TSG-RAN Meeting #18 ***RP-020827***
***New-Orleans, USA, 03* - 06 December 2002**

Title: **Agreed CR (Rel-5) to TS 25.322**

Source: **TSG-RAN WG2**

Agenda item: **7.2.5**

Doc-1st-	Status-	Spec	CR	Rev	Phase	Subject	Cat	Version-	Version
R2-022704	Agreed	25.322	210	-	Rel-5	Generation of RLC Status Reports to coordinate with MAC-hs reset	B	5.2.0	5.3.0

3GPP TSG-RAN2 Meeting #33
Sophia Antipolis, France, 12th-15th November 2002

Tdoc ⌘R2-022704

CR-Form-v7

CHANGE REQUEST

⌘ **25.322** **CR** **210** ⌘ **rev** **-** ⌘ Current version: **5.2.0** ⌘

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

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

Title:	⌘	Generation of RLC Status Reports to coordinate with MAC-hs reset
Source:	⌘	InterDigital
Work item code:	⌘	HSDPA-L23
Date:	⌘	Sep 27, 2002
Category:	⌘	**B**
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:	⌘	Upon MAC-hs reset, RLC status report should be generated to efficiently recover the source Node-B data.
Summary of change:	⌘	Generation of the RLC status report upon indication received following MAC-hs reset and processing of PDU's flushed from the reordering buffers, where the indication from the MAC shall override the STATUS prohibit and the EPC mechanism which prohibit the Receiver from sending a status report.
Consequences if not approved:	⌘	Unnecessary delay in recovery of data lost in the source Node-B following handovers.

Clauses affected:	⌘	9.5, 9.7.2, 11.5.2

Other specs affected:	⌘	Y	N		⌘	
		X		Other core specifications		25.321 CR 137, 25.308 CR 004.
			X	Test specifications		
			X	O&M Specifications		

Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
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.

9.5 Timers

The timers defined in this subclause are normative. The timers shall be considered active from the time they are started until the time they either expire or are stopped.

a) Timer_Poll.

This timer shall only be used when so configured by upper layers. The value of the timer is signalled by upper layers. In the UE this timer shall be started when the successful or unsuccessful transmission of an AMD PDU containing a poll is indicated by lower layer. In UTRAN it should be started when an AMD PDU containing a poll is submitted to lower layer. If x is the value of the state variable VT(S) after the poll was submitted to lower layer, the timer shall be stopped upon receiving:

- positive acknowledgements for all the AMD PDUs with "Sequence Number" up to and including x - 1; or
- a negative acknowledgement for the AMD PDU with "Sequence Number" = x - 1.

If the timer expires and no STATUS PDU fulfilling the criteria above has been received:

- the Receiver shall be polled once more;
- the timer shall be restarted; and
- the new value of VT(S) shall be saved.

If a new poll is sent when the timer is active, the timer shall be restarted at the time specified above, and the value of VT(S) shall be saved.

b) Timer_Poll_Prohibit.

This timer shall only be used when so configured by upper layers. It is used to prohibit transmission of polls within a certain period. The value of the timer is signalled by upper layers.

In the UE this timer shall be started when the successful or unsuccessful transmission of an AMD PDU containing a poll is indicated by lower layer. In UTRAN it should be started when an AMD PDU containing a poll is submitted to lower layer.

From the time a poll is triggered until the timer expires, polling is prohibited. If another poll is triggered while polling is prohibited, its transmission shall be delayed until the timer expires (see subclause 9.7.1). Only one poll shall be transmitted when Timer_Poll_Prohibit expires even if several polls were triggered in the meantime. This timer shall not be affected by the reception of STATUS PDUs.

When Timer_Poll_Prohibit is not configured by upper layers, polling is never prohibited.

c) Timer_EPC.

This timer shall only be used when the EPC function is configured by upper layers. It is meant to account for the roundtrip delay, i.e. the time between the transmission of a status report and the reception of the first retransmitted AMD PDU. The initial value of the timer is signalled by upper layers.

In the UE, this timer shall be started when the successful or unsuccessful transmission of the first STATUS PDU of a status report is indicated by lower layer. In UTRAN it should be started when the first STATUS PDU of a status report is submitted to lower layer. Only after Timer_EPC expires shall VR(EP) be decremented as described in subclause 9.7.4.

d) Timer_Discard.

This timer shall be used when timer-based SDU discard is configured by upper layers. The value of the timer is signalled by upper layers. In the transmitter, a new timer is started upon reception of an SDU from upper layer.

In UM/TM, if a timer expires before the corresponding SDU is submitted to lower layer, "SDU discard without explicit signalling" specified in subclauses 11.2.4.3 and 11.1.4.2 shall be initiated. In AM, if a timer expires before the corresponding SDU is acknowledged, "SDU discard with explicit signalling" specified in subclause 11.6 shall be initiated.

e) Timer_Poll_Periodic.

This timer shall only be used when "timer based polling" is configured by upper layers. The value of the timer is signalled by upper layers. The timer shall be started when the RLC entity is created. When the timer expires, the RLC entity shall:

- restart the timer;
- if AMD PDUs are available for transmission or retransmission (not yet acknowledged):
  - trigger a poll.

Timer_Status_Prohibit.

This timer shall only be used when so configured by upper layers. It is meant to prohibit the Receiver from sending consecutive acknowledgement status reports except for the generation of a status report triggered by MAC-hs reset. A status report is an acknowledgement status report if it contains any of the SUFIs LIST, BITMAP, RLIST or ACK. The value of the timer is signalled by upper layers.

In the UE, this timer shall be started when the successful or unsuccessful transmission of the last STATUS PDU of an acknowledgement status report is indicated by lower layer. In UTRAN it should be started when the last STATUS PDU of an acknowledgement status report is submitted to lower layer.

From the time an acknowledgement status report is triggered until the Timer_Status_Prohibit timer expires, acknowledgement is prohibited. If another such status report is triggered by triggers others than an indication from lower layers following a MAC-hs reset while acknowledgement is prohibited, its transmission shall be delayed until the timer expires (see subclause 9.7.2).. The status report may be updated during this time. If a status report is triggered by an indication from lower layers following a MAC-hs reset, a status report shall be transmitted immediately and the timer shall be restarted. The transmission of SUFIs MRW, MRW_ACK, WINDOW or NO_MORE is not restricted.

When Timer_Status_Prohibit is not configured by upper layers, acknowledgment is not prohibited.

g) Timer_Status_Periodic.

This timer shall only be used when timer based status reporting is configured by upper layers.

This timer shall be started when the RLC entity is created. When the timer expires the transmission of a status report shall be triggered and the timer shall be restarted. This timer can be blocked by upper layers. The timer shall be restarted when upper layers indicate that it is no longer blocked.

h) Timer_RST.

This timer is meant to handle the loss of a RESET PDU by the peer entity, or the loss of a RESET ACK PDU from the peer entity. The value of the timer is signalled by upper layers.

In the UE this timer shall be started when the successful or unsuccessful transmission of a RESET PDU is indicated by lower layer. In UTRAN it should be started when a RESET PDU is submitted to lower layer.

Timer_RST shall only be stopped upon reception of a RESET ACK PDU (with same RSN as RESET PDU), i.e. this timer shall not be stopped when an RLC reset initiated by the peer RLC entity occurs. If this timer expires, the RESET PDU shall be retransmitted.

i) Timer_MRW.

This timer is used to trigger the retransmission of a status report containing an MRW SUFI field. The value of the timer is signalled by upper layers.

In the UE this timer shall be started when the successful or unsuccessful transmission of a STATUS PDU containing the MRW SUFI is indicated by lower layer. In UTRAN, it should be started when a STATUS PDU containing the MRW SUFI is submitted to lower layer.

Each time the timer expires the MRW SUFI is retransmitted and the timer is restarted. It shall be stopped when one of the termination criteria for the SDU discard with explicit signalling procedure is fulfilled (see subclause 11.6.4).

9.7.2 STATUS transmission for acknowledged mode

The Receiver transmits status reports to the Sender in order to inform the Sender about which AMD PDUs have been received and not received. Each status report consists of one or several STATUS PDUs. The Receiver shall trigger the transmission of a status report when receiving a poll request. Additionally, the following triggers for transmission of status reports are configurable by upper layers:

1) Detection of missing PDU(s).

   If the Receiver detects one or several missing AMD PDUs it shall trigger the transmission of a status report to the Sender.

2) Timer based status report transfer.

   The Receiver triggers the transmission of a status report to the Sender periodically. The timer Timer_Status_Periodic controls the time period according to subclause 9.5 g). When "Periodical Status blocking" is configured by upper layers, the trigger shall not be active.

3) The EPC mechanism.

   The timer Timer_EPC is started according to subclause 9.5 c) and the state variable VR(EP) is set and decreased according to subclause 9.7.4. If not all AMD PDUs requested for retransmission have been received before the variable VR(EP) equalled zero, a new status report is triggered by the Receiver. A more detailed description of the EPC mechanism is given in subclause 9.7.4.

There are two functions that can prohibit the Receiver from sending a status report containing any of the SUFIs LIST, BITMAP, RLIST or ACK. Status reports containing other SUFIs are not prohibited. Upper layers control which functions should be used for each RLC entity. If any of the following functions is used the transmission of the status report shall be delayed, even if any of the triggering conditions above are fulfilled, except for the generation of a status report triggered by MAC-hs reset:

1) STATUS prohibit.

   The timer Timer_Status_Prohibit is started according to subclause 9.5 f). The Receiver is not allowed to transmit a status report while acknowledgement is prohibited (see subclause 9.5 f)). If a status report was triggered during this time, the status report is transmitted after the timer Timer_Status_Prohibit has expired, as described below.

2) The EPC mechanism.

   If the "EPC mechanism" is active and the transmission of a status report is triggered it shall be delayed until the "EPC mechanism" has ended, as described below.

When a status report is triggered the Receiver shall:

- if transmission of status reports is not prohibited by any of the functions "STATUS prohibit" or "EPC mechanism":
  - assemble and transmit the status report to the Sender, as specified in subclauses 11.5.2.2 and 11.5.2.3.
- otherwise (if the status report is prohibited by at least one of the functions "STATUS prohibit" or "EPC mechanism"):
  - if MRW, MRW_ACK or WINDOW SUFIs are required in the status report:
    - send a status report immediately excluding ACK, LIST, BITMAP, and RLIST SUFIs;
  - if ACK, LIST, BITMAP, or RLIST SUFIs are required in the status report:
    - delay sending these SUFIs until the prohibit function terminates.

Upon expiry of the timer Timer_Status_Prohibit or termination of the "EPC mechanism", the Receiver shall:

- if at least one status report was triggered during the time the transmission of a status reports was prohibited that could not be transmitted due to prohibition; and
- if transmission of a status reports is no longer prohibited by any of the functions "STATUS prohibit" or "EPC mechanism":
  - transmit one status report to the Sender, using the procedure described in subclause 11.5.2.3.

11.5.2 Initiation

The Receiver shall:

- if one of the following triggers is detected:

1) The "Polling bit" in a received AMD PDU is set to "1";
2) "Missing PDU Indicator" is configured and a missing AMD PDU is detected;
3) The "Timer based STATUS transfer" is configured and the timer Timer_Status_Periodic has expired:
   - act on the trigger as specified in subclause 9.7.2.

4) An indicator received from MAC requesting generation of a status report following MAC-hs reset:
   - generate a status report,even if the STATUS prohibit or the EPC mechanism is configured to prohibit the Receiver from sending a status report containing any of the SUFIs LIST, BITMAP, RLIST or ACK as specified in subclause 9.7.2.