3GPP TSG-RAN WG2 Meeting #113 Electronic R2-210XXXX

Elbonia, 25 January – 5 February 2020

**Agenda item: 6.8.2**

**Source: Rapporteur (Nokia)**

**Title: [AT113-e][220][DCCA] Stage-2, Fast Scell activation and early measurements (Nokia)**

**WID/SID: LTE\_NR\_DC\_CA\_enh-Core-**

**Release: Release 16**

**Document for: Discussion and Decision**

# 1 Introduction

This is discussion document for the email:

* [AT113-e][220][DCCA] Stage-2, Fast Scell activation and early measurements (Nokia)

Scope:

* + - Discuss corrections under 6.8.x marked for this discussion to see which CRs could be agreeable
    - Some (or even all) CRs may be merged together if seen needed

Intended outcome:

* + - Discussion summary in R2-2101966 (by email rapporteur).
    - Agreeable CRs (if any)

Deadline for providing comments, for rapporteur inputs, conclusions and CR finalization:

* + - Initial deadline (for companies' feedback): 1st week Thu, UTC 0900
    - Initial deadline (for rapporteur's summary in R2-2101966): 1st week Fri, UTC 09:00
    - Deadline for CR finalization: 2nd week Thu, UTC 1000

where following documents are to be treated:

### 6.8.1 General and Stage-2 Corrections

By Email [220] (1+2)

Stage-2 corrections:

[R2-2101400](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101400.zip) CR on support of NR-DC within the same gNB-DU ZTE Corporation, Sanechips CR Rel-16 37.340 16.4.0 0246 - F LTE\_NR\_DC\_CA\_enh-Core

[R2-2101479](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101479.zip) Corrections on UL power sharing Huawei, HiSilicon, ZTE Corporation (rapporteur) CR Rel-16 37.340 16.4.0 0248 - F NR\_newRAT-Core, LTE\_NR\_DC\_CA\_enh-Core

[R2-2101728](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101728.zip) Corrections on UL power sharing vivo CR Rel-16 37.340 16.4.0 0250 - F LTE\_NR\_DC\_CA\_enh-Core

### 6.8.2 Fast Scell activation

By email [220] (1)

TCI state corrections:

[R2-2101747](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101747.zip) Correction on tci-PresentInDCI ASUSTeK CR Rel-16 38.331 16.3.1 2436 - F LTE\_NR\_DC\_CA\_enh-Core

* Revised in [R2-2101942](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101942.zip)

[R2-2101942](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101942.zip) Correction on tci-PresentInDCI ASUSTeK CR Rel-16 38.331 16.3.1 2436 1 F LTE\_NR\_DC\_CA\_enh-Core [R2-2101747](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101747.zip)

By Email [220] (3)

*Miscellaneous EMR corrections:*

[R2-2101570](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101570.zip) Clarification on sCellState configuration upon SCell modification ZTE Corporation, Sanechips CR Rel-16 38.331 16.3.1 2422 - F LTE\_NR\_DC\_CA\_enh-Core

*(moved from 6.8.3)*

[R2-2100303](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2100303.zip) Corrections on condition of idle-inactive measurement configuration update OPPO CR Rel-16 38.331 16.3.1 2318 - F LTE\_NR\_DC\_CA\_enh-Core

[R2-2100304](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2100304.zip) Clarification on carrier frequency in MeasIdleConfigSIB OPPO CR Rel-16 38.331 16.3.1 2319 - F LTE\_NR\_DC\_CA\_enh-Core

By Email [220] (3)

*BWP-related corrections:*

[R2-2100305](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2100305.zip) Clarification on UE behaviour due to entering dormant BWP OPPO CR Rel-16 38.321 16.3.0 1011 - F LTE\_NR\_DC\_CA\_enh-Core

[R2-2101500](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101500.zip) Correction on BWP operation Samsung CR Rel-16 38.321 16.3.0 1036 - F LTE\_NR\_DC\_CA\_enh-Core

[R2-2101017](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101017.zip) Correction on first active uplink BWP vivo CR Rel-16 38.331 16.3.1 2375 - F LTE\_NR\_DC\_CA\_enh-Core

# 2 Discussion

## 2.1 UL power sharing stage-2 updates

By Email [220] (1+2)

Stage-2 corrections:

[R2-2101400](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101400.zip) CR on support of NR-DC within the same gNB-DU ZTE Corporation, Sanechips CR Rel-16 37.340 16.4.0 0246 - F LTE\_NR\_DC\_CA\_enh-Core

In the above paper it is proposed to clarify in stage 2 spec, that NR-DC can also be supported between different cells within the same DU:

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| --- | --- | --- |
| Company | Need for CR | Comments |
| Nokia | Neutral | Intention seems tob e good and we agree with the technical aspects. So we are fine to agree on the CR but as there is no interoperability problems foreseen is the category correct to be F? |
| Qualcomm | Intention is fine, but CR needs modifications | From spec view, we identify below issues of the CR:   * In general, 37.340 does not and should not care about disaggregated RAN. In fact, Note 2 of 4.1.1 makes that very point. * The new Note 3 proposed in the CR is out of place: the section is about common MR-DC principles. The new Note 3 may be true but is not a common principle because whether you can have options 7/4 in same node is not strictly the business of 37.340. Thus, we think the new Note 3 is not necessary. * The real problem comes in the section 4.1.3.3 because the legacy “in addition” phrase should never have mentioned gNB-DUs. * Finally, we don’t agree with the “reaons for change“ in cover sheet: the reason to change spec should not because CA may not be possible intra-DU (so you need DC). It is just that DC can work irrespective of network configuration, and current text is unnecessarily restrictive.   Based on above concerns, we propose below changes the CR:  1) “Reason for change” in cover page:  • It is sufficient to state that “NR-DC can work under two cells under same gNB-DU”. No need to mention CA may not be possible itra-DU.  2) Section 4.1  • Remove new Note 3  3) Section 4.1.3.3  • Remove the proposed change, and add one more statement at the end of the paragraph: “In addition, NR-DC may also be used when the UE is connected to a single gNB, acting as both MN and SN, and configuring both MCG and SCG” |
| vivo | Yes | We think the use case is valid, and the clarification is thus needed. If it is going to have some changes, then we prefer the clarifications proposed by Qualcomm to be added in Section 4.1.3.3. |
| Samsung | No, but | Our understanding is that the current specifiation does not limit the network implementation as usual. Moreover, the concerned scenario would be transparet to UE. However, if the majority want to clarify this, then we are fine with this. |

[R2-2101479](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101479.zip) Corrections on UL power sharing Huawei, HiSilicon, ZTE Corporation (rapporteur) CR Rel-16 37.340 16.4.0 0248 - F NR\_newRAT-Core, LTE\_NR\_DC\_CA\_enh-Core

[R2-2101728](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101728.zip) Corrections on UL power sharing vivo CR Rel-16 37.340 16.4.0 0250 - F LTE\_NR\_DC\_CA\_enh-Core

Two above papers Want to ensure that all MR-DC arcthitecture options are covered by stage-2 power sharing. :

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| Company | Need for CR | Comments |
| Nokia | Yes | We think it is good to ensure stage-2 is covering all architecture options. We have preference to Huawei style of capturing the changes as in our view it is easier to read and understand. |
| Qualcomm | Yes | We also prefer Huawei’s version. |
| vivo | Yes | We support CR 1728, and the reasons are:   1. **power control and power sharing have different meaning in RAN1 spec.** According to TS 38.213, dynamic power sharing can be find for all MR-DC strucuture, while it is failed to find any semi-static power sharing descriptions for (NG)EN-DC and NE-DC but only for NR-DC. For (NG)EN-DC and NE-DC, it is stated in TS 38.213 that if dynamic power sharing is not configured, then power control is performed per CG independtly based on the corresponding configured max power which is splited from the max power of the UE. From this context, power control and power sharing have different meaning. We can understand that from RAN2 perspective, independent power control per CG based on split power can be regarded as a kind of power sharing to some extent (that is, share the total power of the UE). However, it is not consistent with RAN1 spec perfectly and may cause some confusion.   **NR-DC semi-static power sharing:** For NR-DC semi-static power sharing, the following is stated in TS 38.213, which means the max power per CG is not via configuration totally, but given by [8-3, TS 38.101-3] andmay exceed the configured one of MCG or SCG in this case.  *“otherwise, the UE determines a power for the transmission on MCG or the SCG overlapping with slot , as described in [8-3, TS 38.101-3] and in Clauses 7.1 through 7.5 without considering or , respectively”*  In short, dynamic PS is supported for all MR-DC structure, while semi-static PS is only supported for NR-DC. And for NR-DC semi-static power sharing, the max power per CG is not only depended on configuration. |
| Samsung | Yes | R2-2101479 seems better. |

## 2.2 Fast SCell activation

### 2.2.1 TCI state corrections

By email [220] (1)

TCI state corrections:

[R2-2101747](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101747.zip) Correction on tci-PresentInDCI ASUSTeK CR Rel-16 38.331 16.3.1 2436 - F LTE\_NR\_DC\_CA\_enh-Core

* Revised in [R2-2101942](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101942.zip)

[R2-2101942](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101942.zip) Correction on tci-PresentInDCI ASUSTeK CR Rel-16 38.331 16.3.1 2436 1 F LTE\_NR\_DC\_CA\_enh-Core [R2-2101747](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101747.zip)

The paper indicates that According to TS 38.331, in case of cross carrier scheduling, the network sets tci-PresentInDCI field to enabled for the ControlResourceSet used for cross carrier scheduling in the scheduling cell, whose constraint was introduced in Rel-15.

But in Rel-16 MR-DC above constraint was removed with the introdcution of enableDefaultBeamForCSS and the network is allowed to set tci-PresentInDCI field to disabled in the concerned case if enableDefaultBeamForCSS is configured. Therefore it is proposed to remove the constraint in TS 38.331 to avoid contradiction or confusion.

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| Company | Need for CR | Comments |
| Nokia | Yes | This seems to be valid observations and good to correct to avoid IOT problems in future. |
| Qualcomm | Yes | Same understanding as Nokia |
| vivo | Yes |  |
| Samsung | Yes |  |

### 2.2.1 Miscellaneous EMR corrections

By Email [220] (3)

*Miscellaneous EMR corrections:*

[R2-2101570](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101570.zip) Clarification on sCellState configuration upon SCell modification ZTE Corporation, Sanechips CR Rel-16 38.331 16.3.1 2422 - F LTE\_NR\_DC\_CA\_enh-Core

*(moved from 6.8.3)*

The CR states: In Rel-16, SCell can be directly activated upon SCell configuration (i.e. including sCellState in RRCReconfiguration message) in case of SCell addition, reconfiguration with sync, and resuming an RRC connection. However, in the current procedure text in section 5.3.5.5.9, upon SCell modification, the UE shall check whether the sCellState is included only in case of configuration of SCG SCells in RRC resume, but not for other cases where sCellState may be included in the SCell configuration as well, e.g. MCG SCells in RRC resume and SCells in reconfiguration with sync

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| Company | Need for CR | Comments |
| Nokia | Yes | CR has valid observations and proposed corrrection seems tob e corrrct. Best to agree to avoid any debate in future which cases are supported for direct activation.. |
| Qualcomm | Yes | We agree the issues and CR |
| vivo | Yes | We agree the CR. |
| Samsung | Yes |  |

[R2-2100303](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2100303.zip) Corrections on condition of idle-inactive measurement configuration update OPPO CR Rel-16 38.331 16.3.1 2318 - F LTE\_NR\_DC\_CA\_enh-Core

CR states: If the RRCRelease message with/without suspendConfig was received in response to an RRCResumeRequest or an RRCResumeRequest1, the measIdleConfig IE can be also included in the RRCRelease message. In this case, the UE may also need to update the idle measurement configuration according to the SIB11/4 immediately. But idle measurement configuration update is missing for the case of “from RRC\_INACTIVE to RRC\_INACTIVE/RRC\_IDLE”.

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| Company | Need for CR | Comments |
| Nokia | Possibly | Intention seems to be OK but we are not sure if change would cover also RRC\_INACTIVE -> RRC\_INACTIVE case as that probably cannot be considered as “entering“ state when one is already in corresponding state. Secondly we wonder if there is need to change anything as UE will monitorin SIB changes during the access procedure and thus second bullet (one below the proposed change) would triggert he procedure as well. |
| Qualcomm | No | We agree with Nokia that 2nd bullet has covered the cases of RRC\_INACTIVE ->RRC\_INACTIVE and RRC\_INACTIVE ->RRC\_IDLE. |
| vivo | Yes | For the case “from RRC\_INACTIVE to RRC\_INACTIVE/RRC\_IDLE”, it is possible for the UE to receive the idle/inactive measurement configuration in RRCRelease message, and we understand this case is not covered by the second bullet, that is, *upon update of system information (SIB4, or SIB11), e.g. due to intra-RAT cell (re)selection;*  We wonder if the CR is not agreed, whether it will enforce the NW or the UE behaviour when idle/inactive measurement configuration in received in RRCRelease message in this case. |
| Samsung | No | We have some sympathy with the intention. However, it will work as Nokia pointed out. |

[R2-2100304](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2100304.zip) Clarification on carrier frequency in MeasIdleConfigSIB OPPO CR Rel-16 38.331 16.3.1 2319 - F LTE\_NR\_DC\_CA\_enh-Core

CR states: In RAN2#107 meeting, RAN2 make a agreement as below and common understanding is that only async SSB is configured in SIB11. But the spec is not clear.

The legacy SSB measurement configurations in NR SIB2/4 and LTE SIB24 are reused for NR early measurements performed in frequencies which are candidates of cell selection/reselection, i.e. not introduce new measurement configurations in NR/LTE SIB for these SSBs.

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| Company | Need for CR | Comments |
| Nokia | No | This seems tob e purely editorial (thus category wrong) and thus we do not really see need fort he CR.. |
| Qualcomm | No | We don’t agree with the change. The proposed statement is a wrong understanding: SSB in sync raster can also be included in new SIB (SIB11), if this SSB is not for cell reselection purpose (i.e. SSB in non-overlapping carrier can also be in sync raster). |
| vivo | No | Agree with Qualcomm. |
| Samsung | No | Same view as Nokia. |

### 2.2.1 BWP related corrections

By Email [220] (3)

*BWP-related corrections:*

[R2-2100305](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2100305.zip) Clarification on UE behaviour due to entering dormant BWP OPPO CR Rel-16 38.321 16.3.0 1011 - F LTE\_NR\_DC\_CA\_enh-Core

CR states: When entering dormant BWP, the UE stay the current UL BWP, but stop some UL behaviour. But the current spec has misleading word. “a BWP” here only means DL dormant BWP, and “the BWP” is also mean “a BWP”. However, when entering dormant BWP, the UE stop UL behaviour one the current active UL BWP.

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| Company | Need for CR | Comments |
| Nokia | No | We do not identify ambiquity in the existing text and thus see no need fort he change.. |
| Qualcomm | No | We think the current spec is clear: "A BWP is activated" means a pair of BWP of UL and DL.  In addition, the reason for change seems to also have issue: it is only for FDD system. RAN2 has agreed:   * RAN2 confirm that, for TDD, the first non-dormant UL BWP is the UL BWP with the same ID as the first non-dormant DL BWP (no change to today, wrt BWP switching). |
| vivo | No | The current spec is clear enough to us. And we agree with QC that the setence “if a BWP is activated and the active DL BWP for the Serving Cell is dormant BWP“ means a activated BWP shall include the DL BWP and UL BWP pair. |
| Samsung | No | The current spec is already clear since we don’t touch the UL BWP when DL BWP is switched to dormant BWP. There would be no problem with the fact that “The BWP” indicates the UL BWP. |

[R2-2101500](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101500.zip) Correction on BWP operation Samsung CR Rel-16 38.321 16.3.0 1036 - F LTE\_NR\_DC\_CA\_enh-Core

CR states: According to the current specification, UE does not monitor the PDCCH for the BWP if a BWP is activated and the active DL BWP for the Serving Cell is dormant BWP.

However, for dormant BWP, UE should monitor the PDCCH for the BWP to leave dormant BWP based on instruction from PDCCH as specified in TS 38.213.

Moreover, whether to monitor the PDCCH for the BWP would not be specified as shown in the procedural text for activated BWP or deactivated BWP.

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| Company | Need for CR | Comments |
| Nokia | Possibly | If we understand correctly Samsung is saying that the cross carrier scheduling for the dormant BWP should be allowed to activate another BWP through DCI. However, is the BWP switch is regarded as "PDCCH monitoring for the BWP"?  Secondly , if the change would be agreed, what should the UE do if NW indicates a DL assignment for the dormant BWP through X-scheduling? |
| Qualcomm | No | The deleted statement is for cross-scheduling case, which has RAN2 agreement:   * UE will not monitor the PDCCH for the Scell (i.e. for cross-carrier scheduling) when the scheduled SCell is in dormancy.   In additon, as propoent mentioned, how the UE performs PDCCH monitoring to leave dormant BWP is specifed in 38.213. Thus, we don't think the concerned statement will cause confusion. |
| vivo | No | We don’t think “Not monitor the PDCCH for the dormant BWP“ means the UE should not monitor the PDCCH for BWP switching. |
| Samsung | Yes (Proponent) | We are not considering the cross-scheduling case since the network cannot cross-schedule UE and it is very clear for UE to be unable to monitor PDCCH for cross-scheduling on dormant BWP due to the absence of PDCCH-config for dormant DL BWP.  Our intention is that UE should monitor PDCCH indicating the dormancy of a dormant DL BWP of a Scell(or a Scell group) to leave dormant BWP according to 38.213. How could UE leave dormant BWP based on PDCCH indication if UE does not monitor PDCCH for the dormant BWP??  We need to note that for BWP, we don’t specify cross-scheduling behavior (i.e. we have no action such as “monitor the PDCCH for the BWP“ unlike Scell as follows:  Section 5.15 in 38.321.  For each activated Serving Cell configured with a BWP, the MAC entity shall:  1> if a BWP is activated and the active DL BWP for the Serving Cell is not the dormant BWP:  2> transmit on UL-SCH on the BWP;  2> transmit on RACH on the BWP, if PRACH occasions are configured;  2> monitor the PDCCH on the BWP;  ...  1> if a BWP is activated and the active DL BWP for the Serving Cell is dormant BWP:  2> stop the *bwp-InactivityTimer* of this Serving Cell, if running.  2> not monitor the PDCCH on the BWP;  2> not monitor the PDCCH for the BWP;  ...  1> if a BWP is deactivated:  2> not transmit on UL-SCH on the BWP;  2> not transmit on RACH on the BWP;  2> not monitor the PDCCH on the BWP;  ...  Section 5.9 in 38.321  The MAC entity shall for each configured SCell:  1> if an SCell is configured with *sCellState* set to *activated* upon SCell configuration, or an SCell Activation/Deactivation MAC CE is received activating the SCell:  2> if the SCell was deactivated prior to receiving this SCell Activation/Deactivation MAC CE; or  2> if the SCell is configured with *sCellState* set to *activated* upon SCell configuration:  3> if *firstActiveDownlinkBWP-Id* is not set to dormant BWP:  4> activate the SCell according to the timing defined in TS 38.213 [6] for MAC CE activation and according to the timing defined in TS 38.133 [11] for direct SCell activation; i.e. apply normal SCell operation including:  5> SRS transmissions on the SCell;  5> CSI reporting for the SCell;  5> PDCCH monitoring on the SCell;  5> PDCCH monitoring for the SCell;  5> PUCCH transmissions on the SCell, if configured.  ...  1> if the SCell is deactivated:  2> not transmit SRS on the SCell;  2> not report CSI for the SCell;  2> not transmit on UL-SCH on the SCell;  2> not transmit on RACH on the SCell;  2> not monitor the PDCCH on the SCell;  2> not monitor the PDCCH for the SCell;  2> not transmit PUCCH on the SCell.  If we want to specify cross-scheduling behavior for the BWP, then we think that we should add “monitor the PDCCH for the BWP“ to the activated BWP description and add““not monitor the PDCCH for the BWP“ to the deactivated BWP description. However, our understanding is that these were not added intentionally because it would not be correct in case of legacy BWP switching indicating target BWP. |

[R2-2101017](file:///C:\Users\terhentt\Documents\Tdocs\RAN2\RAN2_113-e\R2-2101017.zip) Correction on first active uplink BWP vivo CR Rel-16 38.331 16.3.1 2375 - F LTE\_NR\_DC\_CA\_enh-Core

CR states: The field description of firstActiveUplinkBWP-Id states that “If configured for an SCell, this field contains the ID of the uplink bandwidth part to be used upon MAC-activation of an SCell.”.

However, according to the TS 38.321, if an SCell is configured with sCellState set to activated upon SCell configuration, the MAC entity shall activate the DL BWP and UL BWP indicated by firstActiveDownlinkBWP-Id and firstActiveUplinkBWP-Id respectively. It means firstActiveUplinkBWP-Id also indicate the UL BWP to be used upon activation of an SCell via RRC configuration.

Given above, the current description of firstActiveUplinkBWP-Id is not right..

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| Company | Need for CR | Comments |
| Nokia | Yes | It is also our understanding that *firstActivbeXXXBWP-Id* is supposed to be used for direct Scell activation |
| Qualcomm | Yes | Same understanding as Nokia |
| vivo | Yes | Agree with that *firstActivbeXXXBWP-Id* can be used upon direct Scell activation via RRC. |
| Samsung | Yes | Agree. |

# 3 Conclusion

* Initial deadline (for rapporteur's summary in R2-2101966): 1st week Fri, UTC 09:00

# 4 Contact Information

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| --- | --- |
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