TSG-RAN Working Group 1 meeting #11
San Diego, CA, USA
February 29 – March 3, 2000

TSGR1#11(00)0353

Agenda item:

Source: Ericsson & Nokia

Title: CR 25.214-064r1: Editorial improvement of the IPDL section

Document for: Decision

This CR introduces some editorial updates and clarifications to the IPDL text in TS 25.214 V3.1.0, it has been modified from the original CR contained in tdoc (00)0246 to correct an error in the description of continuous mode operation.

Document R1(00)0353
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**	**064r1**	Current Version:	3.1.0

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

For submission to:	TSG-RAN #7	for approval	X	strategic		(for SMG
list expected approval meeting # here ↑		for information		non-strategic		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:	Ericsson & Nokia	**Date:**	2000-02-22
Subject:	Editorial improvement of the IPDL section		
Work item:			

Category:	F	Correction		**Release:**	Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
(only one category	B	Addition of feature			Release 97	
shall be marked	C	Functional modification of feature			Release 98	
with an X)	D	Editorial modification	X		Release 99	X
					Release 00	

Reason for change:
- Clarifies relation between continuous mode and burst mode
- Clarifies what happens at the end of the radio frame with SFN = 4095
- Editorial improvements

Clauses affected: 10, 10.1, 10.2

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 p~~P~~eriods for IPDL l~~L~~ocation method~~.~~

10.1 General

To support time difference measurements~~ that need to be made~~ for location services, ~~there needs to be~~ i~~I~~dle p~~P~~eriods can be created in the d~~D~~ownl~~L~~ink (hence the name IPDL) during which time transmission of all channels from a N~~n~~ode B is~~are~~ temporari~~l~~ly seized. During these i~~I~~dle p~~P~~eriods the visibility of neighbour ~~basestation~~cells from the UE is improved~~ thus allowing the measurements to be performed~~.

The i~~I~~dle p~~P~~eriods 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 p~~P~~eriods 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 i~~I~~dle p~~P~~eriods:

- Continuous mode, and
- Burst mode.

In continuous mode the i~~I~~dle p~~P~~eriods are active all the time. In burst mode the i~~I~~dle p~~P~~eriods are arranged in bursts where each burst contains enough i~~I~~dle p~~P~~eriods to allow a UE to make sufficient measurements for its location to be calculated. The bursts are separated by a period where no i~~I~~dle p~~P~~eriods occur.

10.2~~1~~ Parameters of IPDL

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

IP_Status: This is a logic value that indicates if the i~~I~~dle p~~P~~eriods are arranged in continuous or burst mode.

IP_Spacing: The number of 10 ms radio frames between the start of a radio frame that contains an ~~I~~idle ~~P~~period and the next radio frame that contains an ~~I~~idle ~~P~~period. ~~(~~Note that there is at most one ~~I~~idle ~~P~~period in a radio frame.~~)~~

IP_Length: The length of the ~~I~~idle ~~P~~periods, expressed in symbols of the CPICH.

IP_~~o~~Offset: A cell specific offset that~~(~~ can be used to synchronise ~~I~~idle ~~P~~periods from different sectors within a N~~n~~ode B~~)~~.

Seed: S~~A s~~eed for the~~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 ~~I~~idle ~~P~~periods starts.

Burst_Length: The number of ~~I~~idle ~~P~~periods in a burst of ~~I~~idle ~~P~~periods.

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

10.2 Calculation of i~~I~~dle ~~P~~period ~~P~~position

In burst mode, the first burst starts in the radio frame with SFN = Burst_Start. The *n*:th burst starts in the radio frame with SFN = Burst_Start + $n \times$Burst_Freq. The sequence of bursts according to this formula continues up to and including the radio frame with SFN = 4095. At the start of the radio frame with SFN = 0, the burst sequence is terminated (no idle periods are generated) and at SFN = Burst_Start the burst sequence is restarted with the first burst followed by the second burst etc., as described above.

Continuous mode is equivalent to burst mode, with only one burst spanning the whole SFN cycle of 4096 radio frames, this burst starting in the radio frame with SFN = 0.

Assume that IP_Position(x) is the position of idle period number x within a burst, where x = 1, 2, …, and IP_Position(x) is measured in number of CPICH symbols from the start of the first radio frame of the burst.

The positions of the idle periods within each burst are then given by the following equation:

IP_Position(x) = ($x \times$ IP_Spacing $\times$ 150) + (rand(x modulo 64) modulo (150 – IP_Length)) + IP_Offset,

where rand(n) is a pseudo random generator defined as follows:

rand(0) = Seed,

rand(n) = (106$\times$rand(n – 1) + 1283) modulo 6075, n = 1, 2, 3, ….

~~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):~~

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

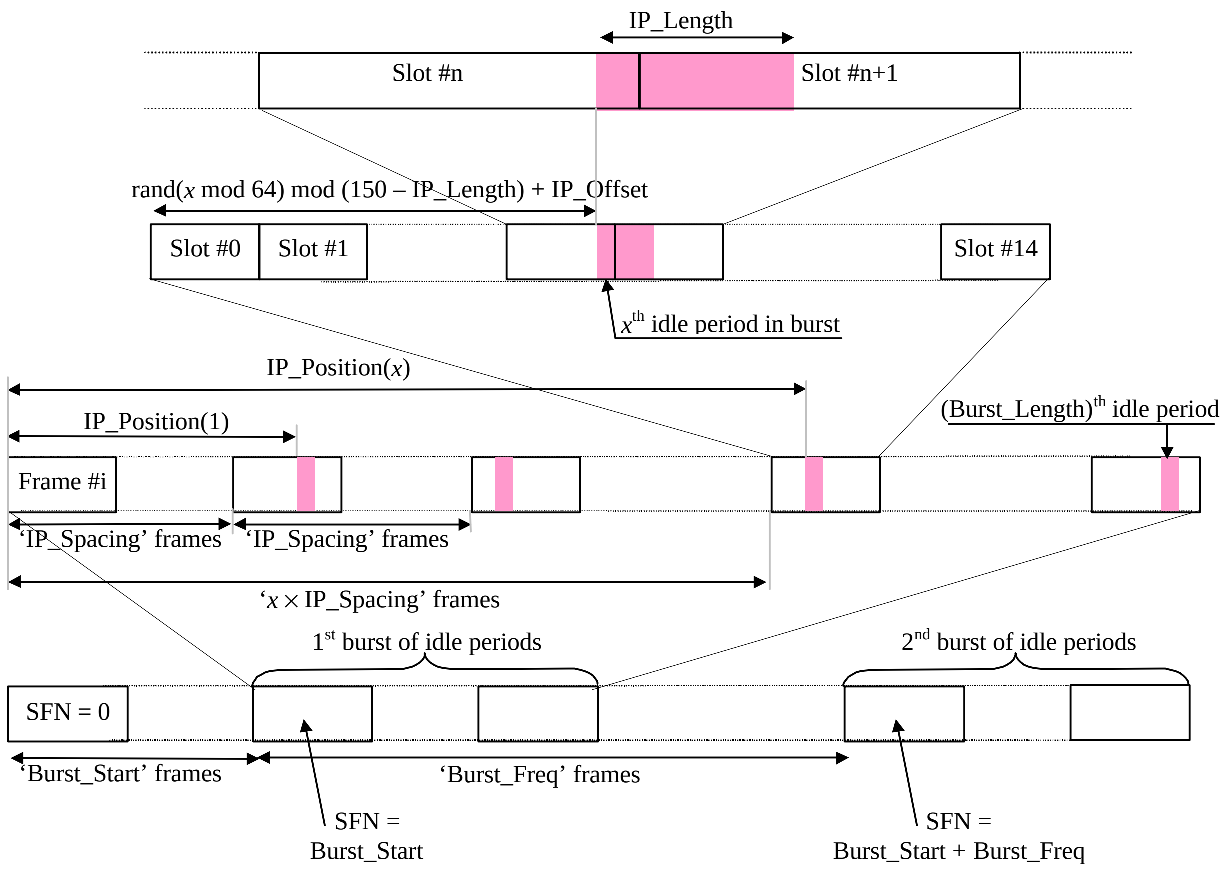
$$\text{where}: \quad Max\_dev = 150 - IP\_Length,$$

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

$$rand(0) = Seed$$

~~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~~is 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 9~~10.1~~ below illustrates the i~~I~~dle p~~P~~eriods for the b~~B~~urst m~~M~~ode case.



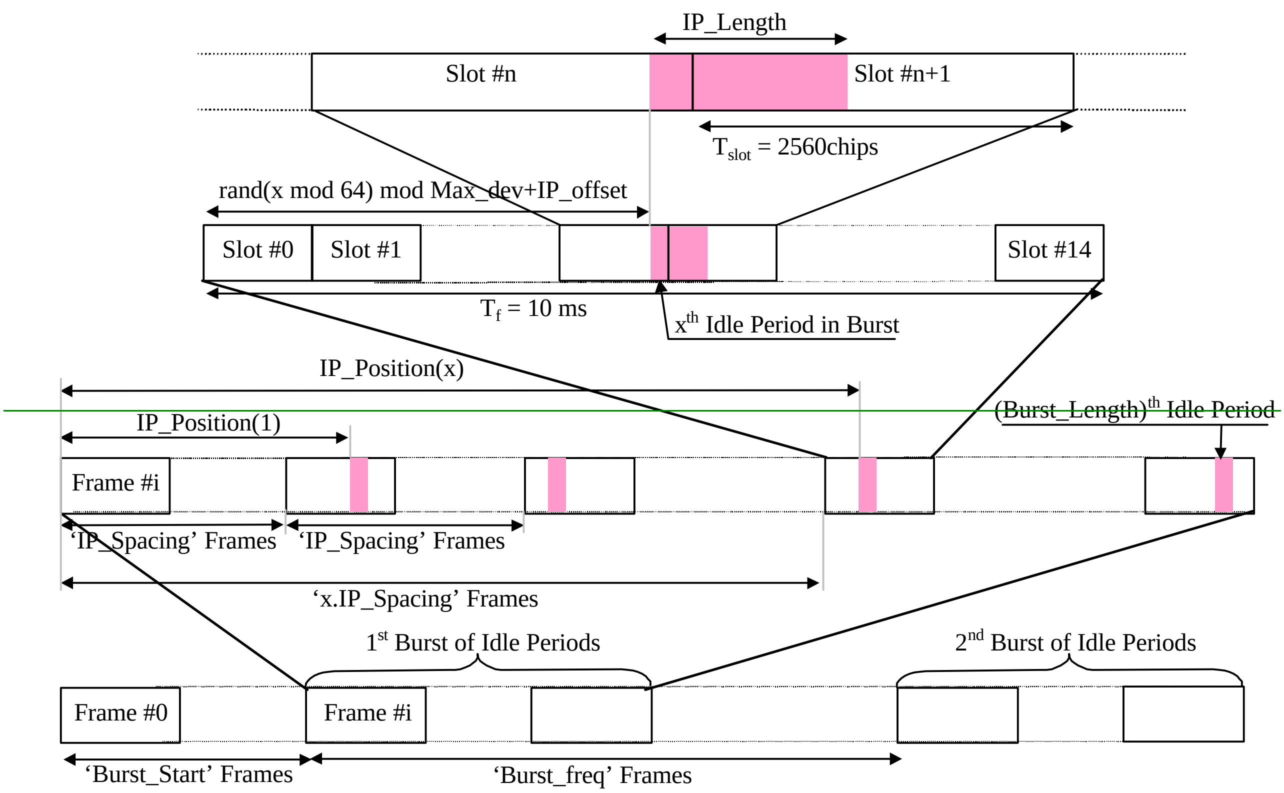


Figure 9~~10.1~~: Idle Period placement in the case of burst mode operation.