

CHANGE REQUEST

⌘ 36.321 CR 0051 ⌘ rev 1 ⌘ Current version: 8.2.0 ⌘

For **HELP** on using this form look at the pop-up text over the ⌘ symbols. Comprehensive instructions on how to use this form can be found at <http://www.3gpp.org/specs/CR.htm>.

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

Title:	⌘ Corrections relating to RACH		
Source to WG:	⌘ Nokia Corporation, Nokia Siemens Networks		
Source to TSG:	⌘ R2		
Work item code:	⌘ LTE-L23	Date:	⌘ 22/08/2008
Category:	⌘ F	Release:	⌘ Rel-8
Use <u>one</u> 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 <u>one</u> of the following releases: R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6) Rel-7 (Release 7) Rel-8 (Release 8) Rel-9 (Release 9)	

Reason for change: ⌘ 1. The current description of the RA-RNTI window location does not reflect the decisions made at WG2#62 regarding where the window begins and ends.
2. The current text describing when the MAC includes C-RNTI in msg3 could be viewed as confusing and uses transmission cause information that may not be known by MAC. C-RNTI is included in all cases except when the transmission is made on CCCH i.e. for RRC Connection Request and RRC Connection Re-establishment following RLF or handover failure and relating C-RNTI inclusion to the cases where transmission is not for CCCH is more appropriate.

Summary of change: ⌘ 1. Text changes to the first paragraph of 5.1.4 and the parameter list in 5.1.1 are made to indicate how the RA-RNTI window is calculated and that MAC requires the window size as input. References to TS 36.211 and TS 36.311 are added to section 2.
2. Text change to 5.1.4 to indicate that C-RNTI is not included in the case of random access for CCCH.

Consequences if not approved: ⌘ The specification will be incomplete.

Clauses affected: ⌘ 2, 5.1.1, 5.1.4

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

Other comments: ⌘

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TR 36.213: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Layer Procedures".
- [3] 3GPP TS 36.322: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Link Control (RLC) protocol specification".
- [4] 3GPP TS 36.323: "Evolved Universal Terrestrial Radio Access (E-UTRA); Packet Data Convergence Protocol (PDCP) Specification".
- [5] 3GPP TS 36.212: "Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding".
- [6] 3GPP TS 36.214: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer; Measurements".
- [7] 3GPP TS 36.211: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation".
- [8] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".

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5.1.1 Random Access Procedure initialization

The Random Access procedure described in this subclause is initiated by a PDCCH order or by the MAC sublayer itself. The PDCCH order or RRC optionally indicate a Random Access Preamble and PRACH resource.

Before the procedure can be initiated, the following information is assumed to be available:

- the available set of PRACH resources for the transmission of the Random Access Preamble and their corresponding RA-RNTIs.
- the groups of Random Access Preambles and the set of available Random Access Preambles in each group.
- the thresholds required for selecting one of the two groups of Random Access Preambles.
- the *RA response window size* *r_a -ResponseWindowSize [8]* ~~parameters required to derive the TTI window described in subclause 5.1.4.~~
- the power-ramping factor POWER_RAMP_STEP.
- the parameter PREAMBLE_TRANS_MAX [integer > 0].
- the initial preamble power PREAMBLE_INITIAL_RECEIVED_TARGET_POWER.
- the parameter Maximum number of Message3 HARQ transmissions.

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[Note that the above parameters may be updated from higher layers before each Random Access procedure is initiated.]

The Random Access procedure shall be performed as follows:

- Flush the [Message3] buffer;
- set the PREAMBLE_TRANSMISSION_COUNTER to 1;
- set the backoff parameter value in the UE to 0 ms;
- proceed to the selection of the Random Access Resource (see subclause 5.1.2).

NOTE: There is only one Random Access procedure ongoing at any point in time. If the UE receives a request for a new Random Access procedure while another is already ongoing, it is up to UE implementation whether to continue with the ongoing procedure or start with the new procedure.

----- Next Section -----

5.1.4 Random Access Response reception

Once the Random Access Preamble is transmitted, the UE shall monitor the PDCCH for Random Access Response(s) identified by the RA-RNTI associated with the RA-RNTI defined below, in the TTI window {RA_WINDOW_BEGIN—RA_WINDOW_END} for Random Access Response(s) identified by the RA-RNTI which starts at the subframe that contains the end of the preamble transmission [7] plus three subframes and has length *ra-ResponseWindowSize* subframes. The RA-RNTI associated with the PRACH resource in which the Random Access Preamble is transmitted, is computed as:

$$\text{RA-RNTI} = t_id + 10 * f_id$$

Where t_id is the index of the first subframe of the specified PRACH resource ($0 \leq t_id < 10$), and f_id is the index of the specified PRACH resource within that subframe, in ascending order of frequency domain ($0 \leq f_id < 6$). The UE may stop monitoring for Random Access Response(s) after successful reception of a Random Access Response corresponding to the Random Access Preamble transmission.

- If notification of a reception of the Random Access Response is received from lower layers, the UE shall:
 - if the Random Access Response contains a Backoff Indicator subheader:
 - set the backoff parameter value in the UE as indicated by the BI field of the Backoff Indicator subheader and Table 7.2-1.
 - else, set the backoff parameter value in the UE to 0 ms.
 - if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble (see subclause 5.1.3), the UE shall:
 - consider this Random Access Response reception successful;
 - process the received Timing Alignment value (see subclause 5.2);
 - process the received UL grant value;
 - if the Random Access Preamble was explicitly signalled (i.e., not selected by MAC):
 - consider the Random Access procedure successfully completed.
 - else, if the Random Access Preamble was selected by UE MAC:
 - set the Temporary C-RNTI to the value received in the Random Access Response message no later than at the time of the first transmission corresponding to the UL grant provided in the Random Access Response message;
 - if this is the first successfully received Random Access Response within this Random Access procedure:

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- if the transmission is not being made for the CCCH logical channel~~UE is in RRC_CONNECTED state [except for RLF]~~, indicate to the Multiplexing and assembly entity to include a C-RNTI MAC control element in the subsequent uplink transmission;
- obtain the MAC PDU to transmit from the "Multiplexing and assembly" entity and store it in the [Message3] buffer.

NOTE: When an uplink transmission is required, e.g., for contention resolution, the eNB should not provide a grant smaller than 80 bits in the Random Access Response.

NOTE: If within a Random Access procedure, an uplink grant provided in the Random Access Response for the same group of Random Access Preambles has a different size than the first uplink grant allocated during that Random Access procedure, the UE behavior is not defined.

If no Random Access Response is received within the TTI window [RA_WINDOW_BEGIN—RA_WINDOW_END], or if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble, the Random Access Response reception is considered not successful and the UE shall:

- if the Random Access procedure was initiated by the MAC sublayer itself; or
- if the Random Access procedure was initiated by a PDCCH order and the PREAMBLE_TRANSMISSION_COUNTER is less than PREAMBLE_TRANS_MAX:
 - increment PREAMBLE_TRANSMISSION_COUNTER by 1;
- if in this Random Access procedure:
 - the Random Access Preamble was selected by MAC; or
 - the Random Access Preamble and PRACH resource were explicitly signalled and will expire before the next available Random Access occasion:
 - based on the backoff parameter in the UE, compute and apply a backoff value indicating when a new Random Access transmission shall be attempted;
- proceed to the selection of a Random Access Resource (see subclause 5.1.2).

Editor's note: Whether error conditions are specified is FFS.