3GPP TSG RAN WG1 Meeting #11
San Diego, USA, Feb. 29th – March 3, 2000

Document R1-00-0233
e.g. for 3GPP use the format TP-99xxx
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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	043r1	Current Version:	3.1.1

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 use only)
list expected approval meeting # here ↑		for information		Non-strategic		

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: LGIC **Date:** 2000-2-29

Subject: Optimum ID Codes for SSDT Power Control

Work item:

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

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

Reason for change: The current ID codes for SSDT power control is not optimised. This CR corrects the codes.

Clauses affected: 5.2.1.4

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:

5.2.1.4 Site selection diversity transmit power control

5.2.1.4.1 General

Site selection diversity transmit power control (SSDT) is an optional macro diversity method in soft handover mode.
Operation is summarised as follows. The UE selects one of the cells from its active set to be ‘primary’, all other cells are classed as ‘non primary’. The main objective is to transmit on the downlink from the primary cell, thus reducing the interference caused by multiple transmissions in a soft handover mode. A second objective is to achieve fast site selection without network intervention, thus maintaining the advantage of the soft handover. In order to select a primary cell, each cell is assigned a temporary identification (ID) and UE periodically informs a primary cell ID to the connecting cells. The non-primary cells selected by UE switch off the transmission power. The primary cell ID is delivered by UE to the active cells via uplink FBI field. SSDT activation, SSDT termination and ID assignment are all carried out by higher layer signalling.

5.2.1.4.1.1 Definition of temporary cell identification

Each cell is given a temporary ID during SSDT and the ID is utilised as site selection signal. The ID is given a binary bit sequence. There are three different lengths of coded ID available denoted as "long", "medium" and "short". The network decides which length of coded ID is used. Settings of ID codes for 1-bit and 2-bit FBI are exhibited in table 3 and table 4, respectively.

Table 3: Settings of ID codes for 1 bit FBI

ID label	ID code "long"	"medium"	"short"
a	000000000000000	~~0000000(0)~~ (0)0000000	00000
b	~~111111111111111~~ 101010101010101	~~1111111(1)~~ (0)1010101	~~11111~~ 01001
c	~~000000001111111~~ 011001100110011	~~0000111(1)~~ (0)0110011	~~00011~~ 11011
d	~~111111110000000~~ 110011001100110	~~1111000(0)~~ (0)1100110	~~11100~~ 10010
e	~~000011111111000~~ 000111100001111	~~0011110(0)~~ (0)0001111	~~00110~~ 00111
f	~~111100000000111~~ 101101001011010	~~1100001(1)~~ (0)1011010	~~11001~~ 01110
g	~~001111000011110~~ 011110000111100	~~0110011(0)~~ (0)0111100	~~01010~~ 11100
h	~~110000111100001~~ 110100101101001	~~1001100(1)~~ (0)1101001	10101

Table 4: Settings of ID codes for 2 bit FBI

ID label	ID code (Column and Row denote slot position and FBI-bit position.) "long"	"medium"	"short"
a	~~0000000(0)~~ ~~0000000(0)~~ (0)0000000 (0)0000000	~~000(0)~~ ~~000(0)~~ (0)000 (0)000	000 000
b	~~1111111(1)~~ ~~1111111(1)~~ (0)0000000 (1)1111111	~~111(1)~~ ~~111(1)~~ (0)000 (1)111	~~111~~ ~~111~~ 000 111
c	~~0000000(0)~~ ~~1111111(1)~~ (0)1010101 (0)1010101	~~000(0)~~ ~~111(1)~~ (0)101 (0)101	~~000~~ ~~111~~ 101 101
d	~~1111111(1)~~ ~~0000000(0)~~ (0)1010101 (1)0101010	~~111(1)~~ ~~000(0)~~ (0)101 (1)010	~~111~~ ~~000~~ 101 010
e	~~0000111(1)~~ ~~1111000(0)~~ (0)0110011 (0)0110011	~~001(1)~~ ~~110(0)~~ (0)011 (0)011	~~001~~ ~~100~~ 011 011
f	~~1111000(0)~~ ~~0000111(1)~~ (0)0110011 (1)1001100	~~110(0)~~ ~~001(1)~~ (0)011 (1)100	~~110~~ ~~011~~ 011 100
g	~~0011110(0)~~ ~~0011110(0)~~ (0)1100110 (0)1100110	~~011(0)~~ ~~011(0)~~ (0)110 (0)110	~~010~~ ~~010~~ 110 110
h	~~1100001(1)~~ ~~1100001(1)~~ (0)1100110 (1)0011001	~~100(1)~~ ~~100(1)~~ (0)110 (1)001	~~101~~ ~~101~~ 110 001

ID must be terminated within a frame. If FBI space for sending a given ID cannot be obtained within a frame, hence if the entire ID is not transmitted within a frame but must be split over two frames, the ~~last~~first bit(s) of the ID is(are) punctured. The relating bit(s) to be punctured are shown with brackets in table 3 and table 4.

5.2.1.4.2 TPC procedure in UE

The TPC procedure of the UE in SSDT is identical to that described in subclause5.2.1.2 or 5.2.1.3 in compressed mode.

5.2.1.4.3 Selection of primary cell

The UE selects a primary cell periodically by measuring the RSCP of CPICHs transmitted by the active cells. The cell with the highest CPICH RSCP is detected as a primary cell.

5.2.1.4.4 Delivery of primary cell ID

The UE periodically sends the ID code of the primary cell via portion of the uplink FBI field assigned for SSDT use (FBI S field). A cell recognises its state as non-primary if the following conditions are fulfilled simultaneously:

- the received primary ID code does not match with the own ID code,
- the received uplink signal quality satisfies a quality threshold, Qth, a parameter defined by the network.
- and, when the uplink link compressed mode, does not results in excessive levels of puncturing on the coded ID. The acceptable level of puncturing on the coded ID is less than (int)$N_{ID}/3$ symbols in the coded ID (where N_{ID} is the length of the coded ID).

Otherwise the cell recognises its state as primary.
The state of the cells (primary or non-primary) in the active set with update synchronous. If a cell receives the last portion of the coded ID in uplink slot #j, the state of cell is updated in downlink slot#{(j+1+T_{os}) mod 15}. Where T_{os} is defined as a constant of 2 time slots. The updating of cell state is unchanged by the operation of downlink compressed mode.

At the UE, the primary ID code to be sent to the cells is segmented into a number of portions. These portions are distributed in the uplink FBI S-field. The cell in SSDT collects the distributed portions of the primary ID code and then detects the transmitted ID. Period of primary cell update depends on the settings of code length and the number of FBI bits assigned for SSDT use as shown in table 5

Table 5: Period of primary cell update

code length	The number of FBI bits per slot assigned for SSDT	
	1	2
"long"	1 update per frame	2 updates per frame
"medium"	2 updates per frame	4 updates per frame
"short"	3 updates per frame	5 updates per frame