Agenda Item: Ad hoc 14

Source : LGIC, GBT, Samsung, Lucent

Title : Revised CRs to 25.211 and 25.214 for Emergency Stop of CPCH transmission and Start of Message Indicator

Document for : Approval

CHANGE REQUEST

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| **25.211** | CR | **044r2** | 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* |
| *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: (U)SIM ☐   ME **X**   UTRAN / Radio **X**   Core Network ☐
(at least one should be marked with an X)

| **Source:** | LGIC, GBT, Samsung, Lucent | **Date:** | 2000-03-02 |

| **Subject:** | Emergency Stop of CPCH transmission and Start of Message Indicator |

| **Work item:** | |

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

Release:
Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	**X**
Release 00	

| **Reason for change:** | 1. Current Emergency Stop of CPCH transmission is not explicit, so that it should be changed into new explicit feature.
2. Start of Message Indictor solves the false mobile problem. |

| **Clauses affected:** | 3
4.2.5
5.3.2.3
7.4 |

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:** | |

help.doc

<--------- double-click here for help and instructions on how to create a CR.

3 Abbreviations

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

AI	Acquisition Indicator
AICH	Acquisition Indicator Channel
AP	Access Preamble
BCH	Broadcast Channel
CCC	CPCH Control Command
CCPCH	Common Control Physical Channel
CCTrCH	Coded Composite Transport Channel
CD	Collision Detection
CPCH	Common Packet Channel
CPICH	Common Pilot Channel
DCH	Dedicated Channel
DPCCH	Dedicated Physical Control Channel
DPCH	Dedicated Physical Channel
DPDCH	Dedicated Physical Data Channel
DSCH	Downlink Shared Channel
DTX	Discontinuous Transmission
FACH	Forward Access Channel
FBI	Feedback Information
MUI	Mobile User Identifier
PCH	Paging Channel
P-CCPCH	Primary Common Control Physical Channel
PCPCH	Physical Common Packet Channel
PDSCH	Physical Downlink Shared Channel
PI	Page Indicator
PICH	Page Indicator Channel
PRACH	Physical Random Access Channel
PSC	Primary Synchronisation Code
RACH	Random Access Channel
RNC	Radio Network Controller
S-CCPCH	Secondary Common Control Physical Channel
SCH	Synchronisation Channel
SF	Spreading Factor
SFN	System Frame Number
SSC	Secondary Synchronisation Code
STTD	Space Time Transmit Diversity
TFCI	Transport Format Combination Indicator
TSTD	Time Switched Transmit Diversity
TPC	Transmit Power Control
UE	User Equipment
UTRAN	UMTS Terrestrial Radio Access Network

4   Transport channels

Transport channels are the services offered by Layer 1 to the higher layers. General concepts about transport channels are described in [12].

A transport channel is defined by how and with what characteristics data is transferred over the air interface. A general classification of transport channels is into two groups:

-   Dedicated Channels

-   Common Channels

4.1   Dedicated transport channels

There exists only one type of dedicated transport channel, the Dedicated Channel (DCH).

4.1.1   DCH – Dedicated Channel

The Dedicated Channel (DCH) is a downlink or uplink transport channel. The DCH is transmitted over the entire cell or over only a part of the cell using beam-forming antennas. The Dedicated Channel (DCH) is characterized by the possibility of fast rate change (every 10ms), fast power control and inherent addressing of UEs.

4.2   Common transport channels

There are six types of common transport channels: BCH, FACH, PCH, RACH, CPCH and DSCH.

4.2.1   BCH – Broadcast Channel

The Broadcast Channel (BCH) is a downlink transport channel that is used to broadcast system- and cell-specific information. The BCH is always transmitted over the entire cell with a low fixed bit rate.

4.2.2   FACH – Forward Access Channel

The Forward Access Channel (FACH) is a downlink transport channel. The FACH is transmitted over the entire cell or over only a part of the cell using beam-forming antennas. The FACH uses slow power control.

4.2.3   PCH – Paging Channel

The Paging Channel (PCH) is a downlink transport channel. The PCH is always transmitted over the entire cell. The transmission of the PCH is associated with the transmission of a physical layer signal, the Paging Indicator, to support efficient sleep-mode procedures.

4.2.4   RACH – Random Access Channel

The Random Access Channel (RACH) is an uplink transport channel. The RACH is always received from the entire cell. The RACH is characterized by a limited size data field, a collision risk and by the use of open loop power control.

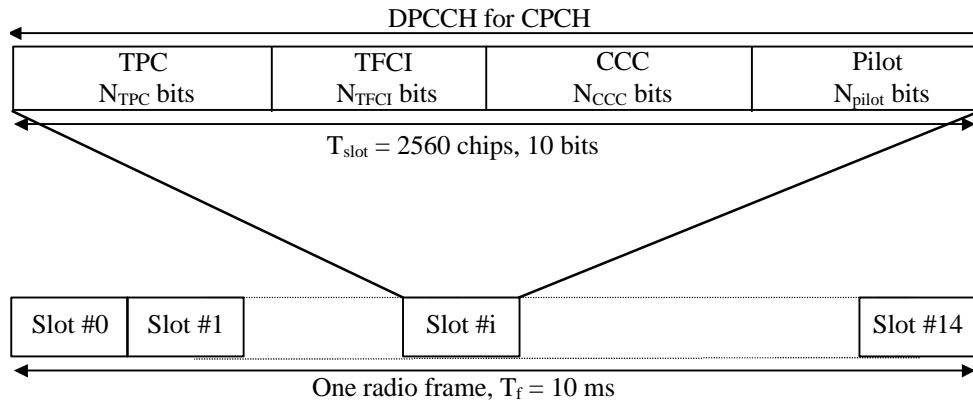### 4.2.5   CPCH – Common Packet Channel

The Common Packet Channel (CPCH) is an uplink transport channel. The CPCH is a contention based random access channel used for transmission of bursty data traffic. CPCH is associated with a dedicated channel on the downlink which provides power control and CPCH Control Commands (e.g. Emergency Stop) for the uplink CPCH.

4.2.6　DSCH – Downlink Shared Channel

The downlink shared channel (DSCH) is a downlink transport channel shared by several UEs The DSCH is associated with a DCH.

5.3.2.3　DL-DPCCH for CPCH

The downlink DPCCH for CPCH is a special case of downlink dedicated physical channel of the slot format #0 in table 11. ~~The spreading factor for the UL-DPCCH (message control part) is 256.~~ The spreading factor for the DL-DPCCH ~~(message control part)~~ is 512. Figure 11 shows the frame structure of DL-DPCCH for CPCH.

DPCCH for CPCH

| TPC N_{TPC} bits | TFCI N_{TFCI} bits | CCC N_{CCC} bits | Pilot N_{pilot} bits |

T_{slot} = 2560 chips, 10 bits

| Slot #0 | Slot #1 | | Slot #i | | Slot #14 |

One radio frame, T_f = 10 ms

Figure 11: Frame structure for downlink DPCCH for CPCH

DL-DPCCH for CPCH consists of known pilot bits, TFCI, TPC commands and CPCH Control Commands (CCC). CPCH control commands are used to support CPCH signalling. There are two types of CPCH control commands: Layer 1 control command such as Start of Message Indicator, and higher layer control command such as Emergency Stop command. The exact number of bits of DL DPCCH fields (N_{pilot}, N_{TFCI}, N_{CCC} and N_{TPC}) is determined in table 15. The pilot bit pattern for N_{pilot}=4 of table 12 is used for DPCCH for CPCH. ~~The following table 15 shows the DL DPCCH fields (message control part) which are identical to the first row of table 11 in section 5.3.2.~~

Table 15: ~~DPDCH and~~ DPCCH fields for CPCH message transmission

Slot Format #i	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	SF	Bits/ Slot	DPCCH Bits/Slot				Transmitted slots per radio frame N_{Tr}
					N_{TPC}	N_{TFCI}	N_{CCC}	N_{Pilot}	
0	15	7.5	512	10	2	0	4	4	15

~~Slot Format #I~~	~~Channel Bit Rate (kbps)~~	~~Channel Symbol Rate (ksps)~~	~~SF~~	~~Bits/Frame~~			~~Bits/ Slot~~	~~DPDCH Bits/Slot~~		~~DPCCH Bits/Slot~~		
				~~DPDCH~~	~~DPCCH~~	~~TOT~~		~~Ndata1~~	~~NData2~~	~~NTFCI~~	~~NTPC~~	~~NPilot~~
~~0~~	~~15~~	~~7.5~~	~~512~~	~~60~~	~~90~~	~~150~~	~~10~~	~~2~~	~~2~~	~~0~~	~~2~~	~~4~~

CCC field in figure 11 is used for the transmission of CPCH control command. On CPCH control command transmission request from higher layer, a certain pattern is mapped onto CCC field, otherwise nothing is transmitted in CCC field. There is one to one mapping between the CPCH control command and the pattern. In case of Emergency Stop of CPCH transmission, [1111] pattern is mapped onto CCC field. The Emergency Stop command shall not be transmitted during the first $N_{Start\_Message}$ frames of DL DPCCH after Power Control preamble.

Start of Message Indicator shall be transmitted during the first $N_{Start\_Message}$ frames of DL DPCCH after Power Control preamble. [1010] pattern is mapped onto CCC field for Start of Message Indicator. The value of $N_{Start\_Message}$ shall be provided by higher layers.

7.4 PCPCH/AICH timing relation

Transmission of random access bursts on the PCPCH is aligned with access slot times. The timing of the access slots is derived from the received Primary CCPCH timing The transmit timing of access slot n starts $n \times 20/15$ ms after the frame boundary of the received Primary CCPCH, where $n = 0, 1, \ldots, 14$. In addition, transmission of access preambles in PCPCH is limited to the allocated access slot subchannel group which is assigned by higher layer signalling to each CPCH set. Twelve access slot subchannels are defined and PCPCH may be allocated all subchannel slots or any subset of the twelve subchannel slots. The access slot subchannel identification is identical to that for the RACH and is described in table 6 of section 6.1 of [5].

Everything in the previous section [PRACH/AICH] applies to this section as well. The timing relationship between preambles, AICH, and the message is the same as PRACH/AICH. Note that the collision resolution preambles follow the access preambles in PCPCH/AICH. However, the timing relationships between CD-Preamble and CD-AICH is identical to RACH Preamble and AICH. The timing relationship between CD-AICH and the Power Control Preamble in CPCH is identical to AICH to message in RACH. The T_{cpch} timing parameter is identical to the PRACH/AICH transmission timing parameter. When T_{cpch} is set to zero or one, the following PCPCH/AICH timing values apply:

Note that a1 corresponds to AP-AICH and a2 corresponds to CD-AICH.

$\tau_{p\text{-}p}$ = Time to next available access slot, between Access Preambles.

      Minimum time = 15360 chips + 5120 chips X Tcpch

      Maximum time = 5120 chips X 12 = 61440 chips

      Actual time is time to next slot (which meets minimum time criterion) in allocated access slot subchannel group.

$\tau_{p\text{-}a1}$ = Time between Access Preamble and AP-AICH has two alternative values: 7680 chips or 12800 chips, depending on T_{cpch}

$\tau_{a1\text{-}cdp}$ = Time between receipt of AP-AICH and transmission of the CD Preamble has one value: 7680 chips.

$\tau_{p\text{-}cdp}$ = Time between the last AP and CD Preamble. is either 3 or 4 access slots, depending on T_{cpch}

$\tau_{cdp\text{-}a2}$ = Time between the CD Preamble and the CD-AICH has two alternative values: 7680 chips or 12800 chips, depending on T_{cpch}

$\tau_{cdp\text{-}pcp}$ = Time between CD Preamble and the start of the Power Control Preamble is either 3 or 4 access slots, depending on $T_{cpch.}$

Figure 25 illustrates the PCPCH/AICH timing relationship when T_{cpch} is set to 0 and all access slot subchannels are available for PCPCH.
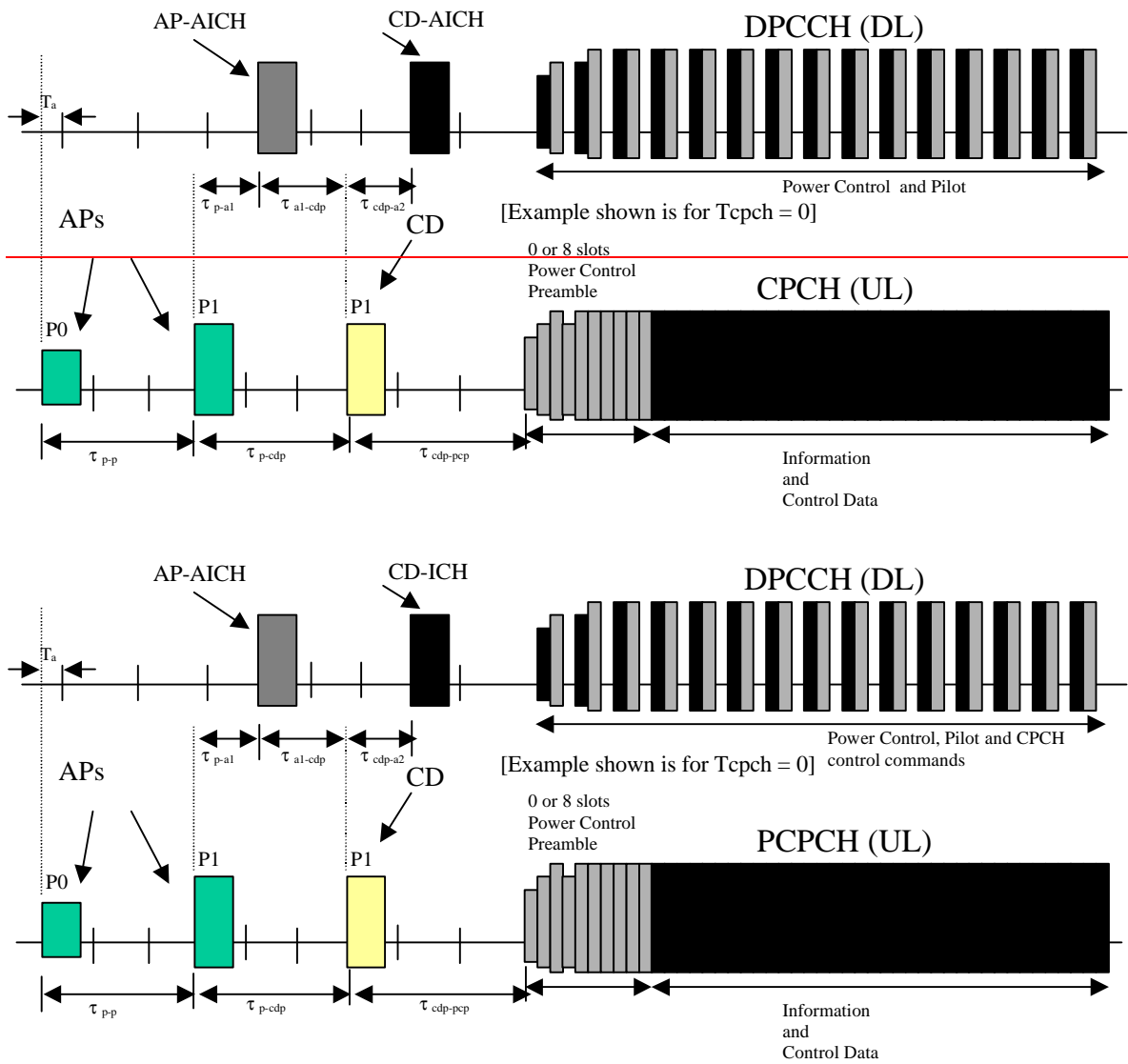
Figure 25: Timing of PCPCH and AICH transmission as seen by the UE, with T$_{cpch}$= 0

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

Document **R1-00-0409**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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25.214	**CR**	**082r2**	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*
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: (U)SIM ☐   ME **X**   UTRAN / Radio **X**   Core Network ☐
(at least one should be marked with an X)

Source: LGIC, GBT, Samsung, Lucent   **Date:** 2000-03-02

Subject: Emergency Stop of CPCH transmission and Start of Message Indicator

Work item:

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

Release:
Phase 2 ☐
Release 96 ☐
Release 97 ☐
Release 98 ☐
Release 99 **X**
Release 00 ☐

Reason for change: 1. Current Emergency Stop of CPCH transmission is not explicit, so that it should be changed into new explicit feature.
2. Start of Message Indictor solves the false mobile problem.

Clauses affected: 6.2

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:

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<--------- double-click here for help and instructions on how to create a CR.

6.2 CPCH Access Procedures

For each CPCH physical channel in a CPCH set allocated to a cell the following physical layer parameters are included in the System Information message:

- UL Access Preamble (AP) scrambling code.

- UL Access Preamble signature set

- The Access preamble slot sub-channels group

- AP- AICH preamble channelization code.

- UL Collision Detection(CD) preamble scrambling code.

- CD Preamble signature set

- CD preamble slot sub-channels group

- CD-AICH preamble channelization code.

- CPCH UL scrambling code.

- CPCH UL channelization code. (variable, data rate dependant)

- DPCCH DL channelization code.([512] chip)

NOTE: There may be some overlap between the AP signature set and CD signature set if they correspond to the same scrambling code.

The following are access, collision detection/resolution and CPCH data transmission parameters:

Power ramp-up, Access and Timing parameters (Physical layer parameters)

1) N_AP_retrans_max = Maximum Number of allowed consecutive access attempts (retransmitted preambles) if there is no AICH response. This is a CPCH parameter and is equivalent to Preamble_Retrans_Max in RACH.

2) $P_{RACH} = P_{CPCH}$ = Initial open loop power level for the first CPCH access preamble sent by the UE.

    [RACH/CPCH parameter]

3) ΔP_0 = Power step size for each successive CPCH access preamble.

    [RACH/CPCH parameter]

4) ΔP_1 = Power step size for each successive RACH/CPCH access preamble in case of negative AICH. A timer is set upon receipt of a negative AICH. This timer is used to determine the period after receipt of a negative AICH when ΔP_1 is used in place of ΔP_0.

    [RACH/CPCH parameter]

5) T_{cpch} = CPCH transmission timing parameter: This parameter is identical to PRACH/AICH transmission timing parameter.

    [RACH/CPCH parameter]

6) $L_{pc\text{-}preamble}$ = Length of power control preamble (0 or 8 slots)

    [CPCH parameter]

7) $N_{Start\_Message}$ = Number of frames for the transmission of Start of Message Indicator in DL-DPCCH for CPCH

NOTE: It is FFS if ΔP_0 for the CPCH access may be different from ΔP_0 for the RACH access as defined in section 6.1.

The CPCH -access procedure in the physical layer is:

1) The UE MAC function selects a CPCH transport channel from the channels available in the assigned CPCH set The CPCH channel selection includes a dynamic persistence algorithm (similar to RACH) for the selected CPCH channel.

2) The UE MAC function builds a transport block set for the next TTI using transport formats which are assigned to the logical channel with data to transmit. The UE MAC funtion sends this transport block set to the UE PHY function for CPCH access and uplink transmission on the selected CPCH transport channel.

3) The UE sets the preamble transmit power to the value $P_{CPCH\_}$ which is supplied by the MAC layer for initial power level for this CPCH access attempt.

4) The UE sets the AP Retransmission Counter to N_AP_Retrans_Max (value TBD).

5) The UE randomly selects a CPCH-AP signature from the signature set for this selected CPCH channel. The random function is TBD.

6) The UE Derives the available CPCH-AP access slots in the next two frames, defined by SFN and SFN+1 in the AP access slot sub-channel group with the help of SFN and table 7 in section 6.1. The UE randomly selects one access slot from the available access slots in the next frame, defined by SFN, if there is one available. If there is no access slot available in the next frame, defined by SFN then, randomly selects one access slot from the available access slots in the following frame, defined by SFN+1. Random function is TBD

7) The UE transmits the AP using the MAC supplied uplink access slot, signature, and initial preamble transmission power.

8) If the UE does not detect the positive or negative acquisition indicator corresponding to the selected signature in the downlink access slot corresponding to the selected uplink access slot, the UE:

   a) Selects the next uplink access slot from among the access slots in the CPCH-AP sub-channel group, as selected in 4.1. There must be a minimum distance of three or four access slots from the uplink access slot in which the last preamble was transmitted depending on the CPCH/AICH transmission timing parameter. [NOTE: Use of random function here to select access slot is FFS for RACH and CPCH.].

   b) Increases the preamble transmission power with the specified offset ΔP . Power offset ΔP_0 s is used unless the negative AICH timer is running, in which case ΔP_1 is used instead..

   c) Decrease the Preamble Retransmission Counter by one.

   d) If the Preamble Retransmission Counter < 0, the UE aborts the access attempt and sends a failure message to the MAC layer.

9) If the UE detects the AP-AICH_nak (negative acquisition indicator) corresponding to the selected signature in the downlink access slot corresponding to the selected uplink access slot, the UE aborts the access attempt and sends a failure message to the MAC layer. The UE sets the negative AICH timer to indicate use of ΔP_1 use as the preamble power offset until timer expiry

10) Upon reception of AP-AICH, the access segment ends and the contention resolution segment begins. In this segment, the UE randomly selects a CD signautre from the signature set and also select one-CD access slot sub-channel from the CD sub-channel group supported in the cell.and transmits a CD Preamble, then waits for a CD-AICH from the Node B.

11) If the UE does not receive a CD-AICH in the designated slot, the UE aborts the access attempt and sends a failure message to the MAC layer.

12) If the UE receives a CD-AICH in the designated slot with a signature that does not match the signature used in the CD Preamble, the UE aborts the access attempt and sends a failure message to the MAC layer.

13) If the UE receives a CD-AICH with a matching signature, the UE transmits the power control preamble $\tau_{cd-p-pc-p}$ ms later as measured from initiation of the CD Preamble. . The transmission of the message portion of the burst starts immediately after the power control preamble.

14) The UE shall test the value of Start of Message Indicator received from DL-DPCCH for CPCH during the first $N_{Start\_Message}$ frames after Power Control preamble. Start of Message Indicator is a known sequence repeated on a frame by frame basis. The value of $N_{Start\_Message}$ shall be provided by the higher layers.

15) If the UE does not detect Start of Message Indicator in the first $N_{Start\ Message}$ frames of DL-DPCCH for CPCH after Power Control preamble, the UE aborts the access attempt and sends a failure message to the MAC layer. Otherwise, UE continuously transmits the packet data.

1416) During CPCH Packet Data transmission, the UE and UTRAN perform inner-loop power control on both the CPCH UL and the DPCCH DL.

15) 17) After the first $N_{Start\ Message}$ frames after Power Control preamble, upon the detection of an Emergency Stop command sent by UTRAN, the UE halts CPCH UL transmission, aborts the access attempt and sends a failure message to the MAC layer.

15) 18) If the UE detects loss of DPCCH DL during transmission of the power control preamble or the packet data, the UE halts CPCH UL transmission, aborts the access attempt and sends a failure message to the MAC layer.

1619) If the UE completes the transmission of the packet data, the UE sends a success message to the MAC layer.