3GPP TSG-RAN WG4 Meeting #109 R4-23xxxx

Chicago, US, November 13 – 17, 2023

**Agenda item:** 8.8.6

**Source:** Moderator (OPPO)

**Title:** Topic summary for [109][209] NR\_RRM\_enh3\_part2

**Document for:** Information

# Introduction

*Briefly introduce background, the scope of this summary (e.g. list of treated agenda items).*

This summary includes RRM Core requirements and performance requirements for FR1-FR1 NR-DC (8.8.3 and 8.8.5).

* Topic #1: RRM Core requirements for FR1-FR1 NR-DC
  + Issue 1-1: Side condition for RACH-less SCG activation/deactivation
  + Issue 1-2: Tsearch requirement for RACH-less PSCell activation
  + Issue 2-1: Tsearch for RACH-based PSCell activation
* Topic #2: RRM performance requirements for FR1-FR1 NR-DC

# Topic #1: RRM Core requirements for FR1-FR1 NR-DC

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2318650**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2318650.zip) | Apple | ***Proposal 1: keep the legacy side condition for Tsearch.*** ***Further discuss the issue in R17 maintenance part, the agreement in R17 (if any) can be reused for R18 in maintenance stage.***  ***Proposal 2: not necessary to change the RACH-less PSCell activation requirement in endorsed CR*** ***R4-2310080. And instead of changing the core requirement, we can compromise to verify UE behavior in certain test environment to avoid UE to fallback to RACH based activation.***  ***Proposal 3: No need to introduce dedicated UE capability to indicate supporting FR1+FR1 NR-DC RRM.***   * ***as long as UE supports band combination of FR1-FR1 NR-DC, UE is required to meet the corresponding RRM requirement of FR1-FR1 NR-DC from Rel-18.*** |
| [**R4-2319470**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319470.zip) | OPPO | **Proposal 1: For RACH-less PSCell activation, keep side condition#1 (known PScell) and side condition#3 (UE is configured with bfd-and-RLM with value true and without detecting RLF or BFD) for Tsearch requirement definition.**   * ***For RACH-less based PSCell activation, if RLM and BFD are configured and TCI state is known, Tsearch = 0 ms if the target cell is a known FR2 or FR1 PScell. There are no requirements if PSCell is unknown.***   **Proposal 2: Further discuss the test case to verify the procedure to RACH-based and RACH-less SCG activation in RRM performance part.** |
| [**R4-2319471**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319471.zip) | OPPO | Formal Big CR for R18 RRM enhancement - FR1+FR1 NR-DC |
| [**R4-2320472**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320472.zip) | Nokia, Nokia Shanghai Bell | General aspects related known and unknown PSCell:   1. RAN4 conditions currently defined for RACH-less access breaks the defined RAN2 procedures. 2. Update the known condition for the deactivated PSCell. 3. The known condition for deactivated FR2 PSCell are updated as below:   In FR1 and FR2, the PSCell is known if it has been meeting the following conditions:  **-** ~~During the last 5 seconds before the~~ **Upon reception of the SCG activation command:**  **- the UE has sent a valid measurement report for the PSCell being activated and**  **- One of the SSBs measured from the PSCell being activated remains detectable according to the cell identification conditions specified in clause 9.3.**  **- One of the SSBs measured from PSCell being activated also remains detectable during the PSCell activation delay Tactivation\_time according to the cell identification conditions specified in clause 9.3.**  Tsearch for RACH-less and RACH-based PSCell activation:   1. When ‘*bdf-and-RLM*’ with value ‘*true*’ is configured for the deactivated PSCell the UE shall perform BFD and RLM on the deactivated PSCell. 2. Evaluation of RLM and BFD on a deactivated PSCell requires the UE to measure the deactivated PSCell regularly to evaluate the downlink radio link quality. 3. If link problems have not been detected the link is currently regarded good enough for continuing the operation in the cell. 4. When UE is configured with *bfd-and-RLM* and has not detected either beam failure or RLF on the deactivated PSCell, there is no need for additional measurements at PSCell activation. 5. A UE which has not detected either BFD or RLF on the deactivated PSCell, need no additional measurements at PSCell activation (Tsearch = 0ms). 6. A UE which has detected either BFD or RLF on the deactivated PSCell is allowed additional measurements at PSCell activation (Tsearch = [TBD]ms). 7. For RACH based PSCell activation, RAN4 need to reconsider *Tsearch = 3\* Trs ms* for an unknown PSCell being activated with ‘*bdf-and-RLM*’ with value ‘*true*’, accounting for the RLM or BFD status upon activation. 8. For RACH-less based PSCell activation, conditions for when Tsearch = 0 ms needs to be reconsidered. 9. For RACH-less based PSCell activation, the UE behavior when the PSCell is unknown would need to be clarified.   Tsearch in RACH-less based PSCell activation delay:   1. Define RACH-less based PSCell activation delay such that it is not conditioned on the when the last valid measurement report was sent. 2. For the RACH-less based PSCell activation the condition when Tsearch = 0ms applies while the TCI state is known.   Based on this we propose to update the RACH-less based PSCell activation as follows, if the proposed changes in proposal 2 for known PSCell conditions are not updated:   1. For RACH-less based PSCell activation, if *bfd-and-RLM* is configured with value true and TCI state is known, Tsearch = 0 ms or if the PSCell is a known FR1 PScell, Tsearch = 0 ms. Otherwise, there are no requirements.   Otherwise, if the proposed known PSCell conditions as proposed in proposal 2 are agreeable, the current conditions of Tsearch for RACH-less access need no changes.  Tsearch in RACH-based PSCell activation delay:   1. For RACH based PSCell activation, if the target cell is a known NR FR1 PSCell, Tsearch = 0 ms. If the target cell is an unknown FR1 PSCell configured with bfd-and-RLM with value true and no RLM has occurred, then Tsearch = [1]\* Trs ms, otherwise if Es/Iot ≥ -2 dB, then Tsearch = 3\* Trs ms.   PSCell activation delay and PSCell DRX:   1. UE shall start monitoring PDCCH on the activated PSCell immediately after the SCG activation delay. |
| [**R4-2320473**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320473.zip) | Nokia, Nokia Shanghai Bell | Draft CR on SCG activation delay for FR1+FR1 NR-DC |
| [**R4-2320625**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320625.zip) | Ericsson | [Proposal 1: Remove the 5 seconds time constraint for the known/unkown side conditions](#_Toc148609540)  [Proposal 2: Update the current FR1-FR2 NR-DC SCG activation test case A.7.5.15 to garantee the UE performance.](#_Toc148609541) |

*The moderator can suggest a limited number of papers which could be presented.*

## Open issues summary

*Before f2f meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 1: RACH-less basd SCG activation requirements for FR1-FR1 NR-DC

*Sub-topic description*

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| **Previous agreements on requirements for RACH-less SCG activation (Tsearch)**   * + Define requiremets for cases when     - 4) Target PSCell is known and TCI is known   + Do not define requirements for other cases     - 1) Target PSCell is unknown but TCI is known     - 2) Target PSCell is unknown and TCI is unknown     - 3) Target PSCell is known but TCI is unknown   + No requirement shall be defined for this case when UE detected either BFD or RLF on the deactivated PSCell during RACH-less SCG activation.     - Do not specify UE behavior in RAN4 specifications |

#### **Issue 1-1: Side condition for RACH-less SCG activation/deactivation**

Proposal:

* Option 1 (Apple, OPPO): keep the legacy side condition for Tsearch. Further discuss the issue in R17 maintenance part, the agreement in R17 (if any) can be reused for R18 in maintenance stage.
* Option 2 (Ericsson, Nokia): Remove the 5 seconds time constraint for the known/unkown side conditions

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| **In FR1 and FR2, the PSCell is known if it has been meeting the following conditions:**  **-** ~~During the last 5 seconds before the~~ **Upon reception of the SCG activation command:**  **- the UE has sent a valid measurement report for the PSCell being activated and**  **- One of the SSBs measured from the PSCell being activated remains detectable according to the cell identification conditions specified in clause 9.3.**  **- One of the SSBs measured from PSCell being activated also remains detectable during the PSCell activation delay Tactivation\_time according to the cell identification conditions specified in clause 9.3.** |

Recommended WF:

* Can we compromise to option 1?
* If no consensus in this meeting, suggest to follow R17 requirements.

#### **Issue 1-2: Tsearch requirement for RACH-less PSCell activation**

Proposals:

* Option 1(Apple, OPPO): For RACH-less based PSCell activation, if RLM and BFD are configured and TCI state is known, Tsearch = 0 ms if the target cell is a known PSCell. There are no requirements if PSCell is unknown.
  + Option 1a (Apple): Instead of changing the core requirement, verify UE behavior in certain test environment to avoid UE to fallback to RACH based activation.
  + Option 1b (Ericsson): Update the current FR1-FR2 NR-DC SCG activation test case A.7.5.15 to garantee the UE performance.
  + Option 1c (OPPO): Further discuss the test case to verify the procedure to RACH-based and RACH-less SCG activation in RRM performance part.
* Option 2 (Nokia): For RACH-less based PSCell activation, if *bfd-and-RLM* is configured with value true and TCI state is known, Tsearch = 0 ms or if the PSCell is a known FR1 PScell, Tsearch = 0 ms. Otherwise, there are no requirements.

Recommended WF:

* Suggest to keep previous agreement that RAN4 only define requirements for cases when Target PSCell is known and TCI is known. RAN4 not to specify UE behaviour and requirements for unknown PScell.
* If needed, Nokia’s paper R4-2320472 is suggested for online discussion
  + One issue identified is that the current RAN4 known conditions breaks the feature for RACH-less activation as defined in RAN2.
  + Another issue identified is the condition which states that the PSCell being known, depends on a fixed time since an L3 measurement report was sent.



### Sub-topic 2: RACH-based basd SCG activation requirements for FR1-FR1 NR-DC

#### **Issue 2-1: Tsearch for RACH-based PSCell activation**

Proposals:

* Option 1(Apple, OPPO): Not necessary to change the RACH based PSCell activation requirement in agreed CR R4-2310080, i.e.,

If the target cell is an unknown FR2 PSCell and Es/Iot ≥ -2 dB, then Tsearch = 24\* Trs ms. If the target cell is an unknown FR1 PSCell and Es/Iot ≥ -2 dB, then Tsearch =3\* Trs ms.

* Option 2 (Nokia):

For RACH based PSCell activation, if the target cell is a known NR FR1 PSCell, Tsearch = 0 ms. If the target cell is an unknown FR1 PSCell configured with bfd-and-RLM with value true and no RLM has occurred, then Tsearch = [1]\* Trs ms, otherwise if Es/Iot ≥ -2 dB, then Tsearch = 3\* Trs ms.

Recommended WF

* Can we keep original agreements? Option 1 is recommended.

### Sub-topic 3: UE capability and release independence

**Issue 3-1: Whether to introduce UE capability to indicate supporting FR1+FR1 NR-DC RRM**

Proposals:

* Option 1 (OPPO): No need to introduce additional UE feature for FR1-FR1 NRDC in R18.
* Option 1a (Apple): No need to introduce dedicated UE capability to indicate supporting FR1+FR1 NR-DC RRM.
  + as long as UE supports band combination of FR1-FR1 NR-DC, UE is required to meet the corresponding RRM requirement of FR1-FR1 NR-DC from Rel-18.

Recommended WF

* Option 1/1a is recommended.

**Issue 3-2: Release independence**

Proposals:

* Option 1: RRM requirements for FR1-FR1 NRDC defined in R18 eFeRRM WI can be release independent from R16.

Recommended WF

* Option 1/1a is recommended.

# Topic #2: RRM performance requirements for FR1-FR1 NR-DC

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

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| [**R4-2319066**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319066.zip) | vivo | **Proposal 1: RAN4 to define the test cases for PSCell addition/release in FR1-FR1 NR-DC as below:**   * **TC1: PSCell addition and release delay of unknown NR PSCell in FR1**   **Proposal 2: RAN4 to define the test case for conditional PSCell addition/release in FR1-FR1 NR-DC as below:**   * **TC1: Conditional PSCell addition and release delay of NR PSCell in FR1(without SSB index measurement)**   **Proposal 3: RAN4 to define the test case for Handover with PSCell change in FR1-FR1 NR-DC as below. Specifically, add the TC2 and TC3 to list of tests in TS 38.133 clause A.3.13A if there are still testability issues after assessment.**   * **TC1: Handover with PSCell change with parallel processing from FR1-FR1 NR-DC to FR1-FR1 NR-DC** * **TC2: Handover with PSCell change with sequential processing in FR1-FR1 NR-DC to FR1-FR2 NR-DC** * **TC3: Handover with PSCell change with parallel processing in FR1-FR2 NR-DC to FR1-FR1 NR-DC**   **Proposal 4: RAN4 to define the test case for PSCell activation and deactivation delay in FR1-FR1 NR-DC as below. The test configuration on RACH-less based SCG activation in R17 can be the baseline.**   * **TC1: RACH-less based PSCell activation and deactivation delay in FR1-FR1 NR-DC**   **Proposal 5: As there is no test case on RACH-based PSCell activation for FR1-FR2 NR-DC specified in R17, RAN4 not to define test case on RACH-based PSCell activation for FR1-FR1 NR-DC in R18** |
| [**R4-2319473**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2319473.zip) | OPPO | **Proposal 1: RAN4 not to define the test case for conditional PSCell addition/release in FR1-FR1 NR-DC.**  **Proposal 2: RAN4 to define TC for PSCell addition and release delay of known FR1 PSCell, and TC for PSCell addition and release delay of unknown FR1 PSCell.**  **Proposal 3: For test cases of HO with PScell, RAN4 to define either parallel processing or sequential processing for each case of HO with PSCell.**  **Proposal 4: OK to introduce one TC to cover both RACH-based and RACH-less based PSCell activation/deactivation.**  **Proposal 5: Encourage companies to agree on the TC list and volunteer to CR slitting in RAN4#109 meeting.**   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **TC#** | **The RRM requirement for test case** | **Support to define** | **Detailed Scope** | **Volunteer Company** | | TC1 | HO with PSCell from FR1-FR1 NR-DC to FR1-FR1 NR-DC | YES | TC 1: with parallel processing  TC 2: with sequential processing  TC 3: with sequential processing | TBA | | TC2 | HO with PSCell from FR1-FR1 NR-DC to FR1-FR2 NR-DC | YES | TBA | | TC3 | HO with PSCell from FR1-FR2 NR-DC to FR1-FR1 NR-DC | YES | TBA | | TC4 | PSCell addition and release delay of known FR1 PSCell | YES |  | TBA | | TC5 | PSCell addition and release delay of unknown FR1 PSCell | YES | TBA | | TC6 | PSCell activation and deactivation for FR1+FR1 NR-DC | YES | FFS: Test both RACH-based and RACH-less based PSCell activation/deactivation in one TC to verify the related core requirements.  1) RACH-based unknown PScell activation  2) deactivation of PScell,  3) RACH-less based known PScell | TBA | |
| [**R4-2320474**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320474.zip) | Nokia, Nokia Shanghai Bell | 1. TC2 for HO with PSCell (FR1-FR1 NR-DC to FR1-FR2 NR-DC) will have the testability issue of FR1+FR2 test. 2. There is no difference from core requirements of view for TC2 for HO with PSCell (FR1-FR1 NR-DC to FR1-FR2 NR-DC) and TC3 (FR1-FR2 NR-DC to FR1-FR1 NR-DC). 3. The test cases for HO with PSCell in FR1+FR1 NR-DC could be defined TC1 (FR1-FR1 NR-DC to FR1-FR1 NR-DC) and TC3 (FR1-FR2 NR-DC to FR1-FR1 NR-DC). 4. TC4 for known PSCell addition/release delay in FR1-FR1 NR-DC would be the similar as existing known FR1 PSCell addition in EN-DC in section A.4.5.7. 5. No need to introduce TC4 for known PSCell addition/release delay in FR1-FR1 NR-DC, TC5 for unknown PSCell addition/release delay in FR1-FR1 NR-DC is needed. 6. Define test case for a detectable target PSCell for conditional PSCell addition requirements in FR1-FR1 NR-DC 7. Define one test case to cover both RACH based and RACH-less based SCG activation in FR1-FR1 NR-DC |
| [**R4-2320624**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320624.zip) | Ericsson | Proposal 1: For HO with Pscell, the 3 listed TC1,TC2 and TC3 shall be included in the test case coverage as they are garantee different performance for different scneario.  Proposal 2: Update the current FR1-FR2 NR-DC SCG activation test case A.7.5.15 to garantee both RACH based and RACH-less SCG activation performance |
| [**R4-2320879**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_109/Docs/R4-2320879.zip) | Qualcomm Incorporated | **Observation**: Since RAN4 already introduced TC for conditional PSCell addition/release or PSCell activation in EN-DC, and the requirements are applicable for both EN-DC and NR-DC. Therefore, it is verified in existing test case and RAN4 does not need to introduce same test for FR1-FR1 NR-DC.  **Proposal: RAN4 does not need to define the test case for conditional PScell addition/release and PSCell activation in FR1-FR1 NR-DC.**  **Proposal: RAN4 introduce “TC1: HO with PSCell from FR1-FR1 NR-DC to FR1-FR1 NR-DC with parallel processing”** |

*The moderator suggest to present R4-2316164 on work pan and work splitting of Performance part.*

## Open issues summary

*Before f2f meeting, moderators shall summarize list of open issues, candidate options and possible WF (if applicable) based on companies’ contributions.*

### Sub-topic 3: Test case design

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| **Issue 2-2: General of test case design for requirements for FR1-FR1 NR-DC** **Agreements:**   * Proposal 1: As there are no CPC tests cases from R16 and R17 in FR1-FR2 NR-DC, RAN4 not to define inter-frequency and intra-frequency CPC test cases for FR1-FR1 NR-DC in R18.   **FFS:**   * FFS: RAN4 to define the test case for conditional PSCell addition/release in FR1-FR1 NR-DC * FFS: Choose one of the parallel processing and sequential processing for each case of HO with PSCell to reduce the number of test cases, e.g.,   + TC1: HO with PSCell from FR1-FR1 NR-DC to FR1-FR1 NR-DC with parallel processing   + TC2: HO with PSCell from FR1-FR1 NR-DC to FR1-FR2 NR-DC with sequential processing   + TC3: HO with PSCell from FR1-FR2 NR-DC to FR1-FR1 NR-DC with parallel processing * FFS: RAN4 to define test case for RACH-based PSCell activation for FR1-FR1 NR-DC |

#### **Issue 3-1: Whether to define the test case for conditional PSCell addition/release in FR1-FR1 NR-DC**

Proposals:

* Option 1(vivo, OPPO, Qualcomm): No
  + Option 1a (Qualcomm): Since RAN4 already introduced TC for conditional PSCell addition/release or PSCell activation in EN-DC, and the requirements are applicable for both EN-DC and NR-DC. Therefore, it is verified in existing test case and RAN4 does not need to introduce same test for FR1-FR1 NR-DC.
* Option 2: YES
  + Option 2a (vivo): TC1: Conditional PSCell addition and release delay of NR PSCell in FR1(without SSB index measurement)
  + Option 2b (Nokia): Define test case for a detectable target PSCell for conditional PSCell addition requirements in FR1-FR1 NR-DC

Recommended WF

* Need discussion

#### **Issue 3-2: Whether to define the test case for PSCell addition/release in FR1-FR1 NR-DC**

Proposals:

* Option 1: Two TCs, TC1 for PSCell addition and release delay of **known** FR1 PSCell, and TC2 for PSCell addition and release delay of **unknown** FR1 PSCell.
* Option 2: one TC for PSCell addition and release delay of **unknown** NR PSCell in FR1

Recommended WF

* Issue 3-2 can be discussed jointly with issue 3-1.
* It seems that components for option 1 with two TCs do not support test case for CPA in issue 3-1 , while the components for option 2 with one TC support one test case for CPA. The total number of test cases for PSCell addition/release and conditional PSCell addition/release are the same.

#### **Issue 3-3: How to define the test case for Handover with PSCell change in FR1-FR1 NR-DC**

Proposals:

* Option 1 (OPPO, vivo, Ericsson): Define 3 test cases
  + TC1: Handover with PSCell change with parallel processing from FR1-FR1 NR-DC to FR1-FR1 NR-DC
  + TC2: Handover with PSCell change with sequential processing in FR1-FR1 NR-DC to FR1-FR2 NR-DC
  + TC3: Handover with PSCell change with parallel processing in FR1-FR2 NR-DC to FR1-FR1 NR-DC
  + Option 1a (vivo): add the TC2 and TC3 to list of tests in TS 38.133 clause A.3.13A if there are still testability issues after assessment.
  + Option 1b (OPPO): RAN4 to define either parallel processing or sequential processing for each case of HO with PSCell.
* Option 2 (Nokia): Define 2 test cases
  + TC1 (FR1-FR1 NR-DC to FR1-FR1 NR-DC) and
  + TC3 (FR1-FR2 NR-DC to FR1-FR1 NR-DC)

as TC2 (FR1-FR1 NR-DC to FR1-FR2 NR-DC) has the testability issue of FR1+FR2 test, and TC2 and TC3 are similar.

* Option 3 (Qualcomm): Define 1 test case
  + TC1: HO with PSCell from FR1-FR1 NR-DC to FR1-FR1 NR-DC with parallel processing

Recommended WF

* Need discussion

#### **Issue 3-4: How to define the test case for PSCell activation and deactivation delay in FR1-FR1 NR-DC**

Proposals:

* Option 1(vivo): The test configuration on RACH-less based SCG activation in R17 can be the baseline. RAN4 not to define test case on RACH-based PSCell activation for FR1-FR1 NR-DC in R18
* Option 2 (Nokia, OPPO): one TC to cover both RACH-based and RACH-less based PSCell activation/deactivation in FR1-FR1 NR-DC
  + Option 2a (Ericsson): Update the current FR1-FR2 NR-DC SCG activation test case A.7.5.15 to guarantee both RACH based and RACH-less SCG activation performance

Recommended WF

* Focus on FR1-FR1 NR-DC firstly
* After the complete of test case for PSCell activation and deactivation delay in FR1-FR1 NR-DC，RAN4 can further check whether to reuse for FR1-FR2

#### **Issue 3-5: Work splitting for RRM performance part of FR1-FR1 NR-DC**

Proposal: Encourage companies to agree on the TC list and volunteer to CR slitting in RAN4#109 meeting.

(based on the test list in WF of last meeting)

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| TC# | The RRM requirement for test case | This TC is needed | Support to define | Detailed Scope | Volunteer Company |
| TC1 | HO with PSCell from FR1-FR1 NR-DC to FR1-FR1 NR-DC | Huawei, vivo, Ericsson, OPPO, Nokia |  | FFS: only consider one of parallel processing and sequential processing for test cases of HO with PSCell to reduce the number of test cases.  FFS: for TC2, considering the testability issue discussed in maintenance part, this test case may not be tested |  |
| TC2 | HO with PSCell from FR1-FR1 NR-DC to FR1-FR2 NR-DC | Huawei, vivo, Ericsson, OPPO, Nokia |  |  |
| TC3 | HO with PSCell from FR1-FR2 NR-DC to FR1-FR1 NR-DC | Huawei, vivo, Ericsson, OPPO, Nokia |  |  |
| TC4 | PSCell addition and release delay of known FR1 PSCell | Huawei, vivo, Ericsson, OPPO |  | FFS: Whether to only define the case of unknown FR1 PSCell  FFS: Regarding FR1 known PSCell addition TC in EN-DC, only consider on unknown FR1 PSCell addition for FR1-FR1 NR-DC |  |
| TC5 | PSCell addition and release delay of unknown FR1 PSCell | Huawei, vivo, Ericsson, OPPO, Nokia |  |  |
| TC6 | PSCell activation and deactivation for FR1+FR1 NR-DC | Huawei, vivo, Ericsson, OPPO, Nokia |  | FFS: define both RACH-based and RACH-less based PSCell activation/deactivation in one TC |  |
| [TC7] | Conditional PSCell addition and release delay of NR PSCell in FR1 | Vivo, Nokia |  | FFS: Conditional PSCell addition and release delay of NR PSCell in FR1(without SSB index measurement) |  |

Recommended WF

Discuss and agree on the TC list and work splitting.