TSG RAN Meeting #20 **RP-030221**
Hämeenlinna, Finland, 3 - 6 June, 2003

Title **CRs (Rel-6) for WI "FDD BS Classification"**
Source **TSG RAN WG4**
Agenda Item **8.10**

RAN4 Tdoc	Spec	CR	R	Cat	Rel	Curr Ver	Title	Work Item
R4-020402	25.104	186		F	Rel-6	6.1.0	Correction to DCH demodulation performance requirement in multipath fading case 4	RInImp-BSClass-FDD
R4-020403	25.141	291		F	Rel-6	6.1.0	Correction to DCH demodulation performance test in multipath fading case 4	RInImp-BSClass-FDD
R4-020404	25.141	292		F	Rel-6	6.1.0	Correction of applicability of requirements to BS classes	RInImp-BSClass-FDD
R4-020606	25.951	001	1	F	Rel-6	6.0.0	Radio network planning considerations	RInImp-BSClass-FDD

3GPP TSG RAN WG4 (Radio) Meeting #27 **R4-030402**

Paris, France 19 - 23 May, 2003

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CHANGE REQUEST

⌘	25.104	CR	186	⌘ rev		⌘	Current version:	6.1.0	⌘

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

Title:	⌘	Correction to DCH demodulation performance requirement in multipath fading case 4		
Source:	⌘	RAN WG4		
Work item code:	⌘	RInImp-BSClass-FDD	***Date:*** ⌘	27/05/2003
Category:	⌘	**F**	***Release:*** ⌘	Rel-6
		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:	⌘	The performance requirement for demodulation of DCH in multipath fading case 4 is applicable to Wide Area BS only. UE speed in multipath fading case 4 is 250 km/h. The frequency stability for Medium Range and Local Area BS allows a maximum UE speed of 196 km/h.
Summary of change:	⌘	The performance requriement for demodulation of DCH in multipath fading case 4 will apply to Wide Area BS only.
Consequences if not approved:	⌘	There will be a mandatory performance requirement for demodulation of DCH in multipath fading case 4 which cannot be met by Medium Range and Local Area BS.

Clauses affected:	⌘	8.3.4				
		Y	**N**			
Other specs affected:	⌘		X	Other core specifications	⌘	
		X		Test specifications		25.141
			X	O&M Specifications		
Other comments:	⌘					

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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.

8.3.4 Multipath fading Case 4

The performance requirement of DCH in multipath fading Case 4 in case of a Wide Area BS is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

8.3.4.1 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in Table 8.5A.

Table 8.5A: Performance requirements in multipath Case 4 channel

Measurement channel	Received E_b/N_0	Required BLER
12.2 kbps	n.a.	< 10^{-1}
	10.2 dB	< 10-2
	11.0 dB	< 10-3
64 kbps	6.4 dB	< 10-1
	6.8 dB	< 10-2
	7.1 dB	< 10-3
144 kbps	5.8 dB	< 10-1
	6.2 dB	< 10-2
	6.6 dB	< 10-3
384 kbps	6.2 dB	< 10-1
	6.6 dB	< 10-2
	7.2 dB	< 10-3

3GPP TSG RAN WG4 (Radio) Meeting #27 **R4-030403**

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CHANGE REQUEST

⌘	**25.141**	**CR 291**	⌘ **rev**		⌘ Current version:	**6.1.0** ⌘

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

Title: ⌘	Correction to DCH demodulation performance test in multipath fading case 4			
Source: ⌘	RAN WG4			
Work item code: ⌘	RInImp-BSClass-FDD		***Date:*** ⌘	27/05/2003
Category: ⌘	**F**		***Release:*** ⌘	Rel-6
	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: ⌘	The performance requirement for demodulation of DCH in multipath fading case 4 is applicable to Wide Area BS only. UE speed in multipath fading case 4 is 250 km/h. The frequency stability for Medium Range and Local Area BS allows a maximum UE speed of 196 km/h.
Summary of change: ⌘	The performance requriement for demodulation of DCH in multipath fading case 4 will apply to Wide Area BS only.
Consequences if not approved: ⌘	There will be a mandatory performance requirement for demodulation of DCH in multipath fading case 4 which cannot be met by Medium Range and Local Area BS.

Clauses affected: ⌘	8.3.4.1			
	Y	**N**		
Other specs affected: ⌘		X	Other core specifications ⌘	
		X	Test specifications	
		X	O&M Specifications	
Other comments: ⌘				

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8.3.4 Multipath fading Case 4

8.3.4.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 4 for Wide Area BS is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The requirement in this subclause shall apply to ~~base stations intended for general purpose applications~~ Wide Area BS only.

8.3.4.2 Minimum requirement

The BLER should not exceed the limit for the E_b/N_0 specified in table 8.8A.

Table 8.8A: Performance requirements in multipath Case 4 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-3}
12.2 kbps	n.a	10.2 dB	11.0 dB
64 kbps	6.4 dB	6.8 dB	7.1 dB
144 kbps	5.8 dB	6.2 dB	6.6 dB
384 kbps	6.2 dB	6.6 dB	7.2 dB

The reference for this requirement is TS 25.104 subclause 8.3.4.1.

8.3.4.3 Test purpose

The test shall verify the receivers ability to receive the test signal under fast fading propagation conditions with a BLER not exceeding a specified limit.

8.3.4.4 Method of test

8.3.4.4.1 Initial conditions

Test environment: normal; see subclause 4.4.1.

RF channels to be tested: B, M and T; see subclause 4.8

1) Connect the BS tester generating the wanted signal, multipath fading simulators and AWGN generators to both BS antenna connectors for diversity reception via a combining network as shown in annex B.

8.3.4.4.2 Procedure

1) Adjust the AWGN generator to -84 dBm/3.84 MHz at the BS input.

2) The characteristics of the wanted signal shall be configured according to the corresponding UL reference measurement channel defined in annex A.

3) The multipath fading emulators shall be configured according to the corresponding channel model defined in annex D.

4) Adjust the equipment so that required E_b/N_0 specified in table 8.8B is achieved. To achieve the specified E_b/N_O, the ratio of the wanted signal level relative to the AWGN signal at the BS input should be adjusted to: $10*\text{Log}10(R_b /3.84*10^6)+E_b/N_0$ [dB].

5) For each of the data rates in table 8.8B applicable for the base station, measure the BLER.

8.3.4.5 Test requirements

The BLER measured according to subclause 8.3.4.4.2 shall not exceed the BLER limits for the E_b/N_0 levels specified in table 8.8B.

Table 8.8B: Test requirements in multipath Case 4 channel

Measurement channel data rate (R_b)	E_b/N_0 for required BLER < 10^{-1}	E_b/N_0 for required BLER < 10^{-2}	E_b/N_0 for required BLER < 10^{-3}
12.2 kbps	n.a	10.8 dB	11.6 dB
64 kbps	7.0 dB	7.4 dB	7.7 dB
144 kbps	6.4 dB	6.8 dB	7.2 dB
384 kbps	6.8 dB	7.2 dB	7.8 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in subclause 4.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.

3GPP TSG RAN WG4 (Radio) Meeting #27 **R4-030404**

Paris, France 19 - 23 May, 2003

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CHANGE REQUEST

⌘ 25.141	CR 292	⌘ rev		⌘ Current version: 6.1.0 ⌘

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

Title:	⌘	Correction of applicability of requirements to BS classes
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-BSClass-FDD ***Date:*** ⌘ 27/05/2003
Category:	⌘	**F** ***Release:*** ⌘ Rel-6

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:	⌘	In Rel-6 all requirements apply to Wide Area, Medium Range and Local Area BS, unless otherwise stated. The sentence found in some clauses: "The requirement in this subclause shall apply to base stations intended for general-purpose applications." limits the applicability of the requirements to Wide Area BS only and shall be removed.
Summary of change:	⌘	The sentence is removed throughout the document.
Consequences if not approved:	⌘	The test of requirements for Medium Range and Local Area BS will remain incomplete.

Clauses affected:	⌘	7.5.1; 8.2.1.1; 8.3.1.1; 8.3.2.1; 8.3.3.1; 8.4.1; 8.5.1; 8.8.1.1; 8.8.2.1; 8.8.3.1; 8.8.4.1; 8.9.1.1; 8.8.2.1; 8.9.3.1; 8.9.4.1

Other specs affected:	Y	N		
⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	O&M Specifications	

Other comments:	⌘	

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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.

7.5 Blocking characteristics

7.5.1 Definition and applicability

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at is assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the adjacent channels. The blocking performance requirement applies as specified in tables 7.4(a) to 7.4(g).

The requirements in Tables 7.4(a1), 7.4(a2) and 7.4(a3) shall apply to the indicated base station class ~~base stations intended for general-purpose applications~~, depending on which frequency band is used. The requirements in Tables 7.4 (b) to 7.4 (g) may be applied when the FDD BS is co-located with GSM900, GSM850, PCS1900 and/or BS operation in DCS1800 band (UTRA or GSM).

7.5.2 Minimum Requirements

The BER shall not exceed 0.001 for the parameters specified in table 7.4.

Table 7.4(a1): Blocking characteristics for Wide Area BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
I	1920 - 1980 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1900 - 1920 MHz 1980 - 2000 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1 MHz -1900 MHz 2000 MHz - 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
II	1850 - 1910 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1830 - 1850 MHz 1910 - 1930 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1 MHz - 1830 MHz 1930 MHz - 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
III	1710 – 1785 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1690 - 1710 MHz 1785 – 1805 MHz	-40 dBm	-115 dBm	10 MHz	WCDMA signal *
	1 MHz - 1690 MHz 1805 MHz - 12750 MHz	-15 dBm	-115 dBm	—	CW carrier
Note *: The characteristics of the W-CDMA interference signal are specified in Annex I.					

Table 7.4(a2): Blocking characteristics for Medium Range BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
I	1920 - 1980 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1900 - 1920 MHz 1980 - 2000 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1 MHz -1900 MHz 2000 MHz - 12750 MHz	-15 dBm	-105 dBm	—	CW carrier
II	1850 - 1910 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1830 - 1850 MHz 1910 - 1930 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1 MHz - 1830 MHz 1930 MHz - 12750 MHz	-15 dBm	-105 dBm	—	CW carrier
III	1710 – 1785 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA signal *
	1690 - 1710 MHz 1785 – 1805 MHz	-35 dBm	-105 dBm	10 MHz	WCDMA *
	1 MHz - 1690 MHz 1805 MHz - 12750 MHz	-15 dBm	-105 dBm	—	CW carrier
Note *: The characteristics of the W-CDMA interference signal are specified in Annex I.					

Table 7.4(a3): Blocking characteristics for Local Area BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal Level	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
I	1920 - 1980 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1900 - 1920 MHz 1980 - 2000 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1 MHz -1900 MHz 2000 MHz - 12750 MHz	-15 dBm	-101 dBm	—	CW carrier
II	1850 - 1910 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1830 - 1850 MHz 1910 - 1930 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1 MHz - 1830 MHz 1930 MHz - 12750 MHz	-15 dBm	-101 dBm	—	CW carrier
III	1710 – 1785 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1690 - 1710 MHz 1785 – 1805 MHz	-30 dBm	-101 dBm	10 MHz	WCDMA signal *
	1 MHz - 1690 MHz 1805 MHz - 12750 MHz	-15 dBm	-101 dBm	—	CW carrier
Note *: The characteristics of the W-CDMA interference signal are specified in Annex I.					

Table 7.4(b): Blocking performance requirement when co-located with GSM900

Operating Band	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
I, III	921 -960 MHz	+16 dBm	-115 dBm	—	CW carrier

Table 7.4(c): Blocking performance requirement for operation when co-located with BTS operating inDCS1800 band (GSM or UTRA)

Operating Band	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
I, III	1805 – 1880 MHz	+16 dBm	-115 dBm	—	CW carrier

Table 7.4(d): Blocking performance requirement for operation when co-located with UTRA BS operating in Frequency band I

Operating band	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
III	2110 – 2170 MHz	+16 dBm	-115 dBm	—	CW carrier

Table 7.4(e): Blocking performance requirement for operation when co-located with PCS1900 BTS

Operating band	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
II	1930 – 1990 MHz	+16 dBm	-115 dBm	—	CW carrier

Table 7.4(f1): Blocking performance requirement (narrowband) for Wide Area BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
II	1850 - 1910 MHz	- 47 dBm	-115 dBm	2.7 MHz	GMSK modulated*
III	1710 – 1785 MHz	- 47 dBm	-115 dBm	2.8 MHz	GMSK modulated*
* GMSK modulation as defined in TS 45.004 [12].					

Table 7.4(f2): Blocking performance requirement (narrowband) for Medium range BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
II	1850 - 1910 MHz	- 42 dBm	-105 dBm	2.7 MHz	GMSK modulated*
III	1710 – 1785 MHz	- 42 dBm	-105 dBm	2.8 MHz	GMSK modulated*
* GMSK modulation as defined in TS 45.004 [12].					

Table 7.4(f3): Blocking performance requirement (narrowband) for Local Area BS

Operating Band	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal mean power	Minimum Offset of Interfering Signal	Type of Interfering Signal
II	1850 - 1910 MHz	- 37 dBm	-101 dBm	2.7 MHz	GMSK modulated*
III	1710 – 1785 MHz	- 37 dBm	-101 dBm	2.8 MHz	GMSK modulated*
* GMSK modulation as defined in TS 45.004 [12].					

Table 7.4(g): Blocking performance requirement for operation when co-located with GSM850 BTS

Operating band	Center Frequency of Interfering Signal	Interfering Signal mean power	Wanted Signal Level	Minimum Offset of Interfering Signal	Type of Interfering Signal
II	869 – 894 MHz	+16 dBm	-115 dBm	—	CW carrier

The normative reference for these requirements is in TS 25.104[1] subclause 7.5

--- next changed section ---

8.2 Demodulation in static propagation conditions

8.2.1 Demodulation of DCH

8.2.1.1 Definition and applicability

The performance requirement of DCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

~~The requirement in this subclause shall apply to base stations intended for general-purpose applications.~~

8.2.1.2 Minimum requirement

--- next changed section ---

8.3 Demodulation of DCH in multipath fading conditions

8.3.1 Multipath fading Case 1

8.3.1.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 1 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

~~The requirement in this subclause shall apply to base stations intended for general-purpose applications.~~

8.3.1.2 Minimum requirement

--- next changed section ---

8.3.2 Multipath fading Case 2

8.3.2.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 2 is determined by the maximum Block Error Rate (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

~~The requirement in this subclause shall apply to base stations intended for general purpose applications.~~

8.3.2.2 Minimum requirement

--- next changed section ---

8.3.3 Multipath fading Case 3

8.3.3.1 Definition and applicability

The performance requirement of DCH in multipath fading Case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

~~The requirement in this subclause shall apply to base stations intended for general purpose applications.~~

8.3.3.2 Minimum requirement

--- next changed section ---

8.4 Demodulation of DCH in moving propagation conditions

8.4.1 Definition and applicability

The performance requirement of DCH in moving propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified Eb/N0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

~~The requirement in this subclause shall apply to base stations intended for general-purpose applications.~~

8.4.2 Minimum requirement

--- next changed section ---

8.5 Demodulation of DCH in birth/death propagation conditions

8.5.1 Definition and applicability

The performance requirement of DCH in birth/death propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

~~The requirement in this subclause shall apply to base stations intended for general purpose applications.~~

8.5.2 Minimum requirement

--- next changed section ---

8.8 RACH performance

8.8.1 RACH preamble detection in static propagation conditions

8.8.1.1 Definition and applicability

The performance requirement of RACH for preamble detection in static propagation conditions is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd). The performance is measured by the required E_c/N_0 at probability of detection, Pd of 0.99 and 0.999. Pfa is defined as a conditional probability of erroneous detection of the preamble when input is only noise (+interference). Pd is defined as conditional probability of detection of the preamble when the signal is present. Pfa shall be 10^{-3} or less. Only one signature is used and it is known by the receiver.

~~The requirement in this subclause shall apply to base stations intended for general-purpose applications.~~

8.8.1.2 Minimum requirement

--- next changed section ---

8.8.2 RACH preamble detection in multipath fading case 3

8.8.2.1 Definition and applicability

The performance requirement of RACH for preamble detection in in multipath fading case 3 is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd). The performance is measured by the required E_c/N_0 at probability of detection, Pd of 0.99 and 0.999. Pfa is defined as a conditional probability of erroneous detection of the preamble when input is only noise (+interference). Pd is defined as conditional probability of detection of the preamble when the signal is present. Pfa shall be 10^{-3} or less. Only one signature is used and it is known by the receiver.

~~The requirement in this subclause shall apply to base stations intended for general-purpose applications.~~

8.8.2.2 Minimum requirement

--- next changed section ---

8.8.3 Demodulation of RACH message in static propagation conditions

8.8.3.1 Definition and applicability

The performance requirement of RACH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The preamble threshold factor is chosen to fulfil the requirements on Pfa and Pd in subclauses 8.8.1 and 8.8.2. Only one signature is used and it is known by the receiver.

~~The requirement in this subclause shall apply to base stations intended for general-purpose applications.~~

8.8.3.2 Minimum requirement

--- next changed section ---

8.8.4 Demodulation of RACH message in multipath fading case 3

8.8.4.1 Definition and applicability

The performance requirement of RACH in multipath fading case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The preamble threshold factor is chosen to fulfil the requirements on Pfa and Pd in subclauses 8.8.1 and 8.8.2. Only one signature is used and it is known by the receiver.

~~The requirement in this subclause shall apply to base stations intended for general-purpose applications.~~

8.8.4.2 Minimum requirement

--- next changed section ---

8.9 CPCH Performance

8.9.1 CPCH access preamble and collision detection preamble detection in static propagation conditions

8.9.1.1 Definition and applicability

The CPCH access preamble and collision detection preamble are identical to the RACH preamble. The performance requirement of CPCH for access preamble (AP) and collision detection preamble (CD) detection in static propagation conditions is the same as that defined for RACH preamble and is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd).

~~The requirement in this subclause shall apply to base stations intended for general-purpose applications.~~

8.9.1.2 Conformance and test requirement

The conformance and test requirement for CPCH for access preamble (AP) and collision detection preamble (CD) detection in static propagation conditions is the same as that defined for RACH preamble in section 8.8.1 of this specification. No additional conformance test is needed.

8.9.2 CPCH access preamble and collision detection preamble detection in multipath fading case 3

8.9.2.1 Definition and applicability

The CPCH access preamble and collision detection preamble are identical to the RACH preamble. The performance requirement of CPCH for access preamble (AP) and collision detection preamble (CD) detection in multipath fading case 3 conditions is the same as that defined for RACH preamble and is determined by the two parameters probability of false detection of the preamble (Pfa) and the probability of detection of preamble (Pd).

~~The requirement in this subclause shall apply to base stations intended for general-purpose applications.~~

8.9.2.2 Conformance and test requirement

The conformance and test requirement for CPCH for access preamble (AP) and collision detection preamble (CD) detection in multipath fading case 3 conditions is the same as that defined for RACH preamble in section 8.8.2 of this specification. No additional conformance test is needed.

8.9.3 Demodulation of CPCH message in static propagation conditions

8.9.3.1 Definition and applicability

The performance requirement of CPCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The power on the access preamble and collision detection preamble is set to meet or exceed the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2. Only one signature is used and it is known by the receiver.

~~The requirement in this subclause shall apply to base stations intended for general-purpose applications.~~

8.9.3.2 Minimum requirement

8.9.4 Demodulation of CPCH message in multipath fading case 3

8.9.4.1 Definition and applicability

The performance requirement of CPCH in multipath fading case 3 is determined by the maximum Block Error Ratio (BLER) allowed when the receiver input signal is at a specified E_b/N_0 limit. The BLER is calculated for each of the measurement channels supported by the base station.

The power on the access preamble and collision detection preamble is set to meet or exceed the requirements on Pfa and Pd in subclauses 8.9.1 and 8.9.2. Only one signature is used and it is known by the receiver.

~~The requirement in this subclause shall apply to base stations intended for general-purpose applications.~~

8.9.4.2 Minimum requirement

3GPP TSG RAN WG4 (Radio) Meeting #27 **R4-030606**

Paris, France 19 - 23 May, 2003

CR-Form-v7

CHANGE REQUEST

⌘ 25.951	CR 001	⌘ rev 1 ⌘	Current version: 6.0.0 ⌘

*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 [X] Core Network [ ]

Title:	⌘	Radio network planning considerations
Source:	⌘	RAN WG4
Work item code:	⌘	RInImp-BSClass-FDD
Date:	⌘	27/05/2003
Category:	⌘	F
Release:	⌘	Rel-6

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:	⌘	During the RAN WG4#26 meeting in Madrid it was agreed that the capacity losses due to ACLR localized around the Local Area and Medium Range BS should be studied further and minuted in TR. Because the specification does not solve all problems operators need to take special care in deployement and operation. The aim of this CR is to have documented guidelines for network planning added into TR 25.951.
Summary of change:	⌘	Current Annex B renamed as Annex C and Table headings modified. Informative Annex B added to TR. The Annex B includes radio network planning considerations which can be applied in case there is any residual interference between adjacent radio networks of different hierarchy level. Change includes measures applicable both to the interfering and interfered radio network.
Consequences if not approved:	⌘	There is no documented guidelines how to solve problems with localised capacity problems in network planning.

Clauses affected:	⌘	Annex B			
		Y	**N**		
Other specs affected:	⌘		X	Other core specifications	⌘
			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.

Annex B (informative): Radio Network Planning Considerations

B.1 General

The RF specification for Base Stations is to a large extent based on statistical averaging of interference effects. This should normally be sufficient to eliminate significant interference effects on adjacent frequency networks, if some simple rules (e.g. 30 dB MCL between Wide Area BS) are followed.

Especially in the case of Local Area and Medium Range BS, also considering some of their likely deployment environments (indoor, street canyons) there is however a higher probability that the interference on adjacent frequencies is localised. In these cases some co-ordination between operators may be required.

This informative Annex considers Radio Network Planning (RNP) measures, which can be applied in case there is significant interference between adjacent radio networks of different hierarchy level, e.g. between a MR and a WA network. In the following mainly aspects related to DL adjacent channel interference will be considered.

B.2 Example analysis for localized interference

Based on a number of assumptions on deployment of networks, the relevant parameter for the impact of DL adjacent channel interference caused by a MR or LA Node B is the maximum output power. From the Monte-Carlo simulation results contained in Annex A it can be seen that the DL capacity loss for an adjacent macro layer is upper-bounded by approximately no more than 6 % for a 38 dBm MR network layer. Similarly, it was shown that the DL capacity impact from a 24 dBm LA network on an adjacent MR network is of similar order.

While the average impact is thus small, there is nevertheless a chance that a macro layer UE gets localised interference by a MR or LA Node B under low coupling loss (CL) and weak serving signal conditions. This will be illustrated by the following example analysis for the case of a LA (indoor) cell interfering to an adjacent macro cell.

The following parameters will be assumed:

UE ACS	33	dB	from 25.101
interfering LA BS maximum Tx power	24	dBm	from this TR
interfering LA BS antenna gain	0	dBi	from this TR
serving cell received DTCH level	-90	dBm	
bit rate	12.2	kbps	
Eb/Io	7	dB	

Table 1: Assumed parameters for the localized interference analysis

With these service parameters we obtain for the required Ec/Io:

Required Ec/Io = -25 dB [processing gain] + 7 dB [Eb/Io] = -18 dB

The area of the localized interference around the LA BS can be estimated as follows[1]:

1. Maximum tolerated interference level on the own channel: -90 dBm + 18 dB [Required Ec/Io] = -72 dBm

[1] In this calculation the own system (cell) interference is not taken into account, i.e. it is assumed that ACI dominates

2. Maximum tolerated interference level on the adjacent channel: -72 dBm + 33 dB [UE ACS] = -39 dBm

3. Required coupling loss CL towards interfering LA BS: +24 dBm – (-39 dBm) = 63 dB

4. Assuming the indoor path loss model from this TR for the case that internal walls are not modelled individually and a single floor, the indoor path loss model is represented by the following formula:

$$PL = 37 + 30 \, Log10(R),$$

with R the UE – LA BS separation given in metres. From this, the required minimum distance towards the interfering LA BS is given by:

$$R = 10\text{^}((63 \text{ dB [CL]} + 0 \text{ dBi [LA BS antenna gain]} – 37) / 30) = 7.36 \text{ m}$$

As can be seen, the required minimum distance towards the interfering LA BS depends not only on the parameters of the interfering system (i.e. TX power, antenna gain), but also on the available DTCH signal level of the serving macro cell.

The following figure shows the size of the localized interference around the LA BS for serving cell received DTCH levels in the range of –70 … -110 dBm:

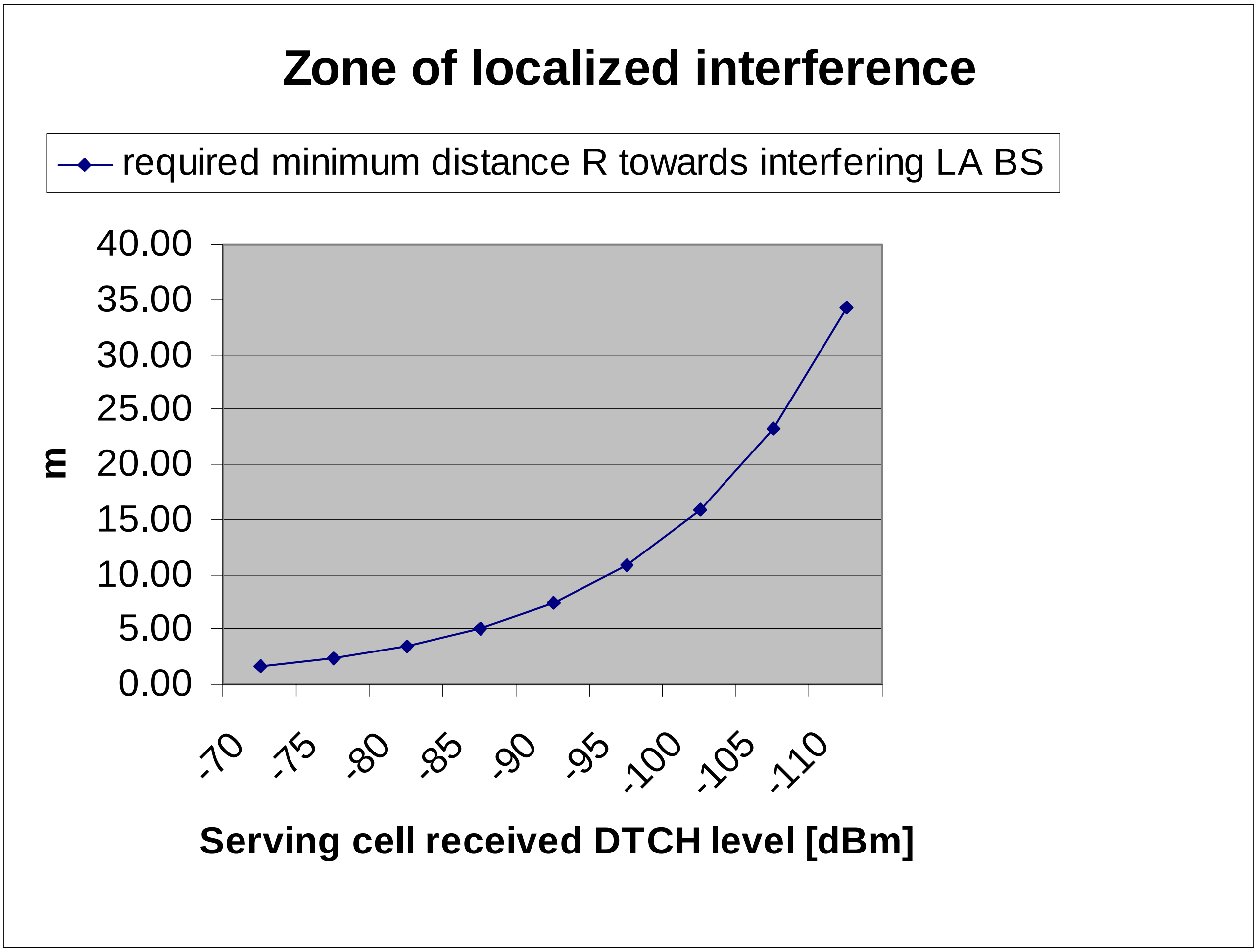

Fig. 1: Localized interference around the LA BS as function of serving cell received DTCH levels

In order to further reduce the likelihood of such localized interference events, the measures presented in the following clause may be applied.

B.2 Deployment guidelines to reduce interference

The following measures are applicable by the operator of the interfering radio network (i.e. LA or MR network) in order to reduce the likelihood of interference towards an adjacent band operator:

- Avoid allocating LA, MR Node B carriers at the assigned band edge(s) to another operator whenever possible. This may be possible e.g. at an early UMTS deployment phase, where only part of the assigned band may be required.

- During a later UMTS deployment phase, for the case that an operator wishes to deploy 2 WA carriers and one MR or LA carrier, the latter carrier could be "sandwiched" by the WA carriers.

- Ensure sufficiently large MCL conditions across the planned micro cell (or in-building) coverage area. This can be facilitated by choosing suitable antenna types, heights and locations. Note that obtaining a sufficiently high MCL (including antenna gains) is also desirable for the MR or LA network operator due to the –25 dBm/3.84 MHz maximum input level requirement of the UE [25.101]; hence, the MCL will also depend on the intended maximum Node B TX power setting.

- Match the setting of the maximum Node B TX power for MR or LA operation to the requirements (i.e. CL) of propagation environment at hand, i.e. avoid using substantially more TX power than is required for the micro cell or in-building coverage. DL power planning can be facilitated by adjusting the CPICH TX power in such a way that the received CPICH RSCP (or Ec/Io) across the desired coverage area meets the outage target, but on the other hand, is not unnecessarily high. Scaling the windows of the DTCH DL power allocations accordingly, will then also lead to appropriate DTCH power levels.

- Co-ordination between adjacent frequency operators of output powers, antenna sites, heights, gains and patterns, or even co-location of interfering sites. This would reduce worst case situations where a strong interfering signal is received by an adjacent frequency UE connected to a BS at large coupling loss, and thus under relatively poor radio conditions.

- For temporary effects, and remaining problems a number of additional system functionalities can be used:

- In case that multiple WA carriers may have become available, the use of IFHO for DL interference avoidance may be used. Hence, the UE may be handed over to the 2nd or 3rd adjacent channel, which will reduce or eliminate the interference.

- In case that adjacent channel interference is encountered within a WA cell, proper setting of the DTCH TX power window can provide the UE with additional power to combat interference. Hence, there is possibility for trading off some capacity / throughput for reducing possible DL coverage holes.

- In case that adjacent channel interference is encountered within a WA cell, reduction of the allocated peak data rate (or AMR codec rate) can provide the UE with additional power to combat interference. Hence, there is possibility for trading off peak data rates for reducing possible DL coverage holes.

- For areas where the received Node B DL signals (or representatively the CPICH RSCP's) from the own and adjacent interfering system differ by much more than 40 dB, own system signal strength may be increased by RNP methods. This can be done by means of directing / tilting antennas beams towards the building in question (e.g. in case of interfering LA network) or by building additional sites.

Annex ~~B~~ C(informative): Change history

Table ~~B~~C.1:Document history

Date	Version	Comment
14 Sept 2000	0.0.1	Document created
20 Nov 2000	1.0.0	Update based on TSG RAN WG4 meeting #14 approved input documents R4-000835 and R4-000860
30 Jan 2001	1.0.1	Update based on TSG RAN WG4 meeting #15 approved input documents R4-010080 and R4-010081
06 July 2001	1.1.0	Update based on TSG RAN WG4 meeting#17 approved input documents R4-010597 and R4-010598
30 April 2002	1.2.0	Update based on TSG RAN WG4 meeting#21 approved input document R4-020179
5 Nov 2002	1.3.0	Update based on TSG RAN WG4 meeting#24, approved input documents R4-021073, R4-021376 and R4-021377
14 Nov 2002	1.4.0	Update based on TSG RAN WG4 meeting#25, approved input documents R4-021430, R4-021431, R4-021433, R4-021435, R4-021491, R4-021492, R4-021494 and R4-021635.
20 Jan 2003	1.4.1	3GPP formatting, editorial corrections
26 Feb 2003	1.5.0	Update based on TSG RAN WG4 meeting#26, approved input documents R4-030087, R4-030093, R4-030109, R4-030110, R4-030111, R4-030198, R4-030284, R4-030327 and R4-030328. Also changes according to document R4-030358 included. References to R4-021695 and R4-030350 added.
5 Mar 2003	1.5.1	Definition changes according to document R4-030210 included.
7 March 2003	2.0.0	Editorial corrections for presentation to TSG RAN#19
14 March 2003	6.0.0	Approved at TSG RAN #19

Table ~~B~~C.2: Change history

TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
RAN4#13	R4-000572			Document created		0.0.1
RAN#10	RP-000598			25.951- FDD Base Station Classifications	0.0.1	1.0.0
RAN4#16	R4-010257			TR25.951 v.1.0.1	1.0.0	1.0.1
RAN4#18	R4-010896			The changes agreed in R4#17	1.0.0	1.1.0
RAN4#23	R4-020688			Updated version V1.2.0 of TR 25.951 "FDD BS classification"	1.1.0	1.2.0
RAN4#24	R4-021073			Receiver sensitivity for Micro class BS in FDD mode	1.2.0	1.3.0
RAN4#24	R4-021376			Transmitter characteristics for Micro class BS in FDD mode	1.2.0	1.3.0
RAN4#24	R4-021377			Blocking and ACS requirements for Micro class BS in FDD mode	1.2.0	1.3.0
RAN4#25	R4-021430			Simulation results and scenarios for Medium Range BS in FDD mode	1.3.0	1.4.0
RAN4#25	R4-021431			RRM requirement changes for FDD Base Station Classification	1.3.0	1.4.0
RAN4#25	R4-021433			Dynamic range for Medium Range BS in FDD mode	1.3.0	1.4.0
RAN4#25	R4-021435			Proposal for Medium Range BS class output power	1.3.0	1.4.0
RAN4#25	R4-021491			Transmitter characteristics for FDD Local area BS class.	1.3.0	1.4.0
RAN4#25	R4-021492			Receiver characteristics for FDD Local area BS class.	1.3.0	1.4.0
RAN4#25	R4-021494			Changes in TS25.133 according to FDD Local area BS	1.3.0	1.4.0
RAN4#25	R4-021635			Proposal of maximum output power for Local area BS	1.3.0	1.4.0
RAN4#26	R4-021695			Introduction of Base Station Classes for TS 25.141	1.4.1	1.5.0
RAN4#26	R4-030329			Revised version V1.5.0 of TR 25.951 "FDD BS classification"	1.4.1	1.5.0
RAN4#26	R4-030087			Co-siting requirements for different FDD BS classes	1.4.1	1.5.0
RAN4#26	R4-030093			Maximum output power for Medium Range BS class	1.4.1	1.5.0
RAN4#26	R4-030109			ACLR requirement for FDD Local area BS class	1.4.1	1.5.0
RAN4#26	R4-030110			Maximum output power requirement for FDD Local area BS class	1.4.1	1.5.0
RAN4#26	R4-030111			Simulation results and scenarios for Local area BS in FDD mode	1.4.1	1.5.0
RAN4#26	R4-030198			Maximum output power requirement for FDD Medium range BS class	1.4.1	1.5.0
RAN4#26	R4-030284			Proposal of maximum output power for Local Area BS	1.4.1	1.5.0
RAN4#26	R4-030327			Maximum output power requirement for FDD Medium range BS class	1.4.1	1.5.0
RAN4#26	R4-030328			Maximum output power requirement for FDD Local area BS class	1.4.1	1.5.0
RAN4#26	R4-030350			Maximum output power for different BS classes for TS 25.141	1.4.1	1.5.0
RAN4#26	R4-030358			Maximum output power for different BS classes for TS 25.104	1.4.1	1.5.0
RAN4#26	R4-030210			The definition of BS classes.	1.4.1	1.5.1