CR-Form-v3

CHANGE REQUEST

⌘   **25.304** CR **64**   ⌘ rev **3** ⌘ Current version: **3.5.0** ⌘

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

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

Title: ⌘	Equivalent PLMN codes	
Source: ⌘	Telia, Nortel Networks	
Work item code: ⌘	GSM-UMTS interworking	***Date:*** ⌘ March. 13th, 2001
Category: ⌘ **F**		***Release:*** ⌘ R99

Use one of the following categories: **F** *(essential correction)* **A** *(corresponds to a correction in an earlier release)* **B** *(Addition of feature),* **C** *(Functional modification of feature)* **D** *(Editorial modification)* Detailed explanations of the above categories can be found in 3GPP TR 21.900.	*Use one of the following releases:* 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)

Reason for change: ⌘	During the recent 3GPP TSG SA workshop on UE in idle mode, it was agreed to propose the multiple MCC+MNC codes for a single operator as an essential correction for Release 99. This would e.g. allow UEs to reselect a cell in the appropriate PLMN when roaming between 3G and 2G RATs. Rev 3 introduces latest results based on CN1 i.e. equivalent PLMN codes apply to PLMN selection also.
Summary of change: ⌘	NAS shall maintain a list of equivalent PLMN codes in the UE. The definition of suitable cells for cell reselection is updated.
Consequences if not approved: ⌘	Some operator scenarios are not supported for multi-PLMN case, e.g. one operator with two PLMN Ids, or two 2G operators sharing the same 3G network.

Clauses affected: ⌘	4.1, 4.2, 4.3

Other specs ⌘	**X** Other core specifications	⌘	23.122, 24.008, 25.331
Affected:	**X** Test specifications		
	☐ O&M Specifications		

Other comments: ⌘	

How to create CRs using this form:

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

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

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

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

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

4.1   Overview

When a UE is switched on, a public land mobile network (PLMN) is selected and the UE searches for a suitable cell of this PLMN to camp on. Criteria for cell selection and cell re-selection between radio access technologies (RATs) described in this document only consider radio criteria. In addition to radio access technology, the PLMN type may differ as well. In this specification, the term PLMN is used as a generic term covering both GSM MAP and ANSI-41 type of PLMNs. According to the type of PLMN, the way to identify it can be different. If the PLMN type is GSM, the PLMN is identified by 'PLMN identity' and if the PLMN type is ANSI-41, the PLMN is identified by 'SID'

The UE searches for a suitable cell of the chosen PLMN and chooses that cell to provide available services, and tunes to its control channel. This choosing is known as "camping on the cell". The UE will then register its presence, by means of a NAS registration procedure, in the registration area of the chosen cell, if necessary.

If the UE finds a more suitable cell ~~of the selected PLMN~~, it reselects onto that cell and camps on it. If the new cell is in a different registration area, location registration is performed.

If necessary, the UE will look for more suitable cells on other PLMNs at regular time intervals, which is referred to as PLMN-reselection. This is described in [9].

If the UE loses coverage of the registered PLMN, either a new PLMN is selected automatically (automatic mode), or an indication of which PLMNs are available is given to the user, so that a manual selection can be made (manual mode).

Registration is not performed by UEs only capable of services that need no registration.

The purpose of camping on a cell in idle mode is fourfold:

   a) It enables the UE to receive system information from the PLMN.

   b) When registered and if the UE wishes to establish an RRC connection, it can do this by initially accessing the network on the control channel of the cell on which it is camped.

   c) If the PLMN receives a call for the registered UE, it knows (in most cases) the registration area of the cell in which the UE is camped. It can then send a "paging" message for the UE on control channels of all the cells in the registration area. The UE will then receive the paging message because it is tuned to the control channel of a cell in that registration area and the UE can respond on that control channel.

   d) It enables the UE to receive cell broadcast services.

If the UE is unable to find a suitable cell to camp on, or the USIM is not inserted, or if the location registration failed, it attempts to camp on a cell irrespective of the PLMN identity, and enters a "limited service" state in which it can only attempt to make emergency calls.

The idle mode tasks can be subdivided into three processes:

   - PLMN selection and reselection;

   - Cell selection and reselection;

   - Location registration.

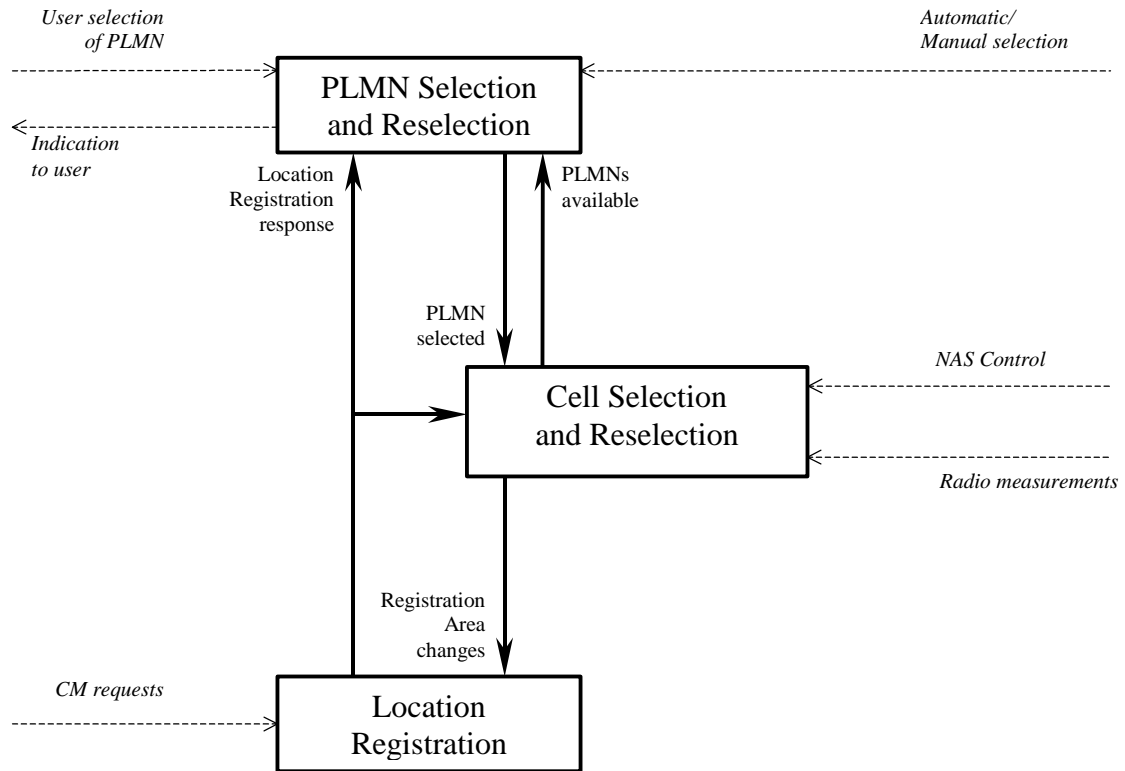The relationship between these processes is illustrated in Figure 1.

Figure 1: Overall Idle Mode process

NOTE: The impact of NAS defined service areas is FFS.

4.2   Functional division between AS and NAS in Idle mode

Table 1 presents the functional division between UE non-access stratum (NAS) and UE access stratum (AS) in idle mode. The non-access stratum part is specified in [5] and the access stratum part in the present document. Examples of different idle mode procedures are presented in Clause 10.

Table 1: Functional division between AS and NAS in idle mode

Idle Mode Process	UE Non-Access Stratum	UE Access Stratum
PLMN Selection and Reselection	Maintain the list of allowed PLMN types. It can be GSM-MAP only, ANSI-41 only or both. Maintain a list of PLMNs in priority order according to [5]. Select a PLMN using automatic or manual mode as specified in [5] and request AS to select a cell belonging to this PLMN. For each PLMN, associated radio access technology(ies) may be set. Evaluate reports of available PLMNs from AS for PLMN selection. Maintain a list of equivalent PLMN codes.	Search for a suitable cell belonging to the PLMN requested by NAS. Perform cell selection process as described below. If associated radio access technology(ies) is (are) set for the PLMN, search in this (these) radio access technology(ies) and other radio access technologies for that PLMN as specified in [5]. Report available PLMNs with associated PLMN type and radio access technology to NAS on request from NAS or autonomously. It must respect allowed PLMN types indications from NAS.
Cell Selection	Control cell selection for example by indicating radio access technology(ies) associated with the selected PLMN to be used initially in the search of a cell in the cell selection. NAS is also maintaining lists of forbidden registration areas and a list of NAS defined service areas in priority order.	Perform measurements needed to support cell selection. Detect and synchronise to a broadcast channel. Receive and handle broadcast information. Forward NAS system information to NAS. Search for a suitable cell belonging to the PLMN requested by NAS. The cells broadcast their 'PLMN identity' (GSM-MAP) or 'SID' in the system information. Respond to NAS whether such cell is found or not. If associated radio access technology(ies) is (are) set for the PLMN, perform the search in this (these) radio access technology(ies) and other radio access technologies for that PLMN as specified in [5]. If such a cell is found, the cell is selected to camp on.
Cell Reselection	Control cell reselection by for example, maintaining lists of forbidden registration areas and a list of NAS defined service areas in priority order. Maintain a list of equivalent PLMN codes and provide the list to AS.	Perform measurements needed to support cell reselection. Detect and synchronise to a broadcast channel. Receive and handle broadcast information. Forward NAS system information to NAS. Change cell if a more suitable cell is found.
Location registration	Register the UE as active after power on. Register the UE's presence in a registration area, for instance regularly or when entering a new registration area. Deregister UE when shutting down.	Report registration area information to NAS.

4.3   Service type in Idle mode

This chapter defines the level of service that may be provided by the network to a UE in Idle mode.

The action of camping on a cell is necessary to get access to some services. Three levels of services are defined for UE in idle mode:

-    Limited service (emergency calls on an acceptable cell)

-    Normal service (for public use on a suitable cell)

-    Operator service (for operators only on a reserved cell)

Furthermore, the cells are categorised according to which services they offer:

acceptable cell:

An "acceptable cell" is a cell on which the UE may camp to obtain limited service (originate emergency calls). Such a cell shall fulfil the following requirements, which is the minimum set of requirements to initiate an emergency call in a UTRAN network:

-    The cell is not barred, see subclause 5.3.4.1

-    The cell selection criteria are fulfilled, see subclause 5.2.3.1.2;

suitable cell:

A "suitable cell" is a cell on which the UE may camp on to obtain normal service. Such a cell shall fulfil all the following requirements.

-    The cell is part of the selected PLMN or, for cell reselection only, of a PLMN considered as equivalent by the UE according to the information provided by the NAS.

-    The cell is not barred, see subclause 5.3.4.1.

-    The cell is not part of a forbidden registration area.

-    The cell selection criteria are fulfilled, see subclause 5.2.3.1.2.

-    The SoLSA criteria are fulfilled [SoLSA support is not in the current release].

barred cell:

A cell is barred if it is so indicated in the system information [4].