TSG-RAN Working Group 1 meeting #9 ***TSGR1#9(99)k16***
Dresden, Germany
November 30 – December 3, 1999

Agenda item: Location Services

Title: CR 25.214-036: Inclusion of idle periods for the IPDL LCS method

Source: Nokia, Ericsson

Document for: Decision

Background

The following CR includes a physical procedure to implement the idle periods in the case of IPDL in support of location services. A text proposal (R1-99k71) was presented in AH17 2/12/99 which was approved with some minor changes. This change request is based on that text proposal with the required changes made.

3GPP TSG RAN WG1 Meeting #9
Dresden, Germany, Nov 30 – Dec 3, 1999

Document ***R1#9(99)k16***
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

25.214	**CR**	**036**	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: TSG-RAN #9 *list expected approval meeting # here ↑*

for approval	X	strategic	
for information		non-strategic	

(for SMG use only)

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*

(U)SIM		ME	X	UTRAN / Radio	X	Core Network	

Source: Nokia,Ericsson **Date:** 1999-11-30

Subject: Inclusion of idle periods for the IPDL LCS

Work item: 25.214

Category: *(only one category shall be marked with an X)*

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature	X		Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: Needed to support the IPDL LCS method, which has been decided to be included in R99.

Clauses affected: New Section 10

Other specs affected:

Other 3G core specifications		→ List of CRs:
Other GSM core specifications		→ List of CRs:
MS test specifications		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments:

10 Idle Periods for IPDL Location method.

To support time difference measurements that need to be made for location services there needs to be Idle Periods created in the DownLink (IPDL) during which time all channels from a node B are temporally seized. During these Idle Periods the visibility of neighbour basestations from the UE is improved thus allowing the measurements to be performed.

The Idle Periods are arranged in a predetermined pseudo random fashion according to higher layer parameters, these parameters are used by layer 1 to arrange and use these Idle Periods. Idle Periods differ from compressed mode in that they are shorter in duration, all channels are silent simultaneously, and no attempt is made to prevent data loss.

In general there are two modes for these Idle Periods:

- Continuous mode, and
- Burst mode

In continuous mode the Idle Periods are active all the time. In burst mode the Idle Periods are arranged in bursts where each burst contains enough Idle Periods to allow a UE to make sufficient measurements for its location to be calculated. The bursts are separated by a period where no Idle Periods occur.

10.1 Parameters of IPDL

The follow parameters are signalled to the UE via higher layers:

IP_Status: This is a logic value that indicates if the Idle Periods are arranged in continuous or burst mode.

IP_Spacing: The number of 10ms frames between the start of a frame that contains an Idle Period and the next frame that contains an Idle Period. (Note that there is at most one Idle Period in a frame)

IP_Length: The length of the Idle Periods, expressed in symbols of the CPICH.

IP_offset: A cell specific offset (can be used to synchronise Idle Periods from different sectors within a node B).

Seed: A seed for a pseudo random number generator.

Additionally in the case of burst mode operation the following parameters are also communicated to the UE.

Burst_Start: The SFN where the first burst of Idle Periods starts.

Burst_Length: The number of Idle Periods in a burst of Idle Periods.

Burst_Freq: The number of frames of the primary CPICH between the start of a burst and the start of the next burst.

10.2 Calculation of Idle Period Position

The position of the x^{th} Idle Period relative to the start of a burst, expressed in symbols of the CPICH, is given by the formula (assuming the Idle Periods are indexed from 1, i.e. the first Idle Period is x=1 etc):

$$x * IP\_Spacing * 150 + rand(x \bmod 64) \bmod Max\_dev + IP\_offset$$

where : $Max\_dev = 150 - IP\_Length$,

$rand(n) = (106 * rand(n-1) + 1283) \bmod 6075$, *and*

$rand(0) = Seed$

Continuous mode can be considered as a specific case of the burst mode with just one burst spanning the whole SFN cycle. Note also that x will be reset to x=1 for the first idle period in a SFN cycle for both continuous and burst modes and will also, in the case of burst mode, be reset for the first Idle Period in every burst.

Figure 10.1 below illustrates the Idle Periods for the Burst Mode case.

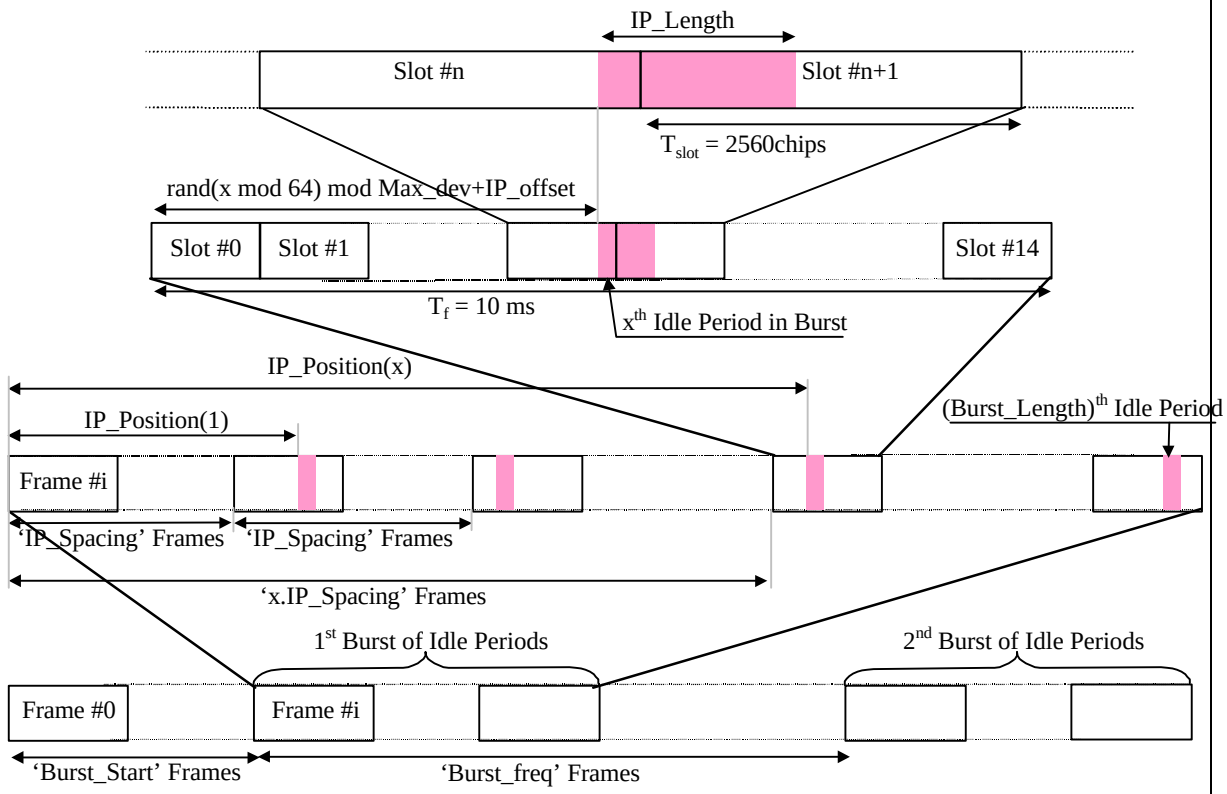

Figure 10.1: Idle Period placement in the case of burst mode operation.