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LTE;  
Telecommunication management;  
Universal Terrestrial Radio Access Network (UTRAN)  
Network Resource Model (NRM)  
Integration Reference Point (IRP);  
Information Service (IS)  
(3GPP TS 28.652 version 15.0.0 Release 15)**



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**ETSI**

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C  
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# Contents

Intellectual Property Rights .....	2
Foreword.....	2
Modal verbs terminology.....	2
Foreword.....	6
Introduction .....	6
1 Scope .....	7
2 References .....	7
3 Definitions and abbreviations.....	9
3.1 Definitions .....	9
3.2 Abbreviations .....	10
4 Model .....	11
4.1 Imported information entities and local labels .....	11
4.2 Class diagrams.....	12
4.2.1 Relationships.....	12
4.2.2 Inheritance .....	15
4.3 Class definitions .....	16
4.3.1 RNCFunction.....	16
4.3.1.1 Definition .....	16
4.3.1.2 Attributes.....	16
4.3.1.3 Attribute constraints .....	16
4.3.1.4 Notifications.....	16
4.3.2 NodeBFunction .....	16
4.3.2.1 Definition .....	16
4.3.2.2 Attributes.....	16
4.3.2.3 Attribute constraints .....	16
4.3.2.4 Notifications.....	16
4.3.3 IubLink .....	16
4.3.3.1 Definition .....	16
4.3.3.2 Attributes.....	17
4.3.3.3 Attribute constraints .....	17
4.3.3.4 Notifications.....	17
4.3.4 UtranRelation .....	17
4.3.4.1 Definition .....	17
4.3.4.2 Attributes.....	17
4.3.4.3 Attribute constraints .....	18
4.3.4.4 Notifications.....	18
4.3.5 ExternalRncFunction.....	18
4.3.5.1 Definition .....	18
4.3.5.2 Attributes.....	18
4.3.5.3 Attribute constraints .....	18
4.3.5.4 Notifications.....	18
4.3.6 UtranGenericCell.....	18
4.3.6.1 Definition .....	18
4.3.6.2 Attributes.....	18
4.3.6.3 Attribute constraints .....	20
4.3.6.4 Notifications.....	20
4.3.7 ExternalUTRANGenericCell.....	20
4.3.7.1 Definition .....	20
4.3.7.2 Attributes.....	20
4.3.7.3 Attribute constraints .....	21
4.3.7.4 Notifications.....	21
4.3.8 UtranCellFDD.....	21
4.3.8.1 Definition .....	21

4.3.8.2	Attributes.....	21
4.3.8.3	Attribute constraints .....	22
4.3.8.4	Notifications.....	22
4.3.9	UtranCellTDD.....	22
4.3.9.1	Definition .....	22
4.3.9.2	Attributes.....	22
4.3.9.3	Attribute constraints .....	22
4.3.9.4	Notifications.....	22
4.3.10	UtranCellTDDLcr .....	23
4.3.10.1	Definition .....	23
4.3.10.2	Attributes.....	23
4.3.10.3	Attribute Constraints .....	23
4.3.10.4	Notifications.....	23
4.3.11	UtranCellTDDHcr .....	23
4.3.11.1	Definition .....	23
4.3.11.2	Attributes.....	23
4.3.11.3	Attribute constraints .....	23
4.3.11.4	Notifications.....	23
4.3.12	ExternalUtranCellFDD.....	23
4.3.12.1	Definition .....	23
4.3.12.2	Attributes.....	24
4.3.12.3	Attribute constraints .....	24
4.3.12.4	Notifications.....	24
4.3.13	ExternalUtranCellTDD.....	24
4.3.13.1	Definition .....	24
4.3.13.2	Attributes.....	24
4.3.13.3	Attribute constraints .....	24
4.3.13.4	Notifications.....	24
4.3.14	ExternalUtranCellTDDHcr .....	24
4.3.14.1	Definition .....	24
4.3.14.2	Attributes.....	25
4.3.14.3	Attribute constraints .....	25
4.3.14.4	Notifications.....	25
4.3.15	ExternalUtranCellTDDLcr .....	25
4.3.15.1	Definition .....	25
4.3.15.2	Attributes.....	25
4.3.15.3	Attribute constraints .....	25
4.3.15.4	Notifications.....	25
4.3.16	EP_IuCS .....	25
4.3.16.1	Definition .....	25
4.3.16.2	Attributes.....	26
4.3.16.3	Attribute constraints .....	26
4.3.16.4	Notifications.....	26
4.3.17	EP_IuPS .....	26
4.3.17.1	Definition .....	26
4.3.17.2	Attributes.....	26
4.3.17.3	Attribute constraints .....	26
4.3.17.4	Notifications.....	26
4.3.18	EP_Iur .....	26
4.3.18.1	Definition .....	26
4.3.18.2	Attributes.....	26
4.3.18.3	Attribute constraints .....	26
4.3.18.4	Notifications.....	26
4.4	Attribute definitions .....	27
4.4.1	Attribute properties .....	27
4.4.2	Constraints .....	38
4.5	Common notifications .....	39
4.5.1	Alarm notifications .....	39
4.5.2	Configuration notifications .....	39
<b>Annex A (informative):</b>	<b>RET Control Architecture .....</b>	<b>40</b>

**Annex B (informative):**    **Change history** .....41  
History .....42

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# Foreword

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# Introduction

The present document is part of a TS-family covering the 3<sup>rd</sup> Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management; as identified below:

- 28.651: "UTRAN Network Resource Model (NRM) Integration Reference Point (IRP); Requirements".
- 28.652: "UTRAN Network Resource Model (NRM) Integration Reference Point (IRP): Information Service (IS)".**
- 28.653: "UTRAN Network Resource Model (NRM) Integration Reference Point (IRP); Solution Set (SS) definitions".

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# 1 Scope

The present document specifies the UTRAN Network Resource Model (NRM) that can be communicated between an IRPAgent and an IRPManager for telecommunication network management purposes, including management of converged networks.

The present document specifies the semantics and behaviour of information object class attributes and relations visible across the reference point in a protocol and technology neutral way. It does not define their syntax and encoding.

---

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TS 32.101: "Telecommunication management; Principles and high level requirements".
- [2] 3GPP TS 32.102: "Telecommunication management; Architecture".
- [3] 3GPP TS 23.003: "Numbering, addressing and identification".
- [4] 3GPP TS 25.401: "UTRAN Overall Description".
- [5] 3GPP TS 25.433: "UTRAN Iub Interface NBAP Signalling".
- [6] 3GPP TS 28.655: "Telecommunication management; GSM/EDGE Radio Access Network (GERAN) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".
- [7] 3GPP TS 32.302: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP); Information Service (IS)".
- [8] 3GPP TS 28.625: "Telecommunication management; State Management Data Definition Integration Reference Point (IRP); Information Service (IS)".
- [9] 3GPP TS 25.331: "Radio Resource Control (RRC) protocol specification".
- [10] 3GPP TS 32.662: "Telecommunication management; Configuration Management (CM); Kernel CM Information Service (IS)".
- [11] 3GPP TS 32.111-2: "Telecommunication management; Fault Management; Part 2: Alarm Integration Reference Point (IRP); Information Service (IS)".
- [12] 3GPP TS 32.422: "Telecommunication management; Subscriber and equipment trace; Trace control and configuration management".
- [13] 3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".
- [14] 3GPP TS 32.600: "Telecommunication management; Configuration Management (CM); Concept and high-level requirements".
- [15] 3GPP TS 23.002: "Network Architecture".
- [16] 3GPP TS 28.622: "Telecommunication management; Generic Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".

- [17] 3GPP TS 28.662: "Telecommunication management; Generic Radio Access Network (RAN) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".
- [18] 3GPP TS 25.413: "UTRAN Iu interface RANAP signalling".
- [19] 3GPP TS 25.466: "UTRAN Iuant interface: Application Part".
- [20] 3GPP TS 28.732: " Telecommunication management; Transport Network (TN) interface Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".
- [21] 3GPP TS 28.702: " Telecommunication management; Core Network (CN) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS) ".
- [22] 3GPP TS 32.130: " Telecommunication management; Network sharing; Concepts and requirements".

---

## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the following definitions apply. For definitions and not found here, please refer to 3GPP TS 32.101 [1], 3GPP TS 32.102 [2], 3GPP TS 28.622 [16] and 3GPP TS 32.600 [14].

**Antenna:** Within the present document an Antenna is the set of radiating elements involved in the transmission and reception of Radio Frequency energy to support the Uu interface of a UTRAN cell. See Annex A for more detail.

**Association:** See definition in TS 28.622 [16].

**Managed Element (ME):** See definition in TS 28.622 [16].

**Managed Object (MO):** See definition in TS 28.622 [16].

**Management Information Model (MIM):** See definition in TS 28.622 [16].

**Network Resource Model (NRM):** See definition in TS 28.622 [16].

**Node B:** A logical node responsible for radio transmission/reception in one or more cells to/from the User Equipment. It terminates the Iub interface towards the RNC.

**TMA:** See TS 25.466 [19].

**Tower Mounted Amplifier:** See TS 25.466 [19].

## 3.2 Abbreviations

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

CN	Core Network
DN	Distinguished Name (see 3GPP TS 32.300 [13])
FDD	Frequency Division Duplex
IOC	Information Object Class
IRP	Integration Reference Point
Iub	Interface between RNC and Node B
Mcps	Mega-chips per second
ME	Managed Element
MIM	Management Information Model
MO	Managed Object
NRM	Network Resource Model
PS	Packet Switched
RDN	Relative Distinguished Name (see 3GPP TS 32.300 [13])
RET	Remote control of Electrical Tilting (RET) antenna
RNC	Radio Network Controller
TDD	Time Division Duplex
TMA	Tower Mounted Amplifier
UML	Unified Modelling Language
UTRA	Universal Terrestrial Radio Access
UTRAN	Universal Terrestrial Radio Access Network

## 4 Model

### 4.1 Imported information entities and local labels

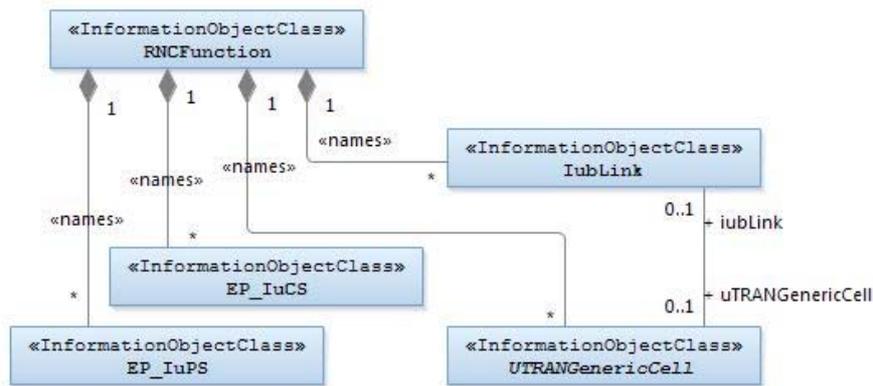
Label reference	Local label
3GPP TS 28.622 [16], IOC, ManagedElement	ManagedElement
3GPP TS 28.622 [16], IOC, ManagedFunction	ManagedFunction
3GPP TS 28.622 [16], IOC, MeContext	MeContext
3GPP TS 28.622 [16], IOC, SubNetwork	SubNetwork
3GPP TS 28.622 [16], IOC, Top	Top
3GPP TS 28.622 [16], IOC, VsDataContainer	VsDataContainer
3GPP TS 28.622 [16], IOC, EP_RP	EP_RP
3GPP TS 28.655 [6], IOC, ExternalGSMCell	ExternalGSMCell
3GPP TS 28.655 [6], IOC, GsmCell	GsmCell
3GPP TS 28.655 [6], IOC, GsmRelation	GsmRelation
3GPP TS 28.625 [8], attribute, operationalState	operationalState
3GPP TS 28.662 [17], IOC, AntennaFunction	AntennaFunction
3GPP TS 28.662 [17], IOC, TmaFunction	TmaFunction
3GPP TS 28.662 [17], IOC, SectorEquipmentFunction	SectorEquipmentFunction
3GPP TS 28.662 [17], IOC, <i>CellReferences</i>	<i>CellReferences</i>
3GPP TS 28.702 [21], IOC, MscServerFunction	MscServerFunction
3GPP TS 28.702 [21], IOC, SGSNFunction	SGSNFunction
3GPP TS 28.732 [20], IOC, TransportNetworkInterface	TransportNetworkInterface
3GPP TS 28.732 [20], IOC, ATMChannelTerminationPoint	ATMChannelTerminationPoint
3GPP TS 28.732 [20], IOC, ATMPATHTerminationPoint	ATMPATHTerminationPoint

## 4.2 Class diagrams

### 4.2.1 Relationships

This clause depicts the set of classes (e.g. IOCs) that encapsulates information relevant for this IRP. This subclause provides the overview of the relationships of relevant classes in UML. Subsequent clauses provide more detailed specification of various aspects of these classes.

The following figures show the containment/naming hierarchy and the associations of the information object classes defined in the present document. They are split in several figures only for a readability purpose.



**Figure 4.2.1-1: Transport view UTRAN NRM Containment/Naming and Association diagram**

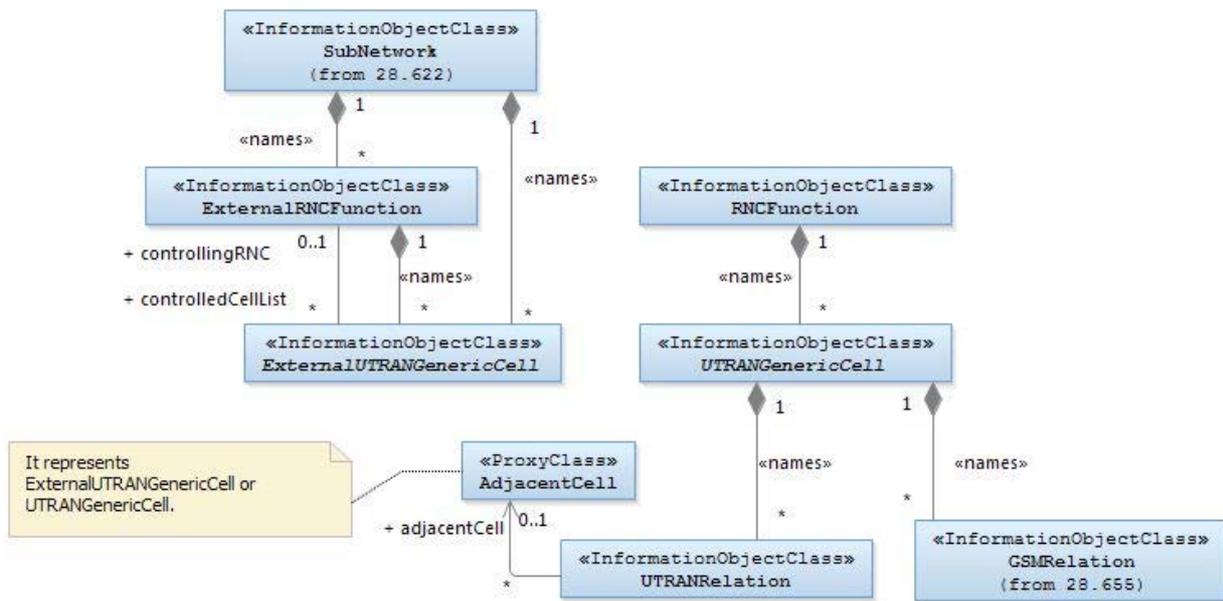
NOTE 1: The listed cardinality numbers, in particular the use of cardinality number zero, do not represent transient states. The transient state is considered an inherent property of all IOC instances and therefore there is no need to represent them by individual IOC cardinality numbers.

NOTE 2: The AntennaFunction instances (referenced by a role-attribute of IOC CellReferences inherited by *UTRANGenericCell*) is required when supporting RET. For a description and clarification of RET, please refer to Annex A.

NOTE 3: The AntennaFunction Instances can be associated with a particular NodeBFunction instance (via *IubLink* and *UTRANGenericCell*). These AntennaFunction instances and NodeBFunction instance must be contained by the same ManagedElement instance.

NOTE 4: The TmaFunction Instances can be associated with a particular NodeBFunction instance (via *IubLink* and *UTRANGenericCell*). These TmaFunction Instances and NodeBFunction instance must be contained by the same ManagedElement instance.

NOTE 5: Please see TS 28.662 [17] for the definitions of the five associations between a) *UtranGenericCell* and AntennaFunction b) between *UtranGenericCell* and SectorEquipmentFunction c) between *UtranGenericCell* and TmaFunction d) between SectorEquipmentFunction and AntennaFunction and e) between SectorEquipmentFunction and TmaFunction.



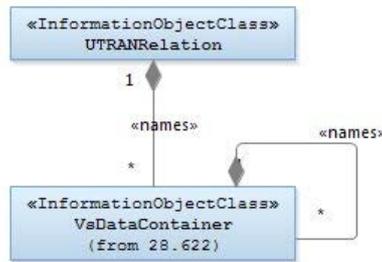
**Figure 4.2.1-1: Transport view UTRAN NRM Containment/Naming and Association diagram**

NOTE 6: The listed cardinality numbers, in particular the use of cardinality number zero, do not represent transient states. The transient state is considered an inherent property of all IOC instances and therefore there is no need to represent them by individual IOC cardinality numbers.

NOTE 7: The relation between GSMRelation and GSMCell is optional. It may be present if both the *UTRANGenericCell* and the *GSMCell* are managed by the same management node.

NOTE 8: The *UtranRelation* and *GsmRelation* can be name-contained under IOCs defined in other NRMs.

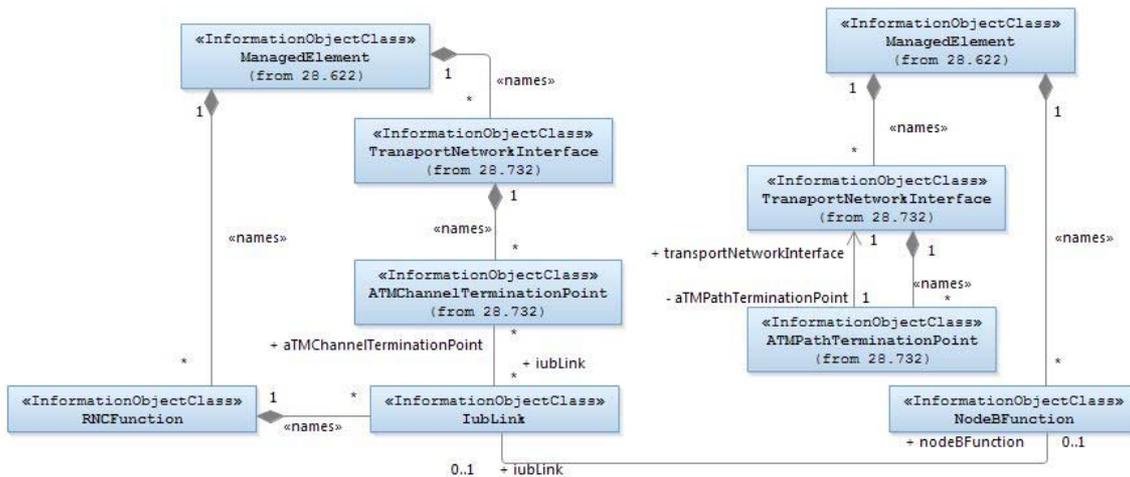
NOTE 9: *ExternalUTRANGenericCell* is contained under *SubNetwork* or *ExternalRncFunction*.



**Figure 4.2.1-2: Cell view UTRAN NRM Containment/Naming and Association diagram**

NOTE 10: The listed cardinality numbers, in particular the use of cardinality number zero, do not represent transient states. The transient state is considered an inherent property of all IOC instances and therefore there is no need to represent them by individual IOC cardinality numbers.

NOTE 11: Each instance of the VsDataContainer shall only be contained under one IOC.  
The VsDataContainer can be contained under IOCs defined in other NRMs.



**Figure 4.2.1-3: VsDataContainer Containment/Naming and Association in UTRAN NRM diagram**

NOTE 1: The ATMChannelTerminationPoint is name-contained under IOCs defined in the Transport Network NRM.

NOTE 2: The group of ATMChannelTerminationPoints associated with an IubLink (the relation AssociatedWith1) represent the RNC end of the ATM Virtual Channel Connections (transport connection) between an RNC and a NodeB.

NOTE 3: An ATMChannelTerminationPoint can be associated with more than one IubLink for the case of AAL2 multiplexing/switching, i.e. to allow an ATM Channel at the RNC to be connected to multiple NodeBs.

**Figure 4.2.1-4: UTRAN Transport Network NRM Containment/Naming and Association diagram**

The VsDataContainer is only used for the Bulk CM IRP.

Each IOC instance is identified with a Distinguished Name (DN) according to 3GPP TS 32.300 [13] that expresses its containment hierarchy. As an example, the DN of an IOC instance representing a cell could have a format like:

SubNetwork=Sweden, MeContext=MEC-Gbg-1, ManagedElement=RNC-Gbg-1, RncFunction=RF-1, UtranCell=Gbg-1.

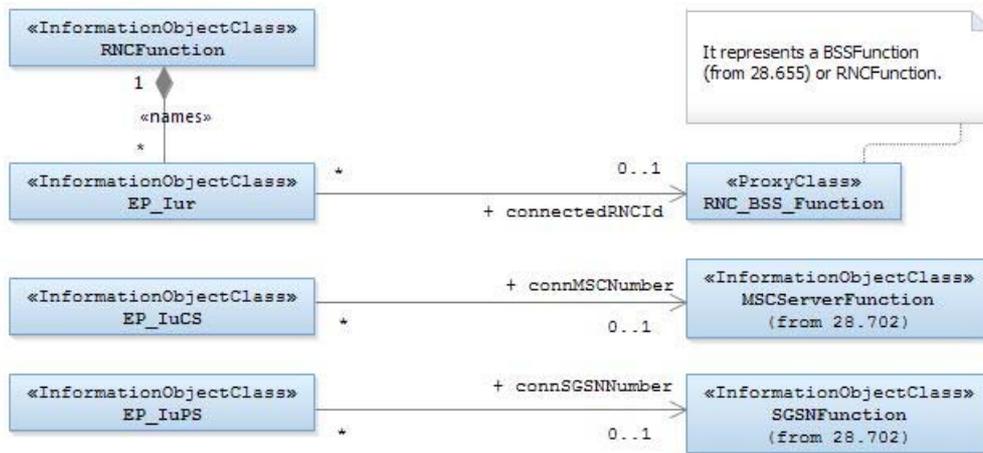


Figure 4.2.1-5: Association diagram of EP\_Iur, EP\_IuCS and EP\_IuPS

## 4.2.2 Inheritance

This clause depicts the inheritance relationships that exist between IOCs.

Figure 4.2.2.1 shows the inheritance hierarchy for the UTRAN NRM.

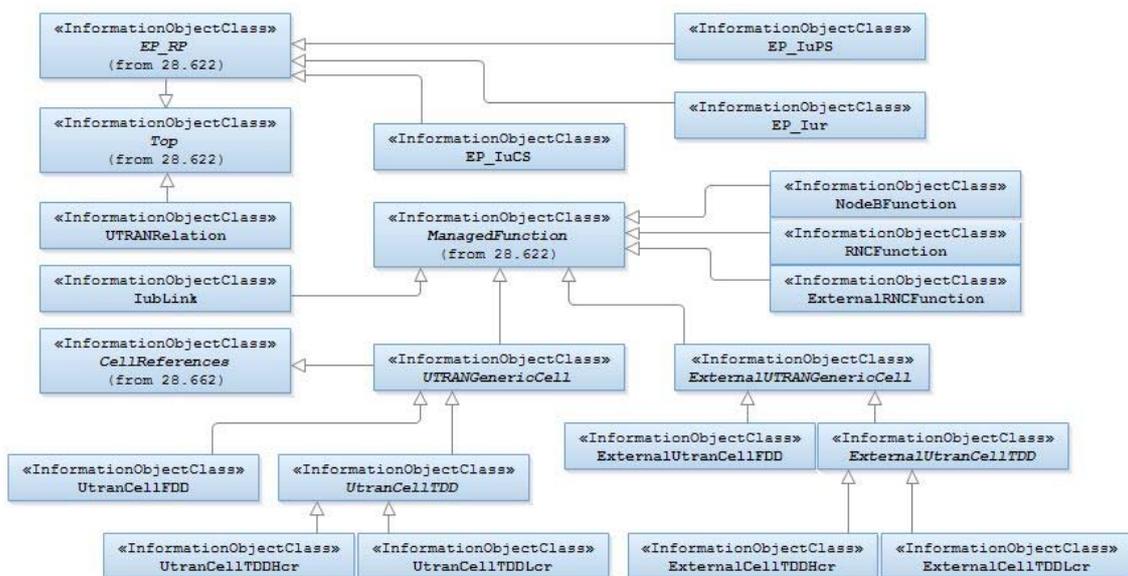


Figure 4.2.2.1: UTRAN NRM Inheritance Hierarchy

## 4.3 Class definitions

### 4.3.1 RNCFunction

#### 4.3.1.1 Definition

This IOC represents RNC functionality. For more information about the RNC, see 3GPP TS 23.002 [15].

#### 4.3.1.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
mcc	M	M	M	-	M
mnc	M	M	M	-	M
rncId	M	M	M	-	M
siptoSupported	M	M	-	-	M
tceIDMappingInfoList	CM	M	M	-	M
sharNetTceMappingInfoList	CM	M	M	-	M

#### 4.3.1.3 Attribute constraints

Name	Definition
tceIDMappingInfoList	The condition is "MDT function is supported" and only one PLMN is supported
sharNetTceMappingInfoList	The condition is "MDT function and several PLMNs are supported"

#### 4.3.1.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

### 4.3.2 NodeBFunction

#### 4.3.2.1 Definition

This IOC represents Node B functionality. For more information about the Node B, see 3GPP TS 23.002 [15].

#### 4.3.2.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
Attribute related to role					
iubLink	M	M	-	-	M

#### 4.3.2.3 Attribute constraints

Name	Definition
nodeBFunction-IubLink M support qualifier	When a particular IubLink identifies this particular NodeBFunction, this particular NodeBFunction must identify the particular IubLink.

#### 4.3.2.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

### 4.3.3 IubLink

#### 4.3.3.1 Definition

This IOC represents the logical link to a Node B as seen from the RNC. For more information about the RNC, see 3GPP TS 23.002 [15].

### 4.3.3.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifiable
<b>Attribute related to role</b>					
uTRANGenericCell	M	M	M	-	M
nodeBFunction	M	M	-	-	M
aTMChannelTerminationPoint	M	M	-		

### 4.3.3.3 Attribute constraints

Name	Definition
<i>iubLink-UTRANCell M support qualifier</i>	<i>When a particular IubLink identifies a particular UTRANGenericCell derivative, that particular UTRANGenericCell derivative must have identified this particular IubLink.</i>
<i>iubLink-NodeBFunction M support qualifier</i>	<i>When a particular IubLink identifies a particular NodeBFunction, that particular NodeBFunction must identify this particular IubLink.</i>
<i>iubLink-ATMChannelTerminationPoint</i>	<i>When a particular IubLink identifies a particular ATMChannelTerminationPoint, that particular ATMChannelTerminationPoint must identify this particular IubLink.</i>

### 4.3.3.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

## 4.3.4 UtranRelation

### 4.3.4.1 Definition

The *UtranRelation* IOC contains radio network related parameters for the relation to the *UTRANGenericCell* or *ExternalUTRANGenericCell* IOC.

The *UTRANGenericCell* and the *ExternalUTRANGenericCell* may be an FDD mode cell, a lcr (low chip rate) 1.28 Mcps TDD mode cell or a hcr (high chip rate) 3.84 (7.68) Mcps TDD mode cell.

NOTE: In handover relation terms, the cell containing the UTRAN Relation object is the source cell for the handover. The cell referred to in the UTRAN relation object is the target cell for the handover. This defines a one-way handover relation where the direction is *from* source cell *to* target cell.

### 4.3.4.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifiable
----------------	-------------------	------------	------------	-------------	--------------

id	M	M	-	M	-
<b>Attribute related to role</b>					
adjacentCell	M	M	M	-	M

#### 4.3.4.3 Attribute constraints

Name	Definition
<i>adjacentCell</i> M support qualifier	<i>This attribute can hold either an UTRANGenericCell (or its derivative) DN or an ExternalUTRANGenericCell (or its derivative) DN or no information.</i>

#### 4.3.4.4 Notifications

The common configuration notifications defined in subclause 4.5.2 are valid for this IOC, without exceptions or additions.

### 4.3.5 ExternalRncFunction

#### 4.3.5.1 Definition

This IOC represents an RNC function controlled by another IRPAgent. For more information about the RNC, see 3GPP TS 23.002 [15].

#### 4.3.5.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifiable
mcc	M	M	M	-	M
mnc	M	M	M	-	M
rncId	M	M	M	-	M
<b>Attribute related to role</b>					
controlledCellList	O	M	-	-	M

#### 4.3.5.3 Attribute constraints

None.

#### 4.3.5.4 Notifications

The common configuration notifications defined in subclause 4.5.2 are valid for this IOC, without exceptions or additions.

### 4.3.6 UtranGenericCell

#### 4.3.6.1 Definition

This abstract IOC represents the common properties of radio cells of different types (FDD, TDD) controlled by an RNC. For more information about radio cells, see 3GPP TS 23.002 [15].

The IOC UtranCellFDD and UtranCellTDD (1,28 Mcps TDD mode cell or a 3.84 (7.68) Mcps TDD mode cell) inherit from that abstract IOC.

#### 4.3.6.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifiable
----------------	-------------------	------------	------------	-------------	--------------

cId	M	M	M	-	M
localCellId	M	M	M	-	M
maximumTransmissionPower	M	M	M	-	M
pichPower	CM	M	O	-	M
pchPower	CM	M	O	-	M
fachPower	CM	M	O	-	M
cellMode	M	M	-	-	M
lac	M	M	M	-	M
rac	CM	M	M	-	M
sac	M	M	M	-	M
uraList	CM	M	M	-	M
hsFlag	CM	M	-	-	M
hsEnable	CM	M	M	-	M
numOfHspdschs	CM	M	M	-	M
numOfHsscchs	CM	M	M	-	M
frameOffset	CO	M	-	-	M
cellIndividualOffset	CO	M	-	-	M
hcsPrio	CO	M	-	-	M
maximumAllowedULTxPower	CO	M	-	-	M
snaInformation	CO	M	-	-	M
qrxlevMin	CO	M	-	-	M
deltaQrxlevmin	CO	M	-	-	M
qhcs	CO	M	-	-	M
penaltyTime	CO	M	-	-	M
referenceTimeDifferenceToCell	CO	M	-	-	M
readSFNIndicator	CO	M	-	-	M
restrictionStateIndicator	CO	M	-	-	M
dpcModeChangeSupportIndicator	CO	M	-	-	M
operationalState (See Note 1)	O	M	-	-	M (see Note 2)
nsPlmnIdList	CM	M	M	-	M
<b>Attribute related to role</b>					
relatedAntennaList	CO	M	M	-	M
relatedSectorEquipment	CM	M	-	-	M
relatedTMAList	CO	M	-	-	M
iubLink	M	M	-	-	M

Note 1: No state propagation shall be implied.

Note 2: The attribute value change is conveyed by the notifyStateChange notification.

### 4.3.6.3 Attribute constraints

Name	Definition
<i>relatedAntennaList</i> and <i>relatedTMAList</i> CO support qualifier	The IOC <i>SectorEquipmentFunction</i> (see 28.662 [17]) is not used
<i>relatedSectorEquipment</i> CM support qualifier	The IOC <i>SectorEquipmentFunction</i> (see 28.662 [17]) is used
<i>uTRANGenericCell-IubLink</i> M support qualifier	When a particular <i>UtranGenericCell</i> derivative identifies a particular <i>IubLink</i> , that particular <i>IubLink</i> must have identified this particular <i>UtranGenericCell</i> derivative.
<i>rac</i> and <i>uraList</i> CM support qualifier	The PLMN contains a PS CN.
<i>hsFlag</i> , <i>hsEnable</i> , <i>numOfHspdschs</i> and <i>numOfHsscchs</i> CM support qualifier	The HSDPA feature is not supported by vendor specific extension mechanisms.
<i>pichPower</i> , <i>pchPower</i> and <i>fachPower</i> CM support qualifier	The attributes <i>pichPower</i> , <i>pchPower</i> and <i>fachPower</i> are not supported by vendor specific extension mechanisms.
<i>frameOffset</i> , <i>cellIndividualOffset</i> , <i>hcsPrio</i> , <i>maximumAllowedULTxPower</i> , <i>snaInformation</i> , <i>qrxlevMin</i> , <i>deltaQrxlevmin</i> , <i>qhcs</i> , <i>penaltyTime</i> , <i>referenceTimeDifferenceToCell</i> , <i>readSFNIndicator</i> , <i>restrictionStateIndicator</i> and <i>dpcModeChangeSupportIndicator</i> CO support qualifier	<i>ltf-p2p</i> is supported.
<i>nsPlmnIdList</i> CM support qualifier	Network sharing is supported (see 32.130 [22])

### 4.3.6.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC. In addition, the following set of notification, defined in 3GPP TS 32.662 [10], is also valid.

Name	Qualifier	Notes
<i>notifyStateChange</i>	O	

## 4.3.7 ExternalUTRANGenericCell

### 4.3.7.1 Definition

This abstract IOC represents the properties of a radio cell controlled by another IRPAgent. This IOC contains necessary attributes for inter-system and intra-system handover. It also contains a subset of the attributes of related IOCs controlled by another IRPAgent. The way to maintain consistency between the attribute values of these IOCs is outside the scope of the present document.

### 4.3.7.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifiable

cId	M	M	M	-	M
mcc	M	M	M	-	M
mnc	M	M	M	-	M
rncId	M	M	M	-	M
cellMode	M	M	-	-	M
lac	M	M	M	-	M
rac	CM	M	M	-	M
hsFlag	CM	M	-	-	M
frameOffset	CO	M	-	-	M
cellIndividualOffset	CO	M	-	-	M
hcsPrio	CO	M	-	-	M
maximumAllowedULTxPower	CO	M	-	-	M
qrxlevMin	CO	M	-	-	M
deltaQrxlevmin	CO	M	-	-	M
qhcs	CO	M	-	-	M
penaltyTime	CO	M	-	-	M
referenceTimeDifferenceToCell	CO	M	-	-	M
readSFNIndicator	CO	M	-	-	M
restrictionStateIndicator	CO	M	-	-	M
dpcModeChangeSupportIndicator	CO	M	-	-	M
snaInformation	CO	M	-	-	M
<b>Attribute related to role</b>					
controllingRNC	O	M	-	-	M

#### 4.3.7.3 Attribute constraints

Name	Definition
<i>rac</i> CM support qualifier	The PLMN contains a PS CN.
<i>hsFlag</i> CM support qualifier	The HSDPA feature is not supported by vendor specific extension mechanisms.
frameOffset, cellIndividualOffset, hcsPrio, maximumAllowedULTxPower, qrxlevMin, deltaQrxlevmin, qhcs, penaltyTime, referenceTimeDifferenceToCell, readSFNIndicator, restrictionStateIndicator, dpcModeChangeSupportIndicator and snaInformation CO support qualifier	lfr-p2p is supported.

#### 4.3.7.4 Notifications

The common configuration notifications defined in subclause 4.5.2 are valid for this IOC, without exceptions or additions.

### 4.3.8 UtranCellFDD

#### 4.3.8.1 Definition

This IOC represents a FDD radio cell controlled by an RNC. For more information about radio cells, see 3GPP TS 23.002 [15].

#### 4.3.8.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifiable
----------------	-------------------	------------	------------	-------------	--------------

uarfcnUl	O	M	M	-	M
uarfcnDl	O	M	M	-	M
primaryScramblingCode	O	M	M	-	M
primaryCpichPower	O	M	M	-	M
primarySchPower	O	M	M	-	M
secondarySchPower	O	M	M	-	M
bchPower	O	M	M	-	M
aichPower	O	M	-	-	M
qqualMin	CO	M	-	-	M
cellCapabilityContainerFDD	CO	M	-	-	M
txDiversityIndicator	CO	M	-	-	M
temporaryOffset1	CO	M	-	-	M
temporaryOffset2	CO	M	-	-	M
sttdSupportIndicator	CO	M	-	-	M
closedLoopModelSupportIndicator	CO	M	-	-	M

#### 4.3.8.3 Attribute constraints

Name	Definition
<i>aichPower</i> CM support qualifier	The attribute <i>aichPower</i> is not supported by vendor specific extension mechanisms.
<i>qqualMin</i> , <i>cellCapabilityContainerFDD</i> , <i>txDiversityIndicator</i> <i>temporaryOffset1</i> , <i>temporaryOffset2</i> , <i>sttdSupportIndicator</i> and <i>closedLoopModelSupportIndicator</i> CO support qualifier	<i>ltf-p2p</i> is supported.

#### 4.3.8.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

### 4.3.9 UtranCellTDD

#### 4.3.9.1 Definition

This IOC is an abstract class representing the common properties of TDD high chip rate (hcr) and TDD low chip rate (lcr) radio cells controlled by an RNC. For more information about radio cells, see 3GPP TS 23.002 [15].

#### 4.3.9.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifiable
uarfcn	O	M	M	-	M
cellParameterId	O	M	M	-	M
primaryCcpchPower	O	M	M	-	M
cellCapabilityContainerTDD	CO	M	-	-	M
sctdIndicator	CO	M	-	-	M
dpchConstantValue	CO	M	-	-	M

#### 4.3.9.3 Attribute constraints

Name	Definition
<i>cellCapabilityContainerTDD</i> , <i>sctdIndicator</i> and <i>dpchConstantValue</i> CO support qualifier	<i>ltf-p2p</i> is supported.

#### 4.3.9.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

## 4.3.10 UtranCellTDDLcr

### 4.3.10.1 Definition

This IOC represents a TDD low chip rate (lcr) radio cell controlled by an RNC. For more information about radio cells, see 3GPP TS 23.002 [15].

### 4.3.10.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
uarfcnLCRList	O	M	M	-	M
fpachPower	O	M	O	-	M
dwPchPower	O	M	M	-	M
tstdIndicator	CO	M	-	-	M
timeSlotLcrList	O	M	M	-	M

### 4.3.10.3 Attribute Constraints

Name	Definition
tstdIndicator CO support qualifier	lfr-p2p is supported.

### 4.3.10.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

## 4.3.11 UtranCellTDDHcr

### 4.3.11.1 Definition

This IOC represents a TDD high chip rate (hcr) radio cell controlled by an RNC. For more information about radio cells, see 3GPP TS 23.002 [15].

### 4.3.11.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
schPower	O	M	M	-	M
temporaryOffset1	CO	M	-	-	M
syncCase	CO	M	-	-	M
timeSlotForSch	CO	M	-	-	M
schTimeSlot	CO	M	-	-	M
timeSlotHcrList	O	M	M	-	M

### 4.3.11.3 Attribute constraints

Name	Definition
temporaryOffset1, syncCase, timeSlotForSch and schTimeSlot CO support qualifier	lfr-p2p is supported.

### 4.3.11.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

## 4.3.12 ExternalUtranCellFDD

### 4.3.12.1 Definition

This IOC represents a FDD radio cell controlled by another IRP agent. For more information about radio cells, see 3GPP TS 23.002 [15].

### 4.3.12.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifiable
uarfcnUl	O	M	M	-	M
uarfcnDl	O	M	M	-	M
primaryScramblingCode	O	M	M	-	M
primaryCpichPower	O	M	M	-	M
qqualMin	CO	M	-	-	M
cellCapabilityContainerFDD	CO	M	-	-	M
txDiversityIndicator	CO	M	-	-	M
temporaryOffset1	CO	M	-	-	M
temporaryOffset2	CO	M	-	-	M
sttdSupportIndicator	CO	M	-	-	M
closedLoopModelSupportIndicator	CO	M	-	-	M

### 4.3.12.3 Attribute constraints

Name	Definition
<i>qqualMin, cellCapabilityContainerFDD, txDiversityIndicator, temporaryOffset1, temporaryOffset2, sttdSupportIndicator and closedLoopModelSupportIndicator CO support qualifier</i>	<i>ltf-p2p is supported.</i>

### 4.3.12.4 Notifications

The common configuration notifications defined in subclause 4.5.2 are valid for this IOC, without exceptions or additions.

## 4.3.13 ExternalUtranCellTDD

### 4.3.13.1 Definition

This IOC is an abstract class representing the common properties of TDD high chip rate (hcr) and TDD low chip rate (lcr) radio cells controlled by another IRP agent. For more information about radio cells, see 3GPP TS 23.002 [15].

### 4.3.13.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifiable
uarfcn	O	M	M	-	M
cellParameterId	O	M	M	-	M
primaryCcpchPower	O	O	O	-	M
cellCapabilityContainerTDD	CO	M	-	-	M
sctdIndicator	CO	M	-	-	M
dpchConstantValue	CO	M	-	-	M

### 4.3.13.3 Attribute constraints

Name	Definition
<i>cellCapabilityContainerTDD, sctdIndicator and dpchConstantValue CO support qualifier</i>	<i>ltf-p2p is supported.</i>

### 4.3.13.4 Notifications

The common configuration notifications defined in subclause 4.5.2 are valid for this IOC, without exceptions or additions.

## 4.3.14 ExternalUtranCellTDDHcr

### 4.3.14.1 Definition

This IOC represents a TDD high chip rate (hcr) radio cell controlled by another IRP agent. For more information about radio cells, see 3GPP TS 23.002 [15].

#### 4.3.14.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
temporaryOffset1	CO	M	-	-	M
syncCase	CO	M	-	-	M
timeSlotForSch	CO	M	-	-	M
schTimeSlot	CO	M	-	-	M
timeSlotHcrList	O	M	-	-	M

#### 4.3.14.3 Attribute constraints

Name	Definition
<i>temporaryOffset1, syncCase, timeSlotForSch and schTimeSlot CO support qualifier</i>	<i>ltf-p2p is supported.</i>

#### 4.3.14.4 Notifications

The common configuration notifications defined in subclause 4.5.2 are valid for this IOC, without exceptions or additions.

### 4.3.15 ExternalUtranCellTDDLcr

#### 4.3.15.1 Definition

This IOC represents a TDD low chip rate (lcr) radio cell controlled by another IRPAgent. For more information about radio cells, see 3GPP TS 23.002 [15].

#### 4.3.15.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
tstdIndicator	CO	M	-	-	M
timeSlotLcrList	O	M	-	-	M

#### 4.3.15.3 Attribute constraints

Name	Definition
<i>tstdIndicator CO support qualifier</i>	<i>ltf-p2p is supported.</i>

#### 4.3.15.4 Notifications

The common configuration notifications defined in subclause 4.5.2 are valid for this IOC, without exceptions or additions.

### 4.3.16 EP\_IuCS

#### 4.3.16.1 Definition

This IOC represents an end point of the Iu-CS interface. For more information Iu-CS interface, see 3GPP TS 23.002 [15].

#### 4.3.16.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifiable
connMscNumber	CO	M	-	-	M

#### 4.3.16.3 Attribute constraints

Name	Definition
<i>connMscNumber</i> CO support qualifier	<i>The farEndEntity is supported</i>

#### 4.3.16.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

### 4.3.17 EP\_IuPS

#### 4.3.17.1 Definition

This IOC represents an end point of the Iu-PS interface. For more information Iu-PS interface, see 3GPP TS 23.002 [15].

#### 4.3.17.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifiable
connSgsnNumber	CO	M	-	-	M

#### 4.3.17.3 Attribute constraints

Name	Definition
<i>connSgsnNumber</i> CO support qualifier	<i>The farEndEntity is supported</i>

#### 4.3.17.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

### 4.3.18 EP\_Iur

#### 4.3.18.1 Definition

This IOC represents an end point of the Iur interface. For more information Iur interface, see 3GPP TS 23.002 [15].

#### 4.3.18.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifiable
<b>Attribute related to role</b>					
connectedRNCId	CO	M	-	-	M

#### 4.3.18.3 Attribute constraints

Name	Definition
connectedRNCId CO support qualifier	The far end entity is supported.  When supported, It either a) identifies one connected RNC; in such case, it contains one RNC-Id or b) identifies one connected BSC; in such case, it contains one RNC-Id to identify BSC. (See "RNC-Id" in TS 23.003 [3]).

#### 4.3.18.4 Notifications

The common configuration notifications defined in subclause 4.5.2 are valid for this IOC, without exceptions or additions.

## 4.4 Attribute definitions

### 4.4.1 Attribute properties

The following table defines the attributes that are present in several Information Object Classes (IOCs) of the present document.

Attribute Name	Documentation and Allowed Values	Properties
aichPower	The Power of the the AICHchannel in an FDD cell, "AICH Power" in TS 25.433 [5].  allowedValues: See "AICH Power" in TS 25.433 [5].	type: Real multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
bchPower	The power of the broadcast channel in the FDD mode cell, "BCH Power" in TS 25.433 [5].  allowedValues: See "DL Power" in TS 25.433 [5].	type: Real multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
cellCapabilityContainerFDD	Defined in 3GPP TS 25.423. This attribute has 32 bits. Each bit indicates whether a cell supports a particular functionality.  allowedValues: See 'CellCapabilityContainer-FDD' in 3GPP TS 25.423.	type: BitString multiplicity: 1 isOrdered: T isUnique: N/A defaultValue: None isNullable: False
cellCapabilityContainerTDD	Defined in 3GPP TS 25.423. This attribute has 32 bits. Each bit indicates whether a cell supports a particular functionality.  allowedValues: See 'CellCapabilityContainer-TDD' in 3GPP TS 25.423.	type: BitString multiplicity: 1 isOrdered: T isUnique: N/A defaultValue: None isNullable: False
cellIndividualOffset	Defined in 3GPP TS 25.331 (25.423). Attribute relevant for HO decision. Used to offset measured quantity value.  allowedValues: See "Cell individual offset" in TS 25.331 [9].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
cellMode	An attribute that identifies the cell mode.  allowedValues: FDD mode", "1.28McpsTDD mode", "3.84McpsTDD mode", "7.68McpsTDD mode".	type: <<enumeration>> multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
cellParameterId	This attribute identifies unambiguously the TDD mode cell: 3.84 and 7.68 Mcps TDD - Code Groups, Scrambling Codes, Midambles and Toffset, or 1.28 Mcps TDD - SYNC-DL and SYNC-UL sequences, the scrambling codes and the midamble codes. "Cell Parameter ID" in TS 25.433 [5]  allowedValues: See "Cell Parameter ID" in TS 25.433 [5].	type: Integer multiplicity: 0..1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
cId	The attribute is the identifier of a cell in one RNC, "C-id" in TS 25.401 [4] and "C-ID" in TS 25.433 [5].  allowedValues: see "C-ID" in TS 25.433 [5].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
closedLoopMode1SupportIndicator	Power control, defined in 3GPP TS 25.423 The Closed Loop Mode1 Support Indicator indicates whether the particular cell is capable to support Closed loop mode1 or not.  allowedValues: supported, not supported	type: <<enumeration>> multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False

connMscNumber	The MSC number of the far end MSC Server connected by the lu-CS interface for which the end point is modelled, "MSC number" in TS 23.003 [3].  allowedValues: See "MSC number" in TS 23.003 [3]	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
connectedRNCId	The RNC-Id of the far end RNC or BSC connected by the lur interface for which the end point is modelled, "RNC-Id" in TS 23.003 [3].  allowedValues: See "RNC-Id" in TS 23.003 [3]	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
connSgsnNumber	The SGSN number of the far end SGSN connected by the lu-PS interface for which the end point is modelled, "SGSN number" in TS 23.003 [3].  allowedValues: See "SGSN number" in TS 23.003 [3]	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
dpcModeChangeSupportIndicator	Power control, defined in 3GPP TS 25.423 The DPC Mode Change Support Indicator IE indicates that the particular cell is capable to support DPC mode change.  allowedValues: supported, not supported	type: <<enumeration>> multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
deltaQrxlevmin	Cell (re)selection, defined in 3GPP TS 25.331 If present, the actual value of Qrxlevmin = Qrxlevmin + DeltaQrxlevmin.  allowedValues: See "DeltaQrxlevmin" in TS 25.331 [9].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
dpchConstantValue	DPCH Constant Value is the power margin in dB used by a UE to set the proper uplink power, "DPCH Constant Value" in Ref. TS 25.433 [5].  allowedValues: See "Constant Value" in TS 25.433 [5].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
dwpchPower	DwPCH Power is the power that shall be used for transmitting the DwPCH in a 1.28 Mcps TDD cell, "DwPCH Power" in TS 25.433 [5].  allowedValues: See "DwPCH Power" in TS 25.433 [5].	type: Real multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
fachPower	The maximum power of the FACH transport channel that may be used in the cell, "Max FACH Power" in Ref 3GPP TS 25.433 [5].  allowedValues: See "DL Power" in TS 25.433 [5].	type: Real multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
fpachPower	The maximum power of the FPACH channel that shall be used in TDD cell, "FPACH Power" in TS 25.433 [5].  allowedValues: See "FPACH Power" in TS 25.433 [5].	type: Real multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False

frameOffset	<p>Neighbouring cells monitoring, defined in TS 25.423 Frame Offset is the required offset between the dedicated channel downlink transmission frames (CFN, Connection Frame Number) and the broadcast channel frame offset (Cell Frame Number). The Frame Offset is used in the translation between Connection Frame Number (CFN) on lub/lur and least significant 8 bits of SFN (System Frame Number) on Uu. The Frame Offset is UE and cell specific.</p> <p>allowedValues: 0..255</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True</p>
hcsPrio	<p>Cell (re)selection for HCS Defined in TS 25.331 [9]. This specifies the HCS priority level (0-7) for serving cell and neighbouring cells. HCS priority level 0 means lowest priority and HCS priority level 7 means highest priority.</p> <p>allowedValues: See "HCS_OFF<sub>mbms</sub>" in TS 25.331 [9].</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True</p>
hsEnable	<p>A label indicating whether or not HSDPA is enabled in the UTRAN cell. A value of 0 represents that HSDPA is not enabled and a value of 1 represents that HSDPA is enabled.</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None allowedValues: 0,1 isNullable: True</p>
hsFlag	<p>A label indicating whether or not HSDPA is supported in the UTRAN cell. A value of 0 indicates that HSDPA is not supported and a value of 1 indicates that HSDPA is supported.</p> <p>allowedValues: 0,1</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True</p>
id	<p>An attribute whose "name+value" can be used as an RDN when naming an instance of the object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance.</p>	<p>type: DN multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None allowedValues: N/A isNullable: False</p>
lac	<p>Location Area Code, "LAC" in TS 23.003 [3].</p> <p>allowedValues: See "LAC" in TS 25.413 [18].</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
localCellId	<p>The Local Cell id is used to uniquely identify the set of resources defined in a Node B to support a cell. It must be unique in Node B at a minimum, but may be unique in UTRAN. Local Cell Identifier" TS 25.401 [4], "Local Cell ID" in 3GPP TS 25.433 [5].</p> <p>allowedValues: See "Local Cell ID" in TS 25.433 [5].</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True</p>
maximumAllowedULTxPower	<p>Cell (re)selection, defined in TS 25.331 [9]. This information element indicates the maximum allowed uplink transmit power.</p> <p>allowedValues: See "Maximum allowed UL TX power" in TS 25.331 [9]. A single integral value in dBm. Range: (-50..33).</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>

maximumTransmissionPower	<p>The maximum transmission power of a cell. It is the maximum power for all downlink channels added together, that is allowed to be used simultaneously in a cell, "Maximum Transmission Power" in TS 25.433 [5].</p> <p>allowedValues: See "Maximum Transmission Power" in TS 25.433 [5].</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
mcc	<p>Mobile Country Code, MCC (part of the PLMN Identifier) in, TS 23.003 [3].</p> <p>allowedValues: See "MCC" in "PLMN identity" in TS 25.413 [19].</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
mnc	<p>Mobile Network Code, "MNC" (part of the PLMN Identity) in TS 23.003 [3].</p> <p>allowedValues: See "MNC" in "PLMN identity" in TS 25.413 [18].</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
nsPlmnIdList	<p>List of unique identities for PLMN. Each element of the list is a tuple made up of mcc and mnc.</p> <p>allowedValues: A list of up to five entries of PLMN Identifiers.</p> <p>Note: A cell can broadcast up to 6 PLMN-id's. This is to support the case that one cell can be used by up to 6 operators' core networks.</p> <p>In case a cell is not shared, this attribute shall contain no information.</p> <p>In case a cell is shared (see TS 32.130 [22]): 1) this attribute shall contain the PLMN Id's of the Participating Operators; 2) the Master Operator PLMN Id is captured at RNCFunction level (attributes mcc and mnc).</p> <p>In case the Master Operator is also a Participating Operator, its PLMN Id is captured only at RNCFunction level.</p> <p>The PLMN Identifier is composed of a Mobile Country Code (MCC) and a Mobile Network Code (MNC).</p> <p>See TS 23.003 [3] subclause 2.2 and 12.1. See also TS 25.331 [9] sections 10.3.1.11 and 10.3.1.7a.</p>	<p>type: &lt;&lt;datatype&gt;&gt; multiplicity: 0..5 isOrdered: False isUnique: True defaultValue: None isNullable: False</p>
numOfHspdschs	<p>In FDD: the number of codes at the defined spreading factor(SF=16), within the complete code tree. See TS 25.433 [5]. In TDD: the number of HS-PDSCHs in a Cell; TS 25.433 [5].</p> <p>allowedValues: 1. Range: (0..15) for FDD mode, 2. Range: (0..95) for TDD mode</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
numOfHsscchs	<p>The number of HS-SCCHs for one cell. See TS 25.433 [5].</p> <p>allowedValues: 1..32</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>

pchPower	The power of PCH transport channel in the cell, "PCH Power" in Ref 3GPP TS 25.433 [5].  allowedValues: See "DL Power" in TS 25.433 [5].	type: Real multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
penaltyTime	Cell (re)selection for HCS, defined in 3GPP TS 25.331 (TS 25.304) This specifies the time duration for which the TEMPORARY_OFFSET is applied for a neighbouring cell.  allowedValues: See "Penalty_time" in TS 25.331 [9].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
pichPower	The Power of the PICH channel in the cell, "PICH Power" in TS 25.433 [5].  allowedValues: See "PICH Power" in TS 25.433 [5].	type: Real multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
primaryCcpchPower	The power of the primary CCPCH channel in the TDD cell, "PCCPCH Power" in TS 25.433 [5].  allowedValues: See "PCCPCH Power" in TS 25.433 [5].	type: Real multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
primaryCpichPower	The power of the primary CPICH channel in the FDD mode cell, "Primary CPICH Power" in TS 25.433 [5].  allowedValues: See "Primary CPICH Power" in TS 25.433 [5].	type: Real multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
primarySchPower	The power of the primary synchronisation channel in the FDD mode cell, "Primary SCH Power" in TS 25.433 [5].  allowedValues: See "DL Power" in TS 25.433 [5].	type: Real multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
primaryScramblingCode	The primary DL scrambling code used by the FDD mode cell, "Primary Scrambling Code" in TS 25.433 [5].  allowedValues: See "Primary Scrambling Code" in TS 25.433 [5].	type: Real multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
qhcs	Cell (re)selection for HCS, defined in TS 25.331 [9]. This specifies the quality threshold levels for applying prioritised hierarchical cell re-selection.  allowedValues: See "Qhcs" in TS 25.331 [9]	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
qqualMin	Cell (re)selection, defined in TS 25.331 [9]. This specifies the minimum required quality level in the cell in dB. It is only applicable for FDD cells.  allowedValues: See "QqualMin" in TS 25.331 [9].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
qrxlevMin	Cell (re)selection, defined in TS 25.331 [9]. This specifies the minimum required RX level in the cell in dBm.  allowedValues: See "QrxlevMin" in TS 25.331 [9].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False

rac	Routing Area Code, "RAC" in TS 23.003 [3].  allowedValues: See "RAC" in TS 25.413 [18].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
readSFNIndicator	Neighbouring cells monitoring, defined in TS 25.331 [9].  allowedValues: See "Read SFN indicator" in TS 25.331 [9]	type: Boolean multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
referenceTimeDifferenceToCell	Neighbouring cells monitoring, defined in TS 25.331 [9]. In the System Information message, the reference time difference to cell indicates the timing difference between the primary CCPCH of the current cell and the primary CCPCH of a neighbouring cell. In the Measurement Control message, the reference time difference to cell indicates the timing difference between UE uplink transmission timing and the primary CCPCH of a neighbouring cell.  allowedValues: 1. See "Reference time difference to cell" in TS 25.331 [9]. 2. A single integral value in chips. Range: (0..38400) by steps of 40, 256 or 2560.	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
restrictionStateIndicator	Cell Access Control, defined in TS 25.423 The Restriction state indicator is the identifier indicates whether the cell is "Cell Reserved for Operator Use" or not. It is provided by DRNS and reported to SRNC.  allowedValues: cell reserved for operation, cell accessible	type: <<enumeration>> multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
rncId	IOC <i>ExternalUTRANGenericCell</i> and <i>ExternalRncFunction</i> : Unique RNC ID for the associated RNC, "RNC Id" in TS 23.003 [3]. IOC <i>RncFunction</i> : Unique RNC ID, "RNC Id" in TS 23.003 [3].  allowedValues: See "RNC-ID" in TS 25.413 [18].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNujllable: True
sac	Service Area Code, "SAC" in TS 23.003 [3].  allowedValues: See "SAC" in TS 25.413 [18].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
schPower	The power of the synchronisation channel in 3.84 Mcps TDD cell.  allowedValues: See "DL Power" in TS 25.433 [5].	type: Real multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
schTimeSlot	The SCH Time Slot IE represents the first time slot (k) of a pair of time slots inside a Radio Frame that is assigned to the Physical Channel SCH.  allowedValues: See "SCH Time Slot" in TS 25.433 [5].	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False

sctdIndicator	<p>This attribute indicates whether SCTD is used, "SCDT Indicator" in TS 25.433 [5].</p> <p>See "SCDT Indicator" in TS 25.433 [5].</p> <p>allowedValues: active, inactive</p>	<p>type: &lt;&lt;enumeration&gt;&gt; multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
secondarySchPower	<p>The power of the secondary synchronisation channel in the FDD mode cell, "Secondary SCH Power in TS 25.433 [5].</p> <p>allowedValues: See "DL Power" in TS 25.433 [5].</p>	<p>type: Real multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
sharNetTceMappingInfoList	<p>This attribute includes a list of elements. Each element is a tuple of shared PLMN Id (called "PLMN Target"), TCE ID and the corresponding TCE IP address.</p> <p>In case of network sharing and Logged MDT, this attribute is used to translate from the TCE IP Address to TCE ID when a Logged MDT is ordered to the UE and to translate the TCE ID to TCE IP address when the UE has sent the log to the network.</p> <p>Each element is a tuple of shared PLMN Id (called "PLMN Target"), TCE ID and the corresponding TCE IP address.</p> <p>allowedValues: See "PLMN Target", "Trace Collection Entity Address" and "Trace Collection Entity Id" in 3GPP TS 32.422 [12].</p>	<p>type: &lt;&lt;dataType&gt;&gt; multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
siptoSupported	<p>This attribute indicates whether the RNC supports SIPTO function. A value of 0 represents that SIPTO is not supported and a value of 1 represents that SIPTO is supported (by the RNC).</p> <p>allowedValues: 0..1</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
snaInformation	<p>Shared Networks Access Control, defined in 3GPP TS 25.423 [5].</p> <p>This information element contains a list of Shared Network Areas, identified by the Shared Network Area Code (SNAC) which a certain cell belongs to.</p> <p>allowedValues: See "shared networks access control" defined in 3GPP TS 25.423 [5].</p>	<p>type: &lt;&lt;dataType&gt;&gt; multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
sttdSupportIndicator	<p>Power control, defined in 3GPP TS 25.423.</p> <p>The STTD Support Indicator indicates whether the STTD can be applied to DL DPCH and F-DPCH in the cell or not.</p> <p>allowedValues: active, inactive</p>	<p>type: &lt;&lt;enumeration&gt;&gt; multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
syncCase	<p>The SCH and PCCPCH in a TDD cell are mapped on one or two downlink slots per frame. There are two cases of Sync Case as follows</p> <ul style="list-style-type: none"> <li>- SCH and PCCPCH allocated in a single TS#k</li> <li>- SCH allocated in two TS: TS#k and TS#k+8. PCCPCH allocated in TS#k</li> </ul> <p>See "Synch Case" in TS 25.433 [5].</p> <p>allowedValues: See "Sync Case" in TS 25.433 [5].</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>

tceIDMappingInfoList	<p>This attribute includes a list of TCE ID and the corresponding TCE IP address. It is used in Logged MDT case to provide the information to the RNC to get the corresponding TCE IP address when there is an MDT log received from the UE. This attribute is used if only one PLMN is supported.</p> <p>allowedValues: See "Trace Collection Entity Address" and "Trace Collection Entity Id" in 3GPP TS 32.422 [12].</p>	<p>type: &lt;&lt;dataType&gt;&gt; multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
temporaryOffset1	<p>Cell (re)selection for HCS, defined in 3GPP TS 25.331 (TS 25.304).</p> <p>This specifies the offset applied to the H and R criteria for a neighbouring cell for the duration of PENALTY_TIME. It is used for TDD and GSM cells and for FDD cells in case the quality measure for cell selection and re-selection is set to CPICH RSCP.</p> <p>allowedValues: See "Temporary_offset1" in TS 25.331 [9].</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
temporaryOffset2	<p>Cell (re)selection for HCS, defined in 3GPP TS 25.331 (TS 25.304).</p> <p>This specifies the offset applied to the H and R criteria for a neighbouring cell for the duration of PENALTY_TIME. It is used for FDD cells in case the quality measure for cell selection and re-selection is set to CPICH Ec/No.</p> <p>allowedValues: See "Temporary_offset2" in TS 25.331 [9].</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
timeSlotForSch	<p>The Time Slot represents the time interval assigned to a Physical Channel referred to the start of a Radio Frame,</p> <p>allowedValues: See "SCH Time Slot" in TS 25.433 [5].</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
timeSlotHcrList	<p>This attribute defines the time slot configuration information in the TDD cell.</p> <p>It is a list which contains 15 (for 3.84 or 7.68 Mcps TDD cell) items.</p> <p>allowedValues: An item has three parts: timeSlotId, timeSlotDirection, timeSlotStatus. ( TS 25.433 [5]) where:</p> <p>timeSlotId: type: Integer allowedValues: 0..14;</p> <p>timeSlotDirection: type: &lt;&lt;enumeration&gt;&gt; allowedValues: UI, DI;</p> <p>timeSlotStatus: type: &lt;&lt;enumeration&gt;&gt; allowedValues: Active, Not active;</p>	<p>type: &lt;&lt;dataType&gt;&gt; multiplicity: 15 isOrdered: False isUnique: True defaultValue: None isNullable: False</p>

timeSlotLcrList	<p>This attribute defines the time slot configuration information in the TDD cell.</p> <p>It is a list which contains 7 (for 1.28 Mcps TDD cell) items.</p> <p>allowedValues: An item has three parts: timeSlotId, timeSlotDirection, timeSlotStatus, corresponding to Time Slot LCR, Time Slot Direction, Time Slot Status ( TS 25.433 [5]).</p> <p>If multiple frequencies exist within the cell, the timeSlotList indicates the Time Slot configuration of Primary Frequency.</p> <p>timeSlotId: type: Integer allowedValues: 0..6;</p> <p>timeSlotDirection: type: &lt;&lt;enumeration&gt;&gt; allowedValues: UI, DI;</p> <p>timeSlotStatus: Type: &lt;&lt;enumeration&gt;&gt; allowedValues: Active, Not active;</p>	<p>type: &lt;&lt;dataType&gt;&gt; multiplicity: 7 isOrdered: False isUnique: True defaultValue: None isNullable: False</p>
tmaFunctionList	<p>This is a referential attribute to list the DNs of TmaFunction(s) that support the <i>UTRANGenericCell</i>.</p> <p>allowedValues: See TS 32.300 [13] for definition of DN.</p>	<p>type: DN multiplicity: 1..* isOrdered: False isUnique: True defaultValue: None isNullable: True</p>
tstdIndicator	<p>This attribute indicates whether TSTD is used. See "TSTD Indicator" in TS 25.433 [5].</p> <p>allowedValues: active, inactive</p>	<p>type: &lt;&lt;enumeration&gt;&gt; multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
txDiversityIndicator	<p>Defined in 3GPP TS 25.331 (25.423)</p> <p>This attribute indicates whether following conditions are satisfied: Primary CPICH is broadcast from two antennas STTD is applied to Primary CCPCH TSTD is applied to Primary SCH and Secondary SCH</p> <p>allowedValues: See "TX Diversity Indicator" in TS 25.331 [9]</p>	<p>type: &lt;&lt;enumeration&gt;&gt; multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
uarfcn	<p>The UTRA absolute Radio Frequency Channel number for TDD mode cell, UARFCN ( TS 25.433 [5]). For 1.28Mcps TDD, if multiple frequencies exist within the cell, the uarfcn indicates the frequency of Primary Frequency.</p> <p>allowedValues: 0..16383</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>

uarfcnLCRList	<p>For 1.28 Mcps TDD, if multiple frequencies exist within the cell, this is a list of items (the UARFCN and Time Slot configuration information of the Secondary Frequencies).</p> <p>allowedValues:</p> <ol style="list-style-type: none"> <li>1. An item has two parts: uarfcn and timeSlotListLcr. The second part is a list of elements which have the sub-elements: timeSlotId, timeSlotDirection, timeSlotStatus.</li> <li>2. These attributes correspond to "UARFCN, Time Slot LCR, Time Slot Direction, Time Slot Status" (TS 25.433 [5]).</li> <li>3. For "uarfcn, timeSlotId, timeSlotDirection, timeSlotStatus", see "UARFCN, Time Slot LCR, Time Slot Direction, Time Slot Status" in TS 25.433 [5].</li> <li>4. For maximum number of the Secondary Frequencies per cell, see "maxFrequencyinCell-1" in TS 25.433 [5].</li> </ol>	<p>type: See note. multiplicity: 1..* isOrdered: False isUnique: True defaultValue: None isNullable: True</p>
uarfcnDl	<p>The DL UTRA absolute Radio Frequency Channel number for FDD mode cell.</p> <p>allowedValues: See "UARFCN" in TS 25.433 [5].</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
uarfcnUl	<p>The UL UTRA absolute Radio Frequency Channel number for FDD mode cell.</p> <p>allowedValues: See "UARFCN" in TS 25.433 [5].</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
uraList	<p>A list of UTRAN Registration Area identities that an UtranCell can belong to.</p> <p>allowedValues:</p> <ol style="list-style-type: none"> <li>1. For URA, see "URA identity" in TS 25.331[9], subclause 10.3.2.6.</li> <li>2. For maximum number of URAs per cell, see "maxURA" in TS 25.331 [9], subclause 10.3.10.</li> </ol>	<p>type: Integer multiplicity: 1..* isOrdered: False isUnique: True defaultValue: None isNullable: True</p>
<b>Attribute related to role</b>		
iubLink	<p>This attribute carries a IubLink DN.</p> <p>allowedValues: N/A</p>	<p>type: DN multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True</p>
atmChannelTerminationPoint	<p>This attribute carries the set of ATMChannelTerminationPoint's DN(s).</p> <p>allowedValues: N/A</p>	<p>type: DN multiplicity: 1..* isOrdered: F isUnique: T defaultValue: None isNullable: True</p>
nodeBFunction	<p>This attribute carries a NodeBFunction DN.</p> <p>allowedValues: N/A</p>	<p>type: DN multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True</p>

uTRANGenericCell	This attribute carries the set of related <i>UTRANGenericCell</i> derivatives' DN(s).  allowedValues: N/A	type: DN multiplicity: 1..* isOrdered: F isUnique: T defaultValue: None isNullable: True
adjacentCell	It carries the DN of the <i>UtranGenericCell</i> or the <i>ExternalUTRANGenericCell</i> .  allowedValues: N/A	type: DN multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
controlledCellList	This attribute carries a set of DNs of derivatives of <i>ExternalUTRANGenericCell</i> .  allowedValues: N/A	type: DN multiplicity: 1..* isOrdered: F isUnique: T defaultValue: None isNullable: True
relatedAntennaList	This is an attribute to list the DNs of <i>AntennaFunction(s)</i> (see TS 28.662 [17]) that support the <i>UTRANGenericCell</i> .  See "relatedAntennaList" in TS 28.662 [17]  allowedValues: N/A	type: DN multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
relatedSectorEquipment	This is an attribute to the DN of <i>SectorEquipment</i> (see TS 28.662 [17]) that supports the <i>UTRANGenericCell</i> .  See "relatedSectorEquipment" TS 28.662 [17].  allowedValues: N/A	type: DN multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
relatedTMAList	This is an attribute to list the DNs of <i>TmaFunction(s)</i> (see TS 28.662 [17]) that support the <i>UTRANGenericCell</i> .  See "relatedTmaList" TS 28.662 [17].  allowedValues: N/A	type: DN multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
iubLink	This attribute carries a <i>IubLink</i> DN.  allowedValues: N/A	type: DN multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
controllingRNC	This attribute carries one <i>ExternalRNCFunction</i> DN.  allowedValues: N/A	type: DN multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True

#### 4.4.2 Constraints

None.

## 4.5 Common notifications

### 4.5.1 Alarm notifications

This subclause presents a list of notifications, defined in [11], that IRPManager can receive. The notification header attribute `objectClass/objectInstance`, defined in [7], would capture the DN of an instance of an IOC defined in this IRP specification.

Name	Qualifier	Notes
<code>notifyAckStateChanged</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyChangedAlarm</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyClearedAlarm</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyNewAlarm</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyComments</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyAlarmListRebuilt</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyPotentialFaultyAlarmList</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	

### 4.5.2 Configuration notifications

This subclause presents a list of notifications, defined in [10], that IRPManager can receive. The notification header attribute `objectClass/objectInstance`, defined in [7], would capture the DN of an instance of an IOC defined in this IRP specification.

Name	Qualifier	Notes
<code>notifyAttributeValueChange</code>	O	
<code>notifyObjectCreation</code>	O	
<code>notifyObjectDeletion</code>	O	

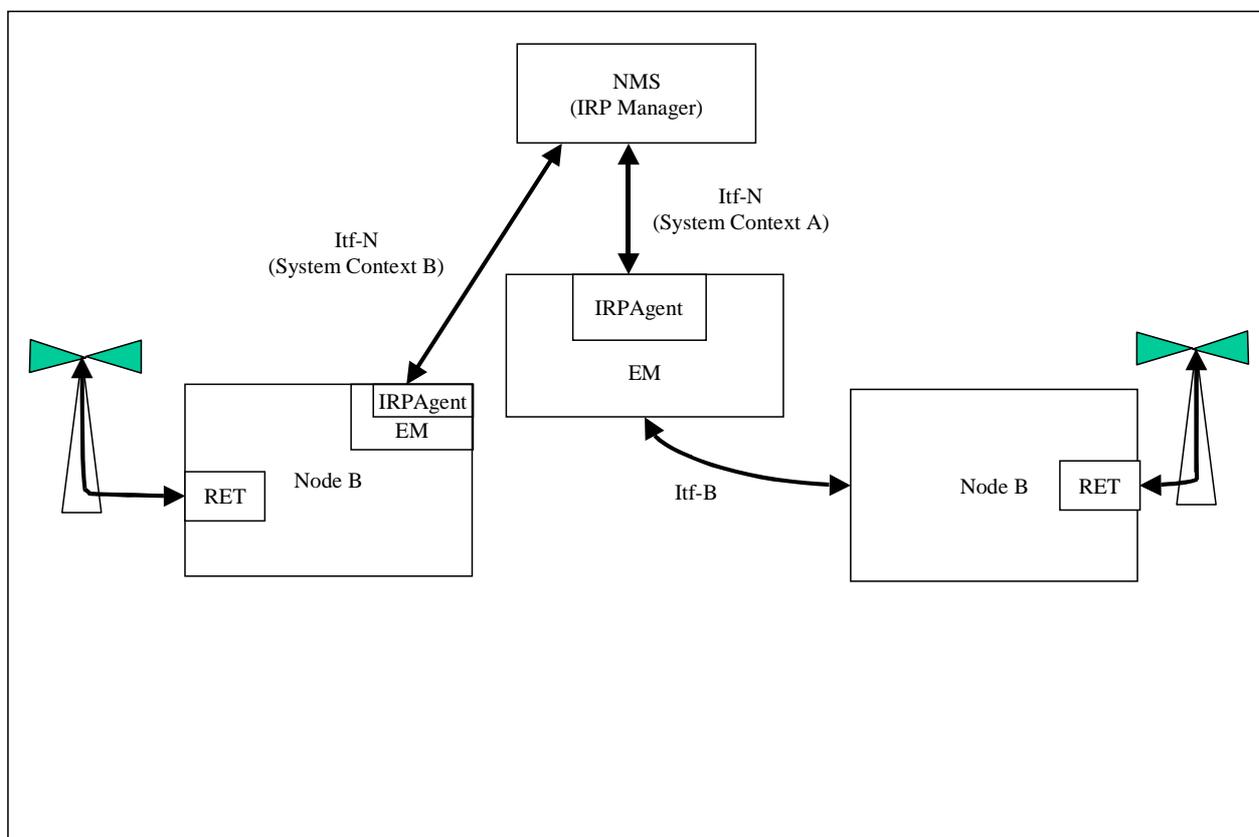
## Annex A (informative): RET Control Architecture

The Itf-N provides an abstraction of resources to allow the monitor and control of physical resource from the network level management systems. For RET, the antenna tilt is controlled via a control unit which is located within the NodeB (from a management perspective). The control unit sends commands to actuators located at the tower top, in order to read, and to adjust antenna tilt values.

The `AntennaFunction` class will report failures and malfunctions of either the control unit, or the tilt.

There are several configurations of antennae. Some support the transmission of several frequencies from a single radome while others are deployed as an array in order to provide effective coverage.

Hence in the UTRAN model there is an N:M relationship between the `UtranCell` class and the `AntennaFunction` class, permitting the model to support all possibilities. The figure B.1 below illustrates the RET architecture.



**Figure B.1: Overall RET architecture**

## Annex B (informative): Change history

Change history								
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Cat	Old	New
2013-03	SA#59	SP-130057	001	1	CR R11 28.652 Addition of missing Network Sharing support for MDT	F	11.0.0	11.1.0
2013-09	SA#61	SP-130433	002	1	UTRAN NRM Correction of wrong import references	F	11.1.0	11.2.0
2014-06	SA#64	SP-140332	003	2	Correction of operationalState attribute definitions	F	11.2.0	11.3.0
			004	1	Correct synCase attribute description and usage of BITSTRING(32) data type	F		
		SP-140359	005	-	remove the feature support statements	F		
2014-09					Correction of editorial issues(MCC)		11.3.0	11.3.1
2014-09					Upgrade to Rel-12 (MCC)		11.3.1	12.0.0
2014-12	SA#66	SP-140800	008	2	Add support for sharing of UTRAN	B	12.0.0	12.1.0
2015-06	SA#68	SP-150316	011	-	Add missing IOC notification support	A	12.1.0	12.2.0
			013	-	Correct IsNullable properties for power attributes	A		
2015-12	SA#70	SP-150691	014	1	Align id attribute definitions	A	12.2.0	12.3.0
2016-01	SA#70				Upgrade to Rel-13(MCC)		12.3.0	13.0.0

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2017-03	SA#75					Promotion to Release 14 without technical change	14.0.0
2018-06	-	-	-	-	-	Update to Rel-15 version (MCC)	<b>15.0.0</b>

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# History

<b>Document history</b>		
V15.0.0	July 2018	Publication