**3GPP TSG-RAN4 Meeting #102e *R4-2203785***

**Electronic Meeting, 21 February - 3 March, 2022**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **38.133** | **CR** |  | **rev** |  | **Current version:** | **17.4.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

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| ***Title:***  | Draft CR on HO with PSCell for NR SA to EN-DC |
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| ***Source to WG:*** | Apple |
| ***Source to TSG:*** | RAN4 |
|  |  |
| ***Work item code:*** | NR\_RRM\_enh2-Core |  | ***Date:*** | 2022-02-14 |
|  |  |  |  |  |
| ***Category:*** | B |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | Introducing the RRM core requirement of HO with PSCell for NR SA to EN-DC. |
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| ***Summary of change:*** | Introducing the RRM core requirement of HO with PSCell for NR SA to EN-DC. |
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| ***Consequences if not approved:*** | The RRM core requirement of HO with PSCell for NR SA to EN-DC is missing. |
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| ***Clauses affected:*** | Section 6.1.x, 6.1.x.1, 6.1.x.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** | **X** |  |  Test specifications | TS 38.533 |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

Start of Change 1

### 6.1.x NR Handover with PSCell

#### 6.1.x.1 Introduction

The purpose of NR handover with PSCell is to change the NR PCell to another NR cell or E-UTRA cell and add or change the PSCell along with PCell handover. The requirements in this clause are applicable to:

* Handover with PSCell from NR SA to EN-DC
* Handover with PSCell from NR-DC to NR-DC
	+ Requirements in this clause only applies to FR1+FR2 NR-DC
* Handover with PSCell from NE-DC to NE-DC
	+ Requirements in this clause only applies to NE-DC with FR1 PCell

#### 6.1.x.2 Handover with PSCell from NR SA to EN-DC

The requirements in this clause are applicable to inter-RAT handover from NR to E-UTRAN and FR1/FR2 PSCell addition.

When the UE receives a RRC message implying handover with PSCell, the UE shall be ready to start the transmission of the new uplink PRACH channel on target E-UTRA PCell within DHOwithPSCell\_PCell msec from the end of the last TTI containing the RRC command, and the UE shall be ready to start the transmission of the new uplink PRACH channel on target PSCell within DHOwithPSCell\_PSCell msec from the end of the last TTI containing the RRC command.

Where:

DHOwithPSCell\_PCell equals the applicable RRC procedure delay (i.e., 50ms) plus the interruption time stated in clause 6.1.x.2.1.

DHOwithPSCell\_PSCell equals the PSCell addition delay stated in clause 6.1.x.2.2.

##### 6.1.x.2.1 Interruption time for inter-RAT HO from NR to E-UTRAN

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay

When handover with PSCell from NR SA to EN-DC is commanded, the interruption time shall be less than Tinterrupt

 Tinterrupt = Tsearch\_HO + TIU + Tprocessing

Where:

Tsearch\_HO is same as the Tsearch defined in section 6.1.2.1.3.

TIU is same as the one defined in section 6.1.2.1.3.

Tprocessing is the SW processing time needed by UE, including RF warm up period. When target PSCell is unknown and SMTC configuration of target unknown PSCell is present in *RRCConnectionReconfiguration* [2], Tprocessing = [FFS] ms if new PSCell is in FR1, Tprocessing = [FFS] ms if new PSCell is in FR2; otherwise, Tprocessing = [FFS] ms if new PSCell is in FR1, Tprocessing = [FFS] ms if new PSCell is in FR2.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant E-UTRA cell identification requirements are described in clause 9.4.1.

##### 6.1.x.2.2 PSCell addition in HO with PSCell for NR SA to EN-DC

The requirements in this section shall apply for PSCell addition during handover with PSCell from NR SA to EN-DC.

When handover with PSCell from NR SA to EN-DC is commanded, the PSCell addition time shall be less than DHOwithPSCell\_PSCell:

DHOwithPSCell\_PSCell = TRRC\_delay + Tprocessing + Tsearch\_HO + Tsearch\_PSCell + T∆ + TPSCell\_ DU + 2 ms

Where:

TRRC\_delay is the RRC procedure delay. TRRC\_delay = 50ms.

Tprocessing is as defined in section 6.1.x.2.1.

Tsearch\_HO is as defined in section 6.1.x.2.1.

Tsearch\_PSCell is same as Tsearch in section 7.31.2 of TS36.133[15], and T∆ and TPSCell\_ DU is same as the one defined in section 7.31.2 of TS36.133[15]. The Trs definition from section 7.31.2 of TS36.133[15] is modified as following for requirement in this section:

Trs is the SMTC periodicity of the target NR cell if target PSCell is unknown and SMTC configuration of target unknown PSCell is present in *RRCConnectionReconfiguration* [2], otherwise Trs is the SMTC configured in the measObjectNR having the same SSB frequency and subcarrier spacing. If the UE is not provided SMTC configuration or measurement object on this frequency, the requirement in this section is applied with Trs = 5 ms assuming the SSB transmission periodicity is 5 ms. There is no requirement if the SSB transmission periodicity is not 5 ms.

PSCell known and unknown condition is as defined in section 7.31.2 of TS36.133[15].

End of Change 1