**3GPP TSG RAN WG1 #108-e R1-2nnnnn**

**e-Meeting, February 21st – March 3rd, 2022**

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

**Title: Session Notes of AI 8.16.2**

**Agenda Item:** **8.16.2**

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



#### 8.16.2 UE features for supporting NR from 52.6 GHz to 71 GHz

[108-e-R17-UE-features-52-71GHz-01] Email discussion on UE features for supporting NR from 52.6 GHz to 71 GHz – Ralf (AT&T)

* 1st check point: February 25
* Final check point: March 3

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

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| 24. NR\_ext\_to\_71GHz | 24-1d | Multiple PDSCH scheduling by single DCI for 120kHz in FR2-2 | 1. Multi-PDSCH scheduling by single DCI for the operation with 120 kHz SCS  2. HARQ enhancements for supporting multi-PDSCH scheduling with singe DCI | 24-1 | Yes | N/A | Multiple PDSCH scheduling by single DCI for 120kHz is not supported | Per band | N/A | N/A | N/A | ~~FFS: to extend this FG to other frequency ranges~~ | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-1f | Multiple PDSCH scheduling by single DCI for 120kHz in FR2-1 | 1. Multi-PDSCH scheduling by single DCI for the operation with 120 kHz SCS  2. HARQ enhancements for supporting multi-PDSCH scheduling with singe DCI |  | Yes | N/A | Multiple PDSCH scheduling by single DCI for 120kHz is not supported | Per band | N/A | N/A | N/A |  | Optional with capability signalling |

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| 24. NR\_ext\_to\_71GHz | 24-1e | Multiple PUSCH scheduling by single DCI for 120kHz in FR2-2 | 1. Multi-PUSCH scheduling by single DCI for the operation with 120 kHz SCS | 24-1a | Yes | N/A | Multiple PUSCH scheduling by single DCI for 120kHz is not supported | Per band | N/A | N/A | N/A | ~~FFS: to extend this FG to other frequency ranges~~ | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-1g | Multiple PUSCH scheduling by single DCI for 120kHz in FR2-1 | 1. Multi-PUSCH scheduling by single DCI for the operation with 120 kHz SCS |  | Yes | N/A | Multiple PUSCH scheduling by single DCI for 120kHz is not supported | Per band | N/A | N/A | N/A |  | Optional with capability signalling |

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| 24. NR\_ext\_to\_71GHz | 24-4 | 480KHz SCS support for DL | 1. 480KH SCS for DL data and control channels, SSB, and reference signal reception in FR2-2 for non-initial access  2. Multiple-slot PDCCH monitoring for 480KHz with (Xs,Ys) = (4,1)  ~~FFS:~~ 3. Multi- PDSCH scheduling by single DCI for the operation with 480 kHz SCS and corresponding HARQ enhancements  4. Within the Ys = 1 slot (with Xs=4), monitoring of type 1 CSS with dedicated RRC configuration, type 3 CSS, and UE-SS with a maximum of two monitoring spans per slot with a span duration of Y symbols and a minimum gap of X symbols between the start of two spans, where ~~set2~~ (X,Y) = (4, 3) and (7, 3) are supported ~~symbols where set2 is defined in FG3-5b (FFS: Monitoring capability within slots of type 1 CSS without dedicated RRC configuration and type0, 0A, and 2 CSS)~~  5. Processing one unicast DCI scheduling DL and one unicast DCI scheduling UL per slot group of Xs slots per scheduled CC for FDD ~~(This supersedes corresponding component of FG 3-5b)~~  6. Processing one unicast DCI scheduling DL and 2 unicast DCI scheduling UL per slot group of Xs slots per scheduled CC for TDD ~~(This supersedes corresponding component of FG 3-5b)~~  [7. For type 1 CSS without dedicated RRC configuration and for type 0, 0A, and 2 CSS, the monitoring occasion can be any OFDM symbol(s) of each slot of the slot group, with the monitoring occasions for any of Type 1- CSS without dedicated RRC configuration, or Types 0, 0A, or 2 CSS configurations within a single span of three consecutive OFDM symbols within each slot of the slot group.] | 24-1 | Yes | N/A | 480KHz SCS for DL is not supported | Per band | N/A | N/A | N/A | ~~FFS: component description without a reference to other R15 FGs~~ | Optional with capability signalling |

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| 24. NR\_ext\_to\_71GHz | 24-4f | Enhanced PDCCH monitoring for 480KHz in FR2-2 | 1. Multiple-slot PDCCH monitoring for 480KHz with (Xs,Ys)=(4,2)  2.) Within each of the Ys = 2 slots, monitoring of type 1 CSS with dedicated RRC configuration, type 3 CSS, and UE-SS in the first 3 OFDM symbols of each slot ~~(FFS: Monitoring capability within slots of type 1 CSS without dedicated RRC configuration and type0, 0A, and 2 CSS)~~ | 24-4 | Yes | N/A | Enhanced PDCCH monitoring for 480KHz in FR2-2 is not supported | Per band | N/A | N/A | N/A | ~~Component 1 candidate values: [one or more of] {[(2,1),] (4,2) }~~  ~~Note: If (2,1) is not agreed, this FG will have no component candidate values and the component 1 description will be updated from (Xs,Ys) to (Xs,Ys)=(4,2) similar to FG 24-4 and 24-5~~ | Optional with capability signalling |

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| 24. NR\_ext\_to\_71GHz | 24-5 | 960KHz SCS support for DL | 1. 960KHz SCS for DL data and control channels, SSB, and reference signal reception in FR2-2 for non-initial access  2. Multiple-slot PDCCH monitoring for 960KHz with (Xs,Ys)=(8,1)  ~~FFS:~~ 3. MultiPDSCH scheduling by single DCI for the operation with 960 kHz SCS and corresponding HARQ enhancements  4~~3~~. Within the Ys = 1 slot (with Xs=8), monitoring of type 1 CSS with dedicated RRC configuration, type 3 CSS, and UE-SS with a span duration of Y symbols and a minimum gap of X symbols between the start of two spans, where (X,Y) ~~set1~~ = (7, 3) symbols ~~where set1 is defined in FG3-5b (FFS: Monitoring capability within slots of type 1 CSS without dedicated RRC configuration and type0, 0A, and 2 CSS)~~  5~~4~~. Processing one unicast DCI scheduling DL and one unicast DCI scheduling UL per slot group of Xs slots per scheduled CC for FDD ~~(This supersedes corresponding component of FG 3-5b)~~  6~~5~~. Processing one unicast DCI scheduling DL and 2 unicast DCI scheduling UL per slot group of Xs slots per scheduled CC for TDD ~~(This supersedes corresponding component of FG 3-5b)~~  [7. For type 1 CSS without dedicated RRC configuration and for type 0, 0A, and 2 CSS, the monitoring occasion can be any OFDM symbol(s) of each slot of the slot group, with the monitoring occasions for any of Type 1- CSS without dedicated RRC configuration, or Types 0, 0A, or 2 CSS configurations within a single span of three consecutive OFDM symbols within each slot of the slot group.] | 24-1 | Yes | N/A | 960KHz SCS support for DL is not supported | Perband | N/A | N/A | N/A | ~~FFS: component description without a reference to other R15 FGs~~ | Optional with capability signalling |

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| 24. NR\_ext\_to\_71GHz | 24-5a | 960KHz SCS support for UL | 1. PRACH with 960KHz and length 139  2. 960KHz SCS for UL data and control channels and reference signal transmission in FR2-2  ~~[~~3. Multi-PUSCH scheduling by single DCI for the operation with 960 kHz SCS~~]~~ | 24-1a, 24-5 | Yes | N/A | 960KHz SCS support for UL is not supported | Per band | N/A | N/A | N/A |  | Optional with capability signalling |

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| 24. NR\_ext\_to\_71GHz | 24-10 | ~~Additional~~ Reduced beam switching time delay | Support~~ed~~ of ~~additional~~ reduced beam switching time delay d = 56 symbols for 480 kHz SCS | ~~Yes~~ | ~~N/A~~ Yes | ~~[Additional beam switching time delay is not supported]~~ N/A | ~~[Per UE/per band]~~ Additional beam switching time delay d = 56 symbols is not supported for 480kHz SCS | ~~N/A~~ per band | N/A | N/A | ~~Yes~~ N/A | ~~Candidate value set: 56 or 112 symbols~~  If this capability is not reported and the UE supports both FG 24-4 and 24-5, the default value of 112 symbols is assumed | Optional with capability signalling |

[R1-2200958](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1%20tdocs\TSGR1_108-e\Docs\R1-2200958.zip) Rel-17 UE features for extension to 71 GHz Huawei, HiSilicon

[R1-2201121](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1%20tdocs\TSGR1_108-e\Docs\R1-2201121.zip) Discussions on UE features for NR operation from 52.6GHz to 71GHz vivo

[R1-2201302](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1%20tdocs\TSGR1_108-e\Docs\R1-2201302.zip) Discussion on UE features for FR2-2 OPPO

[R1-2201395](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1%20tdocs\TSGR1_108-e\Docs\R1-2201395.zip) Discussion on UE features for 52.6 to 71GHz ZTE, Sanechips

[R1-2201409](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1%20tdocs\TSGR1_108-e\Docs\R1-2201409.zip) On UE features for supporting NR from 52.6 GHz to 71 GHz Nokia, Nokia Shanghai Bell

[R1-2201502](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1%20tdocs\TSGR1_108-e\Docs\R1-2201502.zip) Views on Rel-17 UE features for supporting NR in FR2-2 NTT DOCOMO, INC.

[R1-2201727](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1%20tdocs\TSGR1_108-e\Docs\R1-2201727.zip) Discussion on UE capability for extending NR up to 71 GHz Intel Corporation

[R1-2201741](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1%20tdocs\TSGR1_108-e\Docs\R1-2201741.zip) UE features for extending current NR operation to 71 GHz Ericsson

[R1-2201792](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1%20tdocs\TSGR1_108-e\Docs\R1-2201792.zip) Views on Rel-17 Beyond 52.6 GHz UE features Apple

[R1-2202039](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1%20tdocs\TSGR1_108-e\Docs\R1-2202039.zip) On UE features for supporting NR from 52.6 GHz to 71 GHz Samsung

[R1-2202075](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1%20tdocs\TSGR1_108-e\Docs\R1-2202075.zip) Views on UE features for supporting NR from 52.6 GHz to 71 GHz MediaTek Inc.

R1-2202166 UE features for NR from 52.6 Ghz to 71 Ghz Qualcomm Incorporated

Withdrawn

[R1-2202355](file:///C:\Users\youns\OneDrive\Documents\3GPP\RAN1%20tdocs\TSGR1_108-e\Docs\R1-2202355.zip) Discussion on UE features for NR above 52.6 GHz LG Electronics