**3GPP TSG RAN WG1 #109-e R1-220xxxx**

**e-Meeting, May 9th – 20th, 2022**

**Agenda item:** 8.2

**Source:** Moderator (Qualcomm)

**Title:** Moderator Summary for preparation phase on maintenance on Supporting NR from 52.6GHz to 71 GHz

**Document for:** Discussion and Decision

## Introduction

The issues in contributions submitted to RAN1#109e are summarized in the tables of sections 2 and 3. An initial assessment on each of the maintenance issues is provided based on the following classification:

* *High priority (H):* high-priority item (essential, pending issues, broken spec components) and proposed editorial changes that either enhance the clarity of the specs or correct mistakes
* *Non-essential (N)*: all other purposes such as spec optimization and low priority issues
* *Editorial (E)*: editorial issues that will be handled as editorial CRs (to be communicated to the editors/chairs)

## Issues for agenda item “8.2.1 Initial access aspects”

**Table 1 - Initial access aspects**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue#** | **Issue** | **References** | **FL initial assessment** | **Company inputs (if any)** |
| 1-1 | Additional RB offset for 96 PRB CORESET#0 | [1] [2] [4] [5] [6] [7] [8] [9] [10] [11] [13] | H | [Companies will fill input their views here] |
| 1-2 | Use of PBCH DMRS for partial indication of Q | [3] | N | [Companies will fill input their views here] |
| 1-3 | Confirmation of WA on signaling for Q | [4] [7] [9] [11] | H | [Companies will fill input their views here] |
| 1-4 | CD-SSB frequency indication using NCD-SSB | [6] | H | [Companies will fill input their views here] |
| 1-5 | Description update of longBitmap of SSB-ToMeasure | [6] | E  (however for RAN2 spec, therefore suggest to treat as H | [Companies will fill input their views here] |
| 1-6 | Removal of ‘-‘ sign from 24 RB offset for mux pattern 3 | [1] | E | [Companies will fill input their views here] |

## Issues for agenda item “8.2.2 PDCCH monitoring enhancements”

**Table 2 - PDCCH monitoring enhancements**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue#** | **Issue** | **References** | **FL initial assessment** | **Company inputs (if any)** |
| 2-1 | SS configuration for Type1 CSS without dedicated RRC and Type0/0A/2 CSS | [14] [15] [16] [17] [21] [22] [23] [24] [26] [28] [29] [31] [33] | H | [Companies will fill input their views here] |
| 2-2 | default value of *monitoringSlotsWithinSlotGroup-r17* | [29] | N |  |
| 2-3 | PDCCH repetition for Group (1) SS sets | [33] | N |  |
| 2-4 | Applicability of PDCCH monitoring configuration to active or all SSSG in active BWP | [19] [21] [29] | H (related to 2-5) |  |
| 2-5 | SSSG switching between different PDCCH monitoring combinations | [14] [15] [17] [19] [21] [22: FLNote1] [27] [28] [29] [30] [31] [33] | H (related to 2-4) |  |
| 2-6 | SSSG switching minimum time | [23] [27] | E (confirming WA) |  |
| 2-7 | Support PDCCH monitoring before and after SSSG switching | [31] | N |  |
| 2-8 | DCI processing limitations | [14] [33] | H |  |
| 2-9 | Dropping rules in case of overbooking across different slot groups | [17] [25] [33] | N |  |
| 2-10 | Scope of multi-slot PDCCH monitoring being mandatory capability for UE not supporting FR2-2 | [24] | H/E |  |
| 2-11 | BD/CCE budget determination for PDCCH monitoring (e.g. dependency on Ys) | [15] [16] [17] [21] [23] [28] [30] | H |  |
| 2-12 | UE capability signaling for CA/NR-DC operation | [14] [18] [22] [23] [30] | H |  |
| 2-13 | BD/CCE budget allocation over multiple serving cells (incl. multi-DCI multi-TRP) | [22] [30] | H |  |
| 2-14 | PDCCH monitoring pattern alignment across CCs | [30] | N |  |
| 2-15 | Missing RRC parameter *pdcch-BlindDetectionCA-CombIndicator-r17* | [22] | E |  |
| 2-16 | COT sharing conditions | [20] | treat in 8.2.4? |  |
| 2-17 | CSI-RS validation | [20] | treat in 8.2.4? |  |
| 2-18 | Cancellation of downlink reception | [20] | treat in 8.2.4? |  |
| 2-19 | PDCCH monitoring in a beam not covered by gNB sensing | [20] | treat in 8.2.4? |  |
|  | | | | |

FLNote1: For Issue 2-5, [22] suggests that the existing working assumption is sufficient.

## Issues for agenda item “8.2.3 PDSCH/PUSCH enhancements”

**Table 3 – RS and timeline**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue#** | **Issue** | **References** | **FL initial assessment** | **Company inputs (if any)** |
| 3-1 | DMRS Bundling for same TB in FR2-2 with 120 kHz SCS across Multiple PUSCHs.  FL note: the exact same issue had been discussed in RAN1#108-e where one company expressed concerns on lack of requirement study to apply this feature to FR2-2 in RAN4. FL is not aware of any change in RAN4 study status yet. | [36, 49] | N | [Companies will fill input their views here] |
| 3-2 | Minimum applicable scheduling offset for 480/960 kHz SCS.  Note: this issue is due to the newly agreed values from RAN2 on maxK0-SchedulingOffset-r17 and maxK2-SchedulingOffset-r17 for 480 kHz and 960 kHz SCS. | [50] | H |  |
| 3-3 | Antenna port field when both DMRS mapping type A and B are indicated in the TDRA row of DCI. | [43] | H |  |
| 3-4 | PTRS-DMRS association field when both DMRS mapping type A and B are indicated in the TDRA row of DCI. | [43] | H |  |

**Table 4 – Scheduling and HARQ**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue#** | **Issue** | **References** | **FL initial assessment** | **Company inputs (if any)** |
| 4-1 | Clarification on type-1 HARQ CB that time domain bundling is applied across PDSCHs scheduled by “the same DCI” | [34], [41] | H | [Companies will fill input their views here] |
| 4-2 | DCI-to-PDSCH OOO (case 5) and timeline of NNK1 (case 6) are based on configured SLIV vs. valid SLIV. | [34], [35], [36], [39], [41], [44], [45], [47], [48], [49], [50], [51], [52], [53] | H |  |
| 4-3 | Type-1 HARQ CB for multiple PDSCHs scheduled by single DCI 1-1 and slot-aggregated PDSCH scheduled by DCI 1-2 | [34], [38], [43], [45], [49] | H |  |
| 4-4 | Confirm working assumption that type-2 CB is generated based on “configured SLIV” | [35], [47], [49] | H |  |
| 4-5 | Collision handling between PUSCH and CORESET#0 | [37], [38], [47], [52] | N |  |
| 4-6 | Application of *PDSCH-AggregationFactor* /*PUSCH-AggregationFactor* for DCI format 1\_1/0\_1 “with CS-RNTI”  FL note: As per previous agreement, *PDSCH-AggregationFactor*/*PUSCH-AggregationFactor* is not applied for DCI format 1\_1/0\_1 “with CS-RNTI” | [38], [41], [43], [46] | N |  |
| 4-7 | Clarification on UL DAI Indication in multi-PUSCH scheduling DCI | [38] | H |  |
| 4-8 | TDRA information for a DCI indicating SCell dormancy without scheduling PDSCH | [39], [45], [48], [50] | H |  |
| 4-9 | Clarification on type-2 CB generation for a disabled TB when time domain bundling is configured | [39] TP1 | H |  |
| 4-10 | Clarification on type-2 CB generation when both of spatial bundling and time domain bundling are configured | [39] | H |  |
| 4-11 | Introduce an independent formula for type-2 HARQ CB when time domain is not configured but multi-PDSCH scheduling DCI is configured | [39] TP2 | N |  |
| 4-12 | Clarification on when it is used for the first sub-codebook out of two sub-codebooks | [39] TP3 | E |  |
| 4-13 | Reflect the agreement that priority indicator indicated in a multi-PXSCH scheduling DCI is applied to all of scheduled PXSCHs | [40] | E |  |
| 4-14 | Clarification on HARQ ID skipping for invalidated PDSCH scheduled by multi-PDSCH scheduling DCI with ‘tdmSchemeA’ for single DCI based multi-TRP mechanism | [41] | N |  |
| 4-15 | Relationship between COT duration and PDSCHs scheduled by a single DCI | [42], [47] | N |  |
| 4-16 | Restriction on the number of PDSCH receptions/PUSCH transmissions in a slot | [43] | N |  |
| 4-17 | Combining HARQ-disabling feature with multi-PDSCH scheduling | [45] | N |  |
| 4-18 | Reflect the agreement that UE does not apply *pusch-AggregationFactor* to DCI format 0\_1 if multi-PUSCH scheduling DCI is configured | [46] | E |  |
| 4-19 | Clarification on UE behavior if multi-PXSCH scheduling DCI indicates BWP switching | [47] | N |  |
| 4-20 | Applicability of time domain bundling for type-3 CB | [52] | N |  |
| 4-21 | Clarification on the applicability of K1 set extension for K1 values for DCI 1\_0 | [52] | N |  |
| 4-22 | If only one PDSCH is valid among PDSCHs scheduled by a DCI, HARQ-ACK bit for that PDSCH belongs to the first sub-codebook | [53] | N |  |
| 4-23 | Clarification of PDSCH mapping type of PDSCHs scheduled by multi-PDSCH scheduling DCI with ‘tdmSchemeA’ for single DCI based multi-TRP mechanism | [53] | N |  |
| 4-X | Application of TCI states within the span of multi-PDSCH | [34] | Treated in 8.2.5? |  |
| 4-Y | Channel access type indication for multiple PUSCHs in single DCI | [42] | Treated in 8.2.4? |  |
|  | | | | |

## Issues for agenda item “8.2.4 Channel access mechanism”

**Table 5 - Channel access mechanism**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue#** | **Issue** | **References** | **FL initial assessment** | **Company inputs (if any)** |
| 5-1 | ED Threshold when LBT Bandwidth is larger than Active BWP, Upper limit on EDT Threshold | [71], [75], [56], [59], [63] | H | [Companies will fill input their views here] |
| 5-2 | UL Contention Exempt Short Control Signaling: Duty Cycle Constraint | [72], [73], [75], [71], [55], [56], [58], [59], [62], [64], [66] | H |  |
| 5-3 | UL Contention Exempt Short Control Signaling: Signaling for Enabling CET for msg1/msgA together | [73], [75], [71], [55], [56], [59], [60], [65], [66] | H |  |
| 5-4 | Multi-Beam Channel Access: Independent per beam sensing and LBT Procedure for UE Initiated COT | [71], [75], [63], [69] | H |  |
| 5-5 | Multi-Beam Channel Access: Independent per beam sensing and LBT Procedure for UE Initiated COT: COT on a Subset of Beams | [71], [75], [56], [57], [69] | H |  |
| 5-6 | Multi-Beam Channel Access: ED Threshold for independent per beam sensing | [71], [73], [75]  [54], [55], [56], [59], [69] | H |  |
| 5-7 | LBT Upgrade in COT Sharing: RRC Configuration for Channel Access Type Change for UE from Type 1 to Type 2 or Type 3 LBT | [71], [75], [56], [58], [59], [60], [63], [64], [65], [66], [70] | H |  |
| 5-8 | COT resumption after a gap: RRC Configuration of Channel Access Type for resuming a UE initiated COT after a gap | [71], [75], [54], [57], [58], [60], [63], [64], [65] | H |  |
| 5-9 | Channel Access Indication within Fall-Back DCI | [55], [56], [58], [59], [63], [64], [65], [66], [70] | H |  |
| 5-10 | Cyclic prefix extension for CG UL transmissions | [73], [63], [70] | N |  |
| 5-11 | UL To DL COT Sharing, clarification of gNB side LBT | [73*],* [64] | N |  |
| 5-12 | UE Channel Access Type behavior before reporting of LBT Capability | [71], [55], [59], [70] | H |  |
| 5-13 | Clarification on UE Assumption on LBT mode at the gNB for the gNB-UE connection | [54], [59], [62] | H |  |
| 5-14 | SIB 1 indication of whether LBT is required for all UL Transmissions | [54], [58], [64] | H |  |
| 5-15 | Non-Fallback DCI : Extend the use of ChannelAccess-CPext-(CAPC) field to two other Non-Fallback DCI formats, namely 0\_2 and 1\_2 | [55] | N |  |
| 5-16 | Clarification on UE behavior when fallback DCI indicating Type 2 LBT when the UE does not have the capability | [63] | H |  |
| 5-17 | Beam Selection for consecutive PUSCH transmissions when CG-PUSCH and DG-PUSCH are multiplexed | [74] | N |  |
| 5-18 | RAN2 Correction for Value ranges for cg-COT-Sharing-r17 and cg-COT-SharingList-r17 | [55] | E |  |
| 5-19 | Clarification on TCI state for inter-frequency RSSI measurements | [55] | H |  |
| 5-20 | Alignment of RAN2 parameter ChannelAccessMode2-r17 with 37.213 | [55] | E |  |
| 5-21 | Editorial: Channel Access Procedure definition in Section 4.0 of 37.213 | [55] | E |  |
| 5-22 | Default Channel Access type in absence of channelAccessMode2-r17 | [56] | N |  |
| 5-23 | Beam Specific COT-SI, CO and SSGS for DCI 2\_0 | [56], [57], [59], [62], [64], [66], [68] | N |  |
| 5-24 | RAN2 : Per Beam LBT failure indication under directional LBT | [56] | N |  |
| 5-25 | Editorial: Misalignment of higher-layer parameter name between TS 37.213 and TS 38.331. | [56] | E |  |
| 5-26 | Editorial: Misalignment of higher-layer parameter name between TS 38.212 and TS 38.331. | [56] | E |  |
| 5-27 | Editorial: Misalignment of higher-layer parameter name between TS 38.213 and TS 38.331 | [56] | E |  |
| 5-28 | Clarification on Channel access type indication for multiple PUSCHs in single DCI | [61], [64] | H |  |
| 5-29 | Clarification on Channel access Type determination when UE receives multiple channel access type indications | [61], [62], [68] | H |  |
| 5-30 | Multi-Channel channel access clarification | [63] | N |  |
| 5-31 | Clarification on ED Threshold in COT Sharing | [63] | N |  |
| 5-32 | Rx Assistance via PDCCH and PUCCH | [63] | N |  |
| 5-33 | Clarification/Editorial in 38.214 regarding use of beamCorrespondenceWithoutUL-BeamSweeping when used for directional sensing | [64] | E |  |
| 5-34 | LBT Downgrade from Type 2 to Type 1 on failure of Type 2 LBT | [67] | N |  |
|  | | | | |

## Issues for agenda item “8.2.5 Others”

**Table 6 - Enhancements for PUCCH formats 0/1/4**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue#** | **Issue** | **References** | **FL initial assessment** | **Company inputs (if any)** |
| 6-1 | Determination of number of RBs for PF4  In [83] it is observed that 38.212 Section 6.3.1.4 contains the following sentence:  ,  and are the number of PRBs that are determined by the UE for PUCCH formats 2/3/4 transmission respectively according to Clause 9.2 of [5, TS38.213]  In [83], it is claimed that "there is no description in Clause 9.2 of TS 38.213 [2] to determine the actual number of PRBs used for enhanced PUCCH format 4"  To the contrary, the FL observes that 38.213 Clause 9.2.1 does indeed specify the number of PRBs for enhanced PUCCH format 4 according to the following paragraph:  If the *format* indicates *PUCCH-format4*, the PUCCH format configured for a PUCCH resource is PUCCH format 4, where the PUCCH resource also includes a number of symbols for a PUCCH transmission provided by *nrofSymbols*, an orthogonal cover code length by *occ-Length*, an orthogonal cover code index by *occ-Index*, and a first symbol for the PUCCH transmission provided by *startingSymbolIndex*. For PUCCH transmission in FR2-2, the PUCCH resource can also include a number of PRBs provided by *nrofPRBs*; otherwise, *.*  Hence, the FL's assessment is that it is not necessary to discuss this issue. | [83] | N | [Companies will fill input their views here] |
|  |  |  |  |  |
|  | | | | |

**Table 7 - Beam management for new SCSs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue#** | **Issue** | **References** | **FL initial assessment** | **Company inputs (if any)** |
| 7-1 | Introduction of beam switching gap | [76], [80], [82] | H | [Companies will fill input their views here] |
| 7-2 | Whether to update the applied TCI states within the span of multi-PDSCH | [76], [77], [78], [79], [80], [82] | H |  |
| 7-3 | Minimum guard period Y between two SRS resources of an SRS resource set for antenna switching | [77] | N (essential but RAN4 should discuss the issue based on the RAN1 LS) |  |
|  | | | | |

**Table 8 – Other issues**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Issue#** | **Issue** | **References** | **FL initial assessment** | **Company inputs (if any)** |
| 8-1 | [description of the issue] |  |  | [Companies will fill input their views here] |
|  |  |  |  |  |
|  | | | | |

## Conclusion

Based on the responses from participating companies during the preparation phase, the final FL recommendation is:

# References

Contributions submitted to 8.2.1

[1]. R1-2203079, Remaining issue of initial access signals and channels for 52-71GHz spectrum, Huawei, HiSilicon, SIA

[2]. R1-2203290, Remaining issues on initial access aspects for 52.6 to 71GHz, ZTE, Sanechips

[3]. R1-2203369, Remaining issues for initial access operation in 52.6-71GHz, InterDigital, Inc.

[4]. R1-2203430, Remaining issues on Initial access aspects for up to 71GHz operation, CATT

[5]. R1-2203508, Maintenance on initial access for NR operation from 52.6GHz to 71GHz, vivo

[6]. R1-2203858, Maintenance on initial access aspects for NR from 52.6 GHz to 71 GHz, Samsung

[7]. R1-2203986, Discussion on remaining issue for initial access aspects, OPPO

[8]. R1-2204110, Initial Access Aspects, Ericsson

[9]. R1-2204201, Remaining issues for initial access aspects, Apple

[10]. R1-2204338, Remaining issues on initial access aspects for NR in FR2-2, NTT DOCOMO, INC.

[11]. R1-2204599, Initial access aspects, Nokia, Nokia Shanghai Bell

[12]. R1-2204611, Remaining issues of initial access aspects to support NR above 52.6 GHz, LG Electronics

[13]. R1-2204766, Discussion on initial access aspects for extending NR up to 71 GHz, Intel Corporation

Contributions submitted to 8.2.2

[14]. R1-2203080, Remaining issues of PDCCH monitoring enhancement for 52-71GHz spectrum, Huawei, HiSilicon, SIA

[15]. R1-2203291, Remaining issues on PDCCH monitoring enhancements for 52.6 to 71GHz, ZTE, Sanechips

[16]. R1-2203370, Remaining issues for PDCCH monitoring enhancements, InterDigital, Inc.

[17]. R1-2203431, Remaining issues on PDCCH monitoring enhancements for up to 71GHz operation, CATT

[18]. R1-2203509, Maintenance on PDCCH monitoring enhancements for NR operation from 52.6GHz to 71GHz, vivo

[19]. R1-2203859, Maintenance on PDCCH monitoring enhancements for NR from 52.6 GHz to 71 GHz, Samsung

[20]. R1-2203987, Discussion on remaining issue for PDCCH monitoring enhancement, OPPO

[21]. R1-2204075, Remaining issues on PDCCH monitoring , Panasonic

[22]. R1-2204111, PDCCH Monitoring Enhancements, Ericsson

[23]. R1-2204202, On remaining issues for PDCCH Monitoring, Apple

[24]. R1-2204339, Remaining issues on PDCCH monitoring enhancements for NR in FR2-2, NTT DOCOMO, INC.

[25]. R1-2204514, PDCCH monitoring enhancements, Sharp

[26]. R1-2204566, Remaining Issues on PDCCH Monitoring Enhancements in FR2-2, TCL Communication

[27]. R1-2204578, Remaining issues of PDCCH monitoring enhancements for above 52.6GHz, Transsion Holdings

[28]. R1-2204600, Remaining issues on PDCCH monitoring enhancements, Nokia, Nokia Shanghai Bell

[29]. R1-2204612, Remaining issues of PDCCH monitoring enhancements to support NR above 52.6 GHz, LG Electronics

[30]. R1-2204706, Remaining discussion on PDCCH monitoring enhancement for 52.6-71 GHz NR operation, MediaTek Inc.

[31]. R1-2204767, Discussion on PDCCH monitoring enhancements for extending NR up to 71 GHz, Intel Corporation

[32]. R1-2204825, Remaining issues on PDCCH for NR from 52.6 GHz to 71GHz, Lenovo

[33]. R1-2204979, PDCCH monitoring enhancements for NR in 52p6 to 71GHz band, Qualcomm Incorporated

Contributions submitted to 8.2.3

[34]. R1-2203081, Remaining issues of PDSCH/PUSCH enhancement for 52-71GHz spectrum, Huawei, HiSilicon, SIA

[35]. R1-2203292, Remaining issues on data channel enhancements for 52.6 to 71GHz, ZTE, Sanechips

[36]. R1-2203371, Remaining issues for PDSCH/PUSCH enhancements to supporting 52.6-71 GHz band in NR, InterDigital, Inc.

[37]. R1-2203401, Discussion on PDSCH/PUSCH enhancements for NR 52.6-71 GHz, Panasonic

[38]. R1-2203432, Remaining issues on PDSCH/PUSCH enhancements for up to 71GHz operation, CATT

[39]. R1-2203510, Maintenance on PDSCH/PUSCH enhancements for NR operation from 52.6GHz to 71GHz, vivo

[40]. R1-2203678, Remaining issues of PDSCH/PUSCH enhancements for 52.6 to 71GHz, NEC

[41]. R1-2203708, Remaining issues of multi-PDSCH/PUSCH scheduling via a single DCI, Fujitsu Limited

[42]. R1-2203784, Remaining issues on PDSCH and PUSCH enhancements for NR 52.6-71GHz, xiaomi

[43]. R1-2203860, Maintenance on PDSCH/PUSCH enhancements for NR from 52.6 GHz to 71 GHz, Samsung

[44]. R1-2203988, Discussion on remaining issue for PDSCH/PUSCH enhancements, OPPO

[45]. R1-2204112, PDSCH-PUSCH Enhancements, Ericsson

[46]. R1-2204190, Discussion on multi-PXSCH scheduling, ASUSTeK

[47]. R1-2204203, On remaining issues for PDSCH PUSCH Enhancements, Apple

[48]. R1-2204340, Remaining issues on PDSCH/PUSCH enhancements for NR in FR2-2, NTT DOCOMO, INC.

[49]. R1-2204601, Remaining issues on PDSCH/PUSCH enhancements, Nokia, Nokia Shanghai Bell

[50]. R1-2204613, Remaining issues of PDSCH/PUSCH enhancements to support NR above 52.6 GHz, LG Electronics

[51]. R1-2204707, Remaining discussion on multi-PDSCH scheduling design for 52.6-71 GHz NR operation, MediaTek Inc.

[52]. R1-2204768, Discussion on PDSCH/PUSCH enhancements for extending NR up to 71 GHz, Intel Corporation

[53]. R1-2204980, PDSCH and PUSCH enhancements, Qualcomm Incorporated

Contributions submitted to 8.2.4

[54]. R1-2203056, Remaining Details in Channel access for Beyond 52.6 GHz, FUTUREWEI

[55]. R1-2203082, Remaining issues of channel access mechanism for 60 GHz unlicensed operation, Huawei, HiSilicon, SIA

[56]. R1-2203293, Remaining issues on channel access for 52.6 to 71GHz, ZTE, Sanechips

[57]. R1-2203372, Remaining issues for channel access mechanisms, InterDigital, Inc.

[58]. R1-2203433, Remaining issues on channel access mechanism for up to 71GHz operation, CATT

[59]. R1-2203511, Maintenance on channel access mechanism for NR operation from 52.6GHz to 71 GHz, vivo

[60]. R1-2203679, Remaining issues on channel access mechanism supporting NR from 52.6 to 71 GHz, NEC

[61]. R1-2203785, Remaining issues on channel access mechanism for NR on 52.6-71 GHz, xiaomi

[62]. R1-2203861, Maintenance on channel access mechanism for NR from 52.6 GHz to 71 GHz, Samsung

[63]. R1-2203989, Discussion on remaining issue for channel access mechanism, OPPO

[64]. R1-2204113, Channel Access Mechanisms, Ericsson

[65]. R1-2204204, Remaining details on channel access mechanisms for unlicensed access above, Apple

[66]. R1-2204341, Remaining issues on Channel access mechanism for NR in FR2-2, NTT DOCOMO, INC.

[67]. R1-2204546, Remaining issue on channel access for NR from 52.6GHz to 71GHz, WILUS Inc.

[68]. R1-2204567, Remaining Issues on Channel Access for NR in 60GHz Unlicensed Band, TCL Communication

[69]. R1-2204579, Remaining issues of channel access mechanism for above 52.6GHz, Transsion Holdings

[70]. R1-2204602, Remaining issues on channel access mechanism, Nokia, Nokia Shanghai Bell

[71]. R1-2204614, Remaining issues of channel access mechanism to support NR above 52.6 GHz, LG Electronics

[72]. R1-2204636, Remaining issue on channel access scheme for above 52.6GHz, ASUSTeK

[73]. R1-2204769, Discussion on Channel Access Mechanism for extending NR up to 71 GHz, Intel Corporation

[74]. R1-2204826, Remaining issues on channel access for NR from 52.6 GHz to 71GHz, Lenovo

[75]. R1-2204981, Channel access enhancements, Qualcomm Incorporated

Contributions submitted to 8.2.5

[76]. R1-2203294, Remaining issues on beam management for 52.6 to 71GHz, ZTE, Sanechips

[77]. R1-2203373, Remaining issues for beam management for new SCSs, InterDigital, Inc.

[78]. R1-2203512, Maintenance on beam management, vivo

[79]. R1-2204114, Remaining issues for beam management, Ericsson

[80]. R1-2204342, Remaining issues on beam based operation for new SCSs for NR from 52.6 to 71 GHz, NTT DOCOMO, INC.

[81]. R1-2204603, Supported values for SSSG switching delay for 480 kHz and 960 kHz SCS, Nokia, Nokia Shanghai Bell

[82]. R1-2204615, Remaining issues of beam management to support NR above 52.6 GHz, LG Electronics

[83]. R1-2204896, Remaining issues of PUCCH enhancement and beam management enhancement for 52-71GHz spectrum, Huawei, HiSilicon, SIA