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Source: **NEC, NTT DoCoMo**

Title: **Cell Identification Requirements**

Agenda item: **8.4.2**

Document for: **Discussion & Approval**

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1 Introduction

Discussion on inter-frequency cell identification in Cell_DCH started one year ago in RAN4. The investigations within RAN4 consisted of:

- Ensuring that the UE is able to perform inter-frequency measurements with the gaps patterns specified in TS25.133 and to introduce minimum gap density definition if necessary
  - it was felt acceptable to introduce the minimum gap density in R99
- defining new test cases covering relevant scenarios from a deployment perspective
  - it was agreed that these new test cases could be introduced in Rel-5 onwards

2 Status

2.1 Minimum gap density introduction (R99)

Many studies including simulations results were presented. According to these studies, a minimum gap density of 5% at least was shown as suitable to ensure that the performance requirements would be met by the UEs in most of environment conditions.

Unfortunately, no agreement on the simulation assumptions was reached and thereby no consensus on the minimum gap density values was achieved.

However, the discussions led to two main outcomes:

- A potential CR introducing a minimum gap density around 2% (in R4-030353 RAN4#26)
  - No side condition has been included which makes difficult to understand the applicability of the requirements. Side conditions such as UE drift (ppm), BS drift (ppm), synch power (SCH_Ec/Io, propagation channel and UE speed are not specified.
- The outcome as reflected in Tdoc R4-030333 (RAN4#26)
  - Extract: "*The group also recognised that it may not be possible for UEs to meet the inter-FDD cell identification requirement in some of the newly agreed set of compressed mode pattern configurations, namely in high mobility deployment scenarios where a high TGPL value is configured by the operators. Such configurations lead anyway to extremely long cell identification times.*"

NTT DoCoMo and NEC considers that the potential CR is a first step given the timescale for R99 but that this CR does not ensure the UE can meet the performance requirement in terms of inter-frequency measurements and the network cannot depend on uniform UE behaviour to implement inter-frequency handover for all transmission gap patterns.

2.2 Test case definition (Rel-5)

It was agreed that a set of test cases would be specified to provide coverage for typical deployment scenarios (characterised by at least the Compressed Mode pattern configuration, the channel fading models and the relative frequency/timing drift between different cells).

However it was not clarified:

- whether the core requirements would be corrected accordingly
- whether the UE should base its performances only on the test cases which should however not be usual

3.Conclusion

Considering the limited progress achieved for R99 correction in comparison with the work and time allocated to this issue, it is proposed (1) to concentrate the efforts on Rel-5 and that RAN tasks RAN4 to perform the following actions:

- RAN should comment whether this should be in the core requirements for all scenarios or only specified in terms of specific test conditions ie a particular scenario based on a selected transmission gap pattern
- To define both the minimum gap density values and the associated side conditions for which the inter-frequency cell identification performance requirements have to be met by the UE
- To define test cases based on the revised core requirements (e.g. typical scenarios)

Regarding R99, for consistency reasons, it is proposed that the potential CR (in R4-030353) be modified so that a note clarifies that the side conditions are for further study.