November 30 - December 3, 1999

From:	**RAN WG1**
To:	**RAN WG2, RAN WG4**
Title:	**Response to WG2 LS on GSM measurement abilities for the UE (R1#9(99)i25)**

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RAN WG1 thanks RAN WG2 for the response to the liaison on GSM measurement abilities for the UE [2]. WG1 would like to provide some further information to the subject of reading the BSIC of the GSM frequency that is requested to be measured.

RAN WG2 mentioned, they discussed a proposal that the UTRAN should be able to control whether or not the UE shall read the BSIC of the GSM frequency that is requested to be measured.

First of all, WG1 would like to clarify that there are different kinds of GSM measurements, which are to be distinguished.

The RSSI measurement of a target GSM cell is performed without any BSIC decoding. It only measures the power of a given GSM frequency. This method can help to identify potential handover candidates. However, power measurements alone can not assure the availability of a cell, because the received power could be the superposition from two or more GSM cells and none provides the required SNR. The advantage of the measurement is that it can be scheduled at arbitrary time instances.

There are two possibilities for the GSM cell reconfirmation:

The conventional method for the GSM cell reconfirmation uses the SCH burst. It decodes the BSIC and verifies the integrity of the BSIC and the quality of the received signal by a CRC check. Measurements have to be aligned with the SCH burst transmission in the target cell, which only takes place in five out of 51 GSM frames.

Furthermore WG1 has elaborated an additional method, which performs a SIR measurement on the Normal Burst's training sequence of the BCCH or CCCH. This method avoids BSIC decoding for the GSM cell reconfirmation and therefore yields some advantages, because it allows shorter transmission gaps and a more flexible scheduling. It should be noted, that this method faces some limitations: In can not replace the first BSIC decoding and there is a potential ambiguity at PLMN borders. In uncoordinated deployment adjacent cells from different operators on the same frequencies could use the same training sequence and thus become indistinguishable for the Normal Burst method. Just like inside a PLMN this situation should be avoided, because the channel estimation, which is also based on the training sequence, can not distinguish signals from both cells. This would cause a serious performance degradations. So this may not actually restrict the Normal Burst method in well coordinated networks.

By selecting either SCH or optionally Normal Burst for GSM cell reconfirmation upper layers can adapt the reconfirmation process to the specific needs and thus minimise the impact of compressed mode.

This method using the Normal Burst for the GSM cell reconfirmation was already approved at the TSG RAN WG1#8 meeting in New York as an optional method. But the change was not implemented yet, since the corresponding section A.2.3.4 of TS 25.215 has been deleted in response to the request from WG2 to move it into TS 25.922 - RRM strategies. WG1 kindly asks WG2 to consider these changes for their specifications. Please refer to the Appendix for the text proposal.

References:

[1] TSGR1#7(99)A81; Hannover, Germany; 9-1999; Siemens; Method and Algorithm for the GSM cell reconfirmation
[2] TSGR1#9(99)i25; Dresden, Germany; 11-1999; Response to liaison on GSM measurement abilities for the UE

Appendix: Text proposal for Changes to TS 25.215 V3.0.0

A.2.3.4: Setting of compressed mode parameters ~~for SCH decoding~~ for GSM cell reconfirmation~~BSIC reconfirmation~~ and procedure at the UE

In this paragraph it is assumed that the UE has successfully decoded one SCH burst of a given neighbouring GSM cell during the call.

There are two possible methods for the GSM cell reconfirmation:
- SCH decoding for BSIC reconfirmation
- Using the normal burst of the GSM broadcast and common control channel

When a compressed mode pattern is available, then it is up to the UE to trigger and perform the ~~BSIC~~ GSM cell reconfirmation procedure with the available transmission gaps. In this case, no specific signalling is needed between the UE and the UTRAN for GSM cell~~BSIC~~ reconfirmation procedure.

When no compressed mode pattern is available then it is up to the UE to trigger and perform the GSM cell~~BSIC~~ reconfirmation procedure. In that case, UE indicates to the upper layers the schedule of the SCH burst of that cell~~, and the size of the necessary transmission gap necessary to capture one SCH burst~~. The Network Operator decides the target time for ~~BSIC~~ GSM cell reconfirmation and the upper layers uses this and the schedule indicated by the UE to determine the appropriate compressed mode parameters.

The compressed mode parameters for GSM cell reconfirmation are:~~shall be one of those described in section 8.2.3.3.~~

TGL	SFN	SN	GSM cell reconfirmation method
4	(calculated by UTRAN)	(calculated by UTRAN)	SCH*
3	(calculated by UTRAN)	(calculated by UTRAN)	Normal Burst**

* Note, this TGL is in some special relative timing cases not always sufficient for the SCH method
** Note, this TGL is in some special relative timing cases not always sufficient for the normal burst method