TSG-RAN Working Group 4 (Radio) meeting #8 *TSGW4#8(99)647*
Sophia 26th-29th of October 1999

Agenda Item: 8.7

Source: Nokia

Title: Proposal for internal BER calculation verification test

Document for: Approval

---

1. Introduction

Availability of independent test equipment will be one critical part in the beginning of WCDMA life span. Before test equipment which is capable measure BS via standard air interface some kind of test interface/connector is needed between test equipment and BS. To make this kind of test interface/connector as global standard is difficult and takes time. Even though this kind of test interface might be useful we are unsure is it available soon enough for first BS releases. Also many of the network optimization/maintaining tools are traditionally based on internal BER calculations in the 2'nd generation equipment.

Because of these reasons Nokia has proposed that internal BER calculation is accepted in conformance testing as an alternative for external BER calculation. Of course in this case BER calculation correctness need to be verified with separate test. One possible verification test scenario has been proposed in this proposal.

Specification TS25.141 ver. 2.0.2 has been used as base for this proposal.

2. Test proposal

---

7. Receiver characteristics

7.1 General

All tests unless otherwise stated in this subclause shall be conducted on Base Station Systems fitted with a full complement of Transceivers for the configuration. Measurements shall include any RX multicoupler.

The tests in this subclause assume that the receiver is not equipped with diversity. For receivers with diversity, *unless otherwise stated*, ~~the tests may~~ *tests shall* be performed by applying the specified signals to one of the receiver inputs, and terminating or disabling the other(s). The tests and requirements are otherwise unchanged.

~~For receivers with diversity, unless otherwise stated, testing shall be performed by applying the specified signals to one of the receiver inputs, and terminating or disabling the other(s).~~

In all the relevant subclauses in this clause all Bit Error Ratio (BER), Residual BER (RBER) and Frame error rate ~~Frame Erasure Ratio~~ (FER) measurements shall be carried out according to the general rules for statistical testing in annex A.

All tests, unless otherwise stated, in this subclause may be performed using internal BER calculation of the Base Station System after verification test according to 7.9 is passed.

<Definition of test channel is required. They shall be attached in Annex.>

7.9 Verification of the internal BER calculation

7.9.1 Definition and applicability

Base Station System with internal BER calculation can synchronize it's receiver to known pseudo-random data sequence and calculates bit error ratio and frame error ratio from the received data. This test is performed only if Base Station System has this kind of feature. All data rate's which are used in RX conformance testing shall be used in verification test. This test is performed by feeding measurement signal with known BER to the input of the receiver. Locations of the errorneus bits shall be random.

7.9.2 Conformance requirement

BER indicated by the Base Station System shall be within ±[10%] of the BER generated by the RF signal source. Measurement shall be repeated for each measurement signal specified in Table 7.2.1.

Table 7.2.1

Transport channel combination	Data rate	BER
DPCH	12.2 kbps	BER 0.001
TBD	TBD	TBD
…	…	…

7.9.3 Test purpose

To verify that the internal BER calculation accuracy shall meet requirements for conformance testing.

7.9.4 Method of test

7.9.4.1 Initial conditions

(1) Connect BS RX antenna connector to the RF signal source or UE simulator as shown in Figure 7.9.4.1-1.

(2) Set correct signal source parameters as specified in Table 7.2.2.

Table 7.2.1

Parameter	Level/status	Unit
UL signal level	Ref.sens + 10 dB	dBm/3.84 MHz
Data sequence	PN9	

Fig. 7.9.4.1-1. Functional setup for verification of the internal BER calculation

7.9.4.2 Procedure

(1) Measure the BER of received signal from RF signal source or UE simulator to BS antenna connector

(2) BER calculation shall be done at least over 32000 bit's

(3) Repeat test for all required data rate's

7.9.5 Test requirement

BER indicated by the Base Station System shall be within requirement as specified in clause 7.2.2.

3. Conclusion

Verification test for internal BER calculation has been proposed used as an alternative for external BER calculation. This proposal is proposed to be used in TS25.141.