TSG RAN Meeting #19 **RP-030048**
Birmingham, United Kingdom, 11 - 14 March, 2003

Title **CRs (Rel-6) for WI "Technical Enhancements and Improvements"**
Source **TSG RAN WG4**
Agenda Item **9.7**

RAN4 Tdoc	Spec	CR	R	Cat	Rel	Curr Ver	Title	Work Item
R4-020259	25.101	201	1	F	Rel-6	5.5.0	Addition of requirement of CSICH demodulation when CA is active.	TEI6
R4-020319	25.133	553		F	Rel-6	6.0.0	Corrections of CPICH_Ec/Io relative measurement accuracy requirement	TEI6

3GPP TSG RAN WG4 (Radio) Meeting #26 **R4-030259**

Madrid, Spain 17 - 22 February, 2003

CR-Form-v7

CHANGE REQUEST

⌘ **25.101** **CR** **201** ⌘ **rev** **1** ⌘ Current version: **5.5.0** ⌘

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

Title:	⌘	Addition of requirement of CSICH demodulation when CA is active
Source:	⌘	RAN WG4
Work item code:	⌘	TEI6
Date:	⌘	05/03/2003
Category:	⌘	**F**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
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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:	⌘	Based on CPCH operation mode, CSICH can deliver two kinds of informations. The current minimum requirement of CSICH in TS 25.101 only considerd the case when Channel Assignment is not active. So, minumum requirement of CSICH demodulation when CA is active is needed in TS 25.101 in order to complete the minimum requirement of CSICH demodulation.
Summary of change:	⌘	- Chapter 8.16 was devied into 2 parts. - The title of 8.16.1 was changed to “Minimum requirement when Channel Assignement is not active”. - The sentence “When CA is not active.” was added to titles of Table 8.46, 8.47, 8.48, and 8.49 - The General description of CSICH demodulation when CA is active was added to chap 8.16 - New sub chaper was introduced as 8.16.2 “Minimum requirement when CA is active.” - Table 8.xx “CPCH test parameters and conditions for CSICH performance when CA is active “ was added. - Table 8.yy “ AP-AICH test parameters for CSICH performance when CA is active” was added. - Table 8.zz “ CSICH demodulation requirement when CA is active” was added. Change from the previous verion - The releas of CR was change to Rel5
Consequences if not approved:	⌘	Test for demodulation of CSICH is imcomplete.

Clauses affected:	⌘	8.16			
Other specs affected:	⌘	**Y** / **N** ( ) / ( ) **X** / ( ) ( ) / ( )	Other core specifications Test specifications O&M Specifications	⌘	34.121
Other comments:	⌘				

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8.16 Demodulation of CPCH Status Indicator Channel (CSICH)

The receive characteristics of the CPCH Status Indicator Channel (CSICH) when CA is not active are determined by the average message error Ratio (MER). Under the test conditions described in 8.16.1~~below~~, a CSICH message demodulation error will cause the UE to transmit a CPCH message when there is pending UL data to transmit. MER is measured at the message rate listed for the conditions in Table 8.46.

The receive characteristics of the CSICH when CA is active are determined by the error rate of demodulation of Minium Available Spreading Factor (MASF). Under the test conditions descrived in 8.16.2, the demodulation error of MASF bits transmitted over CSICH will casue that the UE transmits wrong CPCH Access Preamble to UTRAN. MASF Error rate is measured under the condition in Table 8.xx

8.16.1 Minimum requirement when CA is not active

For the parameters and conditions specified in Tables 8.46, 8.47 and 8.48 the MER shall not exceed the values listed in table 8.49.

Other downlink channels which are present in this test are P-CPICH, P-CCPCH, and PICH, and their powers are as specified in Annex C.3.2.

Table 8.46: CPCH test parameters and conditions for CSICH performance when CA is not active

Parameter	Test 1	Test 2
CPCH mode	UE Channel Selection (PCPCH availability is broadcast in CSICH)	
Number of PCPCHs in CPCH set	15	
Number of SIs per CSICH frame	15 (one SI message per PCPCH)	
Number of CSICH bits per SI message	8 (CSICH bit repeated 8 times in each SI message)	
CSICH Message Rate	750 per second (15 messages in 20 msec frame)	
AP preamble signatures	15 PCPCHs are given 1 signature each; 1 signature is unused.	
AP preamble slot subchannels	All slot subchannels are available for access without delay.	
CD preamble signatures	16 (all signatures used)	
CD preamble slot subchannels	All slot subchannels are available for access without delay.	
Persistency value for all PCPCHs	1 (full access, no delay)	
CSICH broadcast	N=15 Sis. For each PCPCH SI, SI=0 (PCPCH not available)	
AP-AICH broadcast	In each access slot, Node B transmits 15 AP-AICH-ACKs, one for each PCPCH.	
Channel Assignment (CA)	Not active	
CD/CA-ICH broadcast	In each access slot, Node B transmits 16 CD/CA-ICH ACKs, one for each possible signature.	
Power control preamble length for all PCPCHs	0 slots	
Message length for all PCPCHs	10 ms (1 TTI) (Nfmax = 1)	
Spreading factor for all PCPCHs	64	
Propagation condition	Static	Case 3

Table 8.47: AP-AICH test parameters for CSICH performance when CA is not active

Parameter	Unit	Test 1	Test 2
Phase reference	-	P-CPICH	
I_{oc}	dBm/3.84 MHz	-60	
Number of transmitted AI signatures on AP-AICH	-	15 (all ACK)	
$\hat{I}_{or}/I_{oc}$	DB	-1	-3
AP-AICH_Ec/Ior	DB	-10.0	
AP-AICH Power Offset	DB	0	
Propagation condition		Static	Case 3

Note that AP-AICH_Ec/Ior cannot be set. Its value is calculated from other parameters and it is given for information only. (AP-AICH_Ec/Ior = AP-AICH Power Offset + CPICH_Ec/Ior)

Table 8.48: CD/CA-ICH test parameters for CSICH performance when CA is not acitve

Parameter	Unit	Test 1	Test 2
Phase reference	-	P-CPICH	
I_{oc}	dBm/3.84 MHz	-60	
Number of transmitted CD signatures on CD/CA-ICH	-	16 (all ACK)	
$\hat{I}_{or}/I_{oc}$	DB	-1	-3
CD/CA-ICH_Ec/Ior	DB	-10.0	
CD/CA-ICH Power Offset	DB	0	
Propagation condition		Static	Case 3

Note that CD/CA-ICH_Ec/Ior cannot be set. Its value is calculated from other parameters and it is given for information only. (CD/CA-ICH_Ec/Ior = CD/CA-ICH Power Offset + CPICH_Ec/Ior)

Table 8.49: CSICH demodulation requirements when CA is not active

Test Number	CSICH power offset	CSICH MER
1	-10.5 db	0.001
2	-3.0 db	0.001

8.16.2 Minimum requirement when CA is active

For the parameters and conditions specified in Tables 8.xx and 8.yy, the MASF Error rate shall not exceed the values listed in table 8.zz.

Other downlink channels, which are present in this test, are P-CPICH, P-CCPCH, and PICH, and their powers are as specified in Annex C.3.2.

Table 8.xx: CPCH test parameters and conditions for CSICH performance when CA is active

Parameter	Test 1	Test 2
CPCH mode	Channel Assignment is active (PCPCH availability as well as Minimum Available Spreading Factor are broadcast in CSICH)	
Number of PCPCHs in CPCH set	9	
Number of SIs per CSICH frame	15 (9 Sis for the availability of 9 PCPCH and 6 Sis for the transmission of MASF bits)	
Number of CSICH bits per SI message	8 (CSICH bit repeated 8 times in each SI message)	
CSICH Message Rate	750 per second (15 messages in 20 msec frame)	
AP preamble signatures	2 signatures are given to each data rate and 2 signatures are unused. Where: Signature number 0 and 1 correspond to MASF 256. Signature number 2 and 3 correspond to MASF 128. Signature number 4 and 5 correspond to MASF 64. Signature number 6 and 7 correspond to MASF 32. Signature number 8 and 9 correspond to MASF 16. Signature number 10 and 11 correspond to MASF 8. Signature number 12 and 13 correspond to MASF 4.	
AP preamble slot subchannels	All slot subchannels are available for access without delay.	
CSICH broadcast	The pattern of SIs is "000000000000000" Where: MASF bits value is "000" For each PCPCH SI, SI=0 (All PCPCH are not available)	
PCPCH data rate expected by the UE	More than 15 kbps	
AP-AICH broadcast	In each access slot, Node B transmits 14 AP-AICH-NACKs	
Propagation condition	Static	Case 3

Table 8.yy: AP-AICH test parameters for CSICH performance when CA is active

Parameter	Unit	Test 1	Test 2
Phase reference	-	P-CPICH	
I_{oc}	dBm/3.84 MHz	-60	
Number of transmitted AI signatures on AP-AICH	-	14	
$\hat{I}_{or}/I_{oc}$	DB	-1	-3
AP-AICH_Ec/Ior	DB	-10.0	
AP-AICH Power Offset	DB	0	
Propagation condition		Static	Case 3

Note that AP-AICH_Ec/Ior cannot be set. Its value is calculated from other parameters and it is given for information only. (AP-AICH_Ec/Ior = AP-AICH Power Offset + CPICH_Ec/Ior)

Table 8.zz: CSICH demodulation requirements when CA is active

Test Number	CSICH power offset	CSICH MER
1	-12.55 db	0.001
2	-6.15 db	0.001

Note that CSICH_Ec/Ior = CSICH power_Offset + CPICH_Ec/Ior

3GPP TSG RAN WG4 (Radio) Meeting #26 **R4-030319**

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CHANGE REQUEST

⌘ **25.133** **CR** **553** ⌘ **rev** ⌘ Current version: **6.0.0** ⌘

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

Title:	⌘	Correction of CPICH_Ec/Io relative measurement accuracy requirement
Source:	⌘	RAN WG4
Work item code:	⌘	TEI6
Date:	⌘	05/03/2003
Category:	⌘	**F**
Release:	⌘	Rel-6

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R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The definition of the relative CPICH measurement accuracy is not complete and open to misinterpretation.
Summary of change:	⌘	The definition for the parameter in table 9.6 for the intra-frequency relative CPICH_EC/Io measurement accuracy and in table 9.8 for the inter-frequency relative CPICH_EC/Io measurement accuracy is corrected as being the lower of the CPICH_Ec/Io values of the two cells being measured.
Consequences if not approved:	⌘	The relative measurement accuracy is not defined. **Isolated Impact Analysis:** Incorrect implementation of UE leading to problems with any procedures requiring measurement of relative CPICH_Ec/Io ratios.

Clauses affected:	⌘	9.1.2			
Other specs affected:	⌘	**Y** / **N**	Other core specifications	⌘	
		N: X			
		Y: X	Test specifications		34.121
		N: X	O&M Specifications		
Other comments:	⌘				

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9.1.2 CPICH Ec/Io

Note: This measurement is for Cell selection/re-selection and for handover evaluation.

9.1.2.1 Intra frequency measurements accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.2. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.2.

9.1.2.1.1 Absolute accuracy requirement

The accuracy requirements in table 9.5 are valid under the following conditions:

CPICH_RSCP1$|_{dBm}$ ≥ -114 dBm for Band I,

CPICH_RSCP1$|_{dBm}$ ≥ -112 dBm for Band II,

CPICH_RSCP1$|_{dBm}$ ≥ -111 dBm for Band III.

$$\left|\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left|\left(\frac{CPICH\_E_c}{I_{or}}\right)\right|_{in\ dB} \leq 20dB$$

Table 9.5: CPICH_Ec/Io Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I	Band II	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-91…-50

9.1.2.1.2 Relative accuracy requirement

The relative accuracy of CPICH Ec/Io is defined as the maximum allowable error in the measured difference between the CPICH Ec/Io measured from one cell compared to the CPICH Ec/Io measured from another cell on the same frequency.

The relative accuracy is defined using the lower CPICH Ec/Io of cell 1 and cell 2.

The accuracy requirements in table 9.6 are valid under the following conditions:

CPICH_RSCP1,2$|_{dBm}$ ≥ -114 dBm for Band I,

CPICH_RSCP1,2$|_{dBm}$ ≥ -112 dBm for Band II,

CPICH_RSCP1,2$|_{dBm}$ ≥ -111 dBm for Band III.

$$\left|CPICH\_RSCP1|_{in\ dBm} - CPICH\_RSCP2|_{in\ dBm}\right| \leq 20dB$$

$$\left|\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left|\left(\frac{CPICH\_E_c}{I_{or}}\right)\right|_{in\ dB} \leq 20dB$$

Table 9.6: CPICH_Ec/Io Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I	Band II	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
The lower of the CPICH_Ec/Io from cell 1 and cell 2	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-91…-50

9.1.2.2 Inter frequency measurement accuracy

The measurement period for CELL_DCH state can be found in sub clause 8.1.2.3. The measurement period for CELL_FACH state can be found in sub clause 8.4.2.3.

9.1.2.2.1 Absolute accuracy requirement

The accuracy requirements in table 9.7 are valid under the following conditions:

$CPICH\_RSCP1|_{dBm} \geq$ -114 dBm for Band I,

$CPICH\_RSCP1|_{dBm} \geq$ -112 dBm for Band II,

$CPICH\_RSCP1|_{dBm} \geq$ -111 dBm for Band III.

$$\left| \frac{I_o}{\hat{I}_{or}} \right|_{in\ dB} - \left| \frac{CPICH\_E_c}{I_{or}} \right|_{in\ dB} \leq 20dB$$

Table 9.7: CPICH_Ec/Io Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I	Band II	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-91…-50

9.1.2.2.2 Relative accuracy requirement

The relative accuracy of CPICH Ec/Io in the inter frequency case is defined as the maximum allowable error in the measured difference between the CPICH Ec/Io measured from one cell compared to the CPICH Ec/Io measured from another cell on a different frequency

The relative accuracy is defined using the lower CPICH_Ec/Io of cell 1 and cell 2.

The accuracy requirements in table 9.8 are valid under the following conditions:

$CPICH\_RSCP1,2|_{dBm} \geq$ -114 dBm for Band I,

$CPICH\_RSCP1,2|_{dBm} \geq$ -112 dBm for Band II,

$CPICH\_RSCP1,2|_{dBm} \geq$ -111 dBm for Band III.

$$\left| CPICH\_RSCP1|_{in\ dBm} - CPICH\_RSCP2|_{in\ dBm} \right| \leq 20dB$$

| Channel 1_Io|$_{\text{dBm/3.84 MHz}}$ -Channel 2_Io|$_{\text{dBm/3.84 MHz}}$ | ≤ 20 dB.

$$\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left.\left(\frac{CPICH\_E_c}{I_{or}}\right)\right|_{in\ dB} \leq 20dB$$

Table 9.8: CPICH_Ec/Io Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions		
		Normal condition	Extreme condition	Band I	Band II	Band III
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
The lower of the CPICH_Ec/Io from cell 1 and cell 2	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-91…-50