

**TSG RAN Meeting #27**  
**Tokyo, Japan, 9 - 11 March 2005**

**RP-050092**

**Title** CR (Rel-6 Category F) to TS25.215 for Clarification of the cell on SFN-SFN  
observed time difference  
**Source** TSG RAN WG1  
**Agenda Item** 8.2.3

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RAN1 Tdoc	Spec	CR	Rev	Rel	Cat	Current Version	Subject	Work item	Remarks
R1-050082	25.215	154	-	Rel-6	F	6.1.0	Clarification of the cell on SFN-SFN observed time difference	TEI	CRs for R99, Rel4 and Rel5 are proposed as company proposal in RP-050093

## CHANGE REQUEST

⌘ **25.215 CR 154** ⌘ rev **-** ⌘ Current version: **6.1.0** ⌘

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  Radio Access Network  Core Network

<b>Title:</b>	⌘ Clarification of the cell on SFN-SFN observed time difference
<b>Source:</b>	⌘ RAN WG1
<b>Work item code:</b>	⌘ TEI <span style="float: right;"><b>Date:</b> ⌘ 2 Feb 2005</span>
<b>Category:</b>	⌘ <b>F</b> <span style="float: right;"><b>Release:</b> ⌘ Rel-6</span>
Use <u>one</u> of the following categories:	
<b>F</b> (correction)	
<b>A</b> (corresponds to a correction in an earlier release)	
<b>B</b> (addition of feature),	
<b>C</b> (functional modification of feature)	
<b>D</b> (editorial modification)	
Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .	
Use <u>one</u> of the following releases:	
<b>Ph2</b> (GSM Phase 2)	
<b>R96</b> (Release 1996)	
<b>R97</b> (Release 1997)	
<b>R98</b> (Release 1998)	
<b>R99</b> (Release 1999)	
<b>Rel-4</b> (Release 4)	
<b>Rel-5</b> (Release 5)	
<b>Rel-6</b> (Release 6)	
<b>Rel-7</b> (Release 7)	

**Reason for change:** ⌘ In the UE measurement of "SFN-SFN observed time difference", the timing relation of two cells are reported to UTRAN.

The timing difference is calculated by a subtraction within the value range of [0, 1, ..., 38399]. Cell\_j is right-hand side. Cell\_i is left-hand side. The reported value could be different depending which cell is put as cell\_j in the subtraction.

Example is following. The timing of cell\_a is 20000. The timing of cell\_b is 30000.

- If cell\_a is cell\_j, reported value is  
 $(20000 - 30000) \bmod 38400 = (-10000) \bmod 38400 = 28400$ .
- If cell\_a is cell\_i, reported value is  
 $(30000 - 20000) \bmod 38400 = (10000) \bmod 38400 = 10000$ .

This uncertainty is true also in the case of OFF, which reports SFN relation.

Current specification seems following possible understandings.

1. The decision of cell\_i or cell\_j is up to the order of measurement in UE implementation. The cell\_i shall be measured later than cell\_j.
2. cell\_i is serving cell at the time UE reports "measured result on RACH".
3. cell\_j is serving cell at the time UE reports "measured results on RACH".

According to R1-00-0046, which discusses cell\_i and cell\_j, it is described that UE camps in cell\_i. Therefore, we propose understanding 2.

Current specification seems to requires UE to receive P-CCPCH frame at

	<p><math>T_{RxSFNi}</math>. Although UE is required to receive P-CCPCH of cell <math>i</math> to calculate timing, UE can calculate <math>T_{RxSFNi}</math> timing without receiving P-CCPCH frame at exact <math>T_{RxSFNi}</math>. Required thing in the specification is when is the reference timing for <math>T_{RxSFNi}</math>. Current specification seems to have unnecessary constraint.</p>
<b>Summary of change:</b> ⌘	<ul style="list-style-type: none"> <li>- It is proposed to clarify cell_ <math>i</math> is a serving cell at the time UE report this measurement. This means, if serving cell is changed, the cell_ <math>i</math> also could be different and recalculaiton may be necessary.</li> <li>- The term "received" is removed. Only the reference timing <math>T_{RxSFNi}</math> is specified.</li> </ul>
<b>Consequences if not approved:</b> ⌘	<ul style="list-style-type: none"> <li>- UTRAN could have uncertainty on the knowledge of the reported timing on SFN-SFN observed time difference which could be reported in "Measured results on RACH".</li> <li>- UE implementation is unnecessary constrained.</li> </ul>

<b>Clauses affected:</b> ⌘	5.1.9								
<b>Other specs affected:</b> ⌘	<table border="1"> <thead> <tr> <th>Y</th> <th>N</th> </tr> </thead> <tbody> <tr> <td></td> <td>X</td> </tr> <tr> <td></td> <td>X</td> </tr> <tr> <td></td> <td>X</td> </tr> </tbody> </table> <p>Other core specifications ⌘ Test specifications ⌘ O&amp;M Specifications</p> <p>TS 34.121 section 8.7.5 specifies the test of SFN-SFN observed time difference. Although example reported value is described, transmission timing of these cells are not described.</p>	Y	N		X		X		X
Y	N								
	X								
	X								
	X								
<b>Other comments:</b> ⌘	<ul style="list-style-type: none"> <li>- We are not so sure what is the understanding on SFN-SFN observed time difference type 2 because this is applicable also Cell_DCH, which serving cell is not defined.</li> <li>- We are interested to know the opinion that this CR should be applied from R99 or not.</li> <li>- Implementation of this CR by a release 99 UE will not cause compatibility issue.</li> </ul>								

**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.

### 5.1.9 SFN-SFN observed time difference

<p><b>Definition</b></p>	<p><b>Type 1:</b>                  The SFN-SFN observed time difference to cell is defined as: <math>OFF \times 38400 + T_m</math>, where:  <math>T_m = T_{RxSFNj} - T_{RxSFNi}</math>, given in chip units with the range [0, 1, ..., 38399] chips  <math>T_{RxSFNj}</math> is the time at the beginning of a received neighbouring P-CCPCH frame from cell j.  <math>T_{RxSFNi}</math> is the time at the beginning of the neighbouring P-CCPCH frame from serving cell i received of most recent in time before the time instant <math>T_{RxSFNj}</math> in the UE. If the next neighbouring P-CCPCH frame is received exactly at <math>T_{RxSFNj}</math> then <math>T_{RxSFNj} = T_{RxSFNi}</math> (which leads to <math>T_m = 0</math>).                  and  <math>OFF = (SFN_j - SFN_i) \bmod 256</math>, given in number of frames with the range [0, 1, ..., 255] frames  <math>SFN_j</math> is the system frame number for downlink P-CCPCH frame from cell j in the UE at the time <math>T_{RxSFNj}</math>.  <math>SFN_i</math> is the system frame number for the P-CCPCH frame from serving cell i received in the UE at the time <math>T_{RxSFNi}</math>.                  The reference point for the SFN-SFN observed time difference type 1 shall be the antenna connector of the UE.</p> <p><b>Type 2:</b>                  The relative timing difference between cell j and cell i, defined as <math>T_{CPICHRxj} - T_{CPICHRxi}</math>, where:  <math>T_{CPICHRxj}</math> is the time when the UE receives one Primary CPICH slot from cell j  <math>T_{CPICHRxi}</math> is the time when the UE receives the Primary CPICH slot from cell i that is closest in time to the Primary CPICH slot received from cell j.                  The reference point for the SFN-SFN observed time difference type 2 shall be the antenna connector of the UE.</p>
<p><b>Applicable for</b></p>	<p><b>Type 1:</b> Idle, URA_PCH intra, CELL_PCH intra, CELL_FACH intra  <b>Type 2:</b>                  URA_PCH intra, URA_PCH inter,                  CELL_PCH intra, CELL_PCH inter,                  CELL_FACH intra, CELL_FACH inter                  CELL_DCH intra, CELL_DCH inter</p>