

TSG-RAN Working Group 1 meeting #18
Boston, USA
Jan 15 - 18, 2001

TSGR1#18(01)0107

Agenda item: AH 99

Source: Nokia

Title: CR 25.215-079r2 and CR 25.225-023: Correction of the “observed time difference to GSM” measurement

Document for: Decision

The current “observed time difference to GSM” measurement definition is suitable for *reporting* the observed time difference, but not for the *actual measurement* in the UE:

- ?? The P-CCPCH frame with SFN=0 occurs very seldom, only every 40.96 s. If the actual measurement would be based on this instant, the accuracy would suffer. The sentence “...shall reflect the situation...” is ambiguous.
- ?? For the GSM multiframe timing measurement with the required precision, the SCH is used. Depending on the instant when the measurement is done, the next received SCH shall be used, even if it is not at the start of the GSM multiframe. In connected mode, the SCH measurement occasions depend on the transmission gap pattern sequence given by the network.

As a clear description of the measurement is necessary to allow RAN WG4 to define proper accuracy requirements, we see it beneficial to include some clarifying text.

For the backward calculation of the reported time difference to the reference points, the GSM and UTRA frames are always assumed to of ideal length, i.e. 10 ms for UTRA and (60/13) ms for GSM.

CHANGE REQUEST

✎ **25.215 CR 079** ✎ rev **2** ✎ Current version: **3.5.0** ✎

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 Radio Access Network Core Network

Title:	✎ Correction of the observed time difference to GSM measurement		
Source:	✎ Nokia		
Work item code:	✎	Date:	✎ 15-jan-2001
Category:	✎ F	Release:	✎ R99
	Use <u>one</u> of the following categories: F (essential correction) A (corresponds to a correction in an earlier release) B (Addition of feature), C (Functional modification of feature) D (Editorial modification)		Use <u>one</u> 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)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900.		

Reason for change:	✎ The current measurement definition describes the reporting, not the actual measurement, and therefore has the following problems: The P-CCPCH frame with SFN=0 occurs very seldom, only every 40.96 s. If the actual measurement would be based on this instant, the accuracy would suffer. The sentence "...shall reflect the situation..." is ambiguous. For the GSM multiframe timing measurement with the required precision, the SCH is used, not the FCCH. Depending on the instant when the measurement is done, the next received SCH shall be used, even if it is not at the start of the GSM multiframe. In connected mode, the SCH measurement occasions depend on the transmission gap pattern sequence given by the network.		
Summary of change:	✎ The relationship between actual measurement and reported value is added.		
Consequences if not approved:	✎ "Observed time difference to GSM" will not be usable, as implementations might differ considerably.		

Clauses affected:	✎ 5.1.12		
Other specs affected:	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	✎	
Other comments:	✎		

5.1.12 Observed time difference to GSM cell

Definition	<p>The Observed time difference to GSM cell is defined as: $T_{RxGSMj} - T_{RxSFNi}$, where:</p> <p>T_{RxSFNi} is the time at the beginning of the P-CCPCH frame with SFN=0 from cell i.</p> <p>T_{RxGSMj} is the time at the beginning of the GSM BCCH 51-multiframe from GSM frequency j received closest in time after the time T_{RxSFNi}. If the next GSM multiframe is received exactly at T_{RxSFNi} then $T_{RxGSMj} = T_{RxSFNi}$ (which leads to $T_{RxGSMj} - T_{RxSFNi} = 0$). The timing measurement shall reflect the timing situation when the most recent (in time) P-CCPCH with SFN=0 was received in the UE. The reference point for the Observed time difference to GSM cell shall be the antenna connector of the UE.</p> <p>The beginning of the GSM BCCH 51-multiframe is defined as the beginning of the first tail bit of the frequency correction burst in the first TDMA-frame of the GSM BCCH 51-multiframe, i.e. the TDMA-frame following the IDLE-frame.</p> <p><u>The reported time difference is calculated from the actual measurement in the UE. The actual measurement shall be based on:</u></p> <p><u>$T_{MeasGSM,j}$: The start of the first tail bit of the most recently received GSM SCH on frequency j</u></p> <p><u>$T_{MeasSFN,i}$: The start of the last P-CCPCH frame received on frequency i before receiving the GSM SCH on frequency j</u></p> <p><u>For calculating the reported time difference, the frame lengths are always assumed to be 10 ms for UTRA and (60/13) ms for GSM.</u></p>
Applicable for	Idle, Connected Inter

5.1.12 Observed time difference to GSM cell

Definition	<p>Observed time difference to GSM cell is <u>reported as</u> the time difference T_m in ms, where</p> $T_m = T_{RxGSMk} - T_{RxSFNOi}$ <p>$T_{RxSFNOi}$: time of start (defined by the first detected path in time) of the received frame SFN=0 of the serving TDD cell i</p> <p>T_{RxGSMk}: time of start (defined by the first detected path in time) of the GSM BCCH 51-multiframe of the considered target GSM frequency k received closest in time after the time $T_{RxSFNOi}$. If the next GSM BCCH 51-multiframe is received exactly at $T_{RxSFNOi}$ then $T_{RxGSMk} = T_{RxSFNOi}$ (which leads to $T_m=0$). The beginning of the GSM BCCH 51-multiframe is defined as the beginning of the first tail bit of the frequency correction burst in the first TDMA-frame of the GSM BCCH 51-multiframe, i.e. the TDMA-frame following the IDLE-frame.</p> <p>The reference point for the Observed time difference to GSM cell shall be the antenna connector of the UE.</p> <p><u>The reported time difference is calculated from the actual measurement in the UE. The actual measurement shall be based on:</u></p> <p><u>$T_{MeasGSM,i}$: The start of the first tail bit of the most recently received GSM SCH on frequency i</u></p> <p><u>$T_{MeasSFN,i}$: The start of the last frame received in TDD cell i before receiving the GSM SCH on frequency i</u></p> <p><u>For calculating the reported time difference, the frame lengths are always assumed to be 10 ms for UTRA and (60/13) ms for GSM.</u></p>
Applicable for	Idle mode, connected mode (inter-frequency)