3GPP TSG RAN Meeting #19 **RP-030141**
Birmingham, United Kingdom, 11 - 14 March 2003

Title: **CRs (Rel-5) to TS 25.224**

Source: **TSG-RAN WG1**

Agenda item: **8.1.5**

TS 25.224 **(RP-030141)**

Doc-1st-	Doc-2nd-	Spec	CR	Rev	Subject	Phase	Ca	Versio	Versio	Workitem
RP-030141	R1-030203	25.224	109	1	Corrections to TPC Procedures During a DL	Rel-5	F	5.3.0	5.4.0	TEI-5
RP-030141	R1-030257	25.224	114	1	Corrections to link adaptation procedure for UTRA	Rel-5	F	5.3.0	5.4.0	HSDPA-Phys
RP-030141	R1-030295	25.224	115	2	Minimum timing requirement for CQI transmission	Rel-5	F	5.3.0	5.4.0	HSDPA-Phys
RP-030141	R1-030296	25.224	117	2	Clarification of downlink closed loop power control	Rel-5	F	5.3.0	5.4.0	TEI-5

3GPP TSG-RAN WG1 Meeting #31
Tokyo, Japan, 18-21 February 2003

Tdoc ⌘R1-030203

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CHANGE REQUEST

⌘ **TS 25.224 CR 109** ⌘**rev 1** ⌘ Current version: **5.3.0** ⌘

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Proposed change affects: UICC apps⌘ ☐ ME ☒ Radio Access Network ☒ Core Network ☐

Title:	⌘	Corrections to TPC Procedures During a DL Transmission Pause
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI
Date:	⌘	13/02/2003
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(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)
Rel-6 (Release 6)

Reason for change:	⌘	When interpreted literally, the specification incorrectly states that all TPC commands shall be the same during a transmission pause.
Summary of change:	⌘	It is clarified that successive TPC transmissions only have to carry the same commands during a transmission pause in the event that no beacon transmissions existed inbetween them.
Consequences if not approved:	⌘	Incorrect implementations in UE and/or Node-B that follow the specification literally result in unexpected power control behaviour and subsequent link performance degradation.

Clauses affected:	⌘	4.2.3.4

Other specs affected: ⌘	Y	N	
		X	Other core specifications
		X	Test specifications
		X	O&M Specifications

⌘

Other comments: ⌘

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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://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 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.

4.2.3.4 DPCH, PDSCH

The initial transmission power of the downlink DPCH and the PDSCH shall be set by the network. If associated uplink CCTrCHs for TPC commands are signalled to the UE by higher layers (mandatory for a DPCH), the network shall transit into inner loop power control after the initial transmission. The UE shall then generate TPC commands to control the network transmit power and send them in the TPC field of the associated uplink CCTrCHs. An example on how to derive the TPC commands and the definition of the inner loop power control are given in Annex A.1. A TPC command sent in an uplink CCTrCH controls all downlink DPCHs or PDSCHs to which the associated downlink CCTrCH is mapped to.

In the case that no associated downlink data is scheduled within 15 timeslots before the transmission of a TPC command then this is regarded as a transmission pause. The TPC commands in this case shall be derived from measurements on ~~the P-CCPCH~~beacon function physical channels. An example solution for the generation of the TPC command for this case is given in Annex A 1.

When not in a transmission pause ~~Each~~ each TPC command shall always be based on all associated downlink transmissions received since the previous related TPC command. Related TPC commands are defined as TPC commands associated with the same downlink CCTrCHs. If there are no associated downlink transmissions (or equivalently no beacon transmissions when in a transmission pause) between two or more uplink transmissions carrying related TPC commands, then these TPC commands shall be identical and they shall be regarded by the UTRAN as a single TPC command. ~~This rule applies both to the case where the TPC commands are based on measurements on the associated CCTrCH or, in the case of a transmission pause, on the P-CCPCH.~~

As a response to the received TPC command, UTRAN may adjust the transmit power. When the TPC command is judged as "down", the transmission power may be reduced by the TPC step size, whereas if judged as "up", the transmission power may be raised by the TPC step size.

The UTRAN may apply an individual offset to the transmission power in each timeslot according to the downlink interference level at the UE.

The transmission power of one DPCH or PDSCH shall not exceed the limits set by higher layer signalling by means of Maximum_DL_Power (dB) and Minimum_DL_Power (dB). The transmission power is defined as the average power over one timeslot of the complex QPSK symbols of a single DPCH or PDSCH before spreading relative to the power of the P-CCPCH.

During a downlink transmission pause, both UE and Node B shall use the same TPC step size which is signalled by higher layers. The UTRAN may accumulate the TPC commands received during the pause. TPC commands that shall be regarded as identical may only be counted once. The initial UTRAN transmission power for the first data transmission after the pause may then be set to the sum of transmission power before the pause and a power offset according to the accumulated TPC commands. Additionally this sum may include a constant set by the operator and a correction term due to uncertainties in the reception of the TPC bits. The total downlink transmission power at the Node B within one timeslot shall not exceed Maximum Transmission Power set by higher layer signalling. If the total transmit power of all channels in a timeslot exceeds this limit, then the transmission power of all downlink DPCHs and PDSCHs shall be reduced by the same amount in dB. The value for this power reduction is determined, so that the total transmit power of all channels in this timeslot is equal to the maximum transmission power.

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CHANGE REQUEST

⌘ **25.224** **CR** **114** ⌘ **rev** **1** ⌘ Current version: **5.3.0** ⌘

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Proposed change affects: UICC apps⌘ [-] ME [X] Radio Access Network [X] Core Network [-]

Title:	⌘	Corrections to link adaptation procedure for UTRA TDD (3.84 Mcps Option)
Source:	⌘	TSG RAN WG1
Work item code:	⌘	HSDPA-Phys
Date:	⌘	13/02/2003
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(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)*
Rel-6 *(Release 6)*

Reason for change:	⌘	HS-SCCH indicates that HS-PDSCH resources are allocated continuously from SF=16 channelization code index k_{start} to code index k_{stop} and these channelization code allocations are the same for all timeslots used to map HS-DSCH to HS-PDSCH resources in a given TTI. Furthermore, HS-DSCH allocations can comprise channelization codes in Beacon timeslots. Consistent throughout R99-REL5, special restrictions on midamble allocation and channelization code usage in case of Open-Loop Tx Diversity apply to Beacon channels, which lead to ambiguities in how a UE shall interpret the continuous code allocation indicated by HS-SCCH for the used HS-DSCH timeslots.
Summary of change:	⌘	Inclusion of some exception rules for HS-DSCH allocation with respect to Beacon timeslots: (1) In case that an HS-DSCH TTI as indicated by HS-SCCH comprises more than 1 timeslot, none of these can be a Beacon timeslot. (2) If an HS-DSCH TTI is mapped to a single timeslot and this is a Beacon timeslot, the HS-DSCH in this TTI can *either* be mapped to the Beacon channel only (including the second channelization code on the diversity antenna if SCTD is applied) *or* the one or more non-Beacon codes in the Beacon timeslot.
Consequences if not approved:	⌘	Critical ambiguities in HS-SCCH indication of used channelization codes for HS-DSCH to HS-PDSCH mapping will exist and different possible interpretations will lead to inconsistent UE behaviour.

Clauses affected:	⌘	4.11.1
Other specs	⌘	Y: [ ] N: [X] Other core specifications ⌘

affected:		Test specifications O&M Specifications
Other comments:	⌘	-

4.11 HS-DSCH Procedure

4.11.1 Link Adaptation Procedure

For HS-DSCH, the modulation scheme and effective code rate shall be selected by higher layers located within the NodeB. This shall be achieved by appropriate selection of an HS-DSCH transport block size, modulation format and resources by higher layers. Selection of these parameters may be based on CQI reports from the UE.

The overall HS-DSCH link adaptation procedure consists of *two parts:*

Node B procedure:

1) The NodeB shall transmit HS-SCCH carrying a UE identity identifying the UE for which HS-DSCH TTI allocation has been given. In the case of HS-DSCH transmissions in consecutive TTIs to the same UE, the same HS-SCCH shall be used for associated signalling.

2) The NodeB transmits HS-DSCH to the UE using the resources indicated in the HS-SCCH.

3) Upon receiving the HS-SICH from the respective UE, the status report (ACK/NACK and CQI) shall be passed to higher layers.

UE procedure:

1) When indicated by higher layers, the UE shall start monitoring all HS-SCCHs that are in its HS-SCCH set as signalled to it by higher layers. The information carried on the HS-SCCH is described in [8].

2) In the case that a HS-SCCH is identified to be correct by its CRC, the UE shall read the HS-PDSCHs indicated by the HS-SCCH. In the case that a HS-SCCH is identified to be incorrect, the UE shall discard the data on the HS-SCCH and return to monitoring.

After reading the HS-PDSCHs, the UE shall generate an ACK/NACK message and transmit this to the NodeB in the associated HS-SICH, along with the most recently derived CQI.

The mapping of HS-PDSCH channelisation code set and timeslot information carried by the HS-SCCH for a given HS-DSCH TTI is described in [9].

For a given allocation of HS-PDSCH resources to a UE for a specific HS-DSCH TTI, the following shall apply:

- If timeslot information on HS-SCCH indicates two or more timeslots, none of these timeslots shall comprise a beacon channel.
- If timeslot information on HS-SCCH indicates a single timeslot and this timeslot comprises a beacon channel then:
  - The Node-B shall not indicate SF=1 for any HS-PDSCH resource.
  - The set of HS-PDSCH resources allocated by the Node-B to a UE shall exclusively comprise either beacon function or non-beacon function physical channels. The Node B shall therefore not allocate both beacon function and non-beacon function physical channels within the beacon timeslot to the UE. If the HS-DSCH for a specific HS-DSCH TTI is mapped to the beacon channel, this shall be signalled using k_{start} = 1 and k_{stop} = 1. For a definition of the first and last allocated channelisation code indices k_{start} and k_{stop} on HS-SCCH refer to [9].
  - When SCTD antenna diversity is applied to the beacon channel, then the presence of channelisation code $C_{16}^{(1)}$ within the channelisation code set information on HS-SCCH shall implicitly indicate the presence of channelisation code $C_{16}^{(2)}$.

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Tokyo, Japan, February 18th – 21st, 2003

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CHANGE REQUEST

⌘ **25.224** **CR** **115** ⌘ **rev** **2** ⌘ Current version: **5.3.0** ⌘

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Proposed change affects: UICC apps⌘ [-] ME [X] Radio Access Network [X] Core Network [-]

Title:	⌘	Minimum timing requirement for CQI transmission on HS-SICH in UTRA TDD
Source:	⌘	TSG RAN WG1
Work item code:	⌘	HSDPA-Phys
Date:	⌘	13/02/2003
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(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)*
Rel-6	*(Release 6)*

Reason for change:	⌘	CQI may be transmitted earlier on HS-SICH than the Ack/Nack corresponding to the reception of an HS-DSCH TTI. Currently, a UE would be required to send CQI on HS-SICH in the UL even if the HS-SICH timeslot immediately follows the last DL timeslot used by HS-PDSCH resources in a HS-DSCH TTI. A minimum amount of processing time is necessary to guarantee a UE can receive the HS-DSCH TTI, perform the measurements for CQI, derive CQI and prepare the UL transmission on HS-SICH.
Summary of change:	⌘	Minimum delay of 1 idle timeslot (starting from the end of the latest received timeslot carrying HS-PDSCH resources) required for earliest possible CQI transmission on HS-SICH.
Consequences if not approved:	⌘	Unrealistic requirement and inconsistent UE behaviour for UE transmitting CQI on HS-SICH.

Clauses affected:	⌘	4.11.2

Other specs affected:	⌘	Y	N		⌘
			X	Other core specifications	
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	-

4.11.2 HS-DSCH Channel Quality Indication Procedure

The channel quality indicator (CQI) provides the NodeB with an estimate of the code rate that would have maximised the single-transmission throughput of the previous HS-DSCH transmission if decoded in isolation. The CQI report requires to be referenced to a given set of HS-PDSCH resources by the NodeB, but note that the UE is not restricted to making measurements only on these reference resources when deriving a given CQI. The reference resources for a CQI report shall be a set of HS-PDSCH resources that were received by the UE in a single TTI, and contain a complete transport block. These resources will be known to the NodeB from the relative timings of the HS-SICH carrying the CQI and previous HS-DSCH transmissions to the UE.

The CQI consists of two fields; a Recommended Transport Block Size (RTBS) and a Recommended Modulation Format (RMF). The UE shall use the same mapping table for these fields as is being used for the time slot information and modulation scheme information fields respectively of the HS-SCCH.

The reporting procedure is as follows:

1. The UE receives a message on an HS-SCCH telling it which resources have been allocated to it for the next associated HS-DSCH transmission.

2. The UE reads the associated HS-DSCH transmission, and makes the necessary measurements to derive a CQI that it estimates would have given it the highest single-transmission throughput for the allocated resources whilst achieving a BLER of no more than 10 %.

   BLER, in this context, is defined as the probability that a transport block transmitted using the RTBS and RMF is received in error if decoded in isolation. For the purposes of this calculation, it shall be assumed that the transport block that would be transmitted with these parameters would use redundancy version parameters s = 1 and r = 0. Note that, by this definition, a UE shall never report a CQI that corresponds to a code rate greater than unity.

   Using this definition of BLER, single-transmission throughput shall be defined as follows :

   $$\text{single-transmission throughput} = (1 - \text{BLER}) \times \text{RTBS}$$

3. The CQI report derived from a given HS-DSCH transmission shall be reported to the NodeB in the next HS-SICH available to the UE following that HS-DSCH transmission, unless that HS-SICH immediately follows the last allocated HS-DSCH timeslot, in which case the subsequent available HS-SICH shall be used by the UE. ~~which~~ This HS-SICH may not necessarily be the same HS-SICH that carries the ACK/NACK information for that HS-DSCH transmission. The UE shall always transmit the most recently derived CQI in any given HS-SICH, which may mean that some CQI reports are discarded without being transmitted to the NodeB.

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CHANGE REQUEST

⌘ **25.224** **CR** **117** ⌘**rev** **2** ⌘ Current version: **5.3.0** ⌘

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Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Clarification of downlink closed loop power control procedures for 3.84 Mcps TDD
Source:	⌘	TSG RAN WG1
Work item code:	⌘	TEI-5
Date:	⌘	19/02/2003
Category:	⌘	**F**
Release:	⌘	*Rel-5*

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R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	UTRAN response to TPC commands for closed loop downlink power control is ambiguous in the specification and may lead to incorrect interpretation
Summary of change:	⌘	Clarifies that the UTRAN is at liberty to decide how to respond to power control commands
Consequences if not approved:	⌘	UTRAN procedures for closed loop power control will remain ambiguous and may lead to incorrect implementation of the specification

Clauses affected:	⌘	4.2.3.4			
Other specs Affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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4.2.3.4 DPCH, PDSCH

The initial transmission power of the downlink DPCH and the PDSCH shall be set by the network. If associated uplink CCTrCHs for TPC commands are signalled to the UE by higher layers (mandatory for a DPCH), the network shall transit into inner loop power control after the initial transmission. The UE shall then generate TPC commands to control the network transmit power and send them in the TPC field of the associated uplink CCTrCHs. If the physical channel power should be increased, the TPC command is set to “up” whereas if the power should be reduced the TPC command is set to “down”. An example on how to derive the TPC commands and the definition of the inner loop power control are given in Annex A.1. A TPC command sent in an uplink CCTrCH controls all downlink DPCHs or PDSCHs to which the associated downlink CCTrCH is mapped to.

In the case that no associated downlink data is scheduled within 15 timeslots before the transmission of a TPC command then this is regarded as a transmission pause. The TPC commands in this case shall be derived from measurements on the P-CCPCH. An example solution for the generation of the TPC command for this case is given in Annex A 1.

Each TPC command shall always be based on all associated downlink transmissions received since the previous related TPC command. Related TPC commands are defined as TPC commands associated with the same downlink CCTrCHs. If there are no associated downlink transmissions between two or more uplink transmissions carrying related TPC commands, then these TPC commands shall be identical and they shall be regarded by the UTRAN as a single TPC command. This rule applies both to the case where the TPC commands are based on measurements on the associated CCTrCH or, in the case of a transmission pause, on the P-CCPCH.

~~As a response to the received TPC command,~~ UTRAN may decide how to adjust the transmit power in response to the received TPC command. ~~adjust the transmit power. When the TPC command is judged as "down", the transmission power may be reduced by the TPC step size, whereas if judged as "up", the transmission power may be raised by the TPC step size.~~

The UTRAN may apply an individual offset to the transmission power in each timeslot according to the downlink interference level at the UE.

The transmission power of one DPCH or PDSCH shall not exceed the limits set by higher layer signalling by means of Maximum_DL_Power (dB) and Minimum_DL_Power (dB). The transmission power is defined as the average power over one timeslot of the complex QPSK symbols of a single DPCH or PDSCH before spreading relative to the power of the P-CCPCH.

During a downlink transmission pause, both UE and Node B shall use the same TPC step size which is signalled by higher layers. The UTRAN may accumulate the TPC commands received during the pause. TPC commands that shall be regarded as identical may only be counted once. The initial UTRAN transmission power for the first data transmission after the pause may then be set to the sum of transmission power before the pause and a power offset according to the accumulated TPC commands. Additionally this sum may include a constant set by the operator and a correction term due to uncertainties in the reception of the TPC bits. The total downlink transmission power at the Node B within one timeslot shall not exceed Maximum Transmission Power set by higher layer signalling. If the total transmit power of all channels in a timeslot exceeds this limit, then the transmission power of all downlink DPCHs and PDSCHs shall be reduced by the same amount in dB. The value for this power reduction is determined, so that the total transmit power of all channels in this timeslot is equal to the maximum transmission power.