3GPP TSG-RAN Meeting #15
Jeju, Korea, 5-8 March, 2002

RP-020125

CR-Form-v4

CHANGE REQUEST

⌘ **25.306** **CR** **xxx** ⌘ ev ⌘ Current version: **3.4.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Clarification of Maximum number of TFC in the TFCS
Source:	⌘	Panasonic
Work item code:	⌘	***Date:*** ⌘ 4 March 2002
Category:	⌘ **F**	***Release:*** ⌘ R99

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)

Reason for change: ⌘

The UE capability, "Maximum number of TFC in the TFCS", seems to have three ambiguities.
1. This capability is not clear whether RRC level capability or L1 level capability. By RRC signalling, the amount of TFC combinations in L1 can be different from the amount of TFC combinations network informs to UE. From the section where this capability is described, it seems L1 level capability. But in this case, the network can inform TFC combination as much as they want. e.g. No limitation. This increases UE memory. So, the reasonable understanding of this capability is defined as the total amount of the network can inform. e.g. RRC level.
2. In multiple CCTrCH case such as DSCH, the TFC is counted as sum of each TFC in the CCTrCH. For example, if UE declares 64 TFC is supported, there can be possible two understanding.
   a) 64 TFC in DPCH and 64 TFC in DPCH
   b) The sum of DPCH TFC and DSCH TFC is 64.
3. In DSCH, channelization code is also informed by TFC. Although this capability is described in transport channel capability, the difference of channelization code is counted as different TFC. If this understanding is different, there is no limitation in amount of channelization code the network can inform.

Summary of change: ⌘

Downlink:
1. The definition is to clarifed that RRC level capability
2. The sum of each TFC in each CCTrCH is clarified.
3. The difference of channelization code is counted as separate value is clarified.
Uplink
1. The definition is to clarifed that RRC level capability

Isolated impact analysis:
This clarification is to a function where the specification was not sufficiently explicit. This would not affect implementations behaving like indicated in the CR, but would affect implementations supporting the corrected functionality.
1) If previous understanding is physical layer level, maximum number of TFCS is

		reduced but this case no limitation at RRC level. If previous understanding is RRC level, this CR would not affect implementation. 2) If previous understanding is each CCTrCH has each number of TFCS, the maximum number of TFCS is reduced. If previous understanding is sum of each number of TFCS, this CR would not affect implementation. 3) If previous understanding is difference of channelization code is not counted as different TFC, the maximum number of TFC is reduced but no limitation of the amount of TFC of the channelization code. If previous understanding is counted as counted as different TFC, this CR would not affect implementation.
Consequences if not approved:	⌘	The amount of total TFC the network can configure is not clear and this would have interoperability problem.

Clauses affected:	⌘	4.5.1, 4.5.2		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

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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.

4.5.1 Transport channel parameters in downlink

Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant

NOTE: "Being received" refers to all bits in the active TFC within the TFCS over all simultaneous transport channels received by the UE. "Arbitrary time instant" means that the time instant corresponding to the highest sum of number of bits is relevant. This note also applies to similar parameter definitions below

This parameter is defined as:

$$\Sigma_i(N_i)$$

where N_i is defined as the number of bits in transport block #i, and the sum is over all transport blocks being received at an arbitrary time instant. All transport blocks that are to be simultaneously received by the UE on DCH, FACH, PCH and DSCH transport channels are included in the parameter.

NOTE: A UE does not need to support a TFC within the TFCS for which the sum of *Number of Transport Blocks* * *Transport Block size* over all simultaneous transport channels is larger than what the UE capability indicates.

This UE capability also limits the maximum number of bits before de-rate-matching as follows: The maximum number of bits before de-rate matching being received at an arbitrary time instant (DPCH, PDSCH, S-CCPCH) shall be less or equal to 6.6 times the Maximum sum of number of bits of all transport blocks being received at an arbitrary time instant.

Maximum sum of number of bits of all convolutionally coded transport blocks being received at an arbitrary time instant.

This parameter is defined similar to the parameter above, but the sum includes only transport blocks that are to be convolutionally coded.

Maximum sum of number of bits of all turbo coded transport blocks being received at an arbitrary time instant.

This parameter is defined similar to the parameter above, but the sum includes only transport blocks that are to be turbo coded.

Maximum number of simultaneous transport channels

This is defined as the maximum number of downlink Transport Channels that the UE is capable to process simultaneously, not taking into account the rate of each Transport Channel.

NOTE: The number of simultaneous transport channels affects how the total memory space and processing capacity can be shared among the transport channels. A UE does not need to support more simultaneous transport channels than the UE capability allows for.

Maximum number of simultaneous CCTrCH

This is defined as the maximum number of downlink CCTrCH that the UE is capable to process simultaneously. CCTrCH should be interpreted as consisting of DCH, FACH or DSCH.

Maximum total number of transport blocks received within TTIs that end within the same 10 ms interval

All transport blocks that are to be simultaneously received by the UE on DCH, FACH, PCH and DSCH transport channels are included in the parameter.

NOTE: Relates to processing requirements for CRC in downlink. A UE does not need to support a TFC within the TFCS for which the sum of *Number of Transport Blocks* is larger than what the UE capability indicates. In the case of several CCTrCHs, the combination of the TFCs within the respective TFCSs for simultaneous TTIs at an arbitrary time instant shall not exceed this parameter.

Maximum number of TFC ~~in the TFCS~~

Defines the maximum number of transport format combinations ~~in a downlink transport format combination set~~ RRC in the UE can store, where all transport format combinations for all downlink transport format combination sets are counted. For example, the sum of number of TFCS of DPCH and DSCH in DSCH case. The difference of the channelization code shall be counted as separate TFC in DSCH.~~.~~

Maximum number of TF

The maximum total number of downlink transport formats the UE can store, where all transport formats for all downlink transport channels are counted.

Support for turbo decoding

Defines whether turbo decoding is supported or not.

4.5.2 Transport channel parameters in uplink

Maximum sum of number of bits of all transport blocks being transmitted at an arbitrary time instant

NOTE: "Being transmitted" refers to all bits in the active TFC within the TFCS over all simultaneous transport channels transmitted by the UE. "Arbitrary time instant" means that the time instant corresponding to the highest sum of number of bits is relevant. This note also applies to similar parameter definitions below.

This parameter is defined as:

$$\Sigma_i(N_i)$$

where N_i is defined as the number of bits in transport block #i, and the sum is over all transport blocks being transmitted at an arbitrary time instant.

NOTE: This parameter is related to memory requirements for uplink data received from MAC before it can be transmitted over the radio interface. As shown in Figure 4.1 the worst case occurs for the maximum TTI. A UE does not need to support a TFC within the TFCS for which the sum of *Number of Transport Blocks* * *Transport Block size* over all simultaneous transport channels is larger than what the UE capability indicates.

Maximum sum of number of bits of all convolutionally coded transport blocks being transmitted at an arbitrary time instant

This parameter is defined similar to the parameter above, but the sum includes only transport blocks that are to be convolutionally coded.

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This is defined as the maximum number of uplink transport channels that the UE is capable to process simultaneously, not taking into account the rate of each transport channel.

NOTE: A UE does not need to support a TFC within the TFCS for which the sum of *Number of Transport Blocks* * *Transport Block size* over all simultaneous transport channels is larger than what the UE capability indicates.

Maximum number of simultaneous CCTrCH

This parameter is applicable for TDD only. For FDD there is always only one CCTrCH at a time. The parameter is defined as the maximum number of uplink CCTrCH that the UE is capable to process simultaneously.

Maximum total number of transport blocks transmitted within TTIs that start at the same time

Defines the maximum number of transport blocks that the UE is capable to transmit within TTIs that start at the same time. An example is shown in Figure 4.1.

NOTE: Relates to processing requirements for CRC in uplink.

Maximum number of TFC in the TFCS

Defines the maximum number of transport format combinations in an uplink transport format combination set the RRC in the UE can store.

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Defines whether turbo encoding is supported or not.

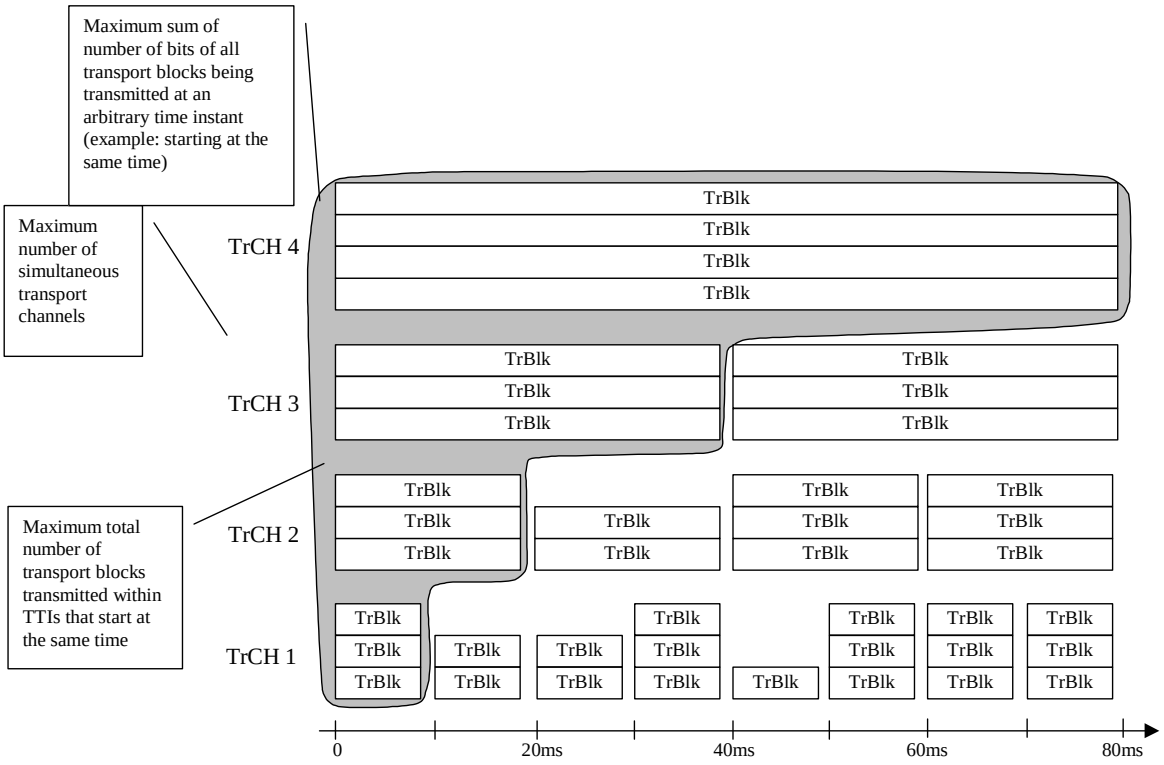

Figure 4.1: UE transport channel processing limitations in uplink

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4.5.2 Transport channel parameters in uplink

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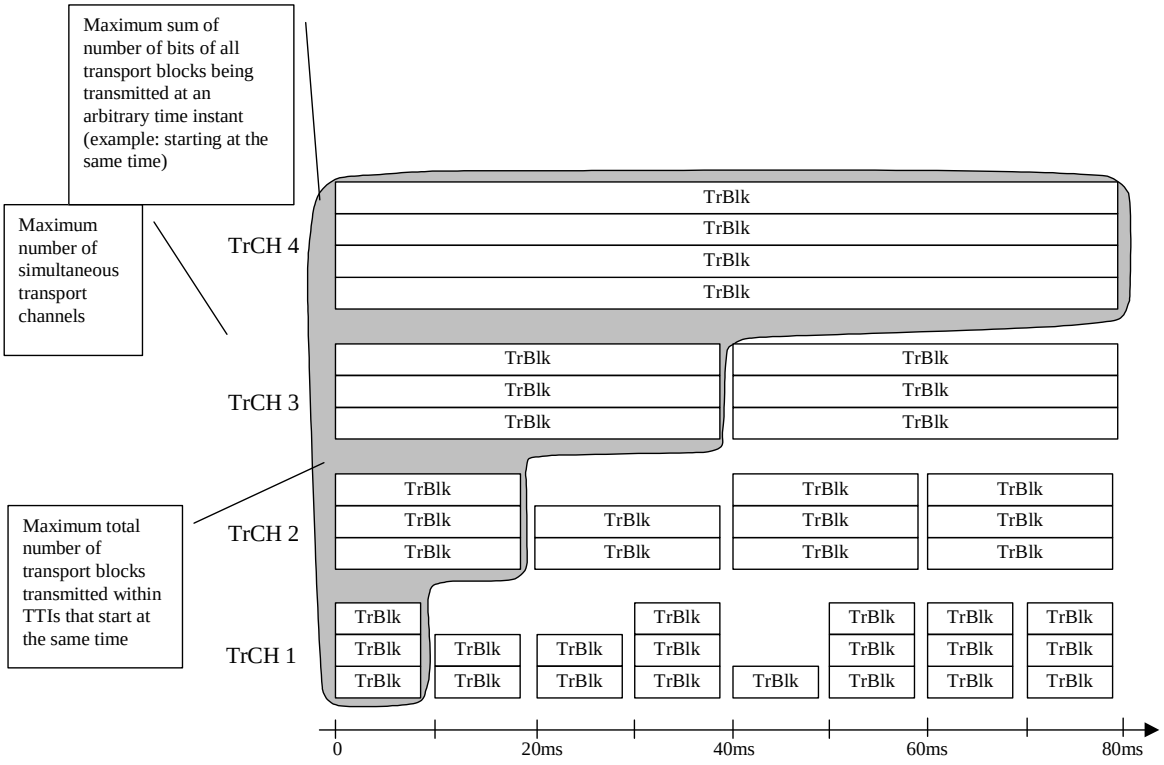

Figure 4.1: UE transport channel processing limitations in uplink