**3GPP TSG RAN WG1 #112bis-e R1-23nnnnn**

**e-Meeting, April 17th – April 26th, 2023**

**Source: Ad-Hoc Chair (AT&T)**

**Title: Session Notes of AI 9.17.15**

**Agenda Item:** **9.17.15**

**Document for:** **Endorsement**

### UE features for BWP without restriction

*Initial input on UE features for BWP without restriction to be provided by rapporteur.*

[112bis-e-R18-UE\_features-04] Email discussion on UE features for BWP without restriction by April 26 – Ralf (AT&T)

* Check points: April 21, April 26

**Agreement: Introduce the following new FG/row, while keeping the yellow highlighting, if any, as shown**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 53. NR\_BWP\_wor | 53-1 | Support RLM/BM/BFD measurements based on CD-SSB outside active BWP without interruptions | 1. UE performs RLM/BM/BFD measurements based on CD-SSB without interruptions, where the CD-SSB is outside active DL BWP but is within the bandwidth of [the corresponding carrier(s) to be measured.]  [2. Bandwidth of UE-specific RRC configured BWP may not include bandwidth of the CORESET#0 (if CORESET#0 is present) and SSB for PCell/PSCell (if configured) and bandwidth of the UE-specific RRC configured BWP may not include SSB for SCell] | [6-1a] | Yes | n/a | UE cannot support RLM/BM/BFD measurements based on CD-SSB outside active BWP without interruptions | [Per band] | No | No | n/a | [UE indicates at most one of FG 53-1 and FG 53-2.]  FFS: candidate component values  This FG is not applicable to RedCap UEs. | Optional with capability signalling |

**Agreement: Introduce the following new FG/row, while keeping the yellow highlighting, if any, as shown**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 53. NR\_BWP\_wor | 53-2 | Support RLM/BM/BFD measurements based on CD-SSB outside active BWP with interruptions | 1. UE is allowed to performs RLM/BM/BFD measurements based on CD-SSB outside the active BWP with interruptions, where the CD-SSB is outside active DL BWP but is within the bandwidth of [the corresponding carrier(s) to be measured]  [2. Bandwidth of UE-specific RRC configured BWP may not include bandwidth of the CORESET#0 (if CORESET#0 is present) and SSB for PCell/PSCell (if configured) and bandwidth of the UE-specific RRC configured BWP may not include SSB for SCell] | [6-1a, [1-7, 2-24, 2-31, 53-3] | Yes | n/a | UE cannot support RLM/BM/BFD measurements based on CD-SSB outside active BWP and meet interruptions requirements | [Per band] | No | No | n/a | This feature only applies if there is no CSI-RS, no NCD- SSB, and no CD-SSB configured for RLM/BM/BFD in the active BWP of [the corresponding carrier(s) to be measured.]  [UE indicates at most one of FG 53-1 and 53-2.]  FFS: candidate component values  This FG is not applicable to RedCap UEs. | Optional with capability signalling |

**Agreement: Introduce the following new FG/row, while keeping the yellow highlighting, if any, as shown**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 53. NR\_BWP\_wor | 53-3 | Support RLM/BM/BFD measurements based on NCD-SSB within active BWP | 1. UE performs RLM/BM/BFD measurements based on NCD-SSB, where the NCD-SSB is within the active DL BWP.  [2. Bandwidth of UE-specific RRC configured BWP may not include bandwidth of the CORESET#0 (if CORESET#0 is present) and SSB for PCell/PSCell (if configured) and bandwidth of the UE-specific RRC configured BWP may not include SSB for Scell] | [6-1a] | Yes | n/a | UE cannot support RLM/BM/BFD measurements based on NCD-SSB within active BWP | [Per band] | No | No | n/a | This FG is not applicable to RedCap UEs. | Optional with capability signalling |

**Agreement: Adopt the following changes highlighted in red, while keeping the yellow highlighting, if any, as shown**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 53. NR\_BWP\_wor | 53-1 | Support RLM/BM/BFD measurements based on CD-SSB outside active BWP without interruptions | 1. UE performs RLM/BM/BFD measurements based on CD-SSB without interruptions, where the CD-SSB is outside active DL BWP but is within the bandwidth of [the corresponding carrier(s) to be measured.]  ~~[~~2. Bandwidth of UE-specific RRC configured BWP may not include bandwidth of the CORESET#0 (if CORESET#0 is present) and SSB for PCell/PSCell (if configured) and bandwidth of the UE-specific RRC configured BWP may not include SSB for SCell~~]~~ | ~~[6-1a]~~ | Yes | n/a | UE cannot support RLM/BM/BFD measurements based on CD-SSB outside active BWP without interruptions | [Per band] | No | No | n/a | [UE indicates at most one of FG 53-1 and FG 53-2.]  FFS: candidate component values  This FG is not applicable to RedCap UEs. | Optional with capability signalling |
| 53. NR\_BWP\_wor | 53-2 | Support RLM/BM/BFD measurements based on CD-SSB outside active BWP with interruptions | 1. UE is allowed to performs RLM/BM/BFD measurements based on CD-SSB outside the active BWP with interruptions, where the CD-SSB is outside active DL BWP but is within the bandwidth of [the corresponding carrier(s) to be measured]  ~~[~~2. Bandwidth of UE-specific RRC configured BWP may not include bandwidth of the CORESET#0 (if CORESET#0 is present) and SSB for PCell/PSCell (if configured) and bandwidth of the UE-specific RRC configured BWP may not include SSB for SCell~~]~~ | ~~[6-1a,~~ [1-7, 2-24, 2-31, 53-3] | Yes | n/a | UE cannot support RLM/BM/BFD measurements based on CD-SSB outside active BWP and meet interruptions requirements | [Per band] | No | No | n/a | This feature only applies if there is no CSI-RS, no NCD- SSB, and no CD-SSB configured for RLM/BM/BFD in the active BWP of [the corresponding carrier(s) to be measured.]  [UE indicates at most one of FG 53-1 and 53-2.]  FFS: candidate component values  This FG is not applicable to RedCap UEs. | Optional with capability signalling |
| 53. NR\_BWP\_wor | 53-3 | Support RLM/BM/BFD measurements based on NCD-SSB within active BWP | 1. UE performs RLM/BM/BFD measurements based on NCD-SSB, where the NCD-SSB is within the active DL BWP.  ~~[~~2. Bandwidth of UE-specific RRC configured BWP may not include bandwidth of the CORESET#0 (if CORESET#0 is present) and SSB for PCell/PSCell (if configured) and bandwidth of the UE-specific RRC configured BWP may not include SSB for Scell~~]~~ | ~~[6-1a]~~ | Yes | n/a | UE cannot support RLM/BM/BFD measurements based on NCD-SSB within active BWP | [Per band] | No | No | n/a | This FG is not applicable to RedCap UEs. | Optional with capability signalling |

* FFS: further clarify relationship to existing FG 6-1a for Option A (RLM/BM/BFD measurements based on CSI-RS within active BWP)

**Proposal: Adopt the following changes highlighted in chromatic fonts, while keeping the yellow highlighting, if any, as shown**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 53. NR\_BWP\_wor | 53-1 | Support RLM/BM/BFD measurements based on CD-SSB outside active BWP without interruptions | 1. UE performs RLM/BM/BFD measurements based on CD-SSB without interruptions, where the CD-SSB is outside active DL BWP but is within the bandwidth of ~~[the corresponding carrier(s) to be measured.]~~ at least one DL BWP of the carrier, where:   * if the UE has one UE-specific DL BWP configuration, the CD-SSB can be outside the bandwidth of this UE specific DL BWP but within the bandwidth of the configured UE-specific carrier * if the UE has more than one UE-specific DL BWP configurations, the CD-SSB is within the bandwidth of at least one of the UE-specific DL BWPs   2. Bandwidth of UE-specific RRC configured BWP may not include bandwidth of the CORESET#0 (if CORESET#0 is present) and CD-SSB for PCell/PSCell (if configured) and bandwidth of the UE-specific RRC configured BWP may not include CD-SSB for SCell |  | Yes | n/a | UE cannot support RLM/BM/BFD measurements based on CD-SSB outside active BWP without interruptions | [Per band] | No | No | n/a | [UE indicates at most one of FG 53-1 and FG 53-2.]  ~~FFS: candidate component values~~  This FG is not applicable to RedCap UEs. | Optional with capability signalling |
| 53. NR\_BWP\_wor | 53-2 | Support RLM/BM/BFD measurements based on CD-SSB outside active BWP with interruptions | 1. UE is allowed to performs RLM/BM/BFD measurements based on CD-SSB outside the active BWP with interruptions, where the CD-SSB is outside active DL BWP but is within the bandwidth of ~~[the corresponding carrier(s) to be measured.]~~ at least one DL BWP of the carrier, where:   * if the UE has one UE-specific DL BWP configuration, the CD-SSB can be outside the bandwidth of this UE specific DL BWP but within the bandwidth of the configured UE-specific carrier * if the UE has more than one UE-specific DL BWP configurations, the CD-SSB is within the bandwidth of at least one of the UE-specific DL BWPs   2. Bandwidth of UE-specific RRC configured BWP may not include bandwidth of the CORESET#0 (if CORESET#0 is present) and CD-SSB for PCell/PSCell (if configured) and bandwidth of the UE-specific RRC configured BWP may not include CD-SSB for SCell | [1-7, 2-24, 2-31, 53-3] | Yes | n/a | UE cannot support RLM/BM/BFD measurements based on CD-SSB outside active BWP and meet interruptions requirements | [Per band] | No | No | n/a | This feature only applies if there is no CSI-RS, no NCD- SSB, and no CD-SSB configured for RLM/BM/BFD in the active BWP of ~~[the corresponding carrier(s) to be measured.]~~ at least one DL BWP of the carrier, where:   * if the UE has one UE-specific DL BWP configuration, the CD-SSB can be outside the bandwidth of this UE specific DL BWP but within the bandwidth of the configured UE-specific carrier * if the UE has more than one UE-specific DL BWP configurations, the CD-SSB is within the bandwidth of at least one of the UE-specific DL BWPs   [UE indicates at most one of FG 53-1 and 53-2.]  ~~FFS: candidate component values~~  This FG is not applicable to RedCap UEs. | Optional with capability signalling |
| 53. NR\_BWP\_wor | 53-3 | Support RLM/BM/BFD measurements based on NCD-SSB within active BWP | 1. UE performs RLM/BM/BFD measurements based on NCD-SSB, where the NCD-SSB is within the active DL BWP.  2. Bandwidth of UE-specific RRC configured BWP may not include bandwidth of the CORESET#0 (if CORESET#0 is present) and CD-SSB for PCell/PSCell (if configured) and bandwidth of the UE-specific RRC configured BWP may not include CD-SSB for Scell |  | Yes | n/a | UE cannot support RLM/BM/BFD measurements based on NCD-SSB within active BWP | [Per band] | No | No | n/a | This FG is not applicable to RedCap UEs. | Optional with capability signalling |

**Proposal:**

* **Add the following component with the yellow highlighting to FG 53-1 and FG 53-2:**
  + **CD-SSB outside active DL BWP but within the bandwidth of [the corresponding carrier(s) to be measured] can be used as the QCL source for other reference signal.**
* **Add the following component for FG 53-3:**
  + **NCD-SSB within the active DL BWP can be used as the QCL source for other reference signal.**

[R1-2302415](file:///Users/../../../../../../youns/OneDrive/Documents/3GPP/RAN1 tdocs/TSGR1_112b-e/Docs/R1-2302415.zip) UE features for BWP without restriction Ericsson

[R1-2302517](file:///Users/../../../../../../youns/OneDrive/Documents/3GPP/RAN1%20tdocs/TSGR1_112b-e/Docs/R1-2302517.zip) Discussion on UE features for BWP without restriction vivo

[R1-2302765](file:///Users/../../../../../../youns/OneDrive/Documents/3GPP/RAN1%20tdocs/TSGR1_112b-e/Docs/R1-2302765.zip) Discussion on UE feature for BWP without restriction ZTE

[R1-2302876](file:///Users/../../../../../../youns/OneDrive/Documents/3GPP/RAN1%20tdocs/TSGR1_112b-e/Docs/R1-2302876.zip) Preliminary UE Features List for BWP Without Restriction Vodafone Italia SpA, vivo

[R1-2302895](file:///Users/../../../../../../youns/OneDrive/Documents/3GPP/RAN1%20tdocs/TSGR1_112b-e/Docs/R1-2302895.zip) Initial views on UE features for BWP without restriction Nokia, Nokia Shanghai Bell

[R1-2303350](file:///Users/../../../../../../youns/OneDrive/Documents/3GPP/RAN1%20tdocs/TSGR1_112b-e/Docs/R1-2303350.zip) UE features for BWP without restriction MediaTek Inc.

[R1-2303623](file:///Users/../../../../../../youns/OneDrive/Documents/3GPP/RAN1%20tdocs/TSGR1_112b-e/Docs/R1-2303623.zip) UE features for BWP without restriction Qualcomm Incorporated

R1-2303653 Summary of UE features for BWP without restriction Moderator (AT&T)

[R1-2303738](file:///Users/../../../../../../youns/OneDrive/Documents/3GPP/RAN1%20tdocs/TSGR1_112b-e/Docs/R1-2303738.zip) Discussion on UE features for BWP without restriction NTT DOCOMO, INC.

[R1-2303865](file:///Users/../../../../../../youns/OneDrive/Documents/3GPP/RAN1%20tdocs/TSGR1_112b-e/Docs/R1-2303865.zip) UE features for BWP without restriction Huawei, HiSilicon