TSG-RAN Meeting #25
Palm Springs, USA, 07-09 April 2004

RP-040332
Agenda item 7.3.5

Source: **TSG-RAN WG2.**

Title: **CRs to 25.304 (Rel-5 and associated Rel-6)**

The following CRs are in RP-040332:

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Workitem	Doc-2nd-Level
25.304	118	-	Rel-5	HCS measurement rules & high-mobility	F	5.5.0	5.6.0	TEI5	R2-041880
25.304	119	-	Rel-6	HCS measurement rules & high-mobility	A	6.2.0	6.3.0	TEI5	R2-041881

CR-Form-v7.1

CHANGE REQUEST

⌘	**25.304** CR **118**	⌘**rev**	**-**	⌘	Current version:	**5.5.0**	⌘

*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 **X** Radio Access Network ☐ Core Network ☐

Title: ⌘	HCS measurement rules & high-mobility	
Source: ⌘	RAN WG2	
Work item code:⌘	TEI5	***Date:*** ⌘ Aug/2004
Category: ⌘	**F**	***Release:*** ⌘ Rel-5

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:
  Ph2 *(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)*
  Rel-7 *(Release 7)*

Reason for change: ⌘	As described in R2-041775, there are inconsistencies in the specification regarding measurements & reselection rules when HCS is in use: 1. There is no clear indication whether threshold based rules are followed in high-mobility. there is no significant benefit between either interpretation, therefore we would only propose clarifying the specification to highlight both interpretations. 2. It is not clear how to prioritise higher priority cells when in high mobility It seems logical to prioritise re-selection of intra-frequency and inter-frequency neighbouring cells on equal HCS priority level as the serving cell before neighbouring cells on higher HCS priority level, and it is proposed to clarify this. 3. There is no clear indication if the UE should still be in high-mobility if the number of reselections exceeds Ncr during Tcrmaxhyst. Reseting of Tcrmaxhyst (section 3): The intention of the specification seems clear that the UE should be kept in high-mobility under the scenario described. We propose to clarify that the UE should only enter low mobility if high mobility is not detected during timer Tcrmaxhyst.
Summary of change:⌘	1. Clarified that threshold based rules maybe used in high-mobility. 2. Clarified to prioritise re-selection of intra-frequency and inter-frequency neighbouring cells on equal HCS priority level as the serving cell before neighbouring cells on higher HCS priority level when in high mobility

state.

3. Clarified the UE should stay be in high-mobility if the number of reselections exceeds Ncr during Tcrmaxhyst.

Implementation of this CR by a R99/Rel-4 UE will not cause any compatibility issues.

Isolated Impact Analysis:
Functionality clarified: Rules for use of HCS.

Isolated impact statement: Clarification and correction to a function where the specification was missing procedural text or rules. Would not affect implementations behaving like indicated in the CR, would affect implementations supporting the corrected functionality otherwise. This CR is limited to the functionality of the UE, and has no impact on the network.

Consequences if not approved:	⌘	The UE behaviour will remain unclear and sub-optimal when HCS is in use, for the cases above illustrated.

Clauses affected:	⌘	5.2.6.1.2

		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.

5.2.6.1.2   Measurement rules for cell re-selection when HCS is used

If the system information broadcast in the serving cell indicates that HCS is used, then for intra-frequency and inter-frequency measurements, the UE shall:

1. For intra-frequency and inter-frequency threshold-based measurement rules

    use Squal for FDD cells and Srxlev for TDD cells for Sx and apply the following rules.

    IF ($Srxlev_s <= Ssearch_{HCS}$) or (if FDD and $S_x <= S_{intersearch}$) THEN

        measure on all intra-frequency and inter-frequency cells. Fast-moving UEs may also use this rule.

    ELSE

        IF ($S_x > S_{intrasearch}$) THEN

            measure on all intra-frequency and inter-frequency cells, which have higher HCS priority level than the serving cell unless measurement rules for fast-moving UEs are triggered

        ELSE

            measure on all intra-frequency and inter-frequency cells, which have equal or higher HCS priority level than the serving cell unless measurement rules for fast-moving UEs are triggered

        ENDIF

    ENDIF

    If HCS is used and if $S_{intrasearch}$ or $S_{searchHCS}$ or $S_{intersearch}$ (in FDD) are not sent for the serving cell, UE shall:

    -   measure on all intra-frequency and inter-frequency cells. Fast-moving UEs may also use this rule.

2. For intra-frequency and inter-frequency measurement rules for fast-moving UEs:

    If the number of cell reselections during time period T_{CRmax} exceeds N_{CR}, high-mobility has been detected. In this high-mobility state, UE shall

        IF the UE is measuring all cells according to the intra-frequency and inter-frequency threshold based measurement rules above THEN

        -   prioritise reselection of intra-frequency and inter-frequency neighbouring cells having lower HCS priority level than the serving cell before neighbouring cells having the same HCS priority level and prioritise neighbouring cells having the same HCS priority before neighbouring cells having higher HCS priority level.

        ELSE

        -   measure intra-frequency and inter-frequency neighbouring cells, which have equal or lower HCS priority than serving cell.

        -   prioritise re-selection of intra-frequency and inter-frequency neighbouring cells on lower HCS priority level than the serving cell before neighbouring cells on same HCS priority level.

        ENDIF

    When the number of cell reselections during time period T_{CRmax} no longer exceeds N_{CR}, UE shall

    -   continue these measurements during time period $T_{CrmaxHyst}$, and

    -   if the criteria for entering high mobility is not detected during time period $T_{CrmaxHyst}$:

        -   revert to measurements according to the threshold based measurement rules.

When serving cell belongs to a hierarchical cell structure, the UE shall follow these rules for Inter-RAT measurements:

1. Inter-RAT threshold-based measurement rules

   use Squal for FDD cells and Srxlev for TDD cells for Sx and apply the following rules.

   IF ($Srxlev_s <= S_{HCS,RATm}$) or (if FDD and $S_{qual} <= S_{SearchRATm}$) THEN

   > UE shall measure on all inter-RATm cells. Fast-moving UEs may also use this rule.

   ELSE

   > IF ($S_x > S_{limit,SearchRATm}$) THEN

   > > UE may choose to not measure neighbouring cells in RAT "m". Inter-RAT measurements that may have been performed shall not be considered in the cell-reselectrion criteria.

   > ELSE

   > > UE shall measure on all neighbouring cells in RAT "m", which have equal or higher HCS priority level than the serving cell unless measurement rules for fast-moving UEs are triggered

   > ENDIF

   ENDIF

   If HCS is used and if $S_{HCS,RATm}$ is not sent for the serving cell, UE shall measure on all inter-RATm cells. Fast-moving UEs may also use this rule.

2. Inter-RAT measurement rules for fast-moving UEs

   - If the number of cell reselections during time period T_{CRmax} exceeds N_{CR}, high-mobility has been detected. In this high-mobility state, UE shall

     - If the UE is measuring neighbouring cells of RAT "m" according to the inter-RAT threshold based measurement rules above THEN

       - prioritise re-selection of neighbouring cells in RAT "m" having lower HCS priority level than the serving cell before neighbouring cells having the same HCS priority level and prioritise neighbouring cells having the same HCS priority before neighbouring cells having higher HCS priority level..

     - ELSE

     - measure the neighbouring cells in RAT "m", which have an equal or lower HCS priority than the serving cell

     - prioritise re-selection of neighbouring cells in RAT "m" on lower HCS priority level than the serving cell before neighbouring cells in RAT "m" on same HCS priority level.

     - END IF

     When the number of cell reselections during time interval T_{CRmax} no longer exceeds N_{CR}, UE shall

     - continue these measurements during time period $T_{CrmaxHyst}$,. and

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       - revert to measure according to the threshold-based measurement rules.

CR-Form-v7.1

CHANGE REQUEST

⌘   **25.304 CR 119**   ⌘**rev**   **-**   ⌘   Current version: **6.2.0** ⌘

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

Title: ⌘	HCS measurement rules & high-mobility

Source: ⌘	RAN WG2

Work item code:⌘	TEI5	**Date:** ⌘ Aug/2004

Category: ⌘	**A**		**Release:** ⌘ Rel-6

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

Other comments:	⌘	This is a shadow of Rel-5 CR 118

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