**3GPP TSG-RAN WG4 Meeting # 98-e-Bis R4-210XXXX**

**Electronic Meeting, 25 Jan – 05 Feb, 2021**

**Agenda item:** 7.5.2.2, 7.5.3.2

**Source:** Moderator (Ericsson)

**Title:** Email discussion summary for [98e][211] LTE\_NR\_DC\_CA\_RRM\_2

**Document for:** Information

# Introduction

This email discussion is intended to cover the following topics

* + 7.5.2.2 Efficient and low latency serving cell configuration, activation and setup [LTE\_NR\_DC\_CA\_enh-Core]
  + 7.5.3.2 Efficient and low latency serving cell configuration, activation and setup [LTE\_NR\_DC\_CA\_enh-Perf]
    - 7.5.3.2.1 Test cases for direct SCell activation
    - 7.5.3.2.2 Test case for SCell Dormancy

The following issues are to be discussed starting from first round:

* Topic #1: Core requirement maintenance
  + Sub-topic 1-1: Maintenance for Direct SCell activation core requirements
    - Issue 1-1-1: Measurement periodicity in SCell activation requirement for known SCell case
    - Issue 1-1-2: TCI state activation for direct SCell activation
  + Sub-topic 1-2: Maintenance for SCell dormancy core requirements
    - Issue 1-2-1: Incremental delay D’ for SCell dormancy switching on multiple CCs
    - Issue 1-2-2: Incremental delay D’ and number of CCs for SCell dormancy switching
* Topic #2: Test cases for Direct SCell activation
  + Sub-topic 2-1: Test cases for direct SCell activation
    - Issue 2-1-1: Whether to test for delay and interruption at direct SCell activation
* Topic #3: Test cases for SCell dormancy
  + Sub-topic 3-1: Test cases for SCell dormancy
    - Issue 3-1-1: Pre-defined CSI-RS configuration for sparse CSI measurements
    - Issue 3-1-2: Pre-defined Dormant BWP configuration
    - Issue 3-1-3: Whether to only test switching from dormancy to non-dormancy
    - Issue 3-1-4: Whether to specify DCI formats to use in tests for triggering during active time
    - Issue 3-1-5: Value for ps-Offset in test for triggering outside active time
    - Issue 3-1-6: Common test framework

Additionally, companies are encouraged to discuss and align draft test cases starting from first round.

* See clause 2.3.1 for test case drafts for Direct SCell activation
* See clause 3.3.1 for test case drafts for SCell dormancy

Please note the following guideline from «RAN4#98-e E-meeting Arrangements and Guidelines» on reducing length of file name for email discussion documents.

* Length of file names shall be reduced, e.g.​
* At the beginning of first round, moderators share / ftp / tsg\_ran / WG4\_Radio / TSGR4\_98\_e / Inbox / Drafts / [98e][101] NR\_NewRAT\_SysParameters\Summary\_101\_1st round\_v01.docx​
* After update by company A: Summary\_101\_1st round\_v02\_companyA​
* After update by company B: Summary\_101\_1st round\_v03\_companyA\_companyB​
* After update by company C: Summary\_101\_1st round\_v04\_companyB\_companyC​

# Topic #1: Core requirement maintenance

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

Agenda Item 7.5.2.2 Efficient and low latency serving cell configuration, activation and setup [LTE\_NR\_DC\_CA\_enh-Core]

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2100227**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100227.zip) | Apple | «Activation time in direct SCell activation»  **Observation 1:** measCycleSCell is no longer suitable as a condition to differentiate activation delay requirements for direct SCell activation.  **Proposal 1: u**pdate Tactivation\_time for known SCell in FR1:  If the SCell is known and belongs to FR1, Tactivation\_time is:   * + TFirstSSB+ 5ms, if the Tsample\_interval is equal to or smaller than 160ms.   + TFirstSSB\_MAX + Trs + 5ms, if the Tsample\_interval is larger than 160ms.   Where Tsample\_interval is defined as:   * + If no DRX is configured or DRX cycle>320ms, Tsample\_interval = Max(MGRP, SMTC period, DRX cycle) × CSSFinter   + Otherwise, Tsample\_interval = 1.5 × Max(MGRP, SMTC period, DRX cycle) × CSSFinter |
| [**R4-2100228**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100228.zip) | Apple | «CR on activation time in direct SCell activation» |
| R4-2101012 | Apple | «CR on activation time in direct SCell activation (R17)» (Rel-17 Cat A) |
| [**R4-2101212**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101212.zip) | MediaTek Inc. | «Discussion on direct Scell activation and dormancy Scell»  **Observation 1:** For UE who report D’ = 800us or 1000us, the maximum number of SCells for simultaneous dormant BWP switching using PCell scheduling DCI could be only 2 or 3  **Proposal 1:** RAN4 to correct the direct SCell activation time for the cases that TCI state is still needed  **Proposal 2:** Introduce a new UE capability for the incremental delay for BWP switch processing on additional CCs for dormancy indication involving BWP switching on multiple CCs. The candidate values for the incremental delay D’ are:   * + D’ = 100us or 200us for UE indicating type1 in bwp-SwitchingDelay   + D’ = 200us or 400us for UE indicating type2 in bwp-SwitchingDelay |
| [**R4-2101213**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101213.zip) | MediaTek Inc. | «CR on TS38.133 for direct Scell activation» |
| R4-2101214 | MediaTek Inc. | «CR on TS38.133 for direct Scell activation» (Rel-17 Cat A) |
| [**R4-2101377**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101377.zip) | vivo | «Remaining issues for Scell dormancy RRM requirements»  **Observation 1:** The mechanism for triggering switching of multiple SCells between dormancy where cross carrier scheduling is used and non-dormancy and simultaneously BWP switch over multiple CCs are different.  **Observation 2:** Currently definition D have a good coverage and provide enough flexibility for implementation. Further optimization on D’ to address the different triggering mechanism is possible however we believe the benefit in practice is limited  **Proposal 1:** The value set of D’ is a subset of D.  **Proposal 2:** For the type 1, D’ is {100us, 200us} and for type 2, D’ is {200us, 400us, 800us} |
| [**R4-2101388**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101388.zip) | vivo | «CR for adding capability D’ for SCell dormancy BWP switch requirement» |
| [**R4-2101389**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101389.zip) | vivo | «CR for adding capability D’ for SCell dormancy BWP switch requirement» (Rel-17 Cat A) |
| [**R4-2102254**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102254.zip) | Nokia, Nokia Shanghai Bell | «CR clarifying the UE measurement requirements for an SCell with dormant BWP» |
| R4-2102255 | Nokia, Nokia Shanghai Bell | «CR clarifying the UE measurement requirements for an SCell with dormant BWP» (Rel-17 Cat A) |
| [**R4-2102256**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102256.zip) | Nokia, Nokia Shanghai Bell | «Discussion related to multiple SCell dormancy BWP switch»  **Proposal 1:** Remove 800us and 1000us from the capability of incremental delay for each additional CC involved in DCI-based simultaneous multiple BWP switch for type 2 UE.  **Proposal 2:** A Type 2 UE with D3, D4 and D5 delay capability which indicate support of this feature is only applicable for a maximum number of supported CCs for 120KHz SCS. |
| [**R4-2102257**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102257.zip) | Nokia, Nokia Shanghai Bell | «Correction to simultaneous DCI based BWP switch delay on multiple CCs» |
| R4-2102258 | Nokia, Nokia Shanghai Bell | «Correction to simultaneous DCI based BWP switch delay on multiple CCs» |
| [**R4-2102351**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102351.zip) | Ericsson | «On incremental delay for dormancy switching on multiple CCs»  **Proposal 1:** Update definition of TMultipleBWPswitchDelay such that incremental delay D is described as depending on capability bwp-SwitchingMultiCC-r16 for switching between non-dormant BWPs, and on new capability [scellDormancy-SwitchingMultiCC-r16] for switching between non-dormant and dormant BWPs.  **Proposal 2:** Send LS to RAN1/RAN2 on the need for a new capability scellDormancy-SwitchingMultiCC-r16 with the following parameter value sets:  scellDormancy-SwitchingMultiCC-r16   * + UE supporting bwp-SwitchingDelay Type 1: {100us, 200us}   + UE supporting bwp-SwitchingDelay Type 2: {200us, 400us, 800us, 1000us} |
| [**R4-2102352**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102352.zip) | Ericsson | «CR 38.133 (8.2 8.6) Corrections related to SCell dormancy switching» |
| R4-2102353 | Ericsson | «CR 38.133 (8.2 8.6) Corrections related to SCell dormancy switching» (Rel-17 Cat A) |
| [**R4-2102366**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102366.zip) | Ericsson | «CR 36.133 Removal of brackets for SCell dormancy» |
| R4-2102367 | Ericsson | «CR 36.133 Removal of brackets for SCell dormancy» (Rel-17 Cat A) |
| [**R4-2102749**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102749.zip) | Huawei, HiSilicon | «CR on SCell dormancy switching» |
| R4-2102750 | Huawei, HiSilicon | «CR on SCell dormancy switching R17» (Rel-17 Cat A) |
| [**R4-2102881**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102881.zip) | Qualcomm Incorporated | «Cat-F CR to Removal of brackets for SCell Dormancy and Simultaneous DCI based BWP switch delay on multiple CCs in Rel-16» |
| R4-2102882 | Qualcomm Incorporated | «Cat-A CR to Removal of brackets for SCell Dormancy and Simultaneous DCI based BWP switch delay on multiple CCs in Rel-17» (Rel-17 Cat A) |
| [**R4-2102883**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102883.zip) | Qualcomm Incorporated | «Cat-F CR to Removal of brackets for SCell Dormancy and Simultaneous DCI based BWP switch delay on multiple CCs in Rel-16 LTE» |
| R4-2102884 | Qualcomm Incorporated | «Cat-A CR to Removal of brackets for SCell Dormancy and Simultaneous DCI based BWP switch delay on multiple CCs in Rel-17 LTE» (Rel-17 Cat A) |

## Open issues summary

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

### Sub-topic 1-1: Maintenance for Direct SCell activation core requirements

*Open issues and candidate options before e-meeting:*

**Issue 1-1-1:**  Measurement periodicity in SCell activation requirement for known SCell case

The direct SCell activation requirement is currently by reference inheriting the following condition on measCycleSCell for the activation time of known SCell in FR1:

If the SCell is known and belongs to FR1, Tactivation\_time is:

- TFirstSSB+ 5ms, if the SCell measurement cycle is equal to or smaller than 160ms.

- TFirstSSB\_MAX + Trs + 5ms, if the SCell measurement cycle is larger than 160ms.

As the known SCell to be directly activated has not previously been measured in deactivated state, but may have been measured as an inter-frequency neighbour cell, it is proposed in R4-2100227 to change the condition from measCycleSCell to a periodicity that is relevant to neighbour cell measurements.

* Proposals
  + Option 1 (Apple): Replace condition on measCycleSCell with Tsample\_interval defined as follows:
    - If no DRX is configured or DRX cycle>320ms, Tsample\_interval = Max(MGRP, SMTC period, DRX cycle) × CSSFinter
    - Otherwise, Tsample\_interval = 1.5 × Max(MGRP, SMTC period, DRX cycle) × CSSFinter
  + Option 2: TBA
* Recommended WF
  + [Moderator] Discussion needed.

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| **Company** | **Comments for Issue 1-1-1:** Measurement periodicity in SCell activation requirement for known SCell case |
| Apple | We observed that *measCycleSCell* is no longer suitable as a condition to differentiate activation delay requirements for direct SCell activation. The proposed update is based on existing inter-frequency measurement requirements. Even though MGRP is included in the conditions, it can mathematically cover inter-frequency measurement w/o gap scenario, assuming MGRP=0. More clarification can be added if necessary. |

**Issue 1-1-2:**  TCI state activation for direct SCell activation

The direct SCell activation requirements are currently not accounting for delay due to TCI state activation. In R4-2101212 it is raised that there are scenarios where TCI state activation or indication is needed, and therefore it is proposed to correct the direct SCell activation time lines with respect to TCI state activation/indication.

* Proposals
  + Option 1 (MediaTek): RAN4 to correct the direct SCell activation time for the cases that TCI state is still needed:
    - For Direct activation at SCell addition (see highlight):
      * + Ndirect = TRRC\_Process + T1 + Tactivation\_time + TCSI\_Reporting - 3ms for the cases specified in clause 8.3.2 that TCI state is not indicated within Tactivation\_time; otherwise, Ndirect = TRRC\_Process + T1 + THARQ + Tactivation\_time + TCSI\_Reporting
    - For Direct activation at handover (see highlight):
      * + Ndirect = TRRC\_process + Tinterrupt + T2 + T3 + Tactivation\_time + TCSI\_Reporting - 3ms for the cases specified in clause 8.3.2 that TCI state is not indicated within Tactivation\_time; otherwise, Ndirect = TRRC\_process + Tinterrupt + T2 + T3 + THARQ +Tactivation\_time + TCSI\_Reporting
  + Option 2: TBA
* Recommended WF
  + [Moderator] Discussion needed.

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| **Company** | **Comments for Issue 1-1-2:**  TCI state activation for direct SCell activation |
| Apple | Fine with the proposal. It can be observed that if TCI state is configured, total delay would be more or less the same as legacy procedure. We can hardly benefit from direct SCell activation. If RAN2 can conclude the enhancement in R16 then the update may not be needed. But of course based on current RAN4 spec, the proposed change is OK. |
| Qualcomm | This is pending on RAN1 and RAN2. RAN1 is discussing whether TCI state activation is necessary. And RAN2 is discussing whether/how to introduce a singling if it is concluded TCI state activation is needed.  We prefer to wait for conclusion from other working groups as we sent the LS. |

### Sub-topic 1-2: Maintenance for SCell dormancy core requirements

*Open issues and candidate options before e-meeting:*

**Issue 1-2-1: Incremental delay D’ for SCell dormancy switching on multiple CCs**

In previous meeting it was agreed that the UE capability for incremental delay per CC can be different for active BWP switching (of non-dormant BWPs) and SCell dormancy switching, respectively. The agreement was captured in R4-2017213:

Agreement:

Option 1: Introduce a capability D’ for dormant BWP switching of multiple SCells that is separate from corresponding capability D for active BWP switching.

In earlier discussions it has been mentioned that D’ shall be taken from the same set of values as applies for D, but it has not been discussed whether the set of values for D’ and D shall be the same, or whether the values for D’ shall represent a subset of the values for D.

* Proposals
  + Option 1 (Nokia): Introduce the following incremental delay values:
    - D’ is {100µs, 200µs} for UE indicating type1 in bwp-SwitchingDelay
    - D’ is {200µs} for UE indicating type2 in bwp-SwitchingDelay
  + Option 2 (MediaTek): Introduce the following incremental delay values:
    - D’ is {100µs, 200µs} for UE indicating type1 in bwp-SwitchingDelay
    - D’ is {200µs, 400µs} for UE indicating type2 in bwp-SwitchingDelay
  + Option 3 (vivo): Introduce the following incremental delay values:
    - D’ is {100µs, 200µs} for UE indicating type1 in bwp-SwitchingDelay
    - D’ is {200µs, 400µs, 800µs} for UE indicating type2 in bwp-SwitchingDelay
  + Option 4 (Ericsson, Qualcomm [R4-2102891]): Introduce the following incremental delay values:
    - D’ is {100µs, 200µs} for UE indicating type1 in bwp-SwitchingDelay
    - D’ is {200µs, 400µs, 800µs, 1000µs} for UE indicating type2 in bwp-SwitchingDelay
* Recommended WF
  + TBA

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| **Company** | **Comments for Issue 1-2-1:** Incremental delay D’ for SCell dormancy switching on multiple CCs |
| Apple | We support option 4, which is aligned with the original agreement, i.e. D in multiple BWP switching requirements apply to dormancy switching as well. The motivation from our side to agree D’ in last meeting is that we would like to allow the implementation which can support different incremental delay for multiple BWP switch and multiple dormancy switch. however, this should not remove the original options (i.e. 400us, 800us and 1000us). The implementation with these options should also be allowed since it has been agreed even before the last meeting. |
| Qualcomm | Support option 4. We share the same view as Apple. Besides,  1) At least for FR1, there is almost no restriction on the number of cells. And this is per-UE capability. i.e. as the capability is not per SCS, the scheduling restriction is limited.  2) For WUS based dormant BWP switching, no such a restriction since it doesn’t require HARQ-ACK in response to WUS based dormant BWP switching  3) For non-scheduling DCI based dormant BWP switching, HARQ-ACK timeline is still under RAN1 discussion, i.e. the example analysis provided in the RAN1 LS is limited to scheduling DCI based dormant BWP switching  If any modification on simultaneous dormant BWP switching delay capability is needed due to the scheduling delay, the same argument should apply to that of simultaneous active BWP switching. |

**Issue 1-2-2: Incremental delay D’ and number of CCs for SCell dormancy switching**

For some choices of D’, the time for switching on multiple CCs may exceed the maximum time that can be supported by other functions (e.g. HARQ feedback). See for instance discussions in LS out (R4-2012269) and LS reply (R1-2009575) on the matter.

In R4-2102256 it is proposed that, if needed (pending on outcome of Issue 1-2-1), it shall be specified for how many CCs switching can be supported.

Please note that the discussion here is solely whether to capture, somewhere, that there may be a limited applicability w.r.t. number of SCCs. Further discussions on whether such limitation shall be captured e.g. in the capability description are to be carried out in email thread **[98e][114] R16\_UE\_ feature, Issue 1-1: New feature simultaneous dormant BWP switching**.

* Proposals
  + Option 1 (Nokia): If it is agreed that a UE indicating type2in bwp-SwitchingDelay can report a D’ larger than 200µs, then it shall be specified that for SCS 120kHz, the maximum number of supported CCs will depend on the reported value D’:

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| D’ | 200µs | 400µs | 800µs | 1000µs | 200µs | 400µs | 800µs | 1000µs |
|  | DCI received within the first 3 symbols | | | | DCI received after the first 3 symbols | | | |
| #CC | 8 | 5 | 3 | 2 | 8 | 4 | 2 | 2 |

* Recommended WF
  + [Moderator] May need to be coordinated with discussions in thread [98e][218] NR\_RRM\_Enh\_RRM\_1 on BWP switching on multiple CCs. Where to capture, if agreed, is to be discussed in thread [98e][114] R16\_UE\_ feature.

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| **Company** | **Comments for Issue 1-2-2:** Incremental delay D’ and number of CCs for SCell dormancy switching |
| Apple | Agree with recommended WF that we may need to align with thread 218. We think it is ok to only capture the this as side condition for requirement in TS38.133. |
| Qualcomm | We don’t think this is necessary information that should be implemented in the spec. Even if this is captured, it is one of many possible examples, e.g. scheduling DCI vs. non-scheduling DCI (case 2 and WUS), numerology differences b/w cells, configured K0/K2, etc. |

## Companies views’ collection for 1st round

### CRs/TPs comments collection

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| **CR/TP number** | **Comments collection** |
| [**R4-2100228**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100228.zip) | «CR on activation time in direct SCell activation», Apple |
| Qualcomm: pending on Issue 1-1-1. |
| Company B |
|  |
| [**R4-2101213**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101213.zip) | «CR on TS38.133 for direct Scell activation», MediaTek Inc. |
| Qualcomm: we can discuss it after Sub-topic 1-2 is settled. |
| Company B |
|  |
| [**R4-2101388**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101388.zip) | «CR for adding capability D’ for SCell dormancy BWP switch requirement», vivo |
| Qualcomm: we can discuss it after Sub-topic 1-2 is settled. |
| Company B |
|  |
| [**R4-2102254**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102254.zip) | «CR clarifying the UE measurement requirements for an SCell with dormant BWP», Nokia, Nokia Shanghai Bell |
| Qualcomm: SCell with dormant BWP is still considered as an active cell, hence, technically no need to add clarification. |
| Company B |
|  |
| [**R4-2102257**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102257.zip) | «Correction to simultaneous DCI based BWP switch delay on multiple CCs», Nokia, Nokia Shanghai Bell |
| Qualcomm: do not see a reason for the change. |
| Company B |
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| [**R4-2102352**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102352.zip) | «CR 38.133 (8.2 8.6) Corrections related to SCell dormancy switching», Ericsson |
| Qualcomm: support in principle |
| Company B |
|  |
| [**R4-2102366**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102366.zip) | «CR 36.133 Removal of brackets for SCell dormancy», Ericsson |
| Qualcomm: support |
| Company B |
|  |
| [**R4-2102749**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102749.zip) | «CR on SCell dormancy switching», Huawei, HiSilicon |
| Qualcomm: support in principle, and R4-2102881 can be merged into this CR. |
| Company B |
|  |
| [**R4-2102881**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102881.zip) | «Cat-F CR to Removal of brackets for SCell Dormancy and Simultaneous DCI based BWP switch delay on multiple CCs in Rel-16», Qualcomm Incorporated |
| Company A |
| Company B |
|  |
| [**R4-2102883**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102883.zip) | «Cat-F CR to Removal of brackets for SCell Dormancy and Simultaneous DCI based BWP switch delay on multiple CCs in Rel-16 LTE», Qualcomm Incorporated |
| Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

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|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

*Recommendations on WF/LS assignment*

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| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

|  |  |
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| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

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| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #2: Test cases for Direct SCell activation

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

Agenda item 7.5.3.2.1 Test cases for direct SCell activation [LTE\_NR\_DC\_CA\_enh-Perf]

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2100230**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100230.zip) | Apple | «Test case for Direct SCell Activation: EN-DC, NR spCell in FR1, SCell in FR1, SCell addition» (DraftCR) |
| [**R4-2101073**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101073.zip) | NEC | «Draft CR on TC for direct SCell activation during handover in NR SA for FR2» (DraftCR) |
| [**R4-2101215**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101215.zip) | MediaTek Inc. | «CR on TS38.133 for direct SCell activation of SCell in FR2 intra-band in ENDC mode (A.5.5.X)»  **Submitted as CR, but shall be draft CR for endorsement** |
| R4-2101216 | MediaTek Inc. | «CR on TS38.133 for direct SCell activation of SCell in FR2 intra-band in ENDC mode (A.5.5.X)»  **Submitted as Cat A CR, but shall be withdrawn** |
| [**R4-2102260**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102260.zip) | Nokia, Nokia Shanghai Bell | «Draft CR for NR FR1 Intra frequency handover with direct SCell activation» (DraftCR) |
| [**R4-2102357**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102357.zip) | Ericsson | «On TC3 for Direct SCell Activation»  **Proposal 1:** RAN4 to agree on whether test cases for Direct SCell Activation shall test only activation delay, or both activation delay and interruption requirement.  **Proposal 2:** RAN4 to agree on whether to cover only known SCell case or both known and unknown SCell cases by test cases for Direct SCell Activation. If test cases need to be extended to cover both cases, same sourcing company is assumed for both cases. |
| [**R4-2102358**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102358.zip) | Ericsson | «DraftCR 38.133 TC3 Direct SCell activation» (DraftCR) |
| [**R4-2102755**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102755.zip) | Huawei, HiSilicon | «draftCR to introduce TC4 for direct SCell activation» (DraftCR) |

## Open issues summary

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

### Sub-topic 2-1: Test cases for direct SCell activation

*Open issues and candidate options before e-meeting:*

**Issue 2-1-1: Whether to test for delay and interruption at direct SCell activation**

Some of the test case drafts include requirements on interruptions on other serving cells, whereas others do not. It is proposed to align between test cases.

* Proposals
  + Option 1: Test case on Direct SCell activation shall test both activation delay and interruption of other serving cells.
  + Option 2: Test case on Direct SCell activation shall only test both activation delay.
* Recommended WF
  + TBA

|  |  |
| --- | --- |
| **Company** | **Comments on Issue 2-1-1:** Whether to test for delay and interruption at direct SCell activation |
| Apple | As interruption requirements can be verified together with delay requirements without requiring extra testing time, we are fine with testing both. |
| Qualcomm | Share the same view and Apple |

## Companies views’ collection for 1st round

### DraftCRs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [**R4-2100230**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100230.zip) | [TC1] «Test case for Direct SCell Activation: EN-DC, NR spCell in FR1, SCell in FR1, SCell addition», Apple |
| Company A |
| Company B |
|  |
| [**R4-2101215**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101215.zip) | [TC2] «CR on TS38.133 for direct SCell activation of SCell in FR2 intra-band in ENDC mode (A.5.5.X)», MediaTek Inc. |
| Company A |
| Company B |
|  |
| [**R4-2102358**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102358.zip) | [TC3] «DraftCR 38.133 TC3 Direct SCell activation», Ericsson |
| Company A |
| Company B |
|  |
| [**R4-2102755**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102755.zip) | [TC4] «draftCR to introduce TC4 for direct SCell activation», Huawei, HiSilicon |
| Company A |
| Company B |
|  |
| [**R4-2102260**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102260.zip) | [TC5] «Draft CR for NR FR1 Intra frequency handover with direct SCell activation», Nokia, Nokia Shanghai Bell |
| Company A |
| Company B |
|  |
| [**R4-2101073**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101073.zip) | [TC6] «Draft CR on TC for direct SCell activation during handover in NR SA for FR2», NEC |
| Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #3: Test cases for SCell dormancy

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

Agenda item 7.5.3.2.2 Test cases for SCell dormancy [LTE\_NR\_DC\_CA\_enh-Perf]

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2100231**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100231.zip) | Apple | «Test case for SCell Dormancy: EN-DC, NR spCell in FR1, SCell FR1, DCI 2\_6 within/after 3 OFDM symbols» (DraftCR)  **File cannot be unzipped** |
| [**R4-2101074**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101074.zip) | NEC | «Draft CR on TC for SCell dormancy in NR SA for FR1» (DraftCR) |
| [**R4-2101217**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101217.zip) | MediaTek Inc. | «CR on TS38.133 for E-UTRAN – NR SCell FR1 dormant BWP switch with FR1 PSCell in non-DRX in synchronous EN-DC (A.4.5.X)»  **Submitted as CR, but shall be draft CR for endorsement** |
| R4-2101218 | MediaTek Inc. | «CR on TS38.133 for E-UTRAN – NR SCell FR1 dormant BWP switch with FR1 PSCell in non-DRX in synchronous EN-DC (A.4.5.X)»  **Submitted as Cat A CR, but shall be withdrawn** |
| [**R4-2102259**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102259.zip) | Nokia, Nokia Shanghai Bell | «Draft CR for test case 7 for Dormant SCell BWP switch delay» (DraftCR) |
| [**R4-2102359**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102359.zip) | Ericsson | «On TCs 6 and 8 for SCell dormancy switching»  **Proposal 1:** Add pre-defined CSI-RS configurations to TS 38.133 clause A.3.14 for periodic CSI-RS with 40ms periodicity.  **Proposal 2:** Add pre-defined Dormant BWP to TS 38.133 clause A.3.9.2 with same parameters as for DLBWP.1.1. |
| [**R4-2102360**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102360.zip) | Ericsson | «DraftCR 38.133 TCs 6 and 8 SCell dormancy switching» (DraftCR) |
| [**R4-2102756**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102756.zip) | Huawei, HiSilicon | «Further discussion on test for SCell dormancy»  **Proposal 1:** Test the switching from dormancy to non-dormancy but not the switching from non-dormancy to dormancy.  **Proposal 2:** Leave the choice of scheduling method (Case 1 or Case 2) for the test cases with DCI 0\_1/1\_1 to RAN5 or TE implementation.  **Proposal 3:**  For test cases with DCI 2\_6, set the gap between PDCCH WUS and the next DRX on-duration as in Table 1.   * + **Table 1: maximum dormancy switching delay for RRM test cases**  |  |  |  | | --- | --- | --- | |  | **NR Slot length** | **Dormancy switching delay (Slots)** | |  | **(ms)** |  | | 0 | 1 | 6 | | 1 | 0.5 | 9 | | 2 | 0.25 | 15 | | 3 | 0.125 | 28 | |
| [**R4-2102757**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102757.zip) | Huawei, HiSilicon | «draftCR to introduce TC3 for SCell dormancy» (DraftCR) |
| [**R4-2102886**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102886.zip) | Qualcomm Incorporated | «DraftCR on EN-DC NR SpCell in FR1 and 2 NR SCells in FR2 for Dormant SCell switch via DCI 2\_6 within and after 3 OFDM symbols» (DraftCR) |
| [**R4-2102887**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102887.zip) | Qualcomm Incorporated | «Test framework for SCell dormancy performance requirements»  **Proposal 1:** RAN4 to establish a common test framework for SCell dormancy requirements in terms of test methods for requirement verification, e.g. # missing HARQ-ACK/NACKs within specific windows, etc. |

## Open issues summary

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

### Sub-topic 3-1: Test cases for SCell dormancy

*Open issues and candidate options before e-meeting:*

**Issue 3-1-1: Pre-defined CSI-RS configuration for sparse CSI measurements**

In R4-2102359 it is proposed to have sparser CSI measurements during SCell dormancy. In order not to potentially having to define related CSI-RS parameters in each test case, it is proposed to add a sparse CSI-RS configuration to clause A.3.14.

* Proposals
  + Option 1 (Ericsson): Add pre-defined CSI-RS configurations to TS 38.133 clause A.3.14 for periodic CSI-RS with 40ms periodicity.
  + Option 2: TBA
* Recommended WF
  + TBA

|  |  |
| --- | --- |
| **Company** | **Comments on Issue 3-1-1:** Pre-defined CSI-RS configuration for sparse CSI measurements |
| Apple | Fine with the proposal. |
| Qualcomm | Looks okay. |

**Issue 3-1-2: Pre-defined Dormant BWP configuration**

In R4-2102359 it is proposed to define Dormant BWP in clause A.3.9.2 for usage in test cases for SCell dormancy.

* Proposals
  + Option 1 (Ericsson): Add pre-defined Dormant BWP to TS 38.133 clause A.3.9.2 with same parameters as for DLBWP.1.1.
  + Option 2: TBA
* Recommended WF
  + TBA

|  |  |
| --- | --- |
| **Company** | **Comments on Issue 3-1-2:** Pre-defined Dormant BWP configuration |
| Apple | Fine with the proposal. |
| Qualcomm | Looks okay in principle. Can Ericsson explain the difference between BWP.1.1 and BWP.1.3? Any reason why it should be BWP.1.1 nor BWP.1.3? |

**Issue 3-1-3: Whether to only test switching from dormancy to non-dormancy**

In R4-2102756 it is proposed to only test switching from dormancy to non-dormancy.

* Proposals
  + Option 1 (Huawei): Test the switching from dormancy to non-dormancy but not the switching from non-dormancy to dormancy.
  + Option 2: TBA
* Recommended WF
  + TBA

|  |  |
| --- | --- |
| **Company** | **Comments on Issue 3-1-3:** Whether to only test switching from dormancy to non-dormancy |
| Apple | In our CR we test both from dormancy to non-dormancy and from non-dormancy to dormancy, respectively with DCI received within and after 3 OFDM symbols. To address the concern raised in R4-2102756, one possible solution is to only transmit CSI-RS for CQI in dormant BWP. UE shall report out of range when working in non-dormancy BWP. |
| Qualcomm | We do not share the same view as Huawei. In our understanding, during BWP transition from non-dormancy to dormancy, interruption requirements to other serving cells can be verified. |

**Issue 3-1-4: Whether to specify DCI formats to use in tests for triggering during active time**

In R4-2102756 it is proposed to let RAN5 or TE vendors decide whether to test using DCI format 0\_1 or 1\_1for dormancy indication.

* Proposals
  + Option 1 (Huawei): Leave the choice of scheduling method (Case 1 or Case 2) for the test cases with DCI 0\_1/1\_1 to RAN5 or TE implementation.
  + Option 2: TBA
* Recommended WF
  + TBA

|  |  |
| --- | --- |
| **Company** | **Comments on Issue 3-1-4:** Whether to specify DCI formats to use in tests for triggering during active time |
| Apple | Fine with the proposal. |
| Qualcomm | Case 1 should be a default one. Or we can consider Case 1 based BWP switching from dormant to non-dormant and Case 2 based BWP switching from non-dormant to dormant. We’re open to further discussion but do not see a reason to leave it to RAN5. |

**Issue 3-1-5: Value for ps-Offset in test for triggering outside active time**

In R4-2102756 it is proposed to apply a *ps-Offset* that is based on worst case with respect to UE capability on dormancy switching. In R4-2102359 it is instead proposed that the exact value of *ps-Offset* shall depend on capabilities reported by the UE.



* Proposals
  + Option 1 (Huawei): For test cases with DCI 2\_6, set the gap *ps-Offset* between PDCCH WUS and the next DRX on-duration as in Table 1.
    - * **Table 1: maximum dormancy switching delay for RRM test cases**

|  |  |  |
| --- | --- | --- |
|  | **NR Slot length** | **Dormancy switching delay (Slots)** |
|  | **(ms)** |  |
| 0 | 1 | 6 |
| 1 | 0.5 | 9 |
| 2 | 0.25 | 15 |
| 3 | 0.125 | 28 |

* + Option 2 (Ericsson): For test cases with DCI 2\_6, set the gap *ps-Offset* between PDCCH WUS and next onDuration to the allowed SCell dormancy switching time given the UE’s reported capabilities.
  + Option 3: TBA
* Recommended WF
  + TBA

|  |  |
| --- | --- |
| **Company** | **Comments on Issue 3-1-5:** Value for ps-Offset in test for triggering outside active time |
| Apple | Trying to find some middle ground, we suggest to follow option 1 for switch from dormancy to non-dormancy, and follow option 2 for switch from non-dormancy to dormancy. |
| Qualcomm | Support Option 2 in principle because it has to do with NW flexibility and resource prediction. However, depending on DRX on-duration configuration and scheduling on other cells, there can be uncertainties in the test scenario. For example, UE received WUS with no time margin compared to its reported capability, and if the dormant BWP switching time is larger than the gap b/w the WUS and the associated DRX on-duration, and if DRX on-duration length is 1ms, then there seems to be an ambiguity issue. We suggest further discussion on this taking into account these aspects if companies agree. Our preference is to figure out proper test configurations to support Option 2. |

**Issue 3-1-6: Common test framework**

R4-2102887

* Proposals
  + Option 1 (Qualcomm): RAN4 to establish a common test framework for SCell dormancy requirements in terms of test methods for requirement verification, e.g. # missing HARQ-ACK/NACKs within specific windows, etc.
  + Option 2: TBA
* Recommended WF
  + TBA

|  |  |
| --- | --- |
| **Company** | **Comments on Issue 3-1-6:** Common test framework |
| Qualcomm | This is a high-level proposal. We can focus on the technical discussion on Issue 3-1-1 to 3-1-5. And we would like to encourage companies to have a look at the test procedure illustrated in R4-2102887. |

## Companies views’ collection for 1st round

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| [**R4-2100231**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100231.zip) | [TC1] «Test case for SCell Dormancy: EN-DC, NR spCell in FR1, SCell FR1, DCI 2\_6 within/after 3 OFDM symbols», Apple |
| Company A |
| Company B |
|  |
| [**R4-2101217**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101217.zip) | [TC2] «CR on TS38.133 for E-UTRAN – NR SCell FR1 dormant BWP switch with FR1 PSCell in non-DRX in synchronous EN-DC (A.4.5.X)», MediaTek Inc. |
| Company A |
| Company B |
|  |
| [**R4-2102757**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102757.zip) | [TC3] «draftCR to introduce TC3 for SCell dormancy», Huawei, HiSilicon |
| Company A |
| Company B |
|  |
| [**R4-2102886**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102886.zip) | [TC4] «DraftCR on EN-DC NR SpCell in FR1 and 2 NR SCells in FR2 for Dormant SCell switch via DCI 2\_6 within and after 3 OFDM symbols», Qualcomm Incorporated |
| Company A |
| Company B |
|  |
| [**R4-2101074**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101074.zip) | [TC5] «Draft CR on TC for SCell dormancy in NR SA for FR1», NEC |
| Company A |
| Company B |
|  |
| [**R4-2102360**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102360.zip) | [TC6] «DraftCR 38.133 TCs 6 and 8 SCell dormancy switching», Ericsson |
| Company A |
| Company B |
|  |
| [**R4-2102259**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102259.zip) | [TC7] «Draft CR for test case 7 for Dormant SCell BWP switch delay», Nokia, Nokia Shanghai Bell |
| Company A |
| Company B |
|  |
| [**R4-2102360**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102360.zip) | [TC8] «DraftCR 38.133 TCs 6 and 8 SCell dormancy switching», Ericsson |
| Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |