>>Available Subchannels	MP		null	Indicates that all Subchannels are available	
>>>Size2					
>>>>Available Subchannels	MD		Bit string (2)	NOTE	
>>>Size4					
>>>>Available Subchannels	MD		Bit string (4)	NOTE	
>>>Size8					
>>>>Available Subchannels	MD		Bit string (8)	NOTE	

NOTE: Each bit indicates availability of a subchannel, where the subchannels are numbered subchannel 0, subchannel 1 etc. The value 1 of a bit indicates that the subchannel is available for the ASC this IE is associated with. The value 0 of a bit indicates that the subchannel is not available for the ASC this IE is associated with. Default value of the IE is that all subchannels within the size are available for the ASC this IE is associated with.

10.3.7.26 Inter-RAT measured results list

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Inter-RAT measurement results	OP	1 to <maxOtherRAT-16>		
>CHOICE *system*	MP			One spare value is needed.
>>GSM				
>>>Measured GSM cells	MP	1 to <maxReportedGSMCells>		
>>>>GSM carrier RSSI	OP		bit string(6)	RXLEV is mapped to a value between 0 and 63, [46]. When mapping the RXLEV value to the RSSI bit string, the first/ leftmost bit of the bit string contains the most significant bit.~~The RSSI bits are numbered b0 to b5, where b0 is the least significant bit.~~
>>>>CHOICE *BSIC*	MP			
>>>>>Verified BSIC				
>>>>>>inter-RAT cell id	MP		Integer(0..<maxCellMeas>-1)	
>>>>>Non verified BSIC				
>>>>>>BCCH ARFCN	MP		Integer (0..1023)	[45]
>>>>Observed time difference to GSM cell	OP		Observed time difference to GSM cell 10.3.7.52	

10.3.8.2 BSIC

Information Element/Group name	Need	Multi	Type and reference	Semantics description
Base transceiver Station Identity Code (BSIC)	MP			[11]
>Network Colour Code (NCC)	MP		bit string(3)	The first/ leftmost bit of the bit string contains the most significant bit of the NCC.
>Base Station Colour Code (BCC)	MP		bit string(3)	The first/ leftmost bit of the bit string contains the most significant bit of the BCC.

10.3.8.7 Inter-RAT UE radio access capability

This Information Element contains the inter-RAT UE radio access capability that is structured and coded according to the specification used for the corresponding system type.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
CHOICE *system*	MP			
>GSM				
>>Mobile Station Classmark 2	MP		Octet string (5)	This IE is formatted as 'TLV' and is coded in the same way as the *Mobile Station Classmark 2* information element in [5]. The first octet is the *Mobile station classmark 2*

Information Element/Group name	Need	Multi	Type and reference	Semantics description
				IEI and its value shall be set to 33H. The second octet is the *Length of mobile station classmark 2* and its value shall be set to 3. The octet 3 contains the first octet of the value part of the *Mobile Station Classmark 2* information element, the octet 4 contains the second octet of the value part of the *Mobile Station Classmark 2* information element and so on. For each of these octets, the first/ leftmost/ most significant bit of the octet contains b8 of the corresponding octet of the *Mobile Station Classmark 2.* In this version of the protocol the first two octets of the Mobile Station Classmark 2 IE containing the *Mobile station classmark 2 IEI* and the *Length of mobile station classmark 2 contents* should be ignored by the receiver.
>>Mobile Station Classmark 3	MP		Octet string (1..32)	This IE is formatted as 'V' and is coded in the same way as the value part in the *Mobile station classmark 3* information element in [5]. The first octet contains octet 1 of the value part of *Mobile station classmark 3*, the second octet contains octet 2 of the value part of *Mobile station classmark 3* and so on. See NOTE 1.
>cdma2000				
>>cdma2000Message	MP	1.to.<maxlnterSysMessages>		
>>>MSG_TYPE(s)	MP		Bit string (8)	Formatted and coded according to cdma2000 specifications. The first/ leftmost/ most significant bit of the bit string contains bit 7 of the MSG_TYPE.
>>>cdma2000Messagepayload(s)	MP		Bit string (1..512)	Formatted and coded according to cdma2000 specifications. The first/ leftmost/ most significant bit of the bit string contains bit 7 of the first octet of the cdma200 message.

NOTE 1: The value part is specified by means of CSN.1, which encoding results in a bit string, to which final padding may be appended upto the next octet boundary [5]. The first/ leftmost bit of the CSN.1 bit string is placed in the first/ leftmost/ most significant bit of the first octet. This continues until the last bit of the CSN.1 bit string, which is placed in the last/ rightmost/ least significant bit of the last octet.

10.3.8.15 Rplmn information

Contains information to provide faster RPLMN selection in the UE.

Information Element/Group name	Need	Multi	Type and reference	Semantics description	Version
GSM BA Range	OP	1 to maxNumGSMFreqRanges		GSM BA Range	
>GSM Lower Range (UARFCN)	MP		Integer(0..16383)	Lower bound for range of GSM BA freqs	
>GSM Upper Range (UARFCN)	MP		Integer(0..16383)	Upper bound for range of GSM BA freqs	
FDD UMTS Frequency list	OP	1 to maxNumFDDFreqs			
>UARFCN (Nlow)	MP		Integer(0..16383)	[21]	
>UARFCN (Nupper)	OP		Integer(0..16383)	[21] This IE is only needed when the FDD frequency list is specifying a range.	
3.84 Mcps TDD UMTS Frequency list	OP	1 to maxNumTDDFreqs			
>UARFCN	MP		Integer(0..16383)	[22]	
1.28 Mcps TDD UMTS Frequency list	OP	1 to maxNumTDDFreqs			REL-4
>UARFCN	MP		Integer(0..16383)	[22]	REL-4
CDMA2000 UMTS Frequency list	OP	1 to maxNumCDMA200Freqs			
>BAND_CLASS	MP		Bit string(5 bits)	TIA/EIA/IS-2000 When mapping the BAND_CLASS to the bit string, the first/ leftmost bit of the bit string contains the most significant bit.~~The BAND_CLASS bits are numbered b0 to b4, where b0 is the least significant bit.~~	
>CDMA_FREQ	MP		Bit string (11 bits)	TIA/EIA/IS-2000 When mapping the CDMA_FREQ to the bit string, the first/ leftmost bit of the bit string contains the most significant bit.~~The CDMA_FREQ bits are numbered b0 to b10, where b0 is the least significant bit.~~	

10.3.9.8 MIN_P_REV

This Information Element contains minimum protocol revision level.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
MIN_P_REV	MP		Bit string (8)	Minimum protocol revision level. The first/ leftmost bit of the bit string contains the most significant bit of the MIN_P_REV.~~The MIN_P_REV bits are numbered b0 to b7, where b0 is the least significant bit.~~

10.3.9.9 NID

This Information Element contains Network identification.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
NID	MP		Bit string (16)	Network identification. The first/ leftmost bit of the bit string contains the most significant bit of the NID.~~The NID bits are numbered b0 to b15, where b0 is the least significant bit.~~

10.3.9.10 P_REV

This Information Element contains protocol revision level.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
P_REV	MP		Bit string (8)	Protocol revision level. The first/ leftmost bit of the bit string contains the most significant bit of the P_REV.~~The P_REV bits are numbered b0 to b7, where b0 is the least significant bit.~~

10.3.9.11 SID

This Information Element contains System identification.

Information Element/Group name	Need	Multi	Type and reference	Semantics description
SID	MP		Bit string (15)	System identification. The first/ leftmost bit of the bit string contains the most significant bit of the SID.~~The SID bits are numbered b0 to b14, where b0 is the least significant bit.~~