TSG RAN Meeting #27   **RP-050093**
Tokyo, Japan, 9 - 11 March 2005

Title	**CR (Rel-99, Rel-4 and Rel5) to TS25.215 for Clarification of the cell on SFN-SFN observed time difference**
Source	**Panasonic**
Agenda Item	**8.2.3**

RAN1 Tdoc	Spec	CR	Rev	Rel	Cat	Current Version	Subject	Work item	Remarks
-	25.215	156	-	R99	F	3.12.0	Clarification of the cell on SFN-SFN observed time difference	TEI	CRs for Rel6 are agreed in RAN1 as RP-050092.
-	25.215	157	-	Rel-4	A	4.7.0	Clarification of the cell on SFN-SFN observed time difference	TEI	CRs for Rel6 are agreed in RAN1 as RP-050092.
-	25.215	158	-	Rel-5	A	5.5.0	Clarification of the cell on SFN-SFN observed time difference	TEI	CRs for Rel6 are agreed in RAN1 as RP-050092.

CR-Form-v7.1

CHANGE REQUEST

⌘   **25.215** CR **156**   ⌘**rev** **-**   ⌘ Current version: **3.12.0** ⌘

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: ⌘	Clarification of the cell on SFN-SFN observed time difference	
Source: ⌘	Panasonic	
Work item code:⌘	TEI	***Date:*** ⌘ 28 Feb 2005

Category: ⌘ **F**

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.

Release: ⌘   R99

Use <u>one</u> of the following releases:
Ph2   *(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)*
Rel-7   *(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)mod 38400 = (-10000) mod 38400 = 28400.
	- If cell_a is cell_ i, reported value is
	       (30000 - 20000)mod 38400 = (10000) mod 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".
	
	T1 asked to clarification on this topic in R1-050124. RAN1 confirmed cell i is the reference cell.

Summary of change: ⌘	- It is proposed to clarify cell_ i is a serving cell at the time UE report this

measurement. This means, if serving cell is changed, the cell_ i also could be different and recalculaiton may be necessary.

Isolated Impact Analysis
Functionality corrected: SFN-SFN observed time difference

Correction to a function where the specification was ambiguous or not sufficiently explicit. Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.

Consequences if not approved:	⌘	- UTRAN could have uncertaintly on the knowledge of the reported timing on SFN-SFN observed time difference which could be reported in "Measured results on RACH".

Clauses affected:	⌘	5.1.9		

		Y	N			
Other specs affected:	⌘		X	Other core specifications	⌘	T1 asked clarification to this topic in R1-050124.
		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.

5.1.9 SFN-SFN observed time difference

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

CR-Form-v7.1

CHANGE REQUEST

⌘   **25.215** CR **157**   ⌘**rev** **-** ⌘   Current version: **4.7.0** ⌘

*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: ⌘	Clarification of the cell on SFN-SFN observed time difference	
Source: ⌘	Panasonic	
Work item code: ⌘	TEI	***Date:*** ⌘ 28 Feb 2005

Category: ⌘ **A**

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.

Release: ⌘   Rel-4

Use one of the following releases:
   Ph2   *(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)*
   Rel-7   *(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)mod 38400 = (-10000) mod 38400 = 28400.
- If cell_a is cell_ i, reported value is
       (30000 - 20000)mod 38400 = (10000) mod 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".

T1 asked to clarification on this topic in R1-050124. RAN1 confirmed cell i is the reference cell. |
| ***Summary of change:*** ⌘ | - It is proposed to clarify cell_ i is a serving cell at the time UE report this |

measurement. This means, if serving cell is changed, the cell_ i also could be different and recalculaiton may be necessary.

Isolated Impact Analysis
Functionality corrected: SFN-SFN observed time difference

Correction to a function where the specification was ambiguous or not sufficiently explicit. Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise.

Consequences if not approved:	⌘	- UTRAN could have uncertaintly on the knowledge of the reported timing on SFN-SFN observed time difference which could be reported in "Measured results on RACH".

Clauses affected:	⌘	5.1.9			
		Y	**N**		
Other specs affected:	⌘		**X**	Other core specifications ⌘	
		X		Test specifications	T1 asked clarification to this topic in R1-050124.
			X	O&M Specifications	
Other comments:	⌘				

5.1.9 SFN-SFN observed time difference

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

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.215 CR 156** ⌘ **rev** **-** ⌘ Current version: **5.5.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME **X** Radio Access Network **X** Core Network ☐

Title: ⌘	Clarification of the cell on SFN-SFN observed time difference	
Source: ⌘	Panasonic	
Work item code:⌘	TEI	***Date:*** ⌘ 28 Feb 2005

Category: ⌘ **A**

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)*
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Release: ⌘ Rel-5

Use <u>one</u> of the following releases:
   Ph2   *(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)*
   Rel-7 *(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.
	
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Consequences if not approved:	⌘	- 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".

Clauses affected:	⌘	5.1.9			
		Y	**N**		
Other specs affected:	⌘		**X**	Other core specifications ⌘	
		X		Test specifications	T1 asked clarification to this topic in R1-050124.
			X	O&M Specifications	
Other comments:	⌘				

5.1.9 SFN-SFN observed time difference

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