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**Third Generation Partnership Project (3GPP™)**

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Contents:

1 Opening of the E-meeting 15

2 Approval of the agenda 15

3 Election for RAN4 vice chairs 16

4 Letters / reports from other groups / meetings 16

5 Rel-15 and previous release maintenance 19

5.1 Rel-15 New radio access technology 19

5.1.1 System Parameters Maintenance 19

5.1.2 UE RF requirements maintenance 19

5.1.2.1 [FR1] Maintenance for 38.101-1 19

5.1.2.2 [FR2] Maintenance for 38.101-2 27

5.1.2.3 Maintenance for 38.101-3 32

5.1.3 UE EMC requirements maintenance 36

5.1.4 BS RF requirements maintenance 37

5.1.4.1 General 37

5.1.4.2 TX/RX requirements maintenance (38.104) 37

5.1.4.3 MSR specifications maintenance 38

5.1.5 BS conformance testing Maintenance 39

5.1.5.1 General 39

5.1.5.2 Conducted conformance testing (38.141-1) 39

5.1.5.3 Radiated conformance testing (38.141-2) 40

5.1.5.4 eAAS specifications maintenance 42

5.1.6 BS EMC requirements Maintenance 47

5.1.7 RRM core requirements maintenance (38.133/36.133) 48

5.1.8 RRM performance requirements maintenance (38.133/36.133) 54

5.1.9 Demodulation and CSI requirements maintenance (38.101-4/38.104) 74

5.1.9.1 UE demodulation requirements 74

5.1.9.2 CSI requirements 75

5.1.9.3 BS demodulation requirements 77

5.1.10 Positioning specs maintenance (36.171, 37.171 and 38.171) 79

5.1.10.1 Frequency Bands for testing of A-GNSS Sensitivity 79

5.1.10.2 Other 80

5.1.11 Testability Maintenance (38.810) 81

5.2 LTE maintenance (up to Rel-15) 81

5.2.1 Even further mobility enhancement 81

5.2.1.1 RRM core requirements 81

5.2.1.2 RRM performance requirements 81

5.2.2 Other WIs or R16 TEI 81

5.2.2.1 BS RF requirements 81

5.2.2.2 UE RF requirements 81

5.2.2.3 RRM requirements 83

5.2.2.3.1 RRM core requirements 83

5.2.2.3.2 RRM performance requirements 85

5.2.2.4 Demodulation and CSI requirements 85

5.2.2.4.1 UE demodulation requirements 85

5.2.2.4.2 CSI requirements 86

5.2.2.4.3 BS demodulation requirements 86

6 Rel-16 maintenance for both NR and LTE 86

6.1 NR maintenance 86

6.1.1 NR-based access to unlicensed spectrum 86

6.1.1.1 System parameter 86

6.1.1.2 UE RF requirement 86

6.1.1.3 BS RF requirement 87

6.1.1.4 BS conformance testing 89

6.1.1.4.1 Non-contiguous transmission testing 89

6.1.1.4.2 Others 91

6.1.1.5 RRM core requirements (38.133) 91

6.1.1.5.1 General 91

6.1.1.5.2 RRC connection mobility control 92

6.1.1.5.3 SCell activation/deactivation (delay and interruption) 92

6.1.1.5.4 Timing 92

6.1.1.5.5 Other requirements 92

6.1.1.6 RRM performance requirements (38.133) 94

6.1.1.6.1 General 94

6.1.1.6.2 Measurement accuracy requirements 94

6.1.1.6.3 Test cases 94

6.1.1.6.3.1 General 94

6.1.1.6.3.2 RRC IDLE cell re-selection 95

6.1.1.6.3.3 HO (delay and interruptions) 96

6.1.1.6.3.4 RRC Re-establishment 97

6.1.1.6.3.5 RRC Connection Release with Redirection 98

6.1.1.6.3.6 Random access 99

6.1.1.6.3.7 Timing (transmit timing and TA) 100

6.1.1.6.3.8 BWP switching delay and interruptions 101

6.1.1.6.3.9 PSCell addition/release (delay and interruption) 101

6.1.1.6.3.10 SCell activation/deactivation (delay and interruption) 102

6.1.1.6.3.11 Other interruptions 103

6.1.1.6.3.12 RLM 103

6.1.1.6.3.13 Beam management (BFD and link recovery) 104

6.1.1.6.3.14 SS-RSRP/SS-RSRQ/SS-SINR/L1-RSRP measurement procedure (intra-frequency, inter-frequency, inter-RAT) 105

6.1.1.6.3.15 RSSI/CO measurement procedure (intra-frequency, inter-frequency, inter-RAT) 106

6.1.1.6.3.16 SFTD measurement procedure 106

6.1.1.6.3.17 SS-RSRP/SS-RSRQ/SS-SINR/L1-RSRP measurement accuracy (intra-frequency, inter-frequency, inter-RAT) 106

6.1.1.6.3.18 RSSI/CO measurement accuracy (intra-frequency, inter-frequency, inter-RAT) 107

6.1.1.6.3.19 SFTD measurement accuracy 107

6.1.1.6.3.20 Other 107

6.1.1.7 Demodulation and CSI requirements (38.101-4/38.104) 108

6.1.1.7.1 General 108

6.1.1.7.2 UE demodulation requirements 108

6.1.1.7.3 CSI requirements 109

6.1.1.7.4 BS demodulation requirements 110

6.1.2 Integrated Access and Backhaul for NR 115

6.1.2.1 RF requirements 115

6.1.2.2 RF conformance testing 116

6.1.2.2.1 General 116

6.1.2.2.2 Common test issues for conducted and radiated conformance testing 117

6.1.2.2.2.1 Test Model with High PSD and narrow RBs allocation 117

6.1.2.2.2.2 MU clean-up 118

6.1.2.2.2.3 Others 118

6.1.2.2.3 Conducted conformance testing 119

6.1.2.2.4 Radiated conformance testing 119

6.1.2.3 RRM core requirements 120

6.1.2.4 RRM performance requirements 120

6.1.2.5 EMC performance requirements 121

6.1.2.6 Demodulation and CSI requirements 121

6.1.2.6.1 General 122

6.1.2.6.2 IAB-DU performance requirements 122

6.1.2.6.3 IAB-MT performance requirements 123

6.1.3 5G V2X with NR sidelink 124

6.1.3.1 RF core requirements 124

6.1.3.2 RRM requirements (38.133) 125

6.1.3.3 Demodulation requirements (38.101-4) 125

6.1.3.3.1 General 125

6.1.3.3.2 Single link test 126

6.1.3.3.3 Multiple link test 126

6.1.4 Multi-RAT Dual-Connectivity and Carrier Aggregation enhancements 126

6.1.4.1 UE RF requirement (38.101-1) 126

6.1.4.2 RRM core requirement (38.133/36.133) 126

6.1.4.2.1 Early Measurement reporting 126

6.1.4.2.2 Efficient and low latency serving cell configuration, activation and setup 126

6.1.4.3 RRM performance requirements (38.133) 127

6.1.4.3.1 Early Measurement reporting 127

6.1.4.3.2 Efficient and low latency serving cell configuration, activation and setup 127

6.1.5 Enhancements on MIMO for NR 128

6.1.5.1 RRM requirements (38.133) 128

6.1.5.1.1 Applicability of MRTD/MTTD requirements for multi-TRxP 128

6.1.5.1.2 Test case for pathloss RS activation delay 129

6.1.5.1.3 Others 130

6.1.5.2 Others 130

6.1.6 NR Positioning Support 131

6.1.6.1 RRM core requirement (38.133) 131

6.1.6.1.1 PRS-RSTD measurement requirements 131

6.1.6.1.2 PRS-RSRP measurement requirements 133

6.1.6.1.3 UE Rx-Tx time difference measurement requirements 134

6.1.6.1.4 Other requirements 137

6.1.6.2 RRM performance requirements (38.133) 139

6.1.6.2.1 General 139

6.1.6.2.2 UE requirements and test cases 139

6.1.6.2.2.1 General 139

6.1.6.2.2.2 Measurement accuracy requirements 139

6.1.6.2.2.3 Test cases 140

6.1.6.2.2.2.1 PRS RSTD 140

6.1.6.2.2.4 Other 141

6.1.6.2.2.2.2 PRS RSRP 141

6.1.6.2.2.3.1 General 141

6.1.6.2.2.2.2 PRS RSRP 142

6.1.6.2.2.3.1 General 142

6.1.6.2.2.2.3 UE Rx-Tx time difference 143

6.1.6.2.2.3.2 Measurement requirements 143

6.1.6.2.2.2.3 UE Rx-Tx time difference 143

6.1.6.2.2.3.2 Measurement requirements 144

6.1.6.2.2.2.3 UE Rx-Tx time difference 144

6.1.6.2.2.3.2 Measurement requirements 144

6.1.6.2.2.2.3 UE Rx-Tx time difference 145

6.1.6.2.2.3.3 Accuracy requirements 145

6.1.6.2.3 gNB requirements 146

6.1.6.2.3.1 General 146

6.1.6.2.3.2 SRS-RSRP requirements 146

6.1.6.2.3.3 gNB Rx-Tx time difference requirements 147

6.1.7 NR RRM requirement enhancement 148

6.1.7.1 RRM core requirements 148

6.1.7.2 RRM performance requirements 150

6.1.8 NR RRM requirements for CSI-RS based L3 measurement 151

6.1.8.1 RRM core requirements (38.133) 151

6.1.8.2 RRM performance requirements (38.133) 154

6.1.8.2.1 General 154

6.1.8.2.2 Measurement accuracy requirements 154

6.1.8.2.2.1 CSI-RSRP requirements 154

6.1.8.2.2.2 CSI-RSRQ requirements 154

6.1.8.2.2.3 CSI-SINR requirements 154

6.1.8.2.3 Test cases 154

6.1.8.2.3.1 General 154

6.1.8.2.3.2 Intra-frequency measurement 154

6.1.8.2.3.3 Inter-frequency measurement 154

6.1.8.2.3.4 Measurement performance 154

6.1.9 Maintenance for other WIs 154

6.1.9.1 BS RF requirements 154

6.1.9.2 UE RF requirements 157

6.1.9.2.1 [FR1] Maintenance for 38.101-1 158

6.1.9.2.2 [FR2] Maintenance for 38.101-2 164

6.1.9.2.3 Maintenance for 38.101-3 166

6.1.9.3 RRM requirements 168

6.1.9.3.1 RRM core 168

6.1.9.3.2 RRM performance 171

6.1.9.4 Demodulation and CSI requirements 172

6.1.9.4.1 UE demodulation requirements 172

6.1.9.4.2 CSI requirements 173

6.1.9.4.3 BS demodulation requirements 173

6.1.9.5 NR MIMO OTA test methods (38.827) 176

6.1.10 R16 TEI 177

6.1.10.1 BS RF requirements 177

6.1.10.2 UE RF requirements 177

6.1.10.3 RRM requirements 177

6.1.10.4 Demodulation and CSI requirements 178

6.1.10.5 US band n77 (update of requirements) 178

6.2 LTE maintenance and TEI 180

6.2.1 BS RF requirements 180

6.2.2 UE RF requirements 180

6.2.3 RRM requirements 181

6.2.3.1 RRM core requirements 181

6.2.3.2 RRM performance requirements 183

6.2.4 Demodulation and CSI requirements 183

6.2.4.1 UE demodulation requirements 183

6.2.4.2 CSI requirements 183

6.2.4.3 BS demodulation requirements 183

6.3 Rel-16 UE feature list maintenance 183

6.4 LS response for WP5D (RP-210747) on recommendations ITU-R M.2070 and ITU -R M.2071 on Unwanted Emissions of IMT-Advanced 183

7 Rel-17 maintenance for both NR and LTE 184

7.1 Introduction of FR2 FWA UE with maximum TRP of 23dBm for n257 and n258 184

7.2 Introduction of NR band n67 185

7.2.1 UE RF requirements (38.101-1) 185

7.2.2 BS RF requirements (38.104) 185

7.2.3 RRM requirements (38.133) 185

7.3 Introduction of NR band n85 185

7.3.1 UE RF requirements (38.101-1) 185

7.3.2 BS RF requirements (38.104) 185

7.3.3 RRM requirements (38.133) 185

7.4 Introduction of NR band n24 185

7.4.1 UE RF requirements (38.101-1) 185

7.4.2 BS RF requirements (38.104) 185

7.4.3 RRM requirements (38.133) 185

7.5 High power UE (power class 2) for NR band n34 185

7.5.1 General 185

7.5.2 UE RF requirements 185

7.6 Modification of LTE Band 24 specifications to comply with updated regulatory emission limits 185

7.6.1 UE RF requirements 185

7.6.2 BS RF requirements 187

7.6.3 RRM requirements 187

8 Rel-17 spectrum related Work Items for NR 187

8.1 Introduction of lower 6GHz NR unlicensed operation for Europe 187

8.1.1 General 187

8.1.2 Comparison of reusing n96 and defining a new band 187

8.1.3 UE RF requirements 188

8.1.4 BS RF requirements 188

8.1.5 Others 189

8.2 Introduction of operation in full unlicensed band 5925-7125MHz for NR 189

8.2.1 General 189

8.2.2 Regulatory requirements and feasibility of re-using existing NS 189

8.2.3 UE RF requirements 190

8.2.4 BS RF requirements 190

8.3 Introduction of NR 47 GHz band 190

8.3.1 UE RF requirements maintenance (38.101-2) 190

8.3.2 BS RF requirements maintenance (38.104) 191

8.3.3 BS conformance (38.141) 191

8.3.4 RRM requirements maintenance (38.133) 192

8.3.5 Demodulation and CSI requirements 192

8.3.5.1 UE demodulation (38.101-4) 192

8.3.5.2 BS demodulation (38.104) 192

8.4 Introduction of 900 MHz spectrum to 5G NR applicable for Rail Mobile Radio 192

8.4.1 General 192

8.4.2 UE RF requirements 193

8.4.3 BS RF requirements 193

8.4.4 Others 194

8.5 Introduction of 1900 MHz spectrum to 5G NR applicable for Rail Mobile Radio 194

8.5.1 General 194

8.5.2 UE RF requirements 194

8.5.3 BS RF requirements 195

8.5.4 Others 195

8.6 Issues arising from basket WIs but not subject to block approval 195

8.6.1 UE RF requirements 195

8.6.2 Feasibility study of defining “low MSD” for CA and DC 198

8.6.3 Others 200

8.7 NR intra band Carrier Aggregation for xCC DL/yCC UL including contiguous and non-contiguous spectrum (x>=y) 200

8.7.1 Rapporteur Input (WID/TR/CR) 200

8.7.2 UE RF requirements for FR1 200

8.7.3 UE RF requirements for FR2 201

8.8 NR inter-band Carrier Aggregation/Dual Connectivity for 2 bands DL with x bands UL (x=1, 2) 201

8.8.1 Rapporteur Input (WID/TR/CR) 201

8.8.2 NR inter band CA requirements without any FR2 band(s) 202

8.8.3 NR inter band CA requirements with at least one FR2 band 209

8.9 NR Inter-band Carrier Aggregation for 3 bands DL with 1 band UL 211

8.9.1 Rapporteur Input (WID/TR/CR) 211

8.9.2 UE RF requirements 211

8.10 NR Inter-band Carrier Aggregation for 4 bands DL with 1 band UL 217

8.10.1 Rapporteur Input (WID/TR/CR) 217

8.10.2 UE RF requirements 218

8.11 NR Inter-band Carrier Aggregation/Dual connectivity for 3 bands DL with 2 bands UL 221

8.11.1 Rapporteur Input (WID/TR/CR) 221

8.11.2 UE RF requirements 222

8.12 NR inter-band Carrier Aggregation and Dual connectivity for DL 4 bands and 2UL bands 230

8.12.1 Rapporteur Input (WID/TR/CR) 231

8.12.2 UE RF requirements 231

8.13 NR inter-band CA for 5 bands DL with x bands UL (x=1, 2) 235

8.13.1 Rapporteur Input (WID/TR/CR) 235

8.13.2 UE RF requirements 235

8.14 DC of 1 LTE band and 1 NR band 236

8.14.1 Rapporteur Input (WID/TR/CR) 236

8.14.2 EN-DC requirements without FR2 band 236

8.14.3 EN-DC requirements with FR2 band 239

8.15 DC of 2 LTE band and 1 NR band 239

8.15.1 Rapporteur Input (WID/TR/CR) 239

8.15.2 EN-DC requirements without FR2 band 240

8.15.3 DMEN-DC requirements with FR2 band 248

8.16 DC of 3 LTE band and 1 NR band 249

8.16.1 Rapporteur Input (WID/TR/CR) 249

8.16.2 EN-DC requirements without FR2 band 249

8.16.3 EN-DC requirements with FR2 band 255

8.17 DC of 4 LTE band and 1 NR band 256

8.17.1 Rapporteur Input (WID/TR/CR) 256

8.17.2 EN-DC requirements without FR2 band 256

8.17.3 EN-DC requirements with FR2 band 260

8.18 DC of 5 bands LTE inter-band CA (5DL/1L) and 1 NR band (1DL/1UL) 260

8.18.1 Rapporteur Input (WID/TR/CR) 260

8.18.2 UE RF requirements 260

8.19 DC of x bands (x=1,2, 3, 4) LTE inter-band CA and 2 bands NR inter-band CA 260

8.19.1 Rapporteur Input (WID/TR/CR) 260

8.19.2 EN-DC requirements including NR inter CA without FR2 band 261

8.19.3 EN-DC requirements including NR inter CA with FR2 band 266

8.20 DC of x bands (x=1,2) LTE inter-band CA (xDL/xUL) and y bands (y=3-x) NR inter-band CA 267

8.20.1 Rapporteur Input (WID/TR/CR) 267

8.20.2 UE RF requirements 267

8.21 DC of x bands (x=1,2,3) LTE inter-band CA (xDL/1UL) and 3 bands NR inter-band CA (3DL/1UL) 268

8.21.1 Rapporteur Input (WID/TR/CR) 268

8.21.2 UE RF requirements 268

8.22 DC of x bands (x=2,3,4) LTE inter-band CA (xDL/1UL) and 1 NR FR1 band (1DL/1UL) and 1 NR FR2 band (1DL/1UL) 268

8.22.1 Rapporteur Input (WID/TR/CR) 268

8.22.2 UE RF requirements 269

8.23 DC of x bands (x=1,2,3) LTE inter-band CA (xDL/1UL) and 4 bands NR inter-band CA (4DL/1UL) 269

8.23.1 Rapporteur Input (WID/TR/CR) 269

8.23.2 UE RF requirements 269

8.24 Band combinations for SA NR supplementary uplink (SUL) NSA NR SUL, NSA NR SUL with UL sharing from the UE perspective (ULSUP) 269

8.24.1 Rapporteur Input (WID/TR/CR) 269

8.24.2 UE RF requirements 270

8.25 Band combinations for Uu and V2X con-current operation 270

8.25.1 General and Rapporteur Input (WID/TR/CR) 270

8.25.2 UE RF requirement for concurrent operation between NR Uu band and NR PC5 band 271

8.25.3 UE RF requirement for concurrent operation between LTE Uu band and NR PC5 band 271

8.25.4 UE RF requirement for concurrent operation between NR Uu band and LTE PC5 band 271

8.25.5 UE RF requirement for concurrent operation of LTE/NR CA/DC band combinations + PC5 V2X 271

8.26 Adding channel bandwidth support to existing NR bands 271

8.26.1 General and Rapporteur Input (WID/TR/CR) 272

8.26.2 UE RF requirements 272

8.26.2.1 Addition of bandwidth and Tx/Rx requirements 272

8.26.2.2 NR-U 100MHz bandwidth 273

8.26.3 BS RF requirements 274

8.27 Introduction of channel bandwidths 35MHz and 45MHz for NR 274

8.27.1 General and Rapporteur Input (WID/TR/CR) 275

8.27.2 UE RF requirements 275

8.27.3 BS RF requirements 276

8.27.4 RRM requirements 277

8.27.5 UE demodulation and CSI requirements 277

8.28 Introduction of bandwidth combination set 4 (BCS4) for NR 277

8.28.1 General and Rapporteur Input (WID/TR/CR) 277

8.28.2 UE RF requirements 278

8.28.2.1 MSD 279

8.28.2.2 Others (in case MPR/A-MPR is needed) 279

8.29 Addition of MSD (Maximum Sensitivity Degradation) for inter-band EN-DC combinations (1 band LTE+1 band NR FR1) due to added channel bandwidths 280

8.29.1 General and Rapporteur Input (WID/TR/CR) 280

8.29.2 UE RF requirements 280

8.29.3 Others 280

8.30 High-power UE operation for use cases in Band n77 and n78 280

8.30.1 General 280

8.30.2 PC1.5 UE RF requirements 281

8.30.2.1 MPR and A-MPR 281

8.30.2.2 Device type signaling 282

8.30.2.3 FWA MPE handling 282

8.31 High power UE (power class 1.5) for NR band n79 283

8.31.1 General 283

8.31.2 UE RF requirements 283

8.31.2.1 MPR 283

8.32 High power UE (power class 2) for NR band n39 283

8.32.1 General 283

8.32.2 UE RF requirements 283

8.32.2.1 A-MPR 283

8.33 High-power UE operation for fixed-wireless/vehicle-mounted use cases in Band 12, Band 5, Band 13, Band n5, Band n13, and Band n71 284

8.33.1 General 284

8.33.2 Feasibility study 284

8.33.2.1 Coexistence study between B5 and adjacent bands 284

8.33.2.2 Coexistence study between B13/n13 and adjacent bands 284

8.33.2.3 Filter with smaller duplex for B13, n13 and n71 284

8.33.2.4 PA related to MPR and A-MPR for B13, n13, and n71 285

8.33.3 UE RF requirements 285

8.33.3.1 UE REFSENS 285

8.33.3.2 UE Tx requirements (MOP, MPR, A-MPR, and ACLR) 285

8.34 SAR schemes for UE power class 2 (PC2) for NR inter-band Carrier Aggregation and supplemental uplink (SUL) configurations with 2 bands UL 285

8.34.1 General and Rapporteur Input (WID/TR/CR) 285

8.34.2 PC2 SAR solution 285

8.34.3 UE maximum power 286

8.34.4 Others 287

8.35 High power UE (power class 2) for NR inter-band Carrier Aggregation with 2 bands downlink and 2 bands uplink 287

8.35.1 Rapporteur Input (WID/TR/CR) 287

8.35.2 UE RF requirements 287

8.36 High power UE (power class 2) for EN-DC with 1 LTE band + 1 NR TDD band 289

8.36.1 Rapporteur Input (WID/TR/CR) 289

8.36.2 UE RF requirements 289

8.37 Power Class 2 UE for NR inter-band CA and SUL configurations with x (x>2) bands DL and y (y=1, 2) bands UL 290

8.37.1 Rapporteur Input (WID/TR/CR) 290

8.37.2 UE RF requirements 290

8.38 Power Class 2 for EN-DC with xLTE band + yNR DL with 1LTE+1(TDD) NR UL band (x= 2, 3, 4, y=1; x=1, 2, y=2) 292

8.38.1 Rapporteur Input (WID/TR/CR) 292

8.38.2 UE RF requirements 292

8.39 High power UE for NR TDD intra-band carrier aggregation in frequency range FR1 294

8.39.1 General and Rapporteur Input (WID/TR/CR) 294

8.39.2 UE RF requirements 294

8.40 Introduction of FR2 FWA UE with maximum TRP of 23dBm for band n259 294

8.40.1 UE RF requirements 294

8.40.2 RRM performance requirements 295

8.40.3 Others 295

8.41 Additional NR bands for UL-MIMO 295

8.41.1 General and Rapporteur Input (WID/TR/CR) 295

8.41.2 MPR/A-MPR requirements 295

8.41.3 Others 296

8.42 Downlink interruption for band combinations to conduct dynamic Tx Switching 296

8.42.1 General and Rapporteur Input (WID/TR/CR) 296

8.42.2 Determination of inter-band uplink CA and EN-DC combinations for which DL interruption is not allowed 296

8.42.3 Others 296

8.43 Simultaneous Rx/Tx band combinations for CA, SUL, MR-DC and NR-DC 296

8.43.1 General and Rapporteur Input (WID/TR/CR) 296

8.43.2 Applicability rule and criteria of simultaneous RX/TX 296

8.43.3 Identification of simultaneous Rx/Tx capability for band combinations 297

8.44 LTE/NR spectrum sharing in Band 34/n34 and Band 39/n39 298

8.44.1 General 298

8.44.2 Introduction of uplink 7.5KHz frequency shift 298

9 Rel-17 non-spectrum related work items for NR 299

9.1 Multiple Input Multiple Output (MIMO) Over-the-Air (OTA) requirements for NR UEs 299

9.1.1 General 299

9.1.2 Performance requirements 300

9.1.2.1 Performance Requirements for FR1 300

9.1.2.2 Performance Requirements for FR2 300

9.1.3 Testing methodologies 301

9.1.3.1 Testing parameters for Performance 301

9.1.3.2 Optimization of test methodologies 301

9.1.3.3 Channel model validation 302

9.2 Introduction of UE TRP (Total Radiated Power) and TRS (Total Radiated Sensitivity) requirements and test methodologies for FR1 (NR SA and EN-DC) 303

9.2.1 General and work plan 303

9.2.2 SA test methodology 304

9.2.3 EN-DC test methodology 304

9.2.4 UE with multiple antennas test methodology 305

9.2.5 Others 306

9.3 RF requirements enhancement for NR frequency range 1 (FR1) 306

9.3.1 General 306

9.3.2 RF core requirements 306

9.3.2.1 UL MIMO configuration for SUL band configurations 306

9.3.2.2 2Tx switching between carrier 1 and carrier 2 306

9.3.2.3 Tx switching between 1 carrier on band A and 2 contiguous aggregated carriers on band B 306

9.3.2.4 HPUE for TDD intra-band contiguous UL CA 306

9.3.2.5 HPUE for TDD intra-band non-contiguous UL CA 307

9.3.2.6 Intra-band UL contiguous CA for UL MIMO (n41C and n78C) 307

9.3.2.7 Evaluation according to RAN task 308

9.3.2.7.1 Clarification of Tx switching scenarios 308

9.3.2.7.2 Solution for Scell dropping 308

9.3.3 RRM core requirements 310

9.3.3.1 Tx switching requirements 310

9.4 NR RF requirement enhancements for frequency range 2 (FR2) 311

9.4.1 General 311

9.4.2 UE RF requirements for inter-band CA 311

9.4.2.1 Inter-band DL CA requirements 312

9.4.2.1.1 Applicability of CBM/IBM for different CA configurations 312

9.4.2.1.2 CA\_n258A-n260A and CA\_n257A-n259A based on IBM 312

9.4.2.1.3 CA configurations within the same frequency group based on CBM 312

9.4.2.2 Inter-band UL CA requirements 313

9.4.2.2.1 Inter-band UL CA for two bands 313

9.4.2.2.2 CA configuration CA\_n257A-n259A based on IBM 314

9.4.2.3 Feasibility study for DL inter-band CA 314

9.4.2.3.1 Study for CBM between different frequency groups 314

9.4.2.3.2 Study for IBM within the same frequency group 316

9.4.3 UL gaps for self-calibration and monitoring 316

9.4.3.1 Gap use cases and performance evaluation 316

9.4.3.2 UE Tx power management 316

9.4.3.3 Others 317

9.4.4 DC location for intra-band UL CA with > 2 CCs for both FR2 and FR1 317

9.4.5 CA BW classes 318

9.4.5.1 New FR2 CA BW classes 318

9.4.5.2 UE Rx requirements 319

9.4.6 RRM core requirements 319

9.4.6.1 Inter-band DL CA requirements for CBM 319

9.4.6.1.1 MRTD requirements 319

9.4.6.1.2 Other RRM requirements 321

9.4.6.2 Inter-band UL CA for IBM 322

9.4.6.3 UL gaps for self-calibration and monitoring 322

9.5 NR repeater 322

9.5.1 General 322

9.5.1.1 System parameters 323

9.5.1.2 Repeater Class/Type 323

9.5.1.3 TDD repeater switching requirements 324

9.5.1.4 Others 325

9.5.2 Conductive RF core requirements 325

9.5.2.1 Transmitted power related requirements 325

9.5.2.2 Emission requirements 326

9.5.2.3 Others 327

9.5.3 Radiated RF core requirements 327

9.5.3.1 Transmitted power related requirements 327

9.5.3.2 Emission requirements 328

9.5.3.3 Others 329

9.5.4 EMC core requirements 329

9.6 Introduction of DL 1024QAM for NR FR1 330

9.6.1 General 330

9.6.2 BS TX RF requirements 331

9.6.2.1 Deployment and link level simulation 331

9.6.2.2 EVM requirements 331

9.6.2.3 Others 332

9.6.3 UE RX RF requirements 332

9.7 UE RF requirements for Transparent Tx Diversity (TxD) for NR 332

9.7.1 General 332

9.7.2 UE RF requirements for phase 1 (38.101-1) 334

9.7.2.1 UE requirements (other than MPR) 334

9.7.2.2 MPR requirements 334

9.7.3 UE RF requirements for phase 2 (38.101-1) 334

9.7.3.1 SRS antenna switching related 334

9.7.3.2 ULFPTx related 335

9.7.4 Power class ambiguity issues 335

9.7.5 Capability related 337

9.8 Enhancement for NR high speed train scenario in FR1 337

9.8.1 General 337

9.8.2 RRM core requirements 337

9.8.2.1 UE RRM core requirements for CA scenario 337

9.8.2.1.1 Intra-frequency measurements 337

9.8.2.1.2 Inter-frequency measurements 338

9.8.2.1.3 Other 339

9.8.3 UE demodulation requirements (38.101-4) 340

9.8.3.1 General 340

9.8.3.2 PDSCH requirements for CA scenarios 341

9.9 NR support for high speed train scenario in FR2 342

9.9.1 General 342

9.9.2 High speed train deployment scenario in FR2 342

9.9.2.1 Deployment Scenario-A 342

9.9.2.2 Deployment Scenario-B 343

9.9.2.3 Channel modeling 344

9.9.2.4 Others 345

9.9.3 UE RF core requirements 345

9.9.3.1 Baseline power class and UE Tx requirements 345

9.9.3.2 Beam correspondence 345

9.9.3.3 UE Rx requirements 346

9.9.3.4 Others 346

9.9.4 RRM core requirements 346

9.9.4.1 General 346

9.9.4.2 Number of RX beams 347

9.9.4.3 RRC Idle/Inactive and connected state mobility requirements 348

9.9.4.4 Timing requirements 348

9.9.4.5 Signalling characteristics requirements 349

9.9.4.6 Measurement procedure requirements 350

9.9.5 Demodulation requirements 351

9.9.5.1 General 351

9.9.5.2 UE demodulation requirements 351

9.9.5.3 BS demodulation requirements 352

9.9.5.3.1 PUSCH requirements 352

9.9.5.3.2 PUSCH with UL timing adjustment requirements 353

9.9.5.3.3 PRACH requirements 353

9.10 Further RRM enhancement for NR and MR-DC 354

9.10.1 General 354

9.10.2 RRM core requirements 354

9.10.2.1 SRS antenna port switching 354

9.10.2.2 HO with PSCell 355

9.10.2.3 PUCCH SCell activation/deactivation 357

9.11 NR and MR-DC measurement gap enhancements 359

9.11.1 General 359

9.11.2 RRM core requirements 359

9.11.2.1 Pre-configured MG pattern(s) 359

9.11.2.2 Multiple concurrent and independent MG patterns 361

9.11.2.3 Network Controlled Small Gap 363

9.12 Further enhancement on NR demodulation performance 364

9.12.1 General 364

9.12.2 UE demodulation and CSI requirements 365

9.12.2.1 MMSE-IRC receiver for inter-cell interference 365

9.12.2.1.1 PDSCH requirements 365

9.12.2.1.2 CSI requirements 366

9.12.2.2 MMSE-IRC receiver for intra-cell inter-user interference 367

9.12.2.3 Evaluation on CRS interference in scenarios with overlapping spectrum for LTE and NR 369

9.12.3 BS demodulation requirements 372

9.12.3.1 PUSCH demodulation requirements for FR1 256QAM 372

9.13 Solutions for NR to support non-terrestrial networks (NTN) 374

9.13.1 General and work plan 374

9.13.1.1 System parameters 374

9.13.1.2 NTN gNB Class/Type 375

9.13.1.3 Regulatory information 376

9.13.1.4 Others 376

9.13.2 Coexistence aspects 377

9.13.2.1 Coexistence scenarios and Simulation assumptions 377

9.13.2.2 Simulation results 379

9.13.3 BS RF requirements 380

9.13.3.1 TX requirements 380

9.13.3.2 RX requirements 381

9.13.4 UE RF requirements 381

9.13.4.1 TX requirements 381

9.13.4.2 RX requirements 381

9.13.5 RRM core requirements 382

9.13.5.1 General and RRM requirements impacts 382

9.13.5.2 GNSS-related requirements 382

9.13.5.3 Mobility requirements 383

9.13.5.4 Timing requirements 384

9.13.5.5 Measurement procedure requirements 386

9.14 UE Power Saving Enhancements 387

9.14.1 General 387

9.14.2 UE measurements relaxation for RLM and/or BFD 387

9.15 NR Sidelink enhancement 389

9.15.1 General 389

9.15.2 Spectrum request for SL operation 389

9.15.3 System parameters (numerologies, rasters, CBW, etc) 389

9.15.4 UE RF requirements for NR SL enhancement 390

9.15.4.1 TX requirements 390

9.15.4.2 RX requirements 390

9.15.5 Partially used SL operation with NR Uu operating bands 390

9.15.5.1 FDM operation 391

9.15.5.2 TDM operation 391

9.15.5.3 Synchronous operation between NR Uu and NR SL in a TDD band 392

9.15.5.4 Others 392

9.15.6 High power UE(PC2) for SL 393

9.15.6.1 TX requirements 393

9.15.6.2 Coexistence study 394

9.15.6.3 Others 394

9.15.7 Other RF/general requirements for New SL enhancement 395

9.15.8 RRM core requirements 395

9.16 Extending current NR operation to 71GHz 396

9.16.1 General 396

9.16.2 Band plans and regulatory requirements 397

9.16.3 System parameters (numerologies, rasters, CBW, etc) 398

9.16.4 UE RF requirements 399

9.16.4.1 TX requirements 399

9.16.4.2 RX requirements 401

9.16.5 BS RF requirements 401

9.16.5.1 TX requirements 401

9.16.5.2 RX requirements 402

9.16.6 Co-existence simulations 402

9.16.7 RRM core requirements 403

9.16.7.1 General and RRM requirements impacts 403

9.16.7.2 Timing requirements 404

9.16.7.3 Interruption requirements 405

9.16.7.4 Active BWP switching delay requirements 406

9.16.7.5 Measurement gap interruption requirements 407

9.16.8 Others 407

9.17 Enhancements to Integrated Access and Backhaul (IAB) for NR 408

9.17.1 General 408

9.17.2 RF requirements 408

9.17.2.1 Impact for Simultaneous operation of IAB child and parent links 408

9.17.2.2 Impact for Timing enhancement 408

9.17.2.3 Others 409

9.17.3 RRM core requirements 409

9.17.4 Others 410

9.18 NR coverage enhancements 410

9.18.1 General 410

9.18.2 Phase continuity and power consistency for PUSCH and PUCCH repetition 410

9.18.3 RF requirements 412

9.19 Further enhancements on MIMO for NR 412

9.19.1 General 412

9.19.2 UE RF requirements 412

9.19.2.1 Impact of multi-panel reception 412

9.19.2.2 Impact for MPE 413

9.19.3 RRM core requirements 413

9.19.3.1 General and RRM requirements impacts 413

9.19.3.2 Multi-beam operation enhancement 414

9.19.3.3 Link recovery procedure for FR2 serving cells 415

9.20 Support of reduced capability NR devices 415

9.20.1 General 415

9.20.2 UE RF requirements 416

9.20.2.1 Rx-Tx switching time for FR1 HD-FDD Type A device 416

9.20.2.2 Tx requirements for FR1 416

9.20.2.3 Rx requirements for FR1 417

9.20.2.4 Input on FR2 RedCap UE 418

9.20.2.5 Others 418

9.20.3 RRM core requirements 419

9.20.3.1 General and RRM requirements impacts 419

9.20.3.2 UE complexity reduction 420

9.20.3.3 Extended DRX enhancements 421

9.20.3.4 RRM measurement relaxations 423

9.21 Positioning enhancements for NR 424

9.21.1 General 424

9.21.2 RRM core requirements 424

9.21.2.1 General and RRM requirements impacts 424

9.21.2.2 UE Rx/Tx and/or gNB Rx/Tx timing delay mitigation 424

9.21.2.3 Latency reduction of positioning measurement 425

9.21.2.4 Measurement in RRC\_INACTIVE state 426

9.21.2.5 Impact on existing UE positioning and RRM requirements 427

9.21.2.6 Enhancements of A-GNSS positioning 428

9.22 Multi-Radio Dual-Connectivity enhancements 428

9.22.1 General 428

9.22.2 RRM core requirements 428

9.22.2.1 General and RRM requirements impacts 428

9.22.2.2 Efficient activation/de-activation mechanism for SCells 428

9.22.2.3 Efficient activation/de-activation mechanism for one SCG 429

9.22.2.4 Conditional PSCell change and addition 430

9.23 Enhanced IIoT and URLLC support 431

9.23.1 General 431

9.23.2 RRM core requirements 431

9.23.2.1 General and RRM requirements impacts 431

9.23.2.2 Propagation delay compensation enhancements 431

9.23.2.3 Reference point for Te requirements 432

9.24 NR Sidelink Relay 433

9.24.1 General and work plan 433

9.24.2 RRM core requirements 433

10 Rel-17 Study Items for NR 434

10.1 Study on enhanced test methods for FR2 in NR 434

10.1.1 General 434

10.1.2 Test methodology for high DL power and low UL power test cases 434

10.1.3 Polarization basis mismatch 435

10.1.4 Test time reduction 435

10.1.5 OTA test methods for UE RF, RRM and demodulation for 52.6~71GHz 436

10.1.6 Others 437

10.2 Study on Efficient utilization of licensed spectrum that is not aligned with existing NR channel bandwidths 437

10.2.1 General and work plan 437

10.2.2 Evaluation of use of larger channel bandwidths than operator licensed bandwidth 437

10.2.3 Evaluation of use of overlapping UE channel bandwidths 438

10.2.4 Others 439

10.3 Study on band combination handling in RAN4 440

10.3.1 General and TR 440

10.3.2 How to introduce band combinations including TP format 440

10.3.3 Rules and guidelines of specifying band combinations including notations of CA/DC combinations 440

10.3.4 Improving RAN4 specification structures and reducing redundant contents 441

10.3.5 Others 441

10.4 Study on extended 600MHz NR band 442

10.4.1 General 442

10.4.2 Coexistence study 443

10.4.3 Study on frequency arrangements (such as options B1 and B2) 443

10.4.4 Others 443

10.5 Study on high power UE (power class 2) for one NR FDD band 444

10.5.1 General 444

10.5.2 Duty cycle in FDD bands for SAR issue 444

10.5.3 Analyses on receiver sensitivity degradation 445

10.6 Optimizations of pi/2 BPSK uplink power in NR 446

10.6.1 General and work plan 446

10.6.2 UE Tx power for pi/2 BPSK 446

10.6.3 SAR analysis 446

10.6.4 Shaping filter characteristics 446

10.6.5 Link simulation 447

10.7 Study on 5G NR UE Application Layer Data Throughput Performance 447

10.7.1 General and work plan 447

10.7.2 Test methodology 448

10.7.3 Test parameters 449

11 Rel-17 Work Items for LTE 449

11.1 LTE inter-band Carrier Aggregation for 2 bands DL with 1 band UL 449

11.1.1 Rapporteur Input (WID/TR/CR) 449

11.1.2 UE RF with harmonic, close proximity and isolation issues 450

11.1.3 UE RF without specific issues 450

11.2 LTE inter-band Carrier Aggregation for 3 bands DL with 1 band UL 451

11.2.1 Rapporteur Input (WID/TR/CR) 451

11.2.2 UE RF with harmonic, close proximity and isolation issues 452

11.2.3 UE RF without specific issues 452

11.3 LTE inter-band Carrier Aggregation for x bands DL (x=4, 5) with 1 band UL 453

11.3.1 Rapporteur Input (WID/TR/CR) 453

11.3.2 UE RF with 4 LTE bands CA 454

11.3.3 UE RF with 5 LTE bands CA 458

11.4 LTE inter-band Carrier Aggregation for 2 bands DL with 2 band UL 461

11.4.1 Rapporteur Input (WID/TR/CR) 461

11.4.2 UE RF with harmonic, close proximity and isolation issues 461

11.4.3 UE RF without specific issues 461

11.5 LTE inter-band Carrier Aggregation for x bands DL (x= 3, 4, 5) with 2 band UL 462

11.5.1 Rapporteur Input (WID/TR/CR) 462

11.5.2 UE RF with MSD 462

11.5.3 UE RF without MSD 462

11.6 RRM for LTE CA basket WIs 463

11.6.1 RRM Core (36.133) 463

11.6.2 RRM Perf (36.133) 463

11.7 New WID on Additional LTE bands for UE category M1&M2 and/or NB1&NB2 in Rel-17 463

11.7.1 Rapporteur Input (WID/TR/CR) 463

11.7.2 RF 463

11.7.3 Others 466

11.8 Additional enhancements for NB-IoT and LTE-MTC 466

11.8.1 General and work plan 466

11.8.2 Support of 16QAM in NB-IoT 466

11.8.2.1 BS RF requirements 466

11.8.2.2 UE RF requirements 467

11.8.3 Support of power reduction for PRACH, PUCCH, and full-PRB PUSCH in MTC 467

11.8.3.1 UE RF requirements 467

11.8.4 RRM core requirements 467

11.8.4.1 Neighbour cell measurement in RRC Connected state for NB-IoT 467

11.8.5 Others 468

12 Liaison and output to other groups 468

12.1 R17 related 468

12.2 Others 469

13 Revision of the Work Plan 472

13.1 R17 new proposals 472

13.1.1 Spectrum related 472

13.1.2 Non-spectrum related 473

13.2 Others 473

14 Any other business 475

14.1 Celebration of RAN4#100 meeting 475

15 Close of the E-meeting 475

## 5 Rel-15 and previous release maintenance

### 5.1 Rel-15 New radio access technology

#### 5.1.7 RRM core requirements maintenance (38.133/36.133)

================================================================================

**Email discussion: [100-e][201] NR\_RRM\_maintenance\_R15\_Core**

**R4-2115191 Email discussion summary: [100-e][201] NR\_RRM\_maintenance\_R15\_Core**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115376 (from R4-2115191).**

**R4-2115376 Email discussion summary: [100-e][201] NR\_RRM\_maintenance\_R15\_Core**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 25th)**

Issue 1-2-3: SMTC configuration determination in DC

* Proposals
  + Option 1 (HW, MTK, Ericsson, OPPO)
    - Clarify that if such measObjectNRs configured by MN and SN have different SMTC, Trs is the periodicity of one of the SMTC which is up to UE implementation.
  + Option 1a (Apple)
    - Option 1 is fine, but the change to PSCell addition is not needed
  + Option 2 (Nokia)
    - Changes are not needed, they are not essential
* Discussion
  + Nokia: Clarification is useful. However these are not essential and we already understand that this is up to UE implementation.
  + Apple: Fine to update Rel-15 but not change PSCell addition in all releases.
  + Huawei: Changes to PSCell addition were removed from the latest version.
* Agreements:
  + Clarify that if such measObjectNRs configured by MN and SN have different SMTC, Trs is the periodicity of one of the SMTC which is up to UE implementation.
  + Introduce the changes starting from Rel-15 specifications

Issue 1-2-4: Known condition for FR1 SCell activation

* Proposals
  + Option 1 (HW, MTK, Apple, Ericsson, ZTE)
    - If network is not using Tx beamforming or single TCI is configured, the SSB reporting without SSB index can still be used as known condition
    - When network has multiple TCI configuration to UE, SSB reporting with SSB index can be used as known condition
  + Option 2 (Nokia)
    - Changes are not needed, no need to consider SSB index reporting in the FR1 known condition
* Discussion
  + Apple: Option 1. If network configures multiple TCIs UE needs to report.
  + Huawei: Current known condition does not include SSB index information. NW shall request UE to send report with SSB index. “Not using Tx beamforming” – this is just principle and CR has more precise wording.
  + Nokia: For Rel-15 design we assumed no beam sweeping for FR1. We would like to ensure that we don’t change UE behavior. Even without SSB index reporting it can schedule UEs. Also, not clear if it mandates SSB index reporting.
  + Chair: is this essential? Can the gNB/UE operate under current spec?
  + Huawei: this is clarification on known/unknown conditions
  + Nokia: existing devices (gNB and UEs) already work fine.
  + E///: One approach is that we do not change the known conditions but clarify side conditions.
  + Huawei: We are ok to consider approach mentioned by E///. The problem is that currently we have different assumptions for known/unknown.
  + ZTE: need more time check since this is release 15 if there are any implications.
* Agreements:
  + No changes will be introduced in Rel-15.

**1st round email discussion conclusions**

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| [R4-2111967](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2111967.zip) | Draft CR on CSI-RS based beam failure detection requirements | CATT | Agreeable |  |
| [R4-2112085](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2112085.zip) | CR for PSCell change requirements (R15) | Apple | Agreeable |  |
| [R4-2112111](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2112111.zip) | Draft CR for minimum requirement at transitions for BFD R15 | Apple | Agreeable |  |
| [R4-2112953](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2112953.zip) | Draft CR for editorial modification 38.133 | LG Electronics UK | Agreeable |  |
| [R4-2113537](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113537.zip) | draft CR on CSSF for SCell measurements outside gaps in R15 | vivo | Revised |  |
| [R4-2113632](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113632.zip) | draftCR on TS38.133 inter-frequency without gaps - r15 | Ericsson | Revised |  |
| [R4-2113633](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113633.zip) | draftCR on TS38.133 inter-frequency without gap -r16 | Ericsson | Revised |  |
| [R4-2114092](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114092.zip) | CR on clarification on SMTC determination in DC 36133 R15 | Huawei, Hisilicon | Revised |  |
| [R4-2114095](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114095.zip) | CR on clarification on SMTC determination in DC 38133 R15 | Huawei, Hisilicon | Revised |  |
| [R4-2114155](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114155.zip) | CR on TS38.133 for applicable DRX cycle in EN-DC, NR SA, NE-DC, and NR-DC | MediaTek inc. | Revised |  |
| [R4-2114252](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114252.zip) | CR on measurement requirements, SCell activation and definition of reference point for UL timing 38133 | Huawei, HiSilicon | Revised |  |
| [R4-2114255](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114255.zip) | CR on RSTD measurement requirements 36133 | Huawei, HiSilicon | Revised |  |
| [R4-2114447](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114447.zip) | Correction to reference point defintion for UE timing in TS 38.133 | Ericsson, Nokia Shanghai Bell, Intel | Not treated |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115232 | draft CR on CSSF for SCell measurements outside gaps in R15 | vivo | Return to | Treat in GTW |
| R4-2115233 | draftCR on TS38.133 inter-frequency without gaps - r15 | Ericsson | Endorsed |  |
| R4-2115234 | draftCR on TS38.133 inter-frequency without gap -r16 | Ericsson | Withdrawn |  |
| [R4-2113633](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113633.zip) | draftCR on TS38.133 inter-frequency without gap -r16 | Ericsson | Endorsed |  |
| [R4-2115235](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114092.zip) | CR on clarification on SMTC determination in DC 36133 R15 | Huawei, Hisilicon | Endorsed |  |
| [R4-2115236](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114095.zip) | CR on clarification on SMTC determination in DC 38133 R15 | Huawei, Hisilicon | Endorsed |  |
| [R4-2115237](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114155.zip) | CR on TS38.133 for applicable DRX cycle in EN-DC, NR SA, NE-DC, and NR-DC | MediaTek inc. | Endorsed |  |
| [R4-2115238](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114252.zip) | CR on measurement requirements, SCell activation and definition of reference point for UL timing 38133 | Huawei, HiSilicon | Endorsed |  |
| [R4-2115239](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114255.zip) | CR on RSTD measurement requirements 36133 | Huawei, HiSilicon | Endorsed |  |

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**R4-2111967 Draft CR on CSI-RS based beam failure detection requirements**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2111968 Draft CR on CSI-RS based beam failure detection requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2111969 Draft CR on CSI-RS based beam failure detection requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2112084 Clarification on PSCell change requirements**

*Type: discussion For: Approval  
 Source: Apple*

**Decision: Noted.**

**R4-2112085 CR for PSCell change requirements (R15)**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2112086 CR for PSCell change requirements (R16)**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2112087 CR for PSCell change requirements (R17)**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2112111 Draft CR for minimum requirement at transitions for BFD R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2112112 Draft CR for minimum requirement at transitions for BFD R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2112113 Draft CR for minimum requirement at transitions for BFD R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2112953 Draft CR for editorial modification 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: (Rel-16)  
  
 Source: LG Electronics UK*

**Decision: Endorsed.**

**R4-2112955 Draft CR for editorial modification 38.133**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: (Rel-17)  
  
 Source: LG Electronics UK*

**Decision: Endorsed.**

**R4-2113537 draft CR on CSSF for SCell measurements outside gaps in R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: vivo*

**Decision: Postponed.**

**R4-2115232 draft CR on CSSF for SCell measurements outside gaps in R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: vivo*

**Decision: Withdrawn.**

**R4-2113538 draft CR on CSSF for SCell measurements outside gaps in R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: vivo*

**Decision: Withdrawn.**

**R4-2113539 draft CR on CSSF for SCell measurements outside gaps in R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: F (Rel-17)  
  
 Source: vivo*

**Decision: Withdrawn.**

**R4-2113632 draftCR on TS38.133 inter-frequency without gaps - r15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

This draft CR corrects UE measurement without gap for effective MGRP

**Decision: Revised to R4-2115233 (from R4-2113632).**

**R4-2115233 draftCR on TS38.133 inter-frequency without gaps - r15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

This draft CR corrects UE measurement without gap for effective MGRP

**Decision: Endorsed.**

**R4-2113633 draftCR on TS38.133 inter-frequency without gap -r16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR corrects UE measurement without gap for effective MGRP

**Decision: Endorsed.**

**R4-2115234 draftCR on TS38.133 inter-frequency without gap -r16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR corrects UE measurement without gap for effective MGRP

**Decision: Withdrawn.**

**R4-2113634 draftCR on TS38.133 inter-frequency without gap -r17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draft CR corrects UE measurement without gap for effective MGRP

**Decision: Endorsed.**

**R4-2114092 CR on clarification on SMTC determination in DC 36133 R15**

*Type: draftCR For: Endorsement  
 36.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115235 (from R4-2114092).**

**R4-2115235 CR on clarification on SMTC determination in DC 36133 R15**

*Type: draftCR For: Endorsement  
 36.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114093 CR on clarification on SMTC determination in DC 36133 R16**

*Type: draftCR For: Endorsement  
 36.133 v16.10.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114094 CR on clarification on SMTC determination in DC 36133 R17**

*Type: draftCR For: Endorsement  
 36.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114095 CR on clarification on SMTC determination in DC 38133 R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115236 (from R4-2114095).**

**R4-2115236 CR on clarification on SMTC determination in DC 38133 R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114096 CR on clarification on SMTC determination in DC 38133 R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114097 CR on clarification on SMTC determination in DC 38133 R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114155 CR on TS38.133 for applicable DRX cycle in EN-DC, NR SA, NE-DC, and NR-DC**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2115237 (from R4-2114155).**

**R4-2115237 CR on TS38.133 for applicable DRX cycle in EN-DC, NR SA, NE-DC, and NR-DC**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Decision: Endorsed.**

**R4-2114156 CR on TS38.133 for applicable DRX cycle in EN-DC, NR SA, NE-DC, and NR-DC**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Endorsed.**

**R4-2114157 CR on TS38.133 for applicable DRX cycle in EN-DC, NR SA, NE-DC, and NR-DC**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Endorsed.**

**R4-2114252 CR on measurement requirements, SCell activation and definition of reference point for UL timing 38133**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2115238 (from R4-2114252).**

**R4-2115238 CR on measurement requirements, SCell activation and definition of reference point for UL timing 38133**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114253 CR on measurement requirements, SCell activation and definition of reference point for UL timing 38133 R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114254 CR on measurement requirements, SCell activation and definition of reference point for UL timing 38133 R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114255 CR on RSTD measurement requirements 36133**

*Type: draftCR For: Endorsement  
 36.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2115239 (from R4-2114255).**

**R4-2115239 CR on RSTD measurement requirements 36133**

*Type: draftCR For: Endorsement  
 36.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114256 CR on RSTD measurement requirements 36133 R16**

*Type: draftCR For: Endorsement  
 36.133 v16.10.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114257 CR on RSTD measurement requirements 36133 R17**

*Type: draftCR For: Endorsement  
 36.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114447 Correction to reference point defintion for UE timing in TS 38.133**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson, Nokia Shanghai Bell, Intel*

**Abstract:**

Definition of reference point for UE timing error is clarified

**Decision: Revised to R4-2115375 (from R4-2114447).**

**R4-2115375 Correction to reference point defintion for UE timing in TS 38.133**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson, Nokia Shanghai Bell, Intel*

**Abstract:**

Definition of reference point for UE timing error is clarified

**Decision: Postponed.**

**R4-2114448 Correction to reference point defintion for UE timing in TS 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Ericsson, Nokia Shanghai Bell, Intel*

**Abstract:**

Definition of reference point for UE timing error is clarified

**Decision: Withdrawn.**

**R4-2114449 Correction to reference point defintion for UE timing in TS 38.133**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson, Nokia Shanghai Bell, Intel*

**Abstract:**

Definition of reference point for UE timing error is clarified

**Decision: Withdrawn.**

#### 5.1.8 RRM performance requirements maintenance (38.133/36.133)

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**Email discussion: [100-e][202] NR\_RRM\_maintenance\_R15\_Perf**

**R4-2115192 Email discussion summary: [100-e][202] NR\_RRM\_maintenance\_R15\_Perf**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115377 (from R4-2115192).**

**R4-2115377 Email discussion summary: [100-e][202] NR\_RRM\_maintenance\_R15\_Perf**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115240 | WF on Rel-15 NR RRM test case related issues | Ericsson |  |
| R4-2115241  R4-2115242  R4-2115243 | Draft CR on modification of LTE/FR1+FR2 tests  (Rel-15, cat F) | Ericsson | The CR is outcome of discussion on issue 1-3-2.  Cat A Rel-16/17 CRs are also needed. |
| R4-2115244  R4-2115245  R4-2115246 | Draft CR on general modification in clauses A.3.7A and A.3.7.2.2  (Rel-15, cat F) | Qualcomm Incorporate, Vivo | The CR is outcome of discussion on issue 1-3-3. Cat A Rel-16/17 CRs are also needed |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2111846 | Draft CR to specify the number of data RBs allocated | Anritsu Corporation | Revised |  |
| R4-2111849 | Clarification of SNR values in FR2 BFD-LR Test cases | Anritsu Corporation | Agreeable |  |
| R4-2111850 | Clarification of SNR values in FR2 BFD-LR Test cases | Anritsu Corporation | Return to | Chair: withdrawn and new Cat F allocated (R4-2115249) |
| R4-2111853 | Definition of generic channel BW configurations for RRM CA tests | Anritsu Corporation | Revised |  |
| R4-2111856 | Draft CR to update RMC and SCell SSB burst position for A.6.5.2.1 | Anritsu Corporation | Revised |  |
| R4-2111859 | Update NR PSCell Addition and Release Delay RRM Test cases | Anritsu Corporation | Agreeable |  |
| R4-2111862 | Update FR2 SCell Activation and Deactivation Delay Test cases | Anritsu Corporation | Revised |  |
| R4-2111865 | Update inter-frequency FR1-FR2 SS-RSRP measurement accuracy Test cases | Anritsu Corporation | Revised |  |
| R4-2111868 | Update FR2 CSI-RS-based RLM Test cases | Anritsu Corporation | Revised | Coordinate with R4-2113966/R4-2112622 |
| R4-2111871 | CR to the propagation condition of NR cell for InterRAT test cases | Anritsu Corporation | Revised | Merge R4-2114359 |
| R4-2111877 | Introduction of new BWP definition for FR2 SSB SCS240kHz conditions | Anritsu Corporation | Revised |  |
| R4-2111880 | CR to EUTRA-NR Inter-RAT SFTD measurement delay | Anritsu Corporation | Merged to R4-2113957 |  |
| R4-2111883 | CR to General Test Parameters of SCell Activation and Deactivation Delay TCs | Anritsu Corporation | Merged to R4-2113969 |  |
| R4-2111886 | Correction of CSI reporting periodicity for L1RSRP reporting in FR2 | Anritsu Corporation | Merged to R4-2113478 |  |
| R4-2111889 | Correction of SSB configuration for interruption test cases in FR2 | Anritsu Corporation | Agreeable |  |
| R4-2111899 | Correction to Radio Link Monitoring Scheduling Restrictions in FR2 | Anritsu Corporation | Agreeable |  |
| R4-2111900 | Correction of Io in event triggered reporting test | Anritsu Corporation | Agreeable |  |
| R4-2112475 | Correction on configurations in SA FR2 tests in R15 | MediaTek inc. | Agreeable |  |
| R4-2112526 | Correction on the FR2 inter-frequency relative RSRP accuracy in R15 | MediaTek inc. | Revised |  |
| R4-2112536 | Correction on configurations in SCell activation tests in R15 | MediaTek inc. | Revised |  |
| R4-2112613 | Draft-CR to TS 38.133: Missing CORESET RMCs in several test cases (Rel 15) | Rohde & Schwarz | Agreeable |  |
| R4-2112616 | Draft-CR to TS 38.133: Corrections to PRACH test cases (Rel 15) | Rohde & Schwarz | Agreeable |  |
| R4-2112619 | Draft-CR to TS 38.133: Corrections to re-establishment test cases (Rel 15) | Rohde & Schwarz | Agreeable |  |
| R4-2112622 | Draft-CR to TS 38.133: Corrections to radio link monitoring test cases (Rel 15) | Rohde & Schwarz | Revised | Coordinate with R4-2111868/R4-2113966 |
| R4-2112625 | Draft-CR to TS 38.133: Corrections to periodic measurement test cases (Rel 15) | Rohde & Schwarz | Agreeable |  |
| R4-2112692 | Rel-15 Cat-F CR to Interruptions during measurements on deactivated NR SCC in FR1 | Qualcomm Incorporated | Revised | Chair: Cat A CRs allocated |
| R4-2113145 | draftCR to clarify timing reference point for UE UL timing test cases | Intel Corporation | Return to |  |
| R4-2113474 | Correction of Link recovery test parameter tables | Ericsson | Revised |  |
| R4-2113477 | Correction of A3-offset setting in FR2 SA event triggered reporting tests | Ericsson, Anritsu | Agreeable |  |
| R4-2113478 | Correction of FR2 L1-RSRP measurement tests | Ericsson | Revised | Merge R4-2111886 |
| R4-2113852 | Correction to interruption during measurement on deactivated SCell test cases\_R15 | Huawei, HiSilicon | Agreeable |  |
| R4-2113859 | Maintenance CR for test cases - R15 | ZTE Corporation | Merged to R4-2111862 |  |
| R4-2113957 | Correction to Inter-RAT SFTD measurement test cases\_R15 | Huawei, Hisilicon | Revised | Merge R4-2111880 |
| R4-2113960 | Correction to interruption due to BWP switching test cases\_R15 | Huawei, Hisilicon | Agreeable |  |
| R4-2113963 | Correction to PSCell addition test cases\_R15 | Huawei, Hisilicon | Revised |  |
| R4-2113966 | Correction to radio link monitoring test cases\_R15 | Huawei, Hisilicon | Revised | Coordinate with R4-2111868/R4-2112622 |
| R4-2113969 | Correction to SCell activation test cases\_R15 | Huawei, Hisilicon | Revised | Merge R4-2111883 |
| R4-2114165 | DraftCR (R15) Applicability of test cases with LTE/FR1+FR2 | Ericsson | Revised |  |
| R4-2114359 | Draft-CR to TS 38.133: Corrections to propagation condition for inter-RAT test cases (Rel 15) | Rohde & Schwarz | Merged to R4-2111871 |  |
| R4-2114442 | Correction to n261 RRM performance requirements in Rel-15 | Ericsson | Agreeable |  |
| R4-2114444 | Correction to n261 RRM performance requirements in Rel-17 | Ericsson | Agreeable |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115240 | WF on Rel-15 NR RRM test case related issues | Ericsson | Approved |  |
| R4-2115241 | Draft CR on modification of LTE/FR1+FR2 tests | Ericsson | Endorsed |  |
| R4-2115244 | Draft CR on general modification in clauses A.3.7A and A.3.7.2.2 | Qualcomm Incorporate, Vivo | Endorsed |  |
| R4-2115247 | Draft CR to specify the number of data RBs allocated | Anritsu Corporation | Endorsed |  |
| [R4-2111849](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2111849.zip) | Clarification of SNR values in FR2 BFD-LR Test cases | Anritsu Corporation | Endorsed |  |
| R4-2115249 | Clarification of SNR values in FR2 BFD-LR Test cases | Anritsu Corporation | Endorsed |  |
| R4-2115250 | Definition of generic channel BW configurations for RRM CA tests | Anritsu Corporation | Endorsed |  |
| R4-2115252 | Update FR2 Scell Activation and Deactivation Delay Test cases | Anritsu Corporation | Endorsed |  |
| R4-2115253 | Update inter-frequency FR1-FR2 SS-RSRP measurement accuracy Test cases | Anritsu Corporation | Withdrawn |  |
| R4-2111865 | Update inter-frequency FR1-FR2 SS-RSRP measurement accuracy Test cases | Anritsu Corporation | Endorsed |  |
| R4-2115254 | Update FR2 CSI-RS-based RLM Test cases | Anritsu Corporation | Withdrawn |  |
| R4-2111868 | Update FR2 CSI-RS-based RLM Test cases | Anritsu Corporation | Postponed |  |
| R4-2115255 | CR to the propagation condition of NR cell for InterRAT test cases | Anritsu Corporation | Endorsed |  |
| R4-2115256 | Introduction of new BWP definition for FR2 SSB SCS240kHz conditions | Anritsu Corporation | Endorsed |  |
| R4-2115257 | Correction on the FR2 inter-frequency relative RSRP accuracy in R15 | MediaTek inc. | Postponed |  |
| R4-2115258 | Correction on configurations in Scell activation tests in R15 | MediaTek inc. | Endorsed |  |
| R4-2115259 | Draft-CR to TS 38.133: Corrections to radio link monitoring test cases (Rel 15) | Rohde & Schwarz | Withdrawn |  |
| R4-2112622 | Draft-CR to TS 38.133: Corrections to radio link monitoring test cases (Rel 15) | Rohde & Schwarz | Endorsed |  |
| R4-2115260 | Rel-15 Cat-F CR to Interruptions during measurements on deactivated NR SCC in FR1 | Qualcomm Incorporated | Endorsed |  |
| ~~R4-2115262~~  R4-2115263 | Correction of Link recovery test parameter tables | Ericsson | Endorsed |  |
| R4-2115264 | Correction of FR2 L1-RSRP measurement tests | Ericsson | Endorsed |  |
| R4-2115265 | Correction to Inter-RAT SFTD measurement test cases\_R15 | Huawei, Hisilicon | Endorsed |  |
| R4-2115266 | Correction to PSCell addition test cases\_R15 | Huawei, Hisilicon | Endorsed |  |
| R4-2115267 | Correction to radio link monitoring test cases\_R15 | Huawei, Hisilicon | ~~Withdrawn~~ Not pursued |  |
| R4-2113966 | Correction to radio link monitoring test cases\_R15 | Huawei, Hisilicon | Endorsed |  |
| R4-2115268 | Correction to Scell activation test cases\_R15 | Huawei, Hisilicon | Endorsed |  |
| R4-2115269 | DraftCR (R15) Applicability of test cases with LTE/FR1+FR2 | Ericsson | Endorsed |  |
| [R4-2113145](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113145.zip) | draftCR to clarify timing reference point for UE UL timing test cases | Intel Corporation | Return to | Treat in GTW |
| R4-2115251 | Draft CR to update RMC and SCell SSB burst position for A.6.5.2.1 | Anritsu Corporation | Return to | Tdoc recommendation is missing. |

**WF/LS for approval**

**R4-2115240 WF on Rel-15 NR RRM test case related issues**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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**R4-2115241 Draft CR on modification of LTE/FR1+FR2 tests**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Endorsed.**

**R4-2115242 Draft CR on modification of LTE/FR1+FR2 tests**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
 Source: Ericsson*

**Discussion:**

**Decision: Endorsed.**

**R4-2115243 Draft CR on modification of LTE/FR1+FR2 tests**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
 Source: Ericsson*

**Discussion:**

**Decision: Endorsed.**

**R4-2115244 Draft CR on general modification in clauses A.3.7A and A.3.7.2.2**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
 Source: Qualcomm, vivo*

**Abstract:**

**Discussion:**

**Decision: Endorsed.**

**R4-2115245 Draft CR on general modification in clauses A.3.7A and A.3.7.2.2**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
 Source: Qualcomm, vivo*

**Discussion:**

**Decision: Endorsed.**

**R4-2115246 Draft CR on general modification in clauses A.3.7A and A.3.7.2.2**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
 Source: Qualcomm, vivo*

**Discussion:**

**Decision: Endorsed.**

**R4-2111846 Draft CR to specify the number of data RBs allocated**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

Specify the number of data RBs allocated (66RBs). (Refer to the comment to the CR R4-2108883 in topic summary #202 R4-2108371)

**Decision: Revised to R4-2115247 (from R4-2111846).**

**R4-2115247 Draft CR to specify the number of data RBs allocated**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

Specify the number of data RBs allocated (66RBs). (Refer to the comment to the CR R4-2108883 in topic summary #202 R4-2108371)

**Decision: Endorsed.**

**R4-2111847 Draft CR to specify the number of data RBs allocated**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

Specify the number of data RBs allocated (66RBs). (Refer to the comment to the CR R4-2108883 in topic summary #202 R4-2108371)

**Decision: Endorsed.**

**R4-2111848 Draft CR to specify the number of data RBs allocated**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Anritsu Corporation*

**Abstract:**

Specify the number of data RBs allocated (66RBs). (Refer to the comment to the CR R4-2108883 in topic summary #202 R4-2108371)

**Decision: Endorsed.**

**R4-2111849 Clarification of SNR values in FR2 BFD-LR Test cases**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

The assumptions used when choosing the SNR levels for BFD-LR test cases are not stated in the test cases.

**Decision: Endorsed.**

**R4-2115248 Clarification of SNR values in FR2 BFD-LR Test cases**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

The assumptions used when choosing the SNR levels for BFD-LR test cases are not stated in the test cases.

**Decision: Withdrawn.**

**R4-2111850 Clarification of SNR values in FR2 BFD-LR Test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

The assumptions used when choosing the SNR levels for BFD-LR test cases are not stated in the test cases.

**Decision: Withdrawn.**

**R4-2115249 Clarification of SNR values in FR2 BFD-LR Test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

**Discussion:**

**Decision: Endorsed.**

**R4-2111851 Clarification of SNR values in FR2 BFD-LR Test cases**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Anritsu Corporation*

**Abstract:**

The assumptions used when choosing the SNR levels for BFD-LR test cases are not stated in the test cases.

**Decision: Endorsed.**

**R4-2111852 Generic channel BW configuration definition for RRM CA TCs**

*Type: discussion For: Approval  
 Source: Anritsu Corporation*

**Abstract:**

We provided our views on the issue with the channel BW configuration shortage for RRM test cases.

Associated draft CR: R4-2111853-1855

**Decision: Noted.**

**R4-2111853 Definition of generic channel BW configurations for RRM CA tests**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

Associated discussion paper: R4-2111852

**Decision: Revised to R4-2115250 (from R4-2111853).**

**R4-2115250 Definition of generic channel BW configurations for RRM CA tests**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

Associated discussion paper: R4-2111852

**Decision: Endorsed.**

**R4-2111854 Definition of generic channel BW configurations for RRM CA tests**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

Associated discussion paper: R4-2111852

**Decision: Endorsed.**

**R4-2111855 Definition of generic channel BW configurations for RRM CA tests**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Anritsu Corporation*

**Abstract:**

Associated discussion paper: R4-2111852

**Decision: Endorsed.**

**R4-2111856 Draft CR to update RMC and SCell SSB burst position for A.6.5.2.1**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

As discussed at R4-2108850 and agreed in the WF(R4-2108038), RMC for TDD15KHz and SSB burst position of SCell will be updated.

**Decision: Revised to R4-2115251 (from R4-2111856).**

**R4-2115251 Draft CR to update RMC and SCell SSB burst position for A.6.5.2.1**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

As discussed at R4-2108850 and agreed in the WF(R4-2108038), RMC for TDD15KHz and SSB burst position of SCell will be updated.

**Decision: Endorsed.**

**R4-2111857 Draft CR to update RMC and SCell SSB burst position for A.6.5.2.1**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

As discussed at R4-2108850 and agreed in the WF(R4-2108038), RMC for TDD15KHz and SSB burst position of SCell will be updated.

**Decision: Endorsed.**

**R4-2111858 Draft CR to update RMC and SCell SSB burst position for A.6.5.2.1**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Anritsu Corporation*

**Abstract:**

As discussed at R4-2108850 and agreed in the WF(R4-2108038), RMC for TDD15KHz and SSB burst position of SCell will be updated.

**Decision: Endorsed.**

**R4-2111859 Update NR PSCell Addition and Release Delay RRM Test cases**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

FR2 PSCell Addition and Release delay Test cases cannot be implemented reliably with current parameter values, whilst still meeting side conditions.

**Decision: Endorsed.**

**R4-2111860 Update NR PSCell Addition and Release Delay RRM Test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

FR2 PSCell Addition and Release delay Test cases cannot be implemented reliably with current parameter values, whilst still meeting side conditions.

**Decision: Endorsed.**

**R4-2111861 Update NR PSCell Addition and Release Delay RRM Test cases**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Anritsu Corporation*

**Abstract:**

FR2 PSCell Addition and Release delay Test cases cannot be implemented reliably with current parameter values, whilst still meeting side conditions.

**Decision: Endorsed.**

**R4-2111862 Update FR2 SCell Activation and Deactivation Delay Test cases**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

Test cases A.5.5.3.5 and A.7.5.3.2 contain a contradiction during T1, where the SCell is stated to be powered off, but the OTA parameters table specify the SCell as on during all time periods.

**Decision: Revised to R4-2115252 (from R4-2111862).**

**R4-2115252 Update FR2 SCell Activation and Deactivation Delay Test cases**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

Test cases A.5.5.3.5 and A.7.5.3.2 contain a contradiction during T1, where the SCell is stated to be powered off, but the OTA parameters table specify the SCell as on during all time periods.

**Decision: Endorsed.**

**R4-2111863 Update FR2 SCell Activation and Deactivation Delay Test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

Test cases A.5.5.3.5 and A.7.5.3.2 contain a contradiction during T1, where the SCell is stated to be powered off, but the OTA parameters table specify the SCell as on during all time periods.

**Decision: Endorsed.**

**R4-2111864 Update FR2 SCell Activation and Deactivation Delay Test cases**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Anritsu Corporation*

**Abstract:**

Test cases A.5.5.3.5 and A.7.5.3.2 contain a contradiction during T1, where the SCell is stated to be powered off, but the OTA parameters table specify the SCell as on during all time periods.

**Decision: Endorsed.**

**R4-2111865 Update inter-frequency FR1-FR2 SS-RSRP measurement accuracy Test cases**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

Test 1 of FR1-FR2 SS-RSRP measurement accuracy Test cases cannot be implemented reliably in RAN5 with current parameter values, whilst still meeting side conditions.

**Decision: Endorsed.**

**R4-2115253 Update inter-frequency FR1-FR2 SS-RSRP measurement accuracy Test cases**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

Test 1 of FR1-FR2 SS-RSRP measurement accuracy Test cases cannot be implemented reliably in RAN5 with current parameter values, whilst still meeting side conditions.

**Decision: Withdrawn.**

**R4-2111866 Update inter-frequency FR1-FR2 SS-RSRP measurement accuracy Test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

Test 1 of FR1-FR2 SS-RSRP measurement accuracy Test cases cannot be implemented reliably in RAN5 with current parameter values, whilst still meeting side conditions.

**Decision: Endorsed.**

**R4-2111867 Update inter-frequency FR1-FR2 SS-RSRP measurement accuracy Test cases**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Anritsu Corporation*

**Abstract:**

Test 1 of FR1-FR2 SS-RSRP measurement accuracy Test cases cannot be implemented reliably in RAN5 with current parameter values, whilst still meeting side conditions.

**Decision: Endorsed.**

**R4-2111868 Update FR2 CSI-RS-based RLM Test cases**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

FR2 CSI-RS-based RLM Test cases cannot be implemented reliably in RAN5 with current parameter values, whilst still meeting side conditions.

**Decision: Postponed.**

**R4-2115254 Update FR2 CSI-RS-based RLM Test cases**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

FR2 CSI-RS-based RLM Test cases cannot be implemented reliably in RAN5 with current parameter values, whilst still meeting side conditions.

**Decision: Withdrawn.**

**R4-2111869 Update FR2 CSI-RS-based RLM Test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

FR2 CSI-RS-based RLM Test cases cannot be implemented reliably in RAN5 with current parameter values, whilst still meeting side conditions.

**Decision: Withdrawn.**

**R4-2111870 Update FR2 CSI-RS-based RLM Test cases**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Anritsu Corporation*

**Abstract:**

FR2 CSI-RS-based RLM Test cases cannot be implemented reliably in RAN5 with current parameter values, whilst still meeting side conditions.

**Decision: Withdrawn.**

**R4-2111871 CR to the propagation condition of NR cell for InterRAT test cases**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

Correction of propagation condition to TDLA30-70 for NR Cell.

**Decision: Revised to R4-2115255 (from R4-2111871).**

**R4-2115255 CR to the propagation condition of NR cell for InterRAT test cases**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

Correction of propagation condition to TDLA30-70 for NR Cell.

**Decision: Endorsed.**

**R4-2111872 CR to the propagation condition of NR cell for InterRAT test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

Correction of propagation condition to TDLA30-70 for NR Cell.

**Decision: Endorsed.**

**R4-2111873 CR to the propagation condition of NR cell for InterRAT test cases**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Anritsu Corporation*

**Abstract:**

Correction of propagation condition to TDLA30-70 for NR Cell.

**Decision: Endorsed.**

**R4-2111877 Introduction of new BWP definition for FR2 SSB SCS240kHz conditions**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

Added new BW configuration (48RB) for SCS 240 kHz.

**Decision: Revised to R4-2115256 (from R4-2111877).**

**R4-2115256 Introduction of new BWP definition for FR2 SSB SCS240kHz conditions**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

Added new BW configuration (48RB) for SCS 240 kHz.

**Decision: Endorsed.**

**R4-2111878 Introduction of new BWP definition for FR2 SSB SCS240kHz conditions**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

Added new BW configuration (48RB) for SCS 240 kHz.

**Decision: Endorsed.**

**R4-2111879 Introduction of new BWP definition for FR2 SSB SCS240kHz conditions**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Anritsu Corporation*

**Abstract:**

Added new BW configuration (48RB) for SCS 240 kHz.

**Decision: Endorsed.**

**R4-2111880 CR to EUTRA-NR Inter-RAT SFTD measurement delay**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

Current config2 and config3 (LTE FDD-NR TDD condition) definition of cells (asynchronous) is inconsistent with other TCs (NSA, Inter-RAT).

**Decision: Merged.**

**R4-2111881 CR to EUTRA-NR Inter-RAT SFTD measurement delay**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

Current config2 and config3 (LTE FDD-NR TDD condition) definition of cells (asynchronous) is inconsistent with other TCs (NSA, Inter-RAT).

**Decision: Withdrawn.**

**R4-2111882 CR to EUTRA-NR Inter-RAT SFTD measurement delay**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Anritsu Corporation*

**Abstract:**

Current config2 and config3 (LTE FDD-NR TDD condition) definition of cells (asynchronous) is inconsistent with other TCs (NSA, Inter-RAT).

**Decision: Withdrawn.**

**R4-2111883 CR to General Test Parameters of SCell Activation and Deactivation Delay TCs**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

TRS settings for Config 1 and 3 are not specified in the general test parameters table in A.6.5.3.1 (also used for A.6.5.3.2, and A.6.5.3.3).

**Decision: Merged.**

**R4-2111884 CR to General Test Parameters of SCell Activation and Deactivation Delay TCs**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

TRS settings for Config 1 and 3 are not specified in the general test parameters table in A.6.5.3.1 (also used for A.6.5.3.2, and A.6.5.3.3).

**Decision: Withdrawn.**

**R4-2111885 CR to General Test Parameters of SCell Activation and Deactivation Delay TCs**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Anritsu Corporation*

**Abstract:**

TRS settings for Config 1 and 3 are not specified in the general test parameters table in A.6.5.3.1 (also used for A.6.5.3.2, and A.6.5.3.3).

**Decision: Withdrawn.**

**R4-2111886 Correction of CSI reporting periodicity for L1RSRP reporting in FR2**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

Updated L1-RSRP reporting period to 320 slots from 640 slots

**Decision: Merged.**

**R4-2111887 Correction of CSI reporting periodicity for L1RSRP reporting in FR2**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

Updated L1-RSRP reporting period to 320 slots from 640 slots

**Decision: Withdrawn.**

**R4-2111888 Correction of CSI reporting periodicity for L1RSRP reporting in FR2**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Anritsu Corporation*

**Abstract:**

Updated L1-RSRP reporting period to 320 slots from 640 slots

**Decision: Withdrawn.**

**R4-2111889 Correction of SSB configuration for interruption test cases in FR2**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Anritsu Corporation*

**Abstract:**

Correct SSB.1 FR2 to SSB.3 FR2

**Decision: Endorsed.**

**R4-2111890 Correction of SSB configuration for interruption test cases in FR2**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

Correct SSB.1 FR2 to SSB.3 FR2

**Decision: Endorsed.**

**R4-2111891 Correction of SSB configuration for interruption test cases in FR2**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Anritsu Corporation*

**Abstract:**

Correct SSB.1 FR2 to SSB.3 FR2

**Decision: Endorsed.**

**R4-2111899 Correction to Radio Link Monitoring Scheduling Restrictions in FR2**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Anritsu Corporation*

**Abstract:**

Missing implementation from the previously agreed CR (R4-2108884) needs to be corrected. Only Rel-16 spec needs the correction.

**Decision: Endorsed.**

**R4-2111900 Correction of Io in event triggered reporting test**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: F (Rel-17)  
  
 Source: Anritsu Corporation*

**Abstract:**

Missing implementation of Io value from the previously agreed CR (R4-2108888) needs to be corrected.

Only Rel-17 spec needs the correction.

**Decision: Endorsed.**

**R4-2112475 Correction on configurations in SA FR2 tests in R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Decision: Endorsed.**

**R4-2112476 Correction on configurations in SA FR2 tests in R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Endorsed.**

**R4-2112477 Correction on configurations in SA FR2 tests in R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Endorsed.**

**R4-2112526 Correction on the FR2 inter-frequency relative RSRP accuracy in R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Decision: Postponed.**

**R4-2115257 Correction on the FR2 inter-frequency relative RSRP accuracy in R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Decision: Withdrawn.**

**R4-2112527 Correction on the FR2 inter-frequency relative RSRP accuracy in R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Withdrawn.**

**R4-2112528 Correction on the FR2 inter-frequency relative RSRP accuracy in R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Withdrawn.**

**R4-2112529 Discussion on the FR2 inter-frequency relative RSRP accuracy**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2112536 Correction on configurations in SCell activation tests in R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2115258 (from R4-2112536).**

**R4-2115258 Correction on configurations in SCell activation tests in R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: MediaTek inc.*

**Decision: Endorsed.**

**R4-2112537 Correction on configurations in SCell activation tests in R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Endorsed.**

**R4-2112538 Correction on configurations in SCell activation tests in R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Endorsed.**

**R4-2112613 Draft-CR to TS 38.133: Missing CORESET RMCs in several test cases (Rel 15)**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112614 Draft-CR to TS 38.133: Missing CORESET RMCs in several test cases (Rel 16)**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112615 Draft-CR to TS 38.133: Missing CORESET RMCs in several test cases (Rel 17)**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112616 Draft-CR to TS 38.133: Corrections to PRACH test cases (Rel 15)**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112617 Draft-CR to TS 38.133: Corrections to PRACH test cases (Rel 16)**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112618 Draft-CR to TS 38.133: Corrections to PRACH test cases (Rel 17)**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112619 Draft-CR to TS 38.133: Corrections to re-establishment test cases (Rel 15)**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112620 Draft-CR to TS 38.133: Corrections to re-establishment test cases (Rel 16)**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112621 Draft-CR to TS 38.133: Corrections to re-establishment test cases (Rel 17)**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112622 Draft-CR to TS 38.133: Corrections to radio link monitoring test cases (Rel 15)**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2115259 Draft-CR to TS 38.133: Corrections to radio link monitoring test cases (Rel 15)**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Withdrawn.**

**R4-2112623 Draft-CR to TS 38.133: Corrections to radio link monitoring test cases (Rel 16)**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112624 Draft-CR to TS 38.133: Corrections to radio link monitoring test cases (Rel 17)**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112625 Draft-CR to TS 38.133: Corrections to periodic measurement test cases (Rel 15)**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112626 Draft-CR to TS 38.133: Corrections to periodic measurement test cases (Rel 16)**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112627 Draft-CR to TS 38.133: Corrections to periodic measurement test cases (Rel 17)**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112647 Views on principles to handle FR1 FR2 test case**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112692 Rel-15 Cat-F CR to Interruptions during measurements on deactivated NR SCC in FR1**

*Type: CR For: Agreement  
 38.133 v15.14.0 CR-2187 rev Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

Session chair: CR submitted instead of Draft CR. If agreeable, the CR will be endorsed.

**Decision: Revised to R4-2115260 (from R4-2112692).**

**R4-2115260 Draft CR: Interruptions during measurements on deactivated NR SCC in FR1**

*Type: CR For: Agreement  
 38.133 v15.14.0 CR-2187 rev 1 Cat: F (Rel-15)  
  
 Source: Qualcomm Incorporated*

**Decision: Endorsed.**

**R4-2115261 Draft CR: Interruptions during measurements on deactivated NR SCC in FR1**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Qualcomm Incorporated*

Session chair: Cat A for R4-2115260

**Abstract:**

**Discussion:**

**Decision: Endorsed.**

**R4-2115262 Draft CR: Interruptions during measurements on deactivated NR SCC in FR1**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

Session chair: Cat A for R4-2115260

**Abstract:**

**Discussion:**

**Decision: Endorsed.**

**R4-2112697 OTA testability issue**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2113145 draftCR to clarify timing reference point for UE UL timing test cases**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: (Rel-15)  
  
 Source: Intel Corporation*

**Decision: Postponed.**

**R4-2113146 draftCR to clarify timing reference point for UE UL timing test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: (Rel-16)  
  
 Source: Intel Corporation*

**Decision: Withdrawn.**

**R4-2113147 draftCR to clarify timing reference point for UE UL timing test cases**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: (Rel-17)  
  
 Source: Intel Corporation*

**Decision: Withdrawn.**

**R4-2113474 Correction of Link recovery test parameter tables**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

This draft CR correct the parameters for link recovery tests.

**Decision: Revised to R4-2115263 (from R4-2113474).**

**R4-2115263 Correction of Link recovery test parameter tables**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

This draft CR correct the parameters for link recovery tests.

**Decision: Endorsed.**

**R4-2113475 Correction of Link recovery test parameter tables**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR correct the parameters for link recovery tests.

**Decision: Endorsed.**

**R4-2113476 Correction of Link recovery test parameter tables**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draft CR correct the parameters for link recovery tests.

**Decision: Endorsed.**

**R4-2113477 Correction of A3-offset setting in FR2 SA event triggered reporting tests**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson, Anritsu*

**Abstract:**

This draft CR corrects A3-offset setting in FR2 SA event triggered reporting tests

Session chair: Agreeable. Are Rel-15/17 CRs needed?

E///: We don’t need Cat-A CR for Rel-15/17 because this is implementation error specific to TS38.133 V16.8.0

**Decision: Endorsed.**

**R4-2113478 Correction of FR2 L1-RSRP measurement tests**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

This draft CR corrects FR2 L1-RSRP measurement tests.

**Decision: Revised to R4-2115264 (from R4-2113478).**

**R4-2115264 Correction of FR2 L1-RSRP measurement tests**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

This draft CR corrects FR2 L1-RSRP measurement tests.

**Decision: Endorsed.**

**R4-2113479 Correction of FR2 L1-RSRP measurement tests**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR corrects FR2 L1-RSRP measurement tests.

**Decision: Endorsed.**

**R4-2113480 Correction of FR2 L1-RSRP measurement tests**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draft CR corrects FR2 L1-RSRP measurement tests.

**Decision: Endorsed.**

**R4-2113852 Correction to interruption during measurement on deactivated SCell test cases\_R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

Session chair: Agreeable. Are Rel-16/17 CRs needed?

Huawei: since R16,R17 spec have already correctly capture the change, only R15 CR is needed

**Decision: Endorsed.**

**R4-2113859 Maintenance CR for test cases - R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Decision: Merged.**

**R4-2113860 Maintenance CR for test cases - R16 Cat A**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

This is a Cat A CR.

**Decision: Withdrawn.**

**R4-2113861 Maintenance CR for test cases - R17 Cat A**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Abstract:**

This is a Cat A CR.

**Decision: Withdrawn.**

**R4-2113957 Correction to Inter-RAT SFTD measurement test cases\_R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115265 (from R4-2113957).**

**R4-2115265 Correction to Inter-RAT SFTD measurement test cases\_R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2113958 Correction to Inter-RAT SFTD measurement test cases\_R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2113959 Correction to Inter-RAT SFTD measurement test cases\_R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2113960 Correction to interruption due to BWP switching test cases\_R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2113961 Correction to interruption due to BWP switching test cases\_R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2113962 Correction to interruption due to BWP switching test cases\_R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2113963 Correction to PSCell addition test cases\_R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115266 (from R4-2113963).**

**R4-2115266 Correction to PSCell addition test cases\_R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2113964 Correction to PSCell addition test cases\_R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2113965 Correction to PSCell addition test cases\_R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2113966 Correction to radio link monitoring test cases\_R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2115267 Correction to radio link monitoring test cases\_R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Not pursued.**

**R4-2113967 Correction to radio link monitoring test cases\_R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2113968 Correction to radio link monitoring test cases\_R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2113969 Correction to SCell activation test cases\_R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115268 (from R4-2113969).**

**R4-2115268 Correction to SCell activation test cases\_R15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2113970 Correction to SCell activation test cases\_R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2113971 Correction to SCell activation test cases\_R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114098 Discussion on RRM performance maintenance**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2114164 On Rel-15 TCs with mix of carriers in LTE/FR1 and FR2**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on LTE/FR1+FR2 test case design, and how to address testability in Rel-15 test cases. Follow-up on WF R4-2108038.

**Decision: Noted.**

**R4-2114165 DraftCR (R15) Applicability of test cases with LTE/FR1+FR2**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

DraftCR on applicability of test cases with mix of LTE/FR1 and FR2 carriers.

**Decision: Revised to R4-2115269 (from R4-2114165).**

**R4-2115269 DraftCR (R15) Applicability of test cases with LTE/FR1+FR2**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

DraftCR on applicability of test cases with mix of LTE/FR1 and FR2 carriers.

**Decision: Endorsed.**

**R4-2114166 DraftCR (R16) Applicability of test cases with LTE/FR1+FR2**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

DraftCR on applicability of test cases with mix of LTE/FR1 and FR2 carriers.

**Decision: Endorsed.**

**R4-2114167 DraftCR (R17) Applicability of test cases with LTE/FR1+FR2**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

DraftCR on applicability of test cases with mix of LTE/FR1 and FR2 carriers.

**Decision: Endorsed.**

**R4-2114359 Draft-CR to TS 38.133: Corrections to propagation condition for inter-RAT test cases (Rel 15)**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Merged.**

**R4-2114360 Draft-CR to TS 38.133: Corrections to propagation condition for inter-RAT test cases (Rel 16)**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Decision: Withdrawn.**

**R4-2114361 Draft-CR to TS 38.133: Corrections to propagation condition for inter-RAT test cases (Rel 17)**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Withdrawn.**

**R4-2114442 Correction to n261 RRM performance requirements in Rel-15**

*Type: draftCR For: Endorsement  
 38.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

The CR corrects the min SSB\_RP level and missing antenna gain for n261 in power class 1

**Decision: Endorsed.**

**R4-2114443 Correction to n261 RRM performance requirements in Rel-16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR corrects the min SSB\_RP level and missing antenna gain for n261 in power class 1

**Decision: Endorsed.**

**R4-2114444 Correction to n261 RRM performance requirements in Rel-17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The CR corrects the min SSB\_RP level for n261 in power class 1. The antenna gain is present in Rel-17 so Rel-17 correction is not identical to Rel-15

**Decision: Endorsed.**

#### 5.1.10 Positioning specs maintenance (36.171, 37.171 and 38.171)

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**Email discussion: [100-e][203] NR\_NewRAT\_Positioning**

**R4-2115193 Email discussion summary: [100-e][203] NR\_NewRAT\_Positioning**

*Type: other For: Information  
 Source: Moderator (Spirent)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115378 (from R4-2115193).**

**R4-2115378 Email discussion summary: [100-e][203] NR\_NewRAT\_Positioning**

*Type: other For: Information  
 Source: Moderator (Spirent)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**1st round email discussion conclusions**

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2112138 | Remaining issues on testing of A-GNSS Sensitivity requirements in NR and LTE | Apple | Noted |  |
| R4-2113303 | Discussion on Frequency Bands for testing of A-GNSS Sensitivity requirements in NR and LTE | Xiaomi | Noted |  |
| R4-2114210 | Frequency bands for testing of A-GNSS sensitivity requirements | Qualcomm Incorporated | Not Pursued | Not currently acceptable |
| R4-2114208 | Frequency bands for testing of A-GNSS sensitivity requirements | Qualcomm Incorporated | Revised |  |
| R4-2112478 | On the number of satellites for 3-GNSS scenarios | MediaTek Inc., Rohde & Schwarz | Noted |  |
| R4-2112479 | CR on satellite allocation | MediaTek Inc., Rohde & Schwarz | Agreeable |  |
| R4-2112481 | CR on satellite allocation | MediaTek Inc., Rohde & Schwarz | Agreeable |  |
| R4-2113444 | Draft CR on 36.171 requirements for support of A-GNSS | CATT | Return to |  |
| R4-2113443 | Draft CR on 38.171 requirements for support of A-GNSS | CATT | Return to |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115270 | Frequency bands for testing of A-GNSS sensitivity requirements | Qualcomm Incorporated | Endorsed |  |
| R4-2115423 | CR on satellite allocation | MediaTek Inc., Rohde & Schwarz | Endorsed |  |
| R4-2112480 | CR on satellite allocation | MediaTek Inc., Rohde & Schwarz | Endorsed | Cat A |
| R4-2115424 | CR on satellite allocation | MediaTek Inc., Rohde & Schwarz | Endorsed |  |
| R4-2112482 | CR on satellite allocation | MediaTek Inc., Rohde & Schwarz | Endorsed | Cat A |
| R4-2113444 | Draft CR on 36.171 requirements for support of A-GNSS | CATT | Not Pursued | Editorial changes. Not pursued |
| R4-2113443 | Draft CR on 38.171 requirements for support of A-GNSS | CATT | Not Pursued | Editorial changes. Not pursued |

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**R4-2113443 Draft CR on 38.171 requirements for support of A-GNSS**

*Type: draftCR For: Endorsement  
 38.171 v16.1.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Not pursued.**

**R4-2113444 Draft CR on 36.171 requirements for support of A-GNSS**

*Type: draftCR For: Endorsement  
 36.171 v16.2.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Not pursued.**

##### 5.1.10.1 Frequency Bands for testing of A-GNSS Sensitivity

**R4-2112138 Remaining issues on testing of A-GNSS Sensitivity requirements in NR and LTE**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2113303 Discussion on Frequency Bands for testing of A-GNSS Sensitivity requirements in NR and LTE**

*Type: discussion For: Approval  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2114208 Frequency bands for testing of A-GNSS sensitivity requirements**

*Type: CR For: Agreement  
 38.171 v16.1.0 CR-0013 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

Session chair: CR submitted instead of Draft CR. If agreeable, the CR will be endorsed.

**Decision: Revised to R4-2115270 (from R4-2114208).**

**R4-2115270 Frequency bands for testing of A-GNSS sensitivity requirements**

*Type: CR For: Agreement  
 38.171 v16.1.0 CR-0013 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated, Apple*

Session chair: CR submitted instead of Draft CR. If agreeable, the CR will be endorsed.

**Decision: Endorsed.**

**R4-2114210 Frequency bands for testing of A-GNSS sensitivity requirements**

*Type: CR For: Agreement  
 36.171 v16.2.0 CR-0022 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

Session chair: CR submitted instead of Draft CR. If agreeable, the CR will be endorsed.

**Decision: Not pursued.**

##### 5.1.10.2 Other

**R4-2112478 On the number of satellites for 3-GNSS scenarios**

*Type: discussion For: Discussion  
 Source: MediaTek Inc., Rohde & Schwarz*

**Decision: Noted.**

**R4-2112479 CR on satellite allocation**

*Type: draftCR For: Endorsement  
 36.171 v15.1.0 CR- rev Cat: F (Rel-15)  
  
 Source: MediaTek Inc., Rohde & Schwarz*

**Decision: Revised to R4-2115423 (from R4-2112479).**

**R4-2115423 CR on satellite allocation**

*Type: draftCR For: Endorsement  
 36.171 v15.1.0 CR- rev Cat: F (Rel-15)  
  
 Source: MediaTek Inc., Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112480 CR on satellite allocation**

*Type: draftCR For: Endorsement  
 36.171 v16.2.0 CR- rev Cat: A (Rel-16)  
  
 Source: MediaTek Inc., Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112481 CR on satellite allocation**

*Type: draftCR For: Endorsement  
 38.171 v15.3.0 CR- rev Cat: F (Rel-15)  
  
 Source: MediaTek Inc., Rohde & Schwarz*

**Decision: Revised to R4-2115424 (from R4-2112481).**

**R4-2115424 CR on satellite allocation**

*Type: draftCR For: Endorsement  
 38.171 v15.3.0 CR- rev Cat: F (Rel-15)  
  
 Source: MediaTek Inc., Rohde & Schwarz*

**Decision: Endorsed.**

**R4-2112482 CR on satellite allocation**

*Type: draftCR For: Endorsement  
 38.171 v16.1.0 CR- rev Cat: A (Rel-16)  
  
 Source: MediaTek Inc., Rohde & Schwarz*

**Decision: Endorsed.**

### 5.2 LTE maintenance (up to Rel-15)

#### 5.2.2 Other WIs or R16 TEI

##### 5.2.2.3 RRM requirements

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**Email discussion: [100-e][204] LTE\_RRM\_maintenance\_NWM**

**R4-2115194 Email discussion summary: [100-e][204] LTE\_RRM\_maintenance\_NWM**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115379 (from R4-2115194).**

**R4-2115379 Email discussion summary: [100-e][204] LTE\_RRM\_maintenance\_NWM**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 25th)**

**Rel-16 eMTC**

Issue 2-1-1: RSS based RSRQ measurement

* Proposals
  + Option 1: Do not define RSS-based RSRQ
  + Option 2: Consider alternative ways to measure RSSI to be combined with RSRP based on RSS
    - RSSI is measured in the 4-PRB that do not contain RSS in the same subframes of RSS duration within the same narrowband as RSS.
    - RSSI is measured in the 6-PRB narrowband but in subframes without RSS, e.g. after the end of the RSS occasion.
  + Option 3: Adjust applicability requirements in TS 36.133 to enable reuse of existing CRS based RSRQ measurements in case of RSS based RSRP measurement configuration.
    - Based on comments, this option may have impact on other working groups.
* Discussion
  + E///: Option 1 is agreeable
  + QC: Does option 1 mean that RSRQ will be removed from cell reselection? Can option 2 be considered for Rel-17? Option 3 is precluded based on current spec.
  + Nokia: Option 3 is aligned with RAN2 agreements. We should target this for Rel-17. For Rel-16 we can define applicability rule. We can include in the LS that solution will be added in Rel-17.
  + Huawei: Option 1. In our understanding RSRQ will be removed from the cell reselection procedure. UE can measure RSRQ based on implementation but RAN4 requirements will not mandate this. This is similar to NB-IOT non-anchor carrier measurements.
  + QC: RAN2 has concerns on performance without RSRQ.
  + E///: For removal of RSRQ from cell-reselection – this applies to RSS-based measurements only and we still have CRS-based measurements. Agree with Huawei that we already have it for NB-IOT non-anchor carrier.
* Agreements:
  + Do not define RSS-based RSRQ measurement requirements in Rel-16
  + Inform RAN2 on RAN4 decision
* Session chair: Companies can bring proposals in RAN to include RSS-based RSRQ into the scope of Rel-17 NB-IOT/MTC WI. The decision is up to RAN.

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115271 | WF on LTE RRM maintenance requirements | Ericsson | To capture the agreements discussed in thread [100-e][204] LTE\_RRM\_maintenance\_NWM |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2114136 | Correction of RMC of NB-TDD  test cases R15 | Huawei, Hisilicon | Agreeable |  |
| R4-2114137 (cat-A) | Correction of RMC of NB-TDD  test cases R16 | Huawei, Hisilicon | Agreeable |  |
| R4-2114138 (cat-A) | Correction of RMC of NB-TDD test  cases R17 | Huawei, Hisilicon | Agreeable |  |
| R4-2114258 | CR to eMTC RRM  requirements R14 | Huawei, HiSilicon | Revised |  |
| R4-2114259 (cat-A) | CR to eMTC RRM  requirements R15 | Huawei, HiSilicon | Return to |  |
| R4-2114260  (cat-A) | CR to eMTC RRM  requirements R16 | Huawei, HiSilicon | Return to |  |
| R4-2114261  (cat-A) | CR to eMTC RRM  requirements R17 | Huawei, HiSilicon | Return to |  |
| R4-2114262 | CR to eDRX RRM  requirements R13 | Huawei, HiSilicon | Revised |  |
| R4-2114263 | CR to eDRX RRM  requirements R14 | Huawei, HiSilicon | Revised |  |
| R4-2114264  (cat-A) | CR to eDRX RRM  requirements R15 | Huawei, HiSilicon | Return to |  |
| R4-2114265  (cat-A) | CR to eDRX RRM  requirements R16 | Huawei, HiSilicon | Return to |  |
| R4-2114266  (cat-A) | CR to eDRX RRM  requirements R17 | Huawei, HiSilicon | Return to |  |
| R4-2114071 | Applicability of CRS-based RSRQ for RSS-based RSRP measure-  ment configuration | Nokia, Nokia  Shanghai Bell | Return to |  |
| R4-2114072  (cat-A) | Applicability of CRS-based RSRQ for RSS-based RSRP measure-  ment configuration | Nokia, Nokia  Shanghai Bell | Return to |  |
| R4-2114303 | CR on remaining issues in Rel-16 eMTC RRM | Huawei, HiSilicon | Return to |  |
| R4-2114304  (cat-A) | CR on remaining issues in Rel-16 eMTC RRM R17 | Huawei, HiSilicon | Return to |  |
| R4-2113513 | Correction on the synchronous condition for DAPS  handover | Ericsson | Return to |  |
| R4-2113514  (cat-A) | Correction on the synchronous condition for DAPS  handover | Ericsson | Return to |  |

**2nd round email discussion conclusions**

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| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115425 | Reply LS on RSS-based RSRQ | Huawei, HiSilicon | Approved |  |
| R4-2115271 | WF on LTE RRM maintenance requirements | Ericsson | Approved |  |
| R4-2115272 | CR to eMTC RRM  requirements R14 | Huawei, HiSilicon | Endorsed |  |
| R4-2114259 | CR to eMTC RRM  requirements R15 | Huawei, HiSilicon | Endorsed |  |
| R4-2114260 | CR to eMTC RRM  requirements R16 | Huawei, HiSilicon | Endorsed |  |
| R4-2114261 | CR to eMTC RRM  requirements R17 | Huawei, HiSilicon | Endorsed |  |
| R4-2115273 | CR to eDRX RRM  requirements R13 | Huawei, HiSilicon | Endorsed |  |
| R4-2115274 | CR to eDRX RRM  requirements R14 | Huawei, HiSilicon | Endorsed |  |
| R4-2114264 | CR to eDRX RRM  requirements R15 | Huawei, HiSilicon | Endorsed |  |
| R4-2114265 | CR to eDRX RRM  requirements R16 | Huawei, HiSilicon | Endorsed |  |
| R4-2114266 | CR to eDRX RRM  requirements R17 | Huawei, HiSilicon | Endorsed |  |
| R4-2114071 | Applicability of CRS-based RSRQ for RSS-based RSRP measurement configuration | Nokia, Nokia  Shanghai Bell | Noted |  |
| R4-2114072 | Applicability of CRS-based RSRQ for RSS-based RSRP measurement configuration | Nokia,             Nokia  Shanghai Bell | Withdrawn |  |
| R4-2114303 | CR on remaining issues in Rel-16 eMTC RRM | Huawei, HiSilicon | Postponed |  |
| R4-2114304 | CR on remaining issues in Rel-16 eMTC RRM R17 | Huawei, HiSilicon | Withdrawn |  |
| R4-2113513 | Correction on the synchronous condition for DAPS handover | Ericsson | Postponed |  |
| R4-2113514 | Correction on the synchronous condition for DAPS  handover | Ericsson | Withdrawn |  |
| R4-2113829 | Clarification on asynchronous DAPS handover R16 | Huawei, HiSilicon | Return to |  |

**WF/LS for approval**

**R4-2115271 WF on LTE RRM maintenance requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115425 Reply LS on RSS-based RSRQ**

*Type: LS out For: Approval  
 to RAN1, RAN2  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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###### 5.2.2.3.1 RRM core requirements

**R4-2114258 CR to eMTC RRM requirements R14**

*Type: draftCR For: Endorsement  
 36.133 v14.19.0 CR- rev Cat: F (Rel-14)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2115272 (from R4-2114258).**

**R4-2115272 CR to eMTC RRM requirements R14**

*Type: draftCR For: Endorsement  
 36.133 v14.19.0 CR- rev Cat: F (Rel-14)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114259 CR to eMTC RRM requirements R15**

*Type: draftCR For: Endorsement  
 36.133 v15.14.0 CR- rev Cat: A (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114260 CR to eMTC RRM requirements R16**

*Type: draftCR For: Endorsement  
 36.133 v16.10.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114261 CR to eMTC RRM requirements R17**

*Type: draftCR For: Endorsement  
 36.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114262 CR to eDRX RRM requirements R13**

*Type: draftCR For: Endorsement  
 36.133 v13.21.0 CR- rev Cat: F (Rel-13)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2115273 (from R4-2114262).**

**R4-2115273 CR to eDRX RRM requirements R13**

*Type: draftCR For: Endorsement  
 36.133 v13.21.0 CR- rev Cat: F (Rel-13)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114263 CR to eDRX RRM requirements R14**

*Type: draftCR For: Endorsement  
 36.133 v14.19.0 CR- rev Cat: F (Rel-14)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2115274 (from R4-2114263).**

**R4-2115274 CR to eDRX RRM requirements R14**

*Type: draftCR For: Endorsement  
 36.133 v14.19.0 CR- rev Cat: F (Rel-14)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114264 CR to eDRX RRM requirements R15**

*Type: draftCR For: Endorsement  
 36.133 v15.14.0 CR- rev Cat: A (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114265 CR to eDRX RRM requirements R16**

*Type: draftCR For: Endorsement  
 36.133 v16.10.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114266 CR to eDRX RRM requirements R17**

*Type: draftCR For: Endorsement  
 36.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

###### 5.2.2.3.2 RRM performance requirements

**R4-2114136 Correction of RMC of NB-TDD test cases R15**

*Type: draftCR For: Endorsement  
 36.133 v15.14.0 CR- rev Cat: F (Rel-15)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114137 Correction of RMC of NB-TDD test cases R16**

*Type: draftCR For: Endorsement  
 36.133 v16.10.0 CR- rev Cat: A (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114138 Correction of RMC of NB-TDD test cases R17**

*Type: draftCR For: Endorsement  
 36.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

## 6 Rel-16 maintenance for both NR and LTE

### 6.1 NR maintenance

#### 6.1.1 NR-based access to unlicensed spectrum

##### 6.1.1.5 RRM core requirements (38.133)

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**Email discussion: [100-e][206] NR\_unlic\_RRM\_1**

**R4-2115196 Email discussion summary: [100-e][206] NR\_unlic\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115380 (from R4-2115196).**

**R4-2115380 Email discussion summary: [100-e][206] NR\_unlic\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115275 | WF on NR-U RRM Requirements | Ericsson | To capture all agreements in RAN4#100-e in email thread: [100-e][206] NR\_unlic\_RRM\_1 |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2114099 | CR on maintenance of SCell activation requirements for NR-U R16 | Huawei, Hisilicon | Agreeable |  |
| R4-2114100 (cat-A) | CR on maintenance of SCell activation requirements for NR-U R17 | Huawei, Hisilicon | Agreeable |  |
| R4-2114101 | CR on maintenance of measurement requirements for NR-U R16 | Huawei, Hisilicon | Revised |  |
| R4-2114102 (cat-A) | CR on maintenance of measurement requirements for NR-U R17 | Huawei, Hisilicon | Return to |  |
| R4-2113225 | Correction of NR-U inter-frequency cell identification and measurements requirements | Nokia, Nokia Shanghai Bell | Revised |  |
| R4-2113226 (cat-A) | Correction of NR-U inter-frequency cell identification and measurements requirements | Nokia, Nokia Shanghai Bell | Return to |  |
| R4-2113241 | Draft CR correction RLM TCs for NR-U | Nokia, Nokia Shanghai Bell | Merged | Merged with R4-2114123 |
| R4-2113242 (cat-A) | Draft CR correction RLM TCs for NR-U | Nokia, Nokia Shanghai Bell | Withdrawn |  |
| R4-2114123 | CR on RLM for NR-U R16 | Huawei, Hisilicon | Revised | Please include the changes from R4-2113241 |
| R4-2114124 (cat-A) | CR on RLM for NR-U R17 | Huawei, Hisilicon | Return to |  |
| R4-2113244 | Correction of beam failure detection and link recovery TCs under CCA | Nokia, Nokia Shanghai Bell | Merged | To be merged with R4-2114126 |
| R4-2113245 (cat-A) | Correction of beam failure detection and link recovery TCs under CCA | Nokia, Nokia Shanghai Bell | Withdrawn |  |
| R4-2113466 | Draft CR: Correction of beam management test cases for NR-U | Ericsson | Merged | To be merged with R4-2114126 |
| R4-2113467 (cat-A) | Draft CR: Correction of beam management test cases for NR-U | Ericsson | Withdrawn |  |
| R4-2114126 | CR on TC of BFD and CBD for NR-U R16 | Huawei, Hisilicon | Revised | To include changes from R4-2113466 and R4-2113244 |
| R4-2114127 (cat-A) | CR on TC of BFD and CBD for NR-U R17 | Huawei, Hisilicon | Return to |  |
| R4-2114128 | CR on TC of inter-RAT measurement procedure for NR-U R16 | Huawei, Hisilicon | Revised |  |
| R4-2114129 (cat-A) | CR on TC of inter-RAT measurement procedure for NR-U R17 | Huawei, Hisilicon | Return to |  |
| R4-2113246 | Correction of inter-frequency measurement procedures TCs under CCA | Nokia, Nokia Shanghai Bell | Revised |  |
| R4-2113247 (cat-A) | Correction of inter-frequency measurement procedures TCs under CCA | Nokia, Nokia Shanghai Bell | Return to |  |
| R4-2114130 | CR on TC of inter-RAT SFTD measurement procedure for NR-U R16 | Huawei, Hisilicon | Revised |  |
| R4-2114131 (cat-A) | CR on TC of inter-RAT SFTD measurement procedure for NR-U R17 | Huawei, Hisilicon | Return to |  |
| R4-2114132 | CR on TC of intra-frequency measurement accuracy for NR-U R16 | Huawei, Hisilicon | Revised |  |
| R4-2114133 (cat-A) | CR on TC of intra-frequency measurement accuracy for NR-U R17 | Huawei, Hisilicon | Return to |  |
| R4-2113471 | Draft CR: Addition of SS-SINR/SS-RSRQ measurement accuracy tests for NR-U | Ericsson | Revised |  |
| R4-2113472 (cat-A) | Draft CR: Addition of SS-SINR/SS-RSRQ measurement accuracy tests for NR-U | Ericsson | Return to |  |
| R4-2113248 | Removal of TCI state switching TC for unlicensed bands | Nokia, Nokia Shanghai Bell | Agreeable |  |
| R4-2113249 (cat-A) | Removal of TCI state switching TC for unlicensed bands | Nokia, Nokia Shanghai Bell | Agreeable |  |
| R4-2114134 | CR on removing TCI switching TC for NR-U R16 | Huawei, Hisilicon | Merged | Merged with R4-2113248 |
| R4-2114135 | CR on removing TCI switching TC for NR-U R17 | Huawei, Hisilicon | Withdrawn |  |
| R4-2112115 | Draft CR on SSB availability for RLM and L1-RSRP R16 | Apple | Merged | To be merged with R4-2113462 |
| R4-2112116 (cat-A) | Draft CR on SSB availability for RLM and L1-RSRP R17 | Apple | Withdrawn |  |
| R4-2113109 | CR on availability of SSB occasions in R16 | MediaTek inc. | Merged | To be merged with R4-2113462 |
| R4-2113462 | Draft CR: Clarification of availability of SSB monitoring occasions for RLM and BM | Ericsson | Revised |  |
| R4-2113463 (cat-A) | Draft CR: Clarification of availability of SSB monitoring for RLM and BM | Ericsson | Return to |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115275 | WF on NR-U RRM Requirements | Ericsson | Approved |  |
| R4-2115276 | CR on maintenance of measurement requirements for NR-U R16 | Huawei, Hisilicon | Endorsed |  |
| R4-2114102 (cat-A) | CR on maintenance of measurement requirements for NR-U R17 | Huawei, Hisilicon | Endorsed |  |
| R4-2115277 | Correction of NR-U inter-frequency cell identification and measurements requirements | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2113226 (cat-A) | Correction of NR-U inter-frequency cell identification and measurements requirements | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2115278 | CR on RLM for NR-U R16 | Huawei, Hisilicon | Endorsed |  |
| R4-2114124 (cat-A) | CR on RLM for NR-U R17 | Huawei, Hisilicon | Endorsed |  |
| R4-2115279 | CR on TC of BFD and CBD for NR-U R16 | Huawei, Hisilicon | Endorsed |  |
| R4-2114127 (cat-A) | CR on TC of BFD and CBD for NR-U R17 | Huawei, Hisilicon | Endorsed |  |
| R4-2115280 | CR on TC of inter-RAT measurement procedure for NR-U R16 | Huawei, Hisilicon | Endorsed |  |
| R4-2114129 (cat-A) | CR on TC of inter-RAT measurement procedure for NR-U R17 | Huawei, Hisilicon | Endorsed |  |
| R4-2115281 | Correction of inter-frequency measurement procedures TCs under CCA | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2113247 (cat-A) | Correction of inter-frequency measurement procedures TCs under CCA | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2115282 | CR on TC of inter-RAT SFTD measurement procedure for NR-U R16 | Huawei, Hisilicon | Endorsed |  |
| R4-2114131 (cat-A) | CR on TC of inter-RAT SFTD measurement procedure for NR-U R17 | Huawei, Hisilicon | Endorsed |  |
| R4-2115283 | CR on TC of intra-frequency measurement accuracy for NR-U R16 | Huawei, Hisilicon | Endorsed |  |
| R4-2114133 (cat-A) | CR on TC of intra-frequency measurement accuracy for NR-U R17 | Huawei, Hisilicon | Endorsed |  |
| R4-2115284 | Draft CR: Addition of SS-SINR/SS-RSRQ measurement accuracy tests for NR-U | Ericsson | Endorsed |  |
| R4-2113472 (cat-A) | Draft CR: Addition of SS-SINR/SS-RSRQ measurement accuracy tests for NR-U | Ericsson | Endorsed |  |
| R4-2115285 | Draft CR: Clarification of availability of SSB monitoring occasions for RLM and BM | Ericsson | Endorsed |  |
| R4-2113463 (cat-A) | Draft CR: Clarification of availability of SSB monitoring for RLM and BM | Ericsson | Endorsed |  |

**WF/LS for approval**

**R4-2115275 WF on NR-U RRM Requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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###### 6.1.1.5.1 General

**R4-2112114 On remaining issue for NR-U core**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-16)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2112115 Draft CR on SSB availability for RLM and L1-RSRP R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Merged.**

**R4-2112116 Draft CR on SSB availability for RLM and L1-RSRP R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Withdrawn.**

**R4-2113108 Discussion on availability of SSB occasions**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2113109 CR on availability of SSB occasions in R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Merged.**

**R4-2112483 CR on availability of SSB occasions in R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Withdrawn.**

###### 6.1.1.5.2 RRC connection mobility control

###### 6.1.1.5.3 SCell activation/deactivation (delay and interruption)

**R4-2114099 CR on maintenance of SCell activation requirements for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114100 CR on maintenance of SCell activation requirements for NR-U R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

###### 6.1.1.5.4 Timing

###### 6.1.1.5.5 Other requirements

**R4-2113225 Correction of NR-U inter-frequency cell identification and measurements requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Revised to R4-2115277 (from R4-2113225).**

**R4-2115277 Correction of NR-U inter-frequency cell identification and measurements requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Endorsed.**

**R4-2113226 Correction of NR-U inter-frequency cell identification and measurements requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Endorsed.**

**R4-2113461 Availability of SSB monitoring occasions**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the remaining open issues for SSB monitoring capability.

**Decision: Noted.**

**R4-2113462 Draft CR: Clarification of availability of SSB monitoring occasions for RLM and BM**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft clarifies the availability of SSB monitoring occasions for RLM and BM.

**Decision: Revised to R4-2115285 (from R4-2113462).**

**R4-2115285 Draft CR: Clarification of availability of SSB monitoring occasions for RLM and BM**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft clarifies the availability of SSB monitoring occasions for RLM and BM.

**Decision: Endorsed.**

**R4-2113463 Draft CR: Clarification of availability of SSB monitoring for RLM and BM**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draft clarifies the availability of SSB monitoring for RLM and BM.

**Decision: Endorsed.**

**R4-2113878 Availability of SSB occasions for RLM/BFD/L1-RSRP**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2114101 CR on maintenance of measurement requirements for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115276 (from R4-2114101).**

**R4-2115276 CR on maintenance of measurement requirements for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114102 CR on maintenance of measurement requirements for NR-U R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

##### 6.1.1.6 RRM performance requirements (38.133)

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**Email discussion: [100-e][207] NR\_unlic\_RRM\_2**

**R4-2115197 Email discussion summary: [100-e][207] NR\_unlic\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115381 (from R4-2115197).**

**R4-2115381 Email discussion summary: [100-e][207] NR\_unlic\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115286 | WF on NR-U RRM performance requirements | Nokia, Nokia Shanghai Bell | Capturing agreements on the email thread [100-e][206] |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2113464 | Draft CR: Correction of RMC for NR-U test cases | Ericsson | Return to | Pending confirmation of agreement on [206] |
| R4-2114103 | CR on CORESET RMC for NR-U R16 | Huawei, Hisilicon | Endorsable | No comments on the 1st round |
| R4-2113228 | Correction of CCA model for TCs with DRX | Nokia, Nokia Shanghai Bell | Return to | Pending agreement on Issue 1-1 |
| R4-2114078 | Correction to cell reselection test | Ericsson | Merge to R4-2114105 |  |
| R4-2114105 | CR on TC of cell reselection for NR-U R16 | Huawei, Hisilicon | Revised | source to be updated as Huawei, Hisilicon, Ericsson |
| R4-2114077 | Correction to NR-U handover test | Ericsson | Merged to R4-2114107 |  |
| R4-2114107 | CR on TC of HO for NR-U R16 | Huawei, Hisilicon | revised | source to be updated as Huawei, Hisilicon, Ericsson |
| R4-2113230 | Draft CR Correction of Handover TCs | Nokia, Nokia Shanghai Bell | Revised |  |
| R4-2114433 | Correction to RRC re-establishment tests for NR-U in 38.133 | Ericsson | Revised | source to be updated as Ericsson, Huawei, Hisilicon |
| R4-2114109 | CR on TC of RRC Re-establishment for NR-U R16 | Huawei, Hisilicon | Merged to R4-2114433 |  |
| R4-2113232 | Draft CR RRC Re-establishment with CCA | Nokia, Nokia Shanghai Bell | Revised |  |
| R4-2114435 | Correction to RRC re-direction tests for NR-U in 38.133 | Ericsson | Revised | Source to be updated as Ericsson, Nokia, Nokia Shanghai Bell |
| R4-2114111 | CR on TC of RRC Release with Redirection for NR-U R16 | Huawei, Hisilicon | Revised |  |
| R4-2113235 | Correction on release with redirection TCs for unlicensed operation | Nokia, Nokia Shanghai Bell | Merged to R4-2114435 |  |
| R4-2113468 | Draft CR: Correction of random access procedure test cases for NR-U | Ericsson | Revised | Souce to be updated as Ericsson, Huawei, Hisilicon |
| R4-2114113 | CR on TC of RA for NR-U R16 | Huawei, Hisilicon | Merged to R4-2113468 |  |
| R4-2114437 | Correction to UE timing tests for NR in 38.133 | Ericsson | Merged to R4-2114115 |  |
| R4-2114115 | CR on TC of timing requirements for NR-U R16 | Huawei, Hisilicon | Revised | Source to be updated as Huawei, Hisilicon, Ericsson |
| R4-2114439 | Correction to BWP switching tests for NR-U in 38.133 | Ericsson | Revised |  |
| R4-2114117 | CR on TC of BWP switch requirements for NR-U R16 | Huawei, Hisilicon | Revised |  |
| R4-2114119 | CR on TC of PSCell addition and release for NR-U R16 | Huawei, Hisilicon | Endorsable |  |
| R4-2114172 | DraftCR (R16) Correction of test cases for SCell (de)activation | Ericsson | Revised | Source to be updated as Huawei, Hisilicon, Ericsson, Nokia, Shanghai Bell |
| R4-2114121 | CR on TC of SCell activation for NR-U R16 | Huawei, Hisilicon | Merged to R4-2114172 |  |
| R4-2113238 | TC SCell activation/deactivation for unlicensed bands | Nokia, Nokia Shanghai Bell | Merged to R4-2114172 |  |
| R4-2114170 | DraftCR (R16) Correction of test cases for interruptions | Ericsson | Endorsable | No comments on the 1st round |
| R4-2113465 (Cat-A) | Draft CR: Correction of RMC for NR-U test cases | Ericsson | Return to |  |
| R4-2114104 (Cat-A) | CR on CORESET RMC for NR-U R17 | Huawei, Hisilicon | Return to |  |
| R4-2113229 (Cat-A) | Correction of CCA model for TCs with DRX | Nokia, Nokia Shanghai Bell | Return to | Pending agreement on Issue 1-1 |
| R4-2114080 (Cat-A) | Correction to cell reselection test | Ericsson | Withdrawn |  |
| R4-2114106 (Cat-A) | CR on TC of cell reselection for NR-U R16 | Huawei, Hisilicon | Return to | source to be updated as Huawei, Hisilicon, Ericsson |
| R4-2114079 (Cat-A) | Correction to NR-U handover test | Ericsson | Withdrawn |  |
| R4-2114108 (Cat-A) | CR on TC of HO for NR-U R17 | Huawei, Hisilicon | Return to | source to be updated as Huawei, Hisilicon, Ericsson |
| R4-2113231 (Cat-A) | Draft CR Correction of Handover TCs | Nokia, Nokia Shanghai Bell | Return to |  |
| R4-2114434 (Cat-A) | Correction to RRC re-establishment tests for NR-U in 38.133 | Ericsson | Return to | source to be updated as Ericsson, Huawei, Hisilicon |
| R4-2114110 (Cat-A) | CR on TC of RRC Re-establishment for NR-U R17 | Huawei, Hisilicon | Withdrawn |  |
| R4-2113233 (Cat-A) | Draft CR RRC Re-establishment with CCA | Nokia, Nokia Shanghai Bell | Return to |  |
| R4-2114436 (Cat-A) | Correction to RRC re-direction tests for NR-U in 38.133 | Ericsson | Return to | Source to be updated as Ericsson, Nokia, Nokia Shanghai Bell |
| R4-2114112 (Cat-A) | CR on TC of RRC Release with Redirection for NR-U R17 | Huawei, Hisilicon | Return to |  |
| R4-2113236 (Cat-A) | Correction on release with redirection TCs for unlicensed operation | Nokia, Nokia Shanghai Bell | Withdrawn |  |
| R4-2113469 (Cat-A) | Draft CR: Correction of random access procedure test cases for NR-U | Ericsson | Return to | Souce to be updated as Ericsson, Huawei, Hisilicon |
| R4-2114114 (Cat-A) | CR on TC of RA for NR-U R17 | Huawei, Hisilicon | Withdrawn |  |
| R4-2114438 (Cat-A) | Correction to UE timing tests for NR in 38.133 | Ericsson | Withdrawn |  |
| R4-2114116 (Cat-A) | CR on TC of timing requirements for NR-U R16 | Huawei, Hisilicon | Return to | Source to be updated as Huawei, Hisilicon, Ericsson |
| R4-2114440 (Cat-A) | Correction to BWP switching tests for NR-U in 38.133 | Ericsson | Return to |  |
| R4-2114118 (Cat-A) | CR on TC of BWP switch requirements for NR-U R17 | Huawei, Hisilicon | Return to |  |
| R4-2114120 (Cat-A) | CR on TC of PSCell addition and release for NR-U R17 | Huawei, Hisilicon | Return to |  |
| R4-2114173 (Cat-A) | DraftCR (R17) Correction of test cases for SCell (de)activation | Ericsson | Return to | Source to be updated as Huawei, Hisilicon, Ericsson, Nokia, Shanghai Bell |
| R4-2114122 (Cat-A) | CR on TC of SCell activation for NR-U R17 | Huawei, Hisilicon | Withdrawn |  |
| R4-2113239 (Cat-A) | TC SCell activation/deactivation for unlicensed bands | Nokia, Nokia Shanghai Bell | Withdrawn |  |
| R4-2114171 (Cat-A) | DraftCR (R17) Correction of test cases for interruptions | Ericsson | Return to | No comments on the 1st round |

**2nd round email discussion conclusions**

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2115286 | WF on NR-U RRM performance requirements | Nokia, Nokia Shanghai Bell | Approved |  |
| R4-2115417 | Draft CR: Correction of RMC for NR-U test cases | Ericsson | Endorsed |  |
| R4-2113228 | Correction of CCA model for TCs with DRX | Nokia, Nokia Shanghai Bell | Postponed |  |
| R4-2115287 | CR on TC of cell reselection for NR-U R16 | Huawei, Hisilicon | Endorsed | source updated as Huawei, Hisilicon, Ericsson |
| R4-2115288 | CR on TC of HO for NR-U R16 | Huawei, Hisilicon | Endorsed | source updated as Huawei, Hisilicon, Ericsson |
| R4-2115289 | Draft CR Correction of Handover TCs | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2115290 | Correction to RRC re-establishment tests for NR-U in 38.133 | Ericsson | Endorsed | source updated as Ericsson, Huawei, Hisilicon |
| R4-2115291 | Draft CR RRC Re-establishment with CCA | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2115292 | Correction to RRC re-direction tests for NR-U in 38.133 | Ericsson | Endorsed | source updated as Ericsson, Nokia, Nokia Shanghai Bell |
| R4-2115293 | CR on TC of RRC Release with Redirection for NR-U R16 | Huawei, Hisilicon | Endorsed |  |
| R4-2115294 | Draft CR: Correction of random access procedure test cases for NR-U | Ericsson | Endorsed | source updated as Ericsson, Huawei, Hisilicon |
| R4-2115295 | CR on TC of timing requirements for NR-U R16 | Huawei, Hisilicon | Endorsed | source updated as Huawei, Hisilicon, Ericsson |
| R4-2115296 | Correction to BWP switching tests for NR-U in 38.133 | Ericsson | Endorsed |  |
| R4-2115297 | CR on TC of BWP switch requirements for NR-U R16 | Huawei, Hisilicon | Endorsed |  |
| R4-2115298 | DraftCR (R16) Correction of test cases for SCell (de)activation | Ericsson | Endorsed | source updated as Huawei, Hisilicon, Ericsson, Nokia, Shanghai Bell |
| R4-2113465 (Cat-A) | Draft CR: Correction of RMC for NR-U test cases | Ericsson | Endorsed |  |
| R4-2114104 (Cat-A) | CR on CORESET RMC for NR-U R17 | Huawei, Hisilicon | Endorsed |  |
| R4-2113229 (Cat-A) | Correction of CCA model for TCs with DRX | Nokia, Nokia Shanghai Bell | Withdrawn |  |
| R4-2114106 (Cat-A) | CR on TC of cell reselection for NR-U R16 | Huawei, Hisilicon | Endorsed | source updated as Huawei, Hisilicon, Ericsson |
| R4-2114108 (Cat-A) | CR on TC of HO for NR-U R17 | Huawei, Hisilicon | Endorsed | source updated as Huawei, Hisilicon, Ericsson |
| R4-2113231 (Cat-A) | Draft CR Correction of Handover TCs | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2114434 (Cat-A) | Correction to RRC re-establishment tests for NR-U in 38.133 | Ericsson | Endorsed | source updated as Ericsson, Huawei, Hisilicon |
| R4-2113233 (Cat-A) | Draft CR RRC Re-establishment with CCA | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2114436 (Cat-A) | Correction to RRC re-direction tests for NR-U in 38.133 | Ericsson | Endorsed | source updated as Ericsson, Nokia, Nokia Shanghai Bell |
| R4-2114112 (Cat-A) | CR on TC of RRC Release with Redirection for NR-U R17 | Huawei, Hisilicon | Endorsed |  |
| R4-2113469 (Cat-A) | Draft CR: Correction of random access procedure test cases for NR-U | Ericsson | Endorsed | source updated as Ericsson, Huawei, Hisilicon |
| R4-2114116 (Cat-A) | CR on TC of timing requirements for NR-U R16 | Huawei, Hisilicon | Endorsed | source updated as Huawei, Hisilicon, Ericsson |
| R4-2114440 (Cat-A) | Correction to BWP switching tests for NR-U in 38.133 | Ericsson | Endorsed |  |
| R4-2114118 (Cat-A) | CR on TC of BWP switch requirements for NR-U R17 | Huawei, Hisilicon | Endorsed |  |
| R4-2114120 (Cat-A) | CR on TC of PSCell addition and release for NR-U R17 | Huawei, Hisilicon | Endorsed |  |
| R4-2114173 (Cat-A) | DraftCR (R17) Correction of test cases for SCell (de)activation | Ericsson | Endorsed | Source updated as Huawei, Hisilicon, Ericsson, Nokia, Shanghai Bell |
| R4-2114171 (Cat-A) | DraftCR (R17) Correction of test cases for interruptions | Ericsson | Endorsed |  |

**WF/LS for approval**

**R4-2115286 WF on NR-U RRM performance requirements**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

**Discussion:**

**Decision: Endorsed.**

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###### 6.1.1.6.1 General

###### 6.1.1.6.2 Measurement accuracy requirements

###### 6.1.1.6.3 Test cases

6.1.1.6.3.1 General

**R4-2113227 On remaining details of CCA model for NR-U RRM tests**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113228 Correction of CCA model for TCs with DRX**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Postponed.**

**R4-2113229 Correction of CCA model for TCs with DRX**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Withdrawn.**

**R4-2113464 Draft CR: Correction of RMC for NR-U test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR updates RMCs used for NR-U RRM test cases.

**Decision: Revised to R4-2115417 (from R4-2113464).**

**R4-2115417 Draft CR: Correction of RMC for NR-U test cases**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR updates RMCs used for NR-U RRM test cases.

**Decision: Endorsed.**

**R4-2113465 Draft CR: Correction of RMC for NR-U test cases**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draft CR updates RMCs used for NR-U RRM test cases.

**Decision: Endorsed.**

**R4-2114103 CR on CORESET RMC for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114104 CR on CORESET RMC for NR-U R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

6.1.1.6.3.2 RRC IDLE cell re-selection

**R4-2114078 Correction to cell reselection test**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Corrections to NR-U cell reselection test.

**Decision: Merged.**

**R4-2114080 Correction to cell reselection test**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Corrections to NR-U cell reselection test.

**Decision: Withdrawn.**

**R4-2114105 CR on TC of cell reselection for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115287 (from R4-2114105).**

**R4-2115287 CR on TC of cell reselection for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source:* Huawei, Hisilicon, Ericsson

Session chair: source companies list was updated

**Decision: Endorsed.**

**R4-2114106 CR on TC of cell reselection for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source:* Huawei, Hisilicon, Ericsson

Session chair: source companies list was updated

**Decision: Endorsed.**

6.1.1.6.3.3 HO (delay and interruptions)

**R4-2113230 Draft CR Correction of Handover TCs**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Revised to R4-2115289 (from R4-2113230).**

**R4-2115289 Draft CR Correction of Handover TCs**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Endorsed.**

**R4-2113231 Draft CR Correction of Handover TCs**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Endorsed.**

**R4-2114077 Correction to NR-U handover test**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Corrections to NR-U handover test.

**Decision: Merged.**

**R4-2114079 Correction to NR-U handover test**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Corrections to NR-U handover test.

**Decision: Withdrawn.**

**R4-2114107 CR on TC of HO for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115288 (from R4-2114107).**

**R4-2115288 CR on TC of HO for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source:* Huawei, Hisilicon, Ericsson

Session chair: source companies list was updated

**Decision: Endorsed.**

**R4-2114108 CR on TC of HO for NR-U R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source:* Huawei, Hisilicon, Ericsson

Session chair: source companies list was updated

**Decision: Endorsed.**

6.1.1.6.3.4 RRC Re-establishment

**R4-2113232 Draft CR RRC Re-establishment with CCA**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Revised to R4-2115291 (from R4-2113232).**

**R4-2115291 Draft CR RRC Re-establishment with CCA**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Endorsed.**

**R4-2113233 Draft CR RRC Re-establishment with CCA**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Endorsed.**

**R4-2114109 CR on TC of RRC Re-establishment for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Merged.**

**R4-2114110 CR on TC of RRC Re-establishment for NR-U R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Withdrawn.**

**R4-2114433 Correction to RRC re-establishment tests for NR-U in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR corrects test case on RRC re-establishment in NR-U

**Decision: Revised to R4-2115290 (from R4-2114433).**

**R4-2115290 Correction to RRC re-establishment tests for NR-U in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source:* Ericsson, Huawei, Hisilicon

**Abstract:**

The CR corrects test case on RRC re-establishment in NR-U

Session chair: source companies list was updated

**Decision: Endorsed.**

**R4-2114434 Correction to RRC re-establishment tests for NR-U in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source:* Ericsson, Huawei, Hisilicon

**Abstract:**

The CR corrects test case on RRC re-establishment in NR-U

**Decision: Endorsed.**

6.1.1.6.3.5 RRC Connection Release with Redirection

**R4-2113234 Discussion on RRC connection release with redirection RRM requirements with CCA**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113235 Correction on release with redirection TCs for unlicensed operation**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Merged.**

**R4-2113236 Correction on release with redirection TCs for unlicensed operation**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Withdrawn.**

**R4-2114111 CR on TC of RRC Release with Redirection for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115293 (from R4-2114111).**

**R4-2115293 CR on TC of RRC Release with Redirection for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114112 CR on TC of RRC Release with Redirection for NR-U R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114435 Correction to RRC re-direction tests for NR-U in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR corrects test case on RRC re-redirection in NR-U

**Decision: Revised to R4-2115292 (from R4-2114435).**

**R4-2115292 Correction to RRC re-direction tests for NR-U in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source:* Ericsson, Nokia, Nokia Shanghai Bell

**Abstract:**

The CR corrects test case on RRC re-redirection in NR-U

Session chair: source companies list was updated

**Decision: Endorsed.**

**R4-2114436 Correction to RRC re-direction tests for NR-U in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source:* Ericsson, Nokia, Nokia Shanghai Bell

**Abstract:**

The CR corrects test case on RRC re-redirection in NR-U

Session chair: source companies list was updated

**Decision: Endorsed.**

6.1.1.6.3.6 Random access

**R4-2113468 Draft CR: Correction of random access procedure test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR updates the test cases of random access procedure in NR-U.

**Decision: Revised to R4-2115294 (from R4-2113468).**

**R4-2115294 Draft CR: Correction of random access procedure test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source:* Ericsson, Huawei, Hisilicon

**Abstract:**

This draft CR updates the test cases of random access procedure in NR-U.

Session chair: source companies list was updated

**Decision: Endorsed.**

**R4-2113469 Draft CR: Correction of random access procedure test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source:* Ericsson, Huawei, Hisilicon

**Abstract:**

Session chair: source companies list was updated

This draft CR updates the test cases of random access procedure in NR-U.

**Decision: Endorsed.**

**R4-2114113 CR on TC of RA for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Merged.**

**R4-2114114 CR on TC of RA for NR-U R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Withdrawn.**

6.1.1.6.3.7 Timing (transmit timing and TA)

**R4-2114115 CR on TC of timing requirements for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115295 (from R4-2114115).**

**R4-2115295 CR on TC of timing requirements for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source:* Huawei, Hisilicon, Ericsson

Session chair: source companies list was updated

**Decision: Endorsed.**

**R4-2114116 CR on TC of timing requirements for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source:* Huawei, Hisilicon, Ericsson

Session chair: source companies list was updated

**Decision: Endorsed.**

**R4-2114437 Correction to UE timing tests for NR in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR corrects test cases on UE transmit timing and timing advance

**Decision: Merged.**

**R4-2114438 Correction to UE timing tests for NR in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The CR corrects test cases on UE transmit timing and timing advance

**Decision: Withdrawn.**

6.1.1.6.3.8 BWP switching delay and interruptions

**R4-2114117 CR on TC of BWP switch requirements for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115297 (from R4-2114117).**

**R4-2115297 CR on TC of BWP switch requirements for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114118 CR on TC of BWP switch requirements for NR-U R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114439 Correction to BWP switching tests for NR-U in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR corrects test cases on BWP switching.

**Decision: Revised to R4-2115296 (from R4-2114439).**

**R4-2115296 Correction to BWP switching tests for NR-U in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR corrects test cases on BWP switching.

**Decision: Endorsed.**

**R4-2114440 Correction to BWP switching tests for NR-U in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The CR corrects test cases on BWP switching.

**Decision: Endorsed.**

6.1.1.6.3.9 PSCell addition/release (delay and interruption)

**R4-2114119 CR on TC of PSCell addition and release for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114120 CR on TC of PSCell addition and release for NR-U R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

6.1.1.6.3.10 SCell activation/deactivation (delay and interruption)

**R4-2113237 Discussion on SCell activation/deactivation delay performance requirements with CCA**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113238 TC SCell activation/deactivation for unlicensed bands**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Merged.**

**R4-2113239 TC SCell activation/deactivation for unlicensed bands**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Withdrawn.**

**R4-2114121 CR on TC of SCell activation for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Merged.**

**R4-2114122 CR on TC of SCell activation for NR-U R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Withdrawn.**

**R4-2114172 DraftCR (R16) Correction of test cases for SCell (de)activation**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Maintenance of test cases for SCell (de)activation in NR-U.

**Decision: Revised to R4-2115298 (from R4-2114172).**

**R4-2115298 DraftCR (R16) Correction of test cases for SCell (de)activation**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source:* Huawei, Hisilicon, Ericsson, Nokia, Shanghai Bell

**Abstract:**

Maintenance of test cases for SCell (de)activation in NR-U.

Session chair: source companies list was updated

**Decision: Endorsed.**

**R4-2114173 DraftCR (R17) Correction of test cases for SCell (de)activation**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source:* Huawei, Hisilicon, Ericsson, Nokia, Shanghai Bell

**Abstract:**

Maintenance of test cases for SCell (de)activation in NR-U.

Session chair: source companies list was updated

**Decision: Endorsed.**

6.1.1.6.3.11 Other interruptions

**R4-2114170 DraftCR (R16) Correction of test cases for interruptions**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Maintenance of interruption test cases for NR-U.

**Decision: Endorsed.**

**R4-2114171 DraftCR (R17) Correction of test cases for interruptions**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Maintenance of interruption test cases for NR-U.

**Decision: Endorsed.**

6.1.1.6.3.12 RLM

**R4-2113240 Discussion on RLM performance requirements with CCA**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113241 Draft CR correction RLM TCs for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Merged.**

**R4-2113242 Draft CR correction RLM TCs for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Withdrawn.**

**R4-2114123 CR on RLM for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115278 (from R4-2114123).**

**R4-2115278 CR on RLM for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114124 CR on RLM for NR-U R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

6.1.1.6.3.13 Beam management (BFD and link recovery)

**R4-2113243 Discussion on beam failure detection and link recovery requirements with CCA**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113244 Correction of beam failure detection and link recovery TCs under CCA**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Merged.**

**R4-2113245 Correction of beam failure detection and link recovery TCs under CCA**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Withdrawn.**

**R4-2113466 Draft CR: Correction of beam management test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the test cases for bean failure recovery and L1-RSRP reporting in NR-U.

**Decision: Merged.**

**R4-2113467 Draft CR: Correction of beam management test cases for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the test cases for bean failure recovery and L1-RSRP reporting in NR-U.

**Decision: Withdrawn.**

**R4-2114125 Discussion on TC for BFD and CBD for NR-U**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2114126 CR on TC of BFD and CBD for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115279 (from R4-2114126).**

**R4-2115279 CR on TC of BFD and CBD for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114127 CR on TC of BFD and CBD for NR-U R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

6.1.1.6.3.14 SS-RSRP/SS-RSRQ/SS-SINR/L1-RSRP measurement procedure (intra-frequency, inter-frequency, inter-RAT)

**R4-2114128 CR on TC of inter-RAT measurement procedure for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115280 (from R4-2114128).**

**R4-2115280 CR on TC of inter-RAT measurement procedure for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114129 CR on TC of inter-RAT measurement procedure for NR-U R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

6.1.1.6.3.15 RSSI/CO measurement procedure (intra-frequency, inter-frequency, inter-RAT)

**R4-2113246 Correction of inter-frequency measurement procedures TCs under CCA**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Revised to R4-2115281 (from R4-2113246).**

**R4-2115281 Correction of inter-frequency measurement procedures TCs under CCA**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Endorsed.**

**R4-2113247 Correction of inter-frequency measurement procedures TCs under CCA**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Endorsed.**

6.1.1.6.3.16 SFTD measurement procedure

**R4-2114130 CR on TC of inter-RAT SFTD measurement procedure for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115282 (from R4-2114130).**

**R4-2115282 CR on TC of inter-RAT SFTD measurement procedure for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114131 CR on TC of inter-RAT SFTD measurement procedure for NR-U R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

6.1.1.6.3.17 SS-RSRP/SS-RSRQ/SS-SINR/L1-RSRP measurement accuracy (intra-frequency, inter-frequency, inter-RAT)

**R4-2113470 Addition of SS-SINR/SS-RSRQ measurement accuracy tests for NR-U**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the introduction of the SS-RSRQ/SS-SINR measurement accuracy test cases for NR-U.

**Decision: Noted.**

**R4-2113471 Draft CR: Addition of SS-SINR/SS-RSRQ measurement accuracy tests for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the SS-RSRQ/SS-SINR measurement accuracy test cases for NR-U.

**Decision: Revised to R4-2115284 (from R4-2113471).**

**R4-2115284 Draft CR: Addition of SS-SINR/SS-RSRQ measurement accuracy tests for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the SS-RSRQ/SS-SINR measurement accuracy test cases for NR-U.

**Decision: Endorsed.**

**R4-2113472 Draft CR: Addition of SS-SINR/SS-RSRQ measurement accuracy tests for NR-U**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draft CR introduces the SS-RSRQ/SS-SINR measurement accuracy test cases for NR-U.

**Decision: Endorsed.**

**R4-2114132 CR on TC of intra-frequency measurement accuracy for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115283 (from R4-2114132).**

**R4-2115283 CR on TC of intra-frequency measurement accuracy for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114133 CR on TC of intra-frequency measurement accuracy for NR-U R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

6.1.1.6.3.18 RSSI/CO measurement accuracy (intra-frequency, inter-frequency, inter-RAT)

6.1.1.6.3.19 SFTD measurement accuracy

6.1.1.6.3.20 Other

**R4-2113248 Removal of TCI state switching TC for unlicensed bands**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Endorsed.**

**R4-2113249 Removal of TCI state switching TC for unlicensed bands**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Correction of RRM test cases for unlicensed operation.

**Decision: Endorsed.**

**R4-2113879 Test case with UL CCA failure**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2114134 CR on removing TCI switching TC for NR-U R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Merged.**

**R4-2114135 CR on removing TCI switching TC for NR-U R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Withdrawn.**

#### 6.1.2 Integrated Access and Backhaul for NR

##### 6.1.2.3 RRM core requirements

**R4-2114431 Side conditions in IAB-MT RRC connection mobility requirements in TS 38.174**

*Type: draftCR For: Endorsement  
 38.174 v16.3.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR on side conditions (SSB Es/Iot and SSP\_RP) for IAB-MT requirements

**Decision: Endorsed.**

##### 6.1.2.4 RRM performance requirements

**R4-2114432 Correction to IAB-MT RRM tests in TS 38.174**

*Type: draftCR For: Endorsement  
 38.174 v16.3.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The CR to correct IAB-MT performance requirements

**Decision: Endorsed.**

#### 6.1.3 5G V2X with NR sidelink

##### 6.1.3.2 RRM requirements (38.133)

#### 6.1.4 Multi-RAT Dual-Connectivity and Carrier Aggregation enhancements

##### 6.1.4.2 RRM core requirement (38.133/36.133)

###### 6.1.4.2.1 Early Measurement reporting

###### 6.1.4.2.2 Efficient and low latency serving cell configuration, activation and setup

**R4-2112078 On direct SCell activation**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2112079 CR on direct SCell activation (R16)**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Revised to R4-2115427 (from R4-2112079).**

**R4-2115427 CR on direct SCell activation (R16)**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2112080 CR on direct SCell activation (R17)**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2114010 SCell and Direct SCell activation delay**

*Type: discussion For: Agreement  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2114011 Draft CR for Direct SCell activation delay**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Merged.**

**R4-2114012 Draft CR for Direct SCell activation delay**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Withdrawn.**

**R4-2114267 CR on direct SCell activation requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Merged.**

**R4-2114268 CR on direct SCell activation requirements R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

##### 6.1.4.3 RRM performance requirements (38.133)

###### 6.1.4.3.1 Early Measurement reporting

**R4-2114013 Draft CR for Idle Mode measurements of inter-RAT CA candidate cells for early reporting (TC#3)**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2115329 (from R4-2114013).**

**R4-2115329 Draft CR for Idle Mode measurements of inter-RAT CA candidate cells for early reporting (TC#3)**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2114014 Draft CR for Idle Mode measurements of inter-RAT CA candidate cells for early reporting (TC#3)**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

###### 6.1.4.3.2 Efficient and low latency serving cell configuration, activation and setup

**R4-2114168 DraftCR (R16) Clean-up of test cases for Direct SCell activation and SCell dormancy**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Maintenance of test cases for SCell dormancy and Direct SCell activation.

**Decision: Endorsed.**

**R4-2114169 DraftCR (R17) Clean-up of test cases for Direct SCell activation and SCell dormancy**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Maintenance of test cases for SCell dormancy and Direct SCell activation.

**Decision: Endorsed.**

#### 6.1.5 Enhancements on MIMO for NR

##### 6.1.5.1 RRM requirements (38.133)

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**Email discussion: [100-e][208] NR\_eMIMO\_RRM\_NWM**

**R4-2115198 Email discussion summary: [100-e][208] NR\_eMIMO\_RRM\_NWM**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115382 (from R4-2115198).**

**R4-2115382 Email discussion summary: [100-e][208] NR\_eMIMO\_RRM\_NWM**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 25th)**

Issue 1-1: Applicability of MRTD/MTTD requirements

* Proposals:
  + Option 1: Add a applicability section for multi-TRxP scenario

|  |
| --- |
| 3.6.11 Applicability of MRTD/MTTD requirements in intra-band DC/CA  Unless explicitly stated otherwise the Maximum Transmission Timing Difference (MTTD) and Maximum Receive Timing Difference (MRTD) requirements in clauses 7.5.3, 7.6.3 and 7.6.4 for co-located deployment are applicable when  When UE is configured to receive multiple PDCCH  When UE is configured by repetitionScheme set to one of ' fdmSchemeA', ' fdmSchemeB' and 'tdmSchemeA' |

* + Option 2: Add a clarification to MRTD intro for clarifying multi-TRxP scenario
    - Option 2a:

|  |
| --- |
| A UE shall be capable of handling a relative receive timing difference between slot timing boundaries of any one carrier and the closest slot timing boundary of another carrier in NR carrier aggregation; and if UE receives multiple PDSCHs within one of any of the two carriers, the UE shall be capable of handling a relative receive timing difference among the closest slot timing boundaries of two PDSCHs from respective carriers. |

* + Option 2b:

|  |
| --- |
| A UE shall be capable of handling a relative receive timing difference between slot timing boundaries of any one carrier and the closest slot timing boundary of another carrier in NR carrier aggregation; and if a UE is configured to receive multiple PDSCH from different TRP on the same carrier,  the UE shall be capable of handling a relative timing difference between any one of the slot timing boundaries of any one carrier with multiple PDSCH and the closest slot timing boundary of another carrier in NR carrier aggregation. |

* + Option 3: No need to specify the applicability or add a clarification to MRTD intro in RAN4
* Discussion
  + Apple: Reflect previous agreements in spec. Requirements for co-located deployments are also applicable to multi-TRP
  + QC: The applicability needs to be clarified.
  + Huawei: Option 3.
  + E///: Option 3. This opens the door for many other schemes.
  + MTK: Same view as QC. Prefer Option 1.
  + Samsung: Prefer not to have Option 1. Prefer Option 2a or Option 3.
  + Nokia: prefer Option 3. There is no definition of non-colocated in specs.
* Agreements:
  + Add a clarification on MRTD applicability to multi-TRxP scenario into RAN4 specification
    - Option 2a: A UE shall be capable of handling a relative receive timing difference between slot timing boundaries of any one carrier and the closest slot timing boundary of another carrier in NR carrier aggregation; and if UE receives multiple PDSCHs within one of any of the two carriers, the UE shall be capable of handling a relative receive timing difference among the closest slot timing boundaries of two PDSCHs from respective carriers.
    - Option 2b: A UE shall be capable of handling a relative receive timing difference between slot timing boundaries of any one carrier and the closest slot timing boundary of another carrier in NR carrier aggregation; and if a UE is configured to receive multiple PDSCH from different TRP on the same carrier,  the UE shall be capable of handling a relative timing difference between any one of the slot timing boundaries of any one carrier with multiple PDSCH and the closest slot timing boundary of another carrier in NR carrier aggregation.
    - Other options are not precluded

**GTW session (August 27th)**

Agreement

Test Case for Pathloss RS Activation Delay

* + Further study the test method of PL RS activation delay requirement
  + FFS on feasible test method design
  + Companies are encouraged to provide analysis of technical issues on PHR-based test method and corresponding solutions for the test design.

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115299 | WF on NR eMIMO RRM requirement Maintenance | Samsung |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2112098 | Draft CR to 38.133 on applicability of requirements to multi-TRxP - R16 | Apple | Return to | Continue discussion in 2nd round |
| R4-2112838 | draft CR Revision on R16 MRTD Requirement for Multi-TRxP Scenario | Samsung | Return to | Continue discussion in 2nd round. The wording can be revised for a compromise solution. |
| R4-2113863 | [CR] Test cases for applicable timing for PL RS activated by MAC-CE | ZTE Corporation | Return to | More time is needed to check the test method |
| R4-2112534 | Correction on the typo in the L1-SINR test case in R16 | MediaTek inc. | Return to | Since no enough comments collected in 1st round, continue collecting comments in 2nd round. |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115299 | WF on NR eMIMO RRM requirement Maintenance | Samsung | Return to | To be treated in GTW |
| R4-2112098 | Draft CR to 38.133 on applicability of requirements to multi-TRxP - R16 | Apple | Postponed |  |
| R4-2112838 | draft CR Revision on R16 MRTD Requirement for Multi-TRxP Scenario | Samsung | Postponed |  |
| R4-2115300 | [CR] Test cases for applicable timing for PL RS activated by MAC-CE | ZTE Corporation | Postponed |  |
| R4-2112534 | Correction on the typo in the L1-SINR test case in R16 | MediaTek inc. | Endorsed |  |

**WF/LS for approval**

**R4-2115299 WF on NR eMIMO RRM requirement maintenance**

*Type: other For: Approval  
 Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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###### 6.1.5.1.1 Applicability of MRTD/MTTD requirements for multi-TRxP

**R4-2112098 Draft CR to 38.133 on applicability of requirements to multi-TRxP - R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Postponed.**

**R4-2112099 Draft CR to 38.133 on applicability of requirements to multi-TRxP - R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Withdrawn.**

**R4-2112687 Discussion on applicability of MRTD requirements to multi-TRxP**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2112837 Discussion on R16 MRTD requirement for Multi-TRxP Scenario**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2112838 draft CR Revision on R16 MRTD Requirement for Multi-TRxP Scenario**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Samsung*

**Decision: Postponed.**

**R4-2112839 draft CR Revision on R16 MRTD Requirement for Multi-TRxP Scenario (Rel-17)**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Samsung*

**Decision: Withdrawn.**

**R4-2113473 MRTD/MTTD requirements for Rel-16 multi-TRP transmission scheme**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses MRTD/MTTD requirements for Rel-16 multi-TRP transmission schemes.

**Decision: Noted.**

**R4-2113811 Discussion on remaining issues for NR eMIMO core requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114418 On applicability of MRTD requirements for Rel-16 NR eMIMO**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

###### 6.1.5.1.2 Test case for pathloss RS activation delay

**R4-2112100 Discussion on testcase for PL-RS activation**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2113530 Remaining Issues of Test Method for PL-RS Activation Delay**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2113812 Discussion on testbility of pathloss-RS activation delay**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2113862 On defining test cases for PL RS activation delay**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Abstract:**

In thie paper we discuss the feasible methods to define test cases for PL RS activation delay.

**Decision: Noted.**

**R4-2113863 [CR] Test cases for applicable timing for PL RS activated by MAC-CE**

*Type: CR For: Agreement  
 38.133 v16.8.0 CR-2194 rev Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

Session chair: CR submitted instead of Draft CR. If agreeable, the CR will be endorsed.

**Decision: Revised to R4-2115300 (from R4-2113863).**

**R4-2115300 [CR] Test cases for applicable timing for PL RS activated by MAC-CE**

*Type: CR For: Agreement  
 38.133 v16.8.0 CR-2194 rev Cat: B (Rel-16)  
  
 Source: ZTE Corporation*

Session chair: CR submitted instead of Draft CR. If agreeable, the CR will be endorsed.

**Decision: Postponed.**

**R4-2113864 [CR] Test cases for applicable timing for PL RS activated by MAC-CE**

*Type: CR For: Agreement  
 38.133 v17.2.0 CR-2195 rev Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Abstract:**

This is a Cat A CR.

Session chair: CR submitted instead of Draft CR. If agreeable, the CR will be endorsed.

**Decision: Withdrawn.**

###### 6.1.5.1.3 Others

**R4-2112534 Correction on the typo in the L1-SINR test case in R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Endorsed.**

**R4-2112535 Correction on the typo in the L1-SINR test case in R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Endorsed.**

##### 6.1.5.2 Others

#### 6.1.6 NR Positioning Support

##### 6.1.6.1 RRM core requirement (38.133)

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**Email discussion: [100-e][209] NR\_pos\_1**

**R4-2115199 Email discussion summary: [100-e][209] NR\_pos\_1**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115383 (from R4-2115199).**

**R4-2115383 Email discussion summary: [100-e][209] NR\_pos\_1**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 25th)**

Issue 2-1-1: Selection of one PFL in CSSF calculation

* Proposal:
  + Option 1 (vivo)
    - When multiple PFLs are configured, the PFL under measurement for positioning is assumed for CCSF calculation for an RRM frequency layer.
    - CCSF calculation for an RRM frequency layer is the same as Rel-15 by assuming the PFL under measurement as the candidate positioning frequency layer.
  + Option 2 (OPPO, HW, QC)
    - For defining CSSF for an RRM frequency layer,
      * N intermediate CSSF values would be calculated, where N is the number of PFLs and each intermediate CSSF value accounts for only one of the PFLs.
      * The CSSF value for the RRM frequency layer is the highest one among the N intermediate CSSF values.
* Agreements:
  + For defining CSSF for an RRM frequency layer,
    - N intermediate CSSF values would be calculated, where N is the number of PFLs and each intermediate CSSF value accounts for only one of the PFLs.
    - The CSSF value for the RRM frequency layer is the highest one among the N intermediate CSSF values.

Issue 2-3-1: Whether to support of per-FR gap for PRS measurement in Rel-16

* Proposal:
  + Option 1 (QC, Intel, Ericsson, Nokia)
    - Clarify in TS 38.133 that Rel-16 PRS-based measurements are supported with per-UE measurement gaps only.
      * Tables 9.1.2-2 and 9.1.2-3 would be modified to exclude the applicability of per-FR measurement gaps for positioning measurements.
      * Applicability conditions for positioning measurements in sec 9.9.1 would explicitly mention per-UE measurement gaps.
  + Option 2 (CATT, HW)
    - No change is needed, PRS measurement can be performed with per-FR gap.
  + Option 3 (HW)
    - Introduce a new UE capability independentGapConfig-PRS to indicate whether the UE supports per-FR MG for DL-PRS based measurements.
* Discussion
  + Nokia: Option 1.
  + QC: The motivation is to ensure UE implementation flexibility. We have several options. Option 1 is easy way to resolve the problem in Rel-16. New capability will be acceptable as well.
  + E///: We need to find a solution in Rel-16 with minimum impact. We can consider enhancements in future.
  + Intel: Option 1. The most simple way.
  + vivo: It is beneficial to support per-FR gap. New capability is late. We are ok with Option 1 or 3.
  + CATT: Our initial view is Option 2. Is this for per-FR gap capable UE?
    - QC: Yes, this is applicable to UEs with per-FR gap capable UEs
    - Intel: Same view as QC.
  + Huawei: Option 1 means that all UEs will need to use per-UE gap. Good UEs will be penalized. Can compromise to Option 1.
* Agreements:
  + Clarify in TS 38.133 that Rel-16 PRS-based measurements are supported with per-UE measurement gaps only.
    - Tables 9.1.2-2 and 9.1.2-3 would be modified to exclude the applicability of per-FR measurement gaps for positioning measurements.
    - Applicability conditions for positioning measurements in sec 9.9.1 would explicitly mention per-UE measurement gaps.

Issue 4-2-1: TA change due to TA command

* Proposal:
  + Proposals for UE behaviour
    - Option 1 (CATT, Nokia)
      * UE shall continue UE Rx-Tx time difference measurement
    - Option 2 (OPPO, vivo, Ericsson, Intel, Nokia)
      * UE shall discard the UE Rx-Tx time difference measurement
    - Option 3 (QC, HW, Intel)
      * Up to UE implementation
  + Proposals for requirements
    - Option 1 (CATT, Nokia)
      * UE Rx-Tx measurement period requirements are not impacted
    - Option 2 (OPPO, QC, vivo, HW, Ericsson, Intel, Nokia)
      * UE Rx-Tx measurement period requirements are not applicable
* Discussion
  + E///: TA change can be large and will have impact on the measurement. LMF is not aware on TA change. UE needs to discard the measurement. No requirements shall apply.
  + QC: For requirements, we agree that they shall not be applicable. The problem is that it can introduce errors for RTT measurements.
  + vivo: Same view as E///.
  + Huawei: In case of TA change it will cause problem for RTT measurements. We can agree that requirements shall not apply. For UE behavior some UEs may compensate the difference.
  + Nokia: For UE behavior – RAN1 discussed the issue and LMF may know the TA change. We would like to open the door. We are ok with Option 1 or 2. For requirements we can compromise to Option 2.
  + CATT: For requirements we can compromise to Option 2. For UE behavior it is better to have a unified behavior. For Option 2, is it expected that UE needs to restart the measurement?
* Agreements:
  + UE shall restart UE Rx-Tx time difference measurement after UE TX timing change due to TA command during the measurement period
  + UE Rx-Tx measurement period requirements are not applicable

Issue 2-1-2: Requirement applicability for long periodicity measurement

* Proposal:
  + Option 1 (CATT, Intel, OPPO, Nokia, QC, HW)
    - Measurement requirements do not apply if some of the PRS resources in the PFL can be measured with periodicity shorter than or equal to 160 ms. i.e. none of the PRS resources in the PFL would be measured.
  + Option 2 (vivo, Ericsson)
    - Long periodicity measurement requirements apply even if some of the PRS resources in the PFL can be measured with periodicity shorter or equal to 160ms
* Discussion
  + E///: If LMF configures shorter periodicity it is not clear why UE cannot to measure using shorter periodicity.
  + vivo: The main issue is CSSF calculation. There may be ambiguity on CSSF calculation.
  + QC: We are addressing the case when PFL has short and long periodicity. If we prioritize both resources then there will be impact on other measurements. We can measure everything and need to adjust CSSF, another alternative is to avoid such configuration (Option 2) and finally we can measure a subset of resources. If NW vendors think Option 1 is a problem then we can further discuss.
  + Huawei: Agree with E/// and vivo. However there may be different offsets for long/short periodicities. We would like to avoid such configurations since it will affect UE mobility measurements.
  + Nokia: Same view with Huawei. It may not be a typical scenario.
  + E///: we can compromise to Option 1. Does option 1 mean all resources are short or a subset?
    - E///: if all resources are with periodicity < 320 then no changes.
  + vivo: Even with different offsets UE still can measure a subset of resources. It is doable. Mixed periodicity and offsets on a single PFL may not be a practical scenario and can go with Option 1.
* Agreements:
  + NR Positioning measurement requirements for long periodicity measurements apply in case all PRS resources in the PFL are configured with periodicity > 160 ms

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115301 | WF on UE PRS measurement requirements | Huawei, HiSilicon |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| [R4-2111985](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2111985.zip) | Draft CR on PRS RSTD measurement requirements | CATT | Merged |  |
| [R4-2112563](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2112563.zip) | Draft CR to 38.133 correction to PRS RSTD measurement requirements | vivo | Revised | Capture all agreed changes to RSTD requirements |
| [R4-2113258](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113258.zip) | R16 CR to TS 38.133 on RSTD measurements | OPPO | Merged |  |
| [R4-2114270](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114270.zip) | CR to update RSTD measurement requirements | Huawei, HiSilicon | Merged |  |
| [R4-2112565](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2112565.zip) | Draft CR to 38.133 correction on PRS-RSRP measurement requirements | vivo | Merged |  |
| [R4-2114273](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114273.zip) | CR to update PRS-RSRP measurement requirements | Huawei, HiSilicon | Merged |  |
| [R4-2114453](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114453.zip) | PRS-RSRP measurement requirements | Ericsson | Revised | Capture all agreed changes to PRS-RSRP requirements |
| [R4-2112567](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2112567.zip) | Draft CR to 38.133 correction on UE Rx-Tx timing difference measurement requirements | vivo | Merged |  |
| [R4-2113261](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113261.zip) | R16 CR to TS 38.133 on UE Rx-Tx time difference measurements | OPPO | Revised | Capture all agreed changes to UE Rx-Tx requirements |
| [R4-2114276](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114276.zip) | CR to update UE Rx-Tx time difference measurement requirements | Huawei, HiSilicon | Merged |  |
| [R4-2114456](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114456.zip) | UE Rx-Tx measurement requirements | Ericsson | Merged |  |
| [R4-2111987](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2111987.zip) | Draft CR on ECID measurement requirements and AoA/ZoA report mapping | CATT | Agreeable | No comment received in the 1st round |
| [R4-2112569](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2112569.zip) | Draft CR to 38.133 correction on CCSF for NR measurements for positioning | vivo | Merged |  |
| [R4-2114066](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114066.zip) | Selection of positioning frequency layer for MG occasion | Nokia, Nokia Shanghai Bell | Merged |  |
| [R4-2114279](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114279.zip) | CR on CSSF and requirement applicability for PRS measurement | Huawei, HiSilicon | Revised | Capture all agreed changes to CSSF and requirement applicability |
| [R4-2114205](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114205.zip) | Draft CR: Corrections to NR positioning measurement requirements | Qualcomm Incorporated | Revised | Capture all agreed changes to MG applicability |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115301 | WF on UE PRS measurement requirements | Huawei, HiSilicon | Approved |  |
| R4-2115302 | Draft CR to 38.133 correction to PRS RSTD measurement requirements | vivo | Endorsed |  |
| R4-2115303 | PRS-RSRP measurement requirements | Ericsson | Endorsed |  |
| R4-2115304 | R16 CR to TS 38.133 on UE Rx-Tx time difference measurements | OPPO | Endorsed |  |
| R4-2115305 | CR on CSSF and requirement applicability for PRS measurement | Huawei, HiSilicon | Endorsed |  |
| R4-2115306 | Draft CR: Corrections to NR positioning measurement requirements | Qualcomm Incorporated | Endorsed |  |

**WF/LS for approval**

**R4-2115301 WF on UE PRS measurement requirements**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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**R4-2114205 Draft CR: Corrections to NR positioning measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2115306 (from R4-2114205).**

**R4-2115306 Draft CR: Corrections to NR positioning measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Decision: Endorsed.**

**R4-2114206 Draft CR: Corrections to NR positioning measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Endorsed.**

###### 6.1.6.1.1 PRS-RSTD measurement requirements

**R4-2111983 Discussion on PRS RSTD measurement requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2111985 Draft CR on PRS RSTD measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Merged.**

**R4-2111986 Draft CR on PRS RSTD measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Withdrawn.**

**R4-2112540 Remaining issues on PRS RSTD measurement requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112563 Draft CR to 38.133 correction to PRS RSTD measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: vivo*

**Decision: Revised to R4-2115302 (from R4-2112563).**

**R4-2115302 Draft CR to 38.133 correction to PRS RSTD measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: vivo*

**Decision: Endorsed.**

**R4-2112564 Draft CR to 38.133 correction to PRS RSTD measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: vivo*

**Decision: Endorsed.**

**R4-2113153 Discussion on NR PRS RSTD measurement report requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113257 Discussion on the measurement period for RSTD**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113258 R16 CR to TS 38.133 on RSTD measurements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: OPPO*

**Decision: Merged.**

**R4-2113259 R17 CR to TS 38.133 on RSTD measurements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: OPPO*

**Decision: Withdrawn.**

**R4-2114193 On per-UE measurement gaps for NR positioning**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2114233 Remaining issues on NR positioning RSTD requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2114269 Discussion on remaining issues for RSTD measurement requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114270 CR to update RSTD measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Merged.**

**R4-2114271 CR to update RSTD measurement requirements R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

###### 6.1.6.1.2 PRS-RSRP measurement requirements

**R4-2112541 Remaining issues on PRS-RSRP measurement requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112565 Draft CR to 38.133 correction on PRS-RSRP measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: vivo*

**Decision: Merged.**

**R4-2112566 Draft CR to 38.133 correction on PRS-RSRP measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: vivo*

**Decision: Withdrawn.**

**R4-2114234 Remaining issues on PRS-RSRP measurement requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2114272 Discussion on remaining issues for PRS-RSRP measurement requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114273 CR to update PRS-RSRP measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Merged.**

**R4-2114274 CR to update PRS-RSRP measurement requirements R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2114452 On PRS-RSRP measurement requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On PRS-RSRP measurement requirements

**Decision: Noted.**

**R4-2114453 PRS-RSRP measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Correction to PRS-RSRP measurement requirements.

**Decision: Revised to R4-2115303 (from R4-2114453).**

**R4-2115303 PRS-RSRP measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Correction to PRS-RSRP measurement requirements.

**Decision: Endorsed.**

**R4-2114454 PRS-RSRP measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

On open issues related to PRS-RSRP measurement requirements.

**Decision: Endorsed.**

###### 6.1.6.1.3 UE Rx-Tx time difference measurement requirements

**R4-2111984 Discussion on UE Rx-Tx time difference measurement requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112542 Remaining issues on UE RX-TX timing difference measurement requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112567 Draft CR to 38.133 correction on UE Rx-Tx timing difference measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: vivo*

**Decision: Merged.**

**R4-2112568 Draft CR to 38.133 correction on UE Rx-Tx timing difference measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: vivo*

**Decision: Withdrawn.**

**R4-2113260 Discussion on the measurement period for UE Rx-Tx time difference**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113261 R16 CR to TS 38.133 on UE Rx-Tx time difference measurements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: OPPO*

**Decision: Revised to R4-2115304 (from R4-2113261).**

**R4-2115304 R16 CR to TS 38.133 on UE Rx-Tx time difference measurements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: OPPO*

**Decision: Endorsed.**

**R4-2113262 R17 CR to TS 38.133 on UE Rx-Tx time difference measurements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: OPPO*

**Decision: Endorsed.**

**R4-2114194 On UE Rx-Tx measurement requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2114235 Remaining issues on UE Rx-Tx TD measurement requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2114275 Discussion on remaining issues for UE Rx-Rx time difference measurement requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114276 CR to update UE Rx-Tx time difference measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Merged.**

**R4-2114277 CR to update UE Rx-Tx time difference measurement requirements R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2114455 On UE Rx-Tx measurement requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Correction to UE Rx-Tx measurement requirements

**Decision: Noted.**

**R4-2114456 UE Rx-Tx measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Correction to UE Rx-Tx measurement requirements

**Decision: Merged.**

**R4-2114457 UE Rx-Tx measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Correction to UE Rx-Tx measurement requirements

**Decision: Withdrawn.**

###### 6.1.6.1.4 Other requirements

**R4-2111987 Draft CR on ECID measurement requirements and AoA/ZoA report mapping**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2111988 Draft CR on ECID measurement requirements and AoA/ZoA report mapping**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2112543 Remaining issues on general requirements for NR positioning**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112569 Draft CR to 38.133 correction on CCSF for NR measurements for positioning**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: vivo*

**Decision: Merged.**

**R4-2112570 Draft CR to 38.133 correction on CCSF for NR measurements for positioning**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: vivo*

**Decision: Withdrawn.**

**R4-2113263 Discussion on general PRS measurement requirements**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2114065 Discussion on other PRS requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Discussion on other PRS requirements

**Decision: Noted.**

**R4-2114066 Selection of positioning frequency layer for MG occasion**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

CR on other PRS requirements

**Decision: Merged.**

**R4-2114067 Selection of positioning frequency layer for MG occasion**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

CR on other PRS requirements

**Decision: Withdrawn.**

**R4-2114195 On general PRS measurement requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2114278 Discussion on CSSF and requirement applicability for PRS measurement**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114279 CR on CSSF and requirement applicability for PRS measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2115305 (from R4-2114279).**

**R4-2115305 CR on CSSF and requirement applicability for PRS measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114280 CR on CSSF and requirement applicability for PRS measurement R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

##### 6.1.6.2 RRM performance requirements (38.133)

###### 6.1.6.2.1 General

**R4-2114451 Positioning RRM performance requirements in Rel-17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

NR Positioning RRM performance requirements for Rel-16 version was agreed in R4-2108300 and Rel-17 version (cat A) in R4-2108301 (RAN4#99-e). But some requirements in cat A CR was not implemented in Rel-17

**Decision: Revised to R4-2115429 (from R4-2114451).**

**R4-2115429 Positioning RRM performance requirements in Rel-17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

NR Positioning RRM performance requirements for Rel-16 version was agreed in R4-2108300 and Rel-17 version (cat A) in R4-2108301 (RAN4#99-e). But some requirements in cat A CR was not implemented in Rel-17

**Decision: Endorsed.**

###### 6.1.6.2.2 UE requirements and test cases

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**Email discussion: [100-e][210] NR\_pos\_2**

**R4-2115200 Email discussion summary: [100-e][210] NR\_pos\_2**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115384 (from R4-2115200).**

**R4-2115384 Email discussion summary: [100-e][210] NR\_pos\_2**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 26th)**

Sub-topic 2-1 Group delay calibration margin

* Proposal:
  + Option 1(vivo): fixed value for all parameters combinations.
  + Option 2: different values depending on PRS parameters combination
    - PRS BW (Intel, Qualcomm, Huawei)
    - SCS (OPPO)
    - PFLs (Qualcomm, Huawei)
* 2nd round tentative agreement
  + Group delay calibration margin for the RSTD accuracy requirements is FFS
    - Different values for the group delay calibration margin for the RSTD accuracy requirements can be defined depending on PRS parameters combination
      * PRS BW (Intel, Qualcomm, Huawei)
      * SCS (OPPO)
      * Number of PFLs and whether reference/neighbor cells belong to same PFL (Qualcomm, Huawei)
      * FFS on exact PRS parameters combination
* Discussion
  + vivo: Not clear how RF calibration errors are relevant to these parameters (especially SCS)
  + QC: There is dependency on RF BW. For number of PFLs – we expect that the margin will increase for larger number of PFLs
  + vivo: We should discuss on RF aspects. BB margins need to be treated separately. UE should make calibration based on the largest BW.
  + QC: Besides purely RF aspects there will be DFE and antenna paths for FR2. For PFLs there may be difference when reference and neighbor are in the same or different PFLs
* Agreements:
  + Group delay calibration margin for RSTD accuracy requirements is FFS
    - Different values for the group delay calibration margin for the RSTD accuracy requirements can be defined depending on PRS parameters combination.
      * FR (frequency range)
      * PRS BW (absolute BW)
      * Number of PFLs and whether reference/neighbor cells belong to same PFL
    - Companies are encouraged to bring analysis for dependency of margin on these parameters

Sub-topic 2-2 Frequency drift margin

* Proposal:
  + Option 1 (vivo, OPPO): fixed value
  + Option 2 (Intel, Huawei, Qualcomm): The maximum frequency drift between the measured TRPs can be dependent with the maximum time offsets among the measured TRPs/cells.
  + Option 2a (Huawei):
    - For the case where reference resource and neighbor resource are on same PLF, add a margin of +/-32Tc for RSTD accuracy requirements, provided that the separation between the reference resource and the neighbor resource is within 160ms
    - For the case where reference resource and neighbor resource are on different PLFs, no RSTD accuracy requirements are defined in Rel-16. Ask RAN2 to update the RSTD reporting signaling in Rel-17 to allow UE reporting an RSTD reference resource for each PFL.
  + Option 3 (Qualcomm) Depending on TRS BW
* 2nd round tentative agreement
  + The frequency drift margin in RSTD accuracy can be dependent with the time offsets between the two measurements on the PRS resources from the reference cell and neighbor cells which will be used for a single RSTD estimation.
* Agreements:
  + The frequency drift margin for RSTD accuracy requirements is FFS
    - Frequency drift margin will be derived based on the maximum time offset between the PRS resource instances from the reference cell and neighbor cells which are used for a single RSTD measurement.
      * The maximum time offset for margin definition is FFS
    - A single fixed margin value will be used for requirements definition

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115307 | WF on NR Positioning UE RRM performance requirements | Intel |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2114283 |  | Huawei, Hi Silicon | Revised |  |
| R4-2111991 |  | CATT | Revised |  |
| R4-2114203 |  | Qualcomm | Merged | Correction #1 can be merged with [R4-2111991](http://www.3gpp.org/ftp/tsg_ran/WG4_Radio/TSGR4_100-e/Docs/R4-2111991.zip)  Correction #2 can be merged with [R4-2114460](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\100e\Docs\R4-2114460.zip) |
| R4-2114460 |  | Ericsson | Revised |  |
| [R4-2114451](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\100e\Docs\R4-2114451.zip) |  | Ericsson | Postpone | Rel17 mirror CRs can be postpone |
| R4-2111993 |  | CATT | Revised | test case for PRS-RSRP measurement requirements for FR2 in SA |
| R4-2113091 |  | R&S | Merged | CR for PRS configuration  merged with [R4-2114288](file:///C:\Users\rhuang5\OneDrive%20-%20Intel%20Corporation\Documents\my_work\LTE_A\RAN4\100e\Docs\R4-2114288.zip) |
| R4-2113445 |  | CATT | Revised | test case for RSTD measurement requirements in SA |
| R4-2113447 |  | CATT | Merged | test case for RSTD accuracy requirements  Merged with [R4-2114292](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114292.zip) |
| R4-2114288 |  | Huawei, Hi Silicon | Revised | PRS RMC |
| R4-2114290 |  | Huawei, Hi Silicon | Revised | TC for PRS-RSRP measurement requirements for FR1 in SA  Merged with |
| R4-2114292 |  | Huawei, Hi Silicon | Revised | TC for RSTD measurement accuracy for FR1 and FR2 in SA |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115308 | CR on accuracy requirements for RSTD measurement | Huawei, Hi Silicon | Endorsed |  |
| R4-2115309 | DraftCR on PRS-RSRP accuracy requirements | CATT | Endorsed |  |
| R4-2115310 | CR on UE Rx-Tx measurement accuracy requirements | Ericsson | Endorsed |  |
| R4-2115311 | DraftCR on test case for PRS-RSRP measurement requirements for FR2 in SA | CATT | Endorsed |  |
| R4-2115312 | Draft CR on test case for RSTD measurement requirements in SA | CATT | Endorsed |  |
| R4-2115313 | CR to update PRS RMC for positioning tests | Huawei, Hi Silicon | Endorsed |  |
| R4-2115314 | CR to update TC for PRS-RSRP measurement requirements for FR1 in SA | Huawei, Hi Silicon | Endorsed |  |
| R4-2115315 | CR to update TC for RSTD measurement accuracy for FR1 and FR2 in SA | Huawei, Hi Silicon | Endorsed |  |
| R4-2115307 | WF on NR Positioning Performance Requirements | Intel | Approved |  |

**WF/LS for approval**

**R4-2115307 WF on NR Positioning UE RRM performance requirements**

*Type: other For: Approval  
 Source: Intel Corporation*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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6.1.6.2.2.1 General

**R4-2112547 Additional link level simulation results for NR positioning**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2114281 Additional simulation results for PRS measurement performance**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114458 Link level simulation results for RSTD, PRS RSRP and UE Rx-Tx time difference**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Link level simulation results for RSTD, PRS RSRP and UE Rx-Tx time difference based on agreements in RAN4#98bis-e

**Decision: Noted.**

6.1.6.2.2.2 Measurement accuracy requirements

**R4-2113156 Summary of link level simulation results for RSTD, PRS RSRP and UE Rx-Tx time difference**

*Type: other For: Information  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2114203 Draft CR: Corrections to NR positioning performance requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Decision: Merged.**

**R4-2114204 Draft CR: Corrections to NR positioning performance requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

**Decision: Withdrawn.**

6.1.6.2.2.3 Test cases

6.1.6.2.2.2.1 PRS RSTD

**R4-2112544 Remaining issues on PRS RSTD accuracy requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113154 Discussion on NR PRS RSTD measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113264 Discussion on PRS RSTD accuracy requirements**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2114196 On PRS-RSTD measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2114282 Discussion on accuracy requirements for RSTD measurement**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114283 CR on accuracy requirements for RSTD measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2115308 (from R4-2114283).**

**R4-2115308 CR on accuracy requirements for RSTD measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114284 CR on accuracy requirements for RSTD measurement R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

6.1.6.2.2.4 Other

6.1.6.2.2.2.2 PRS RSRP

**R4-2111989 Discussion on PRS RSRP accuracy requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2111991 DraftCR on PRS-RSRP accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Revised to R4-2115309 (from R4-2111991).**

**R4-2115309 DraftCR on PRS-RSRP accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2111992 DraftCR on PRS-RSRP accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2112545 Remaining issues on PRS-RSRP accuracy requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

6.1.6.2.2.3.1 General

**R4-2113091 Draft-CR to TS 38.133: Correction to PRS configuration for positioning test cases (Rel 16)**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Rohde & Schwarz*

**Decision: Merged.**

**R4-2113092 Draft-CR to TS 38.133: Correction to PRS configuration for positioning test cases (Rel 17)**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Withdrawn.**

6.1.6.2.2.2.2 PRS RSRP

**R4-2113265 Discussion on PRS-RSRP accuracy requirements**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113869 Measurement Accuracy Requirements for PRS RSRP**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113871 [CR] accuracy requirements for PRS-RSRP**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Abstract:**

In this draft CR we propose to specify absolute and relative accuracy requirements for PRS-RSRP under extreme conditions. The change proposed in this draft CR can be merged with other CRs discussing detailed values in the table.

**Decision: Merged.**

**R4-2113872 [CR] accuracy requirements for PRS-RSRP**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Abstract:**

This is a Cat A CR.

**Decision: Withdrawn.**

**R4-2114285 Discussion on accuracy requirements for PRS-RSRP measurement**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

6.1.6.2.2.3.1 General

**R4-2114287 Discussion on RRM test case for UE positioning requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114288 CR to update PRS RMC for positioning tests**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2115313 (from R4-2114288).**

**R4-2115313 CR to update PRS RMC for positioning tests**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114289 CR to update PRS RMC for positioning tests R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

6.1.6.2.2.2.3 UE Rx-Tx time difference

**R4-2111990 Discussion on UE Rx-Tx time difference accuracy requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

6.1.6.2.2.3.2 Measurement requirements

**R4-2111993 DraftCR on test case for PRS-RSRP measurement requirements for FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Revised to R4-2115311 (from R4-2111993).**

**R4-2115311 DraftCR on test case for PRS-RSRP measurement requirements for FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2111994 DraftCR on test case for PRS-RSRP measurement requirements for FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

6.1.6.2.2.2.3 UE Rx-Tx time difference

**R4-2112546 Remaining issues on UE Rx-Tx timing difference accuracy requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113155 Discussion on UE RX-TX time difference measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

6.1.6.2.2.3.2 Measurement requirements

**R4-2113445 Draft CR on test case for RSTD measurement requirements in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Revised to R4-2115312 (from R4-2113445).**

**R4-2115312 Draft CR on test case for RSTD measurement requirements in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2113446 Draft CR on test case for RSTD measurement requirements in SA**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

6.1.6.2.2.2.3 UE Rx-Tx time difference

**R4-2113870 Measurement Accuracy Requirements for UE Rx-Tx time difference**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2114197 On UE Rx-Tx measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2114286 Discussion on accuracy requirements for UE Rx-Tx time difference measurement**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

6.1.6.2.2.3.2 Measurement requirements

**R4-2114290 CR to update TC for PRS-RSRP measurement requirements for FR1 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2115314 (from R4-2114290).**

**R4-2115314 CR to update TC for PRS-RSRP measurement requirements for FR1 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114291 CR to update TC for PRS-RSRP measurement requirements for FR1 in SA R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

6.1.6.2.2.2.3 UE Rx-Tx time difference

**R4-2114459 On UE Rx-Tx measurement accuracy requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On UE Rx-Tx measurement accuracy requirement related to remaining issues

**Decision: Noted.**

**R4-2114460 UE Rx-Tx measurement accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

UE Rx-Tx measurement accuracy requirement are updated to completed remaining issues

**Decision: Revised to R4-2115310 (from R4-2114460).**

**R4-2115310 UE Rx-Tx measurement accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

UE Rx-Tx measurement accuracy requirement are updated to completed remaining issues

**Decision: Endorsed.**

**R4-2114461 UE Rx-Tx measurement accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

UE Rx-Tx measurement accuracy requirement are updated to completed remaining issues

**Decision: Endorsed.**

6.1.6.2.2.3.3 Accuracy requirements

**R4-2113447 Draft CR on test case for RSTD accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Merged.**

**R4-2113448 Draft CR on test case for RSTD accuracy requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Withdrawn.**

**R4-2114292 CR to update TC for RSTD measurement accuracy for FR1 and FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2115315 (from R4-2114292).**

**R4-2115315 CR to update TC for RSTD measurement accuracy for FR1 and FR2 in SA**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114293 CR to update TC for RSTD measurement accuracy for FR1 and FR2 in SA R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

###### 6.1.6.2.3 gNB requirements

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**Email discussion: [100-e][211] NR\_pos\_3**

**R4-2115201 Email discussion summary: [100-e][211] NR\_pos\_3**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115385 (from R4-2115201).**

**R4-2115385 Email discussion summary: [100-e][211] NR\_pos\_3**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115316 | WF on gNB positioning measurement requirements | Ericsson |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2114048 | Corrections to gNB SRS-RSRP measurement in 38.133 | Ericsson | Not Pursued | Merged with R4-2114294 |
| R4-2114294 | CR to update SRS-RSRP requirements | Huawei, HiSilicon | Revised |  |
| R4-2114050 | Corrections to gNB Rx-Tx measurement in 38.133 | Ericsson | Revised |  |
| R4-2114297 | CR to update gNB Rx-Tx time difference requirements | Huawei, HiSilicon | Not Pursued | Merged with R4-2114050. |
| R4-2114044 | Summary of link level simulation results of SRS RSRP and gNB TOA | Ericsson | Revised | To compile results from all companies |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115316 | WF on gNB positioning measurement requirements | Ericsson | Approved |  |
| R4-2115317 | CR to update SRS-RSRP requirements | Huawei, HiSilicon | Endorsed |  |
| R4-2115318 | Corrections to gNB Rx-Tx measurement in 38.133 | Ericsson | Endorsed |  |
| R4-2115319 | Summary of link level simulation results of SRS RSRP and gNB TOA | Ericsson | Noted |  |

**WF/LS for approval**

**R4-2115316 WF on gNB positioning measurement requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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6.1.6.2.3.1 General

**R4-2114044 Summary of link level simulation results of SRS RSRP and gNB TOA**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Updated link level simulation results collection

**Decision: Revised to R4-2115320 (from R4-2114044).**

**R4-2115319 Summary of link level simulation results of SRS RSRP and gNB TOA**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Updated link level simulation results collection

**Decision: Noted.**

6.1.6.2.3.2 SRS-RSRP requirements

**R4-2114045 SRS-RSRP requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses SRS-RSRP measurement accuracy requirements

**Decision: Noted.**

**R4-2114048 Corrections to gNB SRS-RSRP measurement in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR updates the SRS-RSRP measurement accuracy requirements

**Decision: Merged.**

**R4-2114047 Corrections to gNB SRS-RSRP measurement in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draft CR updates the SRS-RSRP measurement accuracy requirements

**Decision: Withdrawn.**

**R4-2114294 CR to update SRS-RSRP requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2115317 (from R4-2114294).**

**R4-2115317 CR to update SRS-RSRP requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114295 CR to update SRS-RSRP requirements R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

6.1.6.2.3.3 gNB Rx-Tx time difference requirements

**R4-2114046 gNB Rx-Tx time difference requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses gNB Rx-Tx measurement accuracy requirements

**Decision: Noted.**

**R4-2114050 Corrections to gNB Rx-Tx measurement in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR updates the gnB Rx-Tx measurement accuracy requirements

**Decision: Revised to R4-2115318 (from R4-2114050).**

**R4-2115318 Corrections to gNB Rx-Tx measurement in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This draft CR updates the gnB Rx-Tx measurement accuracy requirements

**Decision: Endorsed.**

**R4-2114049 Corrections to gNB Rx-Tx measurement in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This draft CR updates the gnB Rx-Tx measurement accuracy requirements

**Decision: Endorsed.**

**R4-2114296 Discussion on remaining issues for gNB Rx-Tx requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114297 CR to update gNB Rx-Tx time difference requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Merged.**

**R4-2114298 CR to update gNB Rx-Tx time difference requirements R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

#### 6.1.7 NR RRM requirement enhancement

================================================================================

**Email discussion: [100-e][212] NR\_RRM\_Enh**

**R4-2115202 Email discussion summary: [100-e][212] NR\_RRM\_Enh**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115386 (from R4-2115202).**

**R4-2115386 Email discussion summary: [100-e][212] NR\_RRM\_Enh**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 26th)**

Issue 1-1: Whether to keep 1 bit signalling for NR only measurement gap patten in LTE SA, EN-DC and NE-DC

* Proposals:
  + Option 1: Yes (Huawei, E///, MTK, Intel)
  + Option 2: No (Qualcomm):
    - Proposal 1: Add new bitmaps for signaling the support of NR-only measurement GPs in LTE-SA following NR-SA and NR-DC with the capability being optional for all GPs including GP 2,3,11.
    - Proposal 2: The bitmap for NR-only measurement gap patterns support in LTE-SA needs to be consistent with the support of NR-only measurement gap patterns in NR-SA and NR-DC. Otherwise, they should be all zero.
    - Proposal 3: In EN-DC, since UE signals the bitmap for LTE-SA, UE can use one bit to indicate the support for gap patterns as signalled by the bitmaps for LTE-SA. Similarly, in NE-DC, since UE signals the bitmap for NR-SA/DC, UE can use one bit to indicate the support for gap patterns as signalled by the bitmaps for NR-SA/DC.
    - Proposal 4: RAN4 takes one of the following action:
      * (1) Update note for UE feature list item 9-3 as:
        + Note: Agreements are provided in [TBD]. According to RAN4 agreement, a bitmap should be introduced for LTE-SA and a signle bit should be introduced for EN-DC and NE-DC.
      * (2) Send a separate LS to RAN2 to ask for new UE capability signaling.
* Discussion
  + QC: This is from implementation and testing perspective. Although the GPs are mandatory all GPs need to pass interoperability tests. Not all networks support all GPs. We would like to signal the tested GPs to ensure that there are no issues.
  + MTK: Option 1. Do not see necessity to introduce new capability. 1 bit is already a compromise solution. From testing perspective – we are not convinced on the motivation as it may not be used in the end.
  + E///: Option 1. Do not see any issue with interoperability since all gaps have same MGL. From network perspective we do not expect issues.
  + Apple: No strong view. Existing Option 1 can work. Option 2 is also ok. Option 2 may give more flexibility so that UE can indicate optional patterns.
  + vivo: No strong view. Need to understand backward compatibility aspects.
  + Session chair: No consensus to introduce new signalling at this point. Companies can continue discussion.

Issue 2-1: Test case design of mandatory gap pattern for Rel-16

* Proposals:
  + Option 1 (Nokia, Ericsson):
    - For both FR1 and FR2, R15 test cases on mandatory gap patterns shall be inherited completely to R16 specifications, and R16 UEs shall pass all test cases.
  + Option 2 (Apple, Qualcomm, OPPO):
    - For FR1 test:
      * UE capable of per-FR gap and GP#4 needs to pass both A.6.6.2.1 and A.6.6.2.9.
      * UE not capable of either per-FR gap or GP#4 needs to pass A.6.6.2.9 and is allowed to skip A.6.6.2.1
    - For FR2 test:
      * If the UE can pass A.7.6.2.9, it is allowed to skip A.7.6.2.1.
* Session chair: No consensus to agree on Option 2. By default Option 1 applies. No further discussion expected.

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
|  |  |  |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2112117 | Correction on SMTC alignment for multiple SCell activation R16 | Apple, Qualcomm, Huawei, HiSilicon | Agreeable |  |
| R4-2112532 | Correction on the SRS carrier switching in EN-DC and NE-DC in R16 | MediaTek inc. | Agreeable |  |
| R4-2112685 | CR for multiple Scell activation requirements (R16) | Apple | Return to | Nokia: We have related discussion paper on this topic in another agenda (6.1.4.2.2) R4-2114010. Once that discussion is settled, we can return to this. |
| R4-2112695 | Rel-16 Cat-F CR to FR1 Multiple SCell activation requirement for SSB-less and TCI activation | Qualcomm Incorporated | Revised |  |
| R4-2113635 | draftCR on TS38.133 mandatory gaps - r16 | Ericsson, Mediatek Inc. | Agreeable |  |
| R4-2114211 | CR on RRC-based BWP switch on multiple CCs in Rel16 | Nokia, Nokia Shanghai Bell | Agreeable |  |
| R4-2112082 | CR for test applicability for mandatory gap patterns (R16) | Apple | Return to |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115422 | CR for multiple Scell activation requirements (R16) | Apple | Endorsed |  |
| R4-2115320 | Rel-16 Cat-F CR to FR1 Multiple SCell activation requirement for SSB-less and TCI activation | Qualcomm Incorporated | Endorsed |  |
| [R4-2112082](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2112082.zip) | CR for test applicability for mandatory gap patterns (R16) | Apple | Not pursued |  |
| R4-2115421 | WF on Rel-16 RRM enhancements maintenance | Intel | Approved |  |

**WF/LS for approval**

**R4-2115421 WF on Rel-16 NR RRM enhancements maintenance**

*Type: other For: Approval  
 Source: Intel Corporation*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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##### 6.1.7.1 RRM core requirements

**R4-2112117 Correction on SMTC alignment for multiple SCell activation R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Apple, Qualcomm, Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2112118 Correction on SMTC alignment for multiple SCell activation R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Apple, Qualcomm, Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2112532 Correction on the SRS carrier switching in EN-DC and NE-DC in R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Endorsed.**

**R4-2112533 Correction on the SRS carrier switching in EN-DC and NE-DC in R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Endorsed.**

**R4-2112685 CR for multiple Scell activation requirements (R16)**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Revised to R4-2115422 (from R4-2112685).**

**R4-2115422 CR for multiple Scell activation requirements (R16)**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Revised to R4-2115428 (from R4-2115422).**

**R4-2115428 CR for multiple Scell activation requirements (R16)**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2112686 CR for multiple Scell activation requirements (R17)**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2112693 Rel-16 Cat-A CR to FR1 Multiple SCell activation requirement for SSB-less and TCI activation**

*Type: CR For: Agreement  
 38.133 v16.8.0 CR-2188 rev Cat: A (Rel-16)  
  
 Source: Qualcomm Incorporated*

**Decision: Withdrawn.**

**R4-2112694 Rel-17 Cat-A CR to FR1 Multiple SCell activation requirement for SSB-less and TCI activation**

*Type: CR For: Agreement  
 38.133 v17.2.0 CR-2189 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

Session chair: CR submitted instead of Draft CR. If agreeable, the CR will be endorsed.

**Decision: Withdrawn.**

**R4-2112695 Rel-16 Cat-F CR to FR1 Multiple SCell activation requirement for SSB-less and TCI activation**

*Type: CR For: Agreement  
 38.133 v16.8.0 CR-2190 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

Session chair: CR submitted instead of Draft CR. If agreeable, the CR will be endorsed.

MCC: Is the work item code NR\_RRM\_enh-Core correctly spelled on the work item code field?

**Decision: Revised to R4-2115320 (from R4-2112695).**

**R4-2115320 Rel-16 Cat-F CR to FR1 Multiple SCell activation requirement for SSB-less and TCI activation**

*Type: CR For: Agreement  
 38.133 v16.8.0 CR-2190 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Incorporated*

Session chair: CR submitted instead of Draft CR. If agreeable, the CR will be endorsed.

MCC: Is the work item code NR\_RRM\_enh-Core correctly spelled on the work item code field?

**Decision: Endorsed.**

**R4-2112696 Rel-17 Cat-A CR to FR1 Multiple SCell activation requirement for SSB-less and TCI activation**

*Type: CR For: Agreement  
 38.133 v17.2.0 CR-2191 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Incorporated*

Session chair: CR submitted instead of Draft CR. If agreeable, the CR will be endorsed.

**Decision: Endorsed.**

**R4-2113635 draftCR on TS38.133 mandatory gaps - r16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson, Mediatek Inc.*

**Abstract:**

This draft CR corrects mandatory gap signalling which should applied for NR SA and NR DC

**Decision: Endorsed.**

**R4-2113636 draftCR on TS38.133 mandatory gaps - r17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson, Mediatek Inc.*

**Abstract:**

This draft CR corrects mandatory gap signalling which should applied for NR SA and NR DC

**Decision: Endorsed.**

**R4-2113850 Discussion on mandatory gap pattern in R-16**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114211 CR on RRC-based BWP switch on multiple CCs in Rel16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Resubmission of agreed CR R4-2108234 in RAN4#99e

**Decision: Endorsed.**

**R4-2114212 CR on RRC-based BWP switch on multiple CCs in Rel17 - Cat A**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Resubmission of agreed Cat-A R17 CR R4-2111039 in RAN4#99e which was wrong allocated to Rel16.

**Decision: Endorsed.**

##### 6.1.7.2 RRM performance requirements

**R4-2112081 On test applicability for mandatory gap patterns**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2112082 CR for test applicability for mandatory gap patterns (R16)**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Not pursued.**

**R4-2112083 CR for test applicability for mandatory gap patterns (R17)**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Withdrawn.**

**R4-2112265 On Mandatory GP Test**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2114015 Discussion on test cases for new mandatory GPs**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2114163 On testing in R16 of R15 mandatory gaps**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Continued discussion on test case applicability in Rel-16 for test cases with Rel-15 mandatory gaps.

**Decision: Noted.**

#### 6.1.8 NR RRM requirements for CSI-RS based L3 measurement

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**Email discussion: [100-e][213] NR\_CSIRS\_L3meas**

**R4-2115203 Email discussion summary: [100-e][213] NR\_CSIRS\_L3meas**

*Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115387 (from R4-2115203).**

**R4-2115387 Email discussion summary: [100-e][213] NR\_CSIRS\_L3meas**

*Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 26th)**

Sub-topic 1-2 UE behavior when the timing offset exceeds the threshold with single FFT assumption

* Discussion
  + TBA
* Agreements:
  + No accuracy requirements will be defined for the case when the timing offset exceeds the threshold with single FFT assumption.
  + If timing offset exceeds the threshold
    - Option 1: UE does not report CSI-RS based L3 measurements
    - Option 2: UE is not required to report CSI-RS based L3 measurements. If UE reports CSI-RS based L3 measurement, then the UE shall meet CSI-RS based L3 measurement reporting requirements in TS 38.133 section 9.10.2.4 and 9.10.3.4 based on the accuracy requirements for the case when the timing offset is below the threshold with single FFT assumption
    - Option 3: UE is not required to report CSI-RS based L3 measurements. If UE reports CSI-RS based L3 measurement, then the UE may not meet CSI-RS based L3 measurement reporting requirements in TS 38.133 section 9.10.2.4 and 9.10.3.4 based on the accuracy requirements for the case when the timing offset is below the threshold with single FFT assumption

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115321 | WF on CSI-RS based L3 measurement requirements | CATT |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2111981 | Draft CR on CSI-RS based measurement requirements | CATT | Revised |  |
| R4-2112119 | Draft CR on CSSF for CSI-RS L3 RRM R16 | Apple | Return to | If no further comments in 2nd round, the CR will be endorsed |
| R4-2112396 | CR on 2 windows for CSI-RS L3 measurement R16 | MediaTek inc. | Not Pursued |  |
| R4-2112515 | Draft CR on requirements applicability for CSI-RS based L3 measurement | CMCC | Agreeable |  |
| R4-2112880 | 38.133 CR on the timing offset impact to CSI-RS based measurement | Nokia, Nokia Shanghai Bell | Return to |  |
| R4-2112882 | 38.133 CR on the CSI-RS resource periodicity | Nokia, Nokia Shanghai Bell | Revised |  |
| R4-2112884 | 38.133 CR on the CSI-RS based measurement requirements | Nokia, Nokia Shanghai Bell | Merged | Merged to R4-2111981 and R4-2114300 |
| R4-2114300 | CR on CSI-RS measurement window | Huawei, HiSilicon | Revised |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115321 | WF on CSI-RS based L3 measurement requirements | CATT | Approved |  |
| R4-2115322 | Draft CR on CSI-RS based measurement requirements | CATT | Endorsed |  |
| R4-2112119 | Draft CR on CSSF for CSI-RS L3 RRM R16 | Apple | Endorsed |  |
| R4-2112880 | 38.133 CR on the timing offset impact to CSI-RS based measurement | Nokia, Nokia Shanghai Bell | Not pursued |  |
| R4-2115323 | 38.133 CR on the CSI-RS resource periodicity | Nokia, Nokia Shanghai Bell | Endorsed |  |
| R4-2115324 | CR on CSI-RS measurement window | Huawei, HiSilicon | Endorsed |  |

**WF/LS for approval**

**R4-2115321 WF on CSI-RS based L3 measurement requirements**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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##### 6.1.8.1 RRM core requirements (38.133)

**R4-2111980 Discussion on core part maintenance open issues**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2111981 Draft CR on CSI-RS based measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Revised to R4-2115322 (from R4-2111981).**

**R4-2115322 Draft CR on CSI-RS based measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2111982 Draft CR on CSI-RS based measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2112119 Draft CR on CSSF for CSI-RS L3 RRM R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2112120 Draft CR on CSSF for CSI-RS L3 RRM R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Apple*

**Decision: Endorsed.**

**R4-2112395 Remain issues on CSI-RS L3 measurement**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2112396 CR on 2 windows for CSI-RS L3 measurement R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: MediaTek inc.*

**Decision: Not pursued.**

**R4-2112397 CR on 2 windows for CSI-RS L3 measurement R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Withdrawn.**

**R4-2112515 Draft CR on requirements applicability for CSI-RS based L3 measurement**

*Type: draftCR For: Approval  
 38.133 v16.8.0 CR- rev Cat: (Rel-16)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2112516 Draft CR on requirements applicability for CSI-RS based L3 measurement**

*Type: draftCR For: Approval  
 38.133 v17.2.0 CR- rev Cat: (Rel-17)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2112539 Remaining issues on CSI-RS L3 measurement core requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112879 Open issues on the CSI-RS based measurement requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2112880 38.133 CR on the timing offset impact to CSI-RS based measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Not pursued.**

**R4-2112881 38.133 Cat.A CR on the timing offset impact to CSI-RS based measurement**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Withdrawn.**

**R4-2112882 38.133 CR on the CSI-RS resource periodicity**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2115323 (from R4-2112882).**

**R4-2115323 38.133 CR on the CSI-RS resource periodicity**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2112883 38.133 Cat.A CR on the CSI-RS resource periodicity**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed.**

**R4-2112884 38.133 CR on the CSI-RS based measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Merged.**

**R4-2112885 38.133 Cat. A CR on the CSI-RS based measurement requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Withdrawn.**

**R4-2114299 Discussion on remaining issues in CSI-RS core requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114300 CR on CSI-RS measurement window**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2115324 (from R4-2114300).**

**R4-2115324 CR on CSI-RS measurement window**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2114301 CR on CSI-RS measurement window R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

##### 6.1.8.2 RRM performance requirements (38.133)

###### 6.1.8.2.1 General

###### 6.1.8.2.2 Measurement accuracy requirements

6.1.8.2.2.1 CSI-RSRP requirements

6.1.8.2.2.2 CSI-RSRQ requirements

6.1.8.2.2.3 CSI-SINR requirements

###### 6.1.8.2.3 Test cases

6.1.8.2.3.1 General

6.1.8.2.3.2 Intra-frequency measurement

6.1.8.2.3.3 Inter-frequency measurement

6.1.8.2.3.4 Measurement performance

#### 6.1.9 Maintenance for other WIs

##### 6.1.9.3 RRM requirements

================================================================================

**Email discussion: [100-e][205] NR\_RRM\_maintenance\_R16**

**R4-2115195 Email discussion summary: [100-e][205] NR\_RRM\_maintenance\_R16**

*Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115388 (from R4-2115195).**

**R4-2115388 Email discussion summary: [100-e][205] NR\_RRM\_maintenance\_R16**

*Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 25th)**

Topic #4: measurement requirements for relaxed carriers and non-relaxed carriers (Rel-16 UE power saving)

* Proposal:
  + Option 1: When Srxlev ≤ SnonIntraSearchP or Squal ≤ SnonIntraSearchQ, measurements for UE fulfilling low mobility or not-at-cell edge criteria UE are specified as Ncarrier\_Relax \* Trelax + Ncarrier\_Non\_relax  \* Tnon-Relax 
    - where
    - Trelax is the relaxed measurement requirements specified in clause 4.2.2.10 and 4.2.2.11 in TS38.133,
    - Tnon-Relax is the normal measurement requirements specified in clause 4.2.2.4 and 4.2.2.5 in TS38.133,
    - Ncarrier\_Relax is the total number of inter-frequency carriers configured for only mobility measurements and the number of inter-frequency carriers configured for both mobility measurements and for idle mode CA/DC measurements (while T331 is not running).
    - Ncarrier\_Non\_relax is the total number of NR inter-frequency carriers configured for idle mode CA/DC measurements (while T331 is running).
  + Option 2:
    - When T331 is running,
      * The parameter Ncarrier\_Non\_relax is the total number of NR inter-frequency carriers configured for idle mode CA/DC measurements
      * The parameter Ncarrier\_Relax is the total number of NR inter-frequency carriers not configured for idle mode CA/DC measurements
    - When T331 is not running,
      * The parameter Ncarrier\_Relax is the total number of inter-frequency carriers configured for mobility measurements only and the number of inter-frequency carriers configured for both mobility measurement and ~~for~~ idle mode CA/DC measurements.
      * The parameter Ncarrier\_Non\_relax =0.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | mobility meas. | EMR | When T331 is running | When T331 is not running |
| F1 | O | X | Relax | Relax |
| F2 | X | O | Non-relax | No need to measure |
| F3 | O | O | Non-relax | Relax |

* Discussion
  + Huawei: This is relevant to Rel-16 UE power saving. We got consensus on Option 1 but Nokia suggested some modification and proposed to differentiate T331 running/not running cases. Option 2 addresses it and we are ok.
  + QC: We are overall fine to have the CR.
  + Nokia: We are ok with CR.
  + Chair: common understanding that Option 2 is acceptable, and companies need to work to refine the wording.

**1st round email discussion conclusions**

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2112122 | Draft CR on scheduling restriction applicability for FR1 and FR1+FR2 inter-band CA R16 | Apple | Revised |  |
| R4-2112079 |  |  | Return to |  |
| R4-2114011 |  |  | Return to |  |
| R4-2114267 |  |  | Return to |  |
| R4-2113827 | Correction on measurement requiements in relaxed measurement |  | Return to |  |
| R4-2113516 |  |  | Return to |  |
| R4-2113814 |  |  | Return to |  |
| R4-2111961 |  |  | agreeable |  |
| R4-2111963 |  |  | To be revised to address other’s comments |  |
| R4-2111965 |  |  | agreeable |  |
| R4-2112513 |  |  | To be revised to address others’ comments |  |
| R4-2113266 |  |  | agreeable |  |
| R4-2113855 |  |  | Further clarification on the action on SCell dormancy |  |
| R4-2113884 |  |  | agreeable |  |
| R4-2114013 |  |  | To be revised by Nokia and Anritsu |  |
| R4-2114149 |  |  | Huawei needs to confirm if MTK’s suggested revision is OK |  |
| R4-2114431 |  |  | agreeable |  |
| R4-2114432 |  |  | agreeable |  |
| R4-2114441 |  |  | agreeable |  |
| R4-2113443 |  |  | Return to | Will be treated in [203] |
| R4-2113444 |  |  | Return to | Will be treated in [203] |
| R4-2114168 |  |  | agreeable |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| [R4-2112079](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2112079.zip) | CR on direct SCell activation (R16) | Apple | Revised |  |
| [R4-2114011](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114011.zip) | Draft CR for Direct SCell activation delay | Nokia | Merged |  |
| [R4-2114267](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114267.zip) | CR on direct SCell activation requirements | Huawei | Merged |  |
| R4-2115427 | CR on direct SCell activation (R16) | Apple | Return to |  |
| [R4-2113516](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113516.zip) | CR on TS38.133 for dual active protocol stack handover | Ericsson | Merged |  |
| [R4-2113814](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113814.zip) | Correction to DAPS handover requirements R16 | Huawei, HiSilicon | Endorsed |  |
| R4-2113827 | Correction on measurement requiements in relaxed measurement | Huawei, HiSilicon | Revised |  |
| R4-2115419 | Correction on measurement requiements in relaxed measurement | Huawei, HiSilicon | Endorsed |  |
| R4-2115325 | Draft CR on scheduling restriction applicability for FR1 and FR1+FR2 inter-band CA R16 | Apple | Return to | TEI identifier shall be discussed |
| R4-2115420 | Correction to test cases of inter-RAT cell re-selection with relaxed measurement criterion R16 | Huawei, HiSilicon | Endorsed |  |
| R4-2115327 | Draft CR on measurement delay requirements for Rel-16 HST requirements | CMCC | Endorsed |  |
| [R4-2115329](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114013.zip) | Draft CR for Idle Mode measurements of inter-RAT CA candidate cells for early reporting (TC#3) | Nokia | Endorsed |  |
| R4-2115326 | Draft CR on cell reselection test case for UE Power saving | CATT | Endorsed |  |
| [R4-2113855](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2113855.zip) | draft CR to TS38.133[R16] Updating the introduction of EN-DC Interruption | ZTE | Return to |  |

TEI identifier for R4-2115325

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **unique TEI identifier** | **feature** | **Rel** | **CRs in own WG** | **CRs in/impacts on other WGs** |
| [Sch\_Restr\_InterBandCA] | Scheduling restriction for FR1 and FR1+FR2 inter-band CA | Rel-16 | TBA (38.133, Cat. F) | NA |

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###### 6.1.9.3.1 RRM core

**R4-2111961 Draft CR on UE power saving requirements**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2111962 Draft CR on UE power saving requirements**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2112513 Draft CR on measurement delay requirements for Rel-16 HST requirements**

*Type: draftCR For: Approval  
 38.133 v16.8.0 CR- rev Cat: (Rel-16)  
  
 Source: CMCC*

**Decision: Revised to R4-2115327 (from R4-2112513).**

**R4-2115327 Draft CR on measurement delay requirements for Rel-16 HST requirements**

*Type: draftCR For: Approval  
 38.133 v16.8.0 CR- rev Cat: (Rel-16)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2112514 Draft CR on measurement delay requirements for Rel-16 HST requirements**

*Type: draftCR For: Approval  
 38.133 v17.2.0 CR- rev Cat: (Rel-17)  
  
 Source: CMCC*

**Decision: Endorsed.**

**R4-2113266 Draft CR to TS 38.133 on RRC\_IDLE and RRC\_INACTIVE state mobility**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: OPPO*

**Decision: Endorsed.**

**R4-2115328 Draft CR to TS 38.133 on RRC\_IDLE and RRC\_INACTIVE state mobility**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: OPPO*

**Decision: Endorsed.**

**R4-2113515 TDD UL-DL and DL-UL switching in DAPS handover**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Further clarification on DL-to-UL and UL-to-DL switching time

**Decision: Noted.**

**R4-2113516 CR on TS38.133 for dual active protocol stack handover**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Add conditions for not expected to transmit / not expected to receive covering both source and target cell. Add autonomous interruption allowance if these conditions are unspecified.Correct Ntx-rx and Nrx-tx to 25600 Tc

**Decision: Merged.**

**R4-2113517 CR on TS38.133 for dual active protocol stack handover**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Add conditions for not expected to transmit / not expected to receive covering both source and target cell. Add autonomous interruption allowance if these conditions are unspecified.Correct Ntx-rx and Nrx-tx to 25600 Tc

**Decision: Withdrawn.**

**R4-2113813 Discussion on remaining issues for DAPS handover requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2113814 Correction to DAPS handover requirements R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

E///: It was not discussed in the 2nd round

Session chair: It was discussed in the 2nd round and no concerns raised. Keep the decisions. Companies can discuss if any changes are needed based on LTE DAPS.

**Decision: Endorsed.**

**R4-2113815 Correction to DAPS handover requirements R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2113826 Discussion on measurement requirements for relaxed carriers and non-relaxed carriers**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2113827 Correction on measurement requiements in relaxed measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2115419 (from R4-2113827).**

**R4-2115419 Correction on measurement requiements in relaxed measurement**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2113828 Correction on measurement requiements in relaxed measurement**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Endorsed.**

**R4-2113884 [draft CR] maintenance for conditional PSCell change**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Decision: Endorsed.**

**R4-2113885 [draft CR] maintenance for conditional PSCell change**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

**Abstract:**

This is a Cat A draft CR.

**Decision: Endorsed.**

###### 6.1.9.3.2 RRM performance

**R4-2111963 Draft CR on cell reselection test case for UE Power saving**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Revised to R4-2115326 (from R4-2111963).**

**R4-2115326 Draft CR on cell reselection test case for UE Power saving**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2111964 Draft CR on cell reselection test case for UE Power saving**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2111965 Draft CR on cell reselection test case for HST in FR1**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2111966 Draft CR on cell reselection test case for HST in FR1**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Endorsed.**

**R4-2114149 Correction to test cases of inter-RAT cell re-selection with relaxed measurement criterion R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Revised to R4-2115420 (from R4-2114149).**

**R4-2115420 Correction to test cases of inter-RAT cell re-selection with relaxed measurement criterion R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114150 Correction to test cases of inter-RAT cell re-selection with relaxed measurement criterion R17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, Hisilicon*

**Decision: Endorsed.**

**R4-2114441 Missing n259 RRM performance requirements in Rel-17**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The CR defines n259 RRM performance requirements, which were agreed in R4-2008911 (RAN4#95-e). But some of the requirements for n259 in Rel-17 are missing, while they are correctly implemented in Rel-16.

**Decision: Endorsed.**

#### 6.1.10 R16 TEI

##### 6.1.10.3 RRM requirements

**R4-2112121 Discussion on scheduling restriction applicability for FR1 and FR1+FR2 inter-band CA**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-16)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2112122 Draft CR on scheduling restriction applicability for FR1 and FR1+FR2 inter-band CA R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Apple*

**Decision: Revised to R4-2115325 (from R4-2112122).**

**R4-2115325 Draft CR on scheduling restriction applicability for FR1 and FR1+FR2 inter-band CA R16**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Apple*



**Decision: Revised to R4-2115432 (from R4-2115325).**

**R4-2115432 Scheduling restriction applicability for FR1 and FR1+FR2 inter-band CA R16 [Sch\_Restr\_InterBandCA]**

*Type: draftCR For: Endorsement  
 38.133 v16.8.0 CR- rev Cat: F (Rel-16)  
  
 Source: Apple*

Session chair: This is a Rel-16 TEI CR. Tdoc title has changed.



**Decision: Endorsed.**

**R4-2112123 Scheduling restriction applicability for FR1 and FR1+FR2 inter-band CA R16 [Sch\_Restr\_InterBandCA]**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Apple*

Session chair: This is a Rel-16 TEI CR. Unique TEI identifier needs to be assigned in case TEI is confirmed.

Session chair: Tdoc title has changed.

**Decision: Endorsed.**

**R4-2113855 draft CR to TS38.133[R16] Updating the introduction of EN-DC Interruption**

*Type: CR For: Agreement  
 38.133 v16.8.0 CR-2192 rev Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

Session chair: CR submitted instead of Draft CR. If agreeable, the CR will be endorsed.

MCC: What is the CR number? It reads (nothing) on the cover page but the Tdoc is reserved for CR number 2192.

Session chair: This is TEI16 item. Please let me know if this is a new TEI or a maintenance of one of the existing WIs.

**Decision: Postponed.**

**R4-2113856 draft CR to TS38.133 Updating the introduction of EN-DC Interruption**

*Type: CR For: Agreement  
 38.133 v17.2.0 CR-2193 rev Cat: A (Rel-17)  
  
 Source: ZTE Corporation*

Session chair: CR submitted instead of Draft CR. If agreeable, the CR will be endorsed.

Session chair: This is TEI16 item. Please let me know if this is a new TEI or a maintenance of one of the existing WIs.

**Decision: Withdrawn.**

### 6.2 LTE maintenance and TEI

#### 6.2.3 RRM requirements

##### 6.2.3.1 RRM core requirements

**R4-2113512 TDD UL-DL and DL-UL switching in LTE DAPS handover**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Further clarification on DL-to-UL and UL-to-DL switching time

**Decision: Noted.**

**R4-2113513 Correction on the synchronous condition for DAPS handover**

*Type: draftCR For: Endorsement  
 36.133 v16.10.0 CR- rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Add conditions for not expected to transmit / not expected to receive covering both source and target cell. Add autonomous interruption allowance if these conditions are unspecified.

**Decision: Postponed.**

**R4-2113514 Correction on the synchronous condition for DAPS handover**

*Type: draftCR For: Endorsement  
 36.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Add conditions for not expected to transmit / not expected to receive covering both source and target cell. Add autonomous interruption allowance if these conditions are unspecified.

**Decision: Withdrawn.**

**R4-2113829 Clarification on asynchronous DAPS handover R16**

*Type: draftCR For: Endorsement  
 36.133 v16.10.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Discussion:**

E///: E/// CR is more complete

Nokia: We prefer E/// CR

QC: Support this CR and compliant with 211 spec

Huawei: We had a similar CR in NR, which was endorsed

Apple / MTK: Support CR

E///: we would like to further discuss

E///, Nokia: We would like to revise NR CR as well

**Decision: Postponed.**

**R4-2113830 Clarification on asynchronous DAPS handover R17**

*Type: draftCR For: Endorsement  
 36.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

**R4-2114070 Discussion on RSS based RSRQ for LTE-MTC**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Discussion on proceeding for RSRQ for configured RSS-based RSRP

**Decision: Noted.**

**R4-2114071 Applicability of CRS-based RSRQ for RSS-based RSRP measurement configuration**

*Type: draftCR For: Endorsement  
 36.133 v16.10.0 CR- rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

CR to introduce CRS-based RSRQ in Rel-16.

**Decision: Postponed.**

**R4-2114072 Applicability of CRS-based RSRQ for RSS-based RSRP measurement configuration**

*Type: draftCR For: Endorsement  
 36.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

CR to introduce CRS-based RSRQ in Rel-16.

**Decision: Withdrawn.**

**R4-2114087 Discussions on RSS based RSRQ measurement for Rel-16 eMTC UE**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss the RSS based RSRQ measurement for release 16 eMTC based on the incoming LS and previous agreement captured in [1].

**Decision: Noted.**

**R4-2114200 On RSRQ for RRS-based measurements for LTE-MTC**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2114302 Discussion on remaining issues in Rel-16 eMTC RRM**

*Type: LS out For: Approval  
 to RAN1, RAN2  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114303 CR on remaining issues in Rel-16 eMTC RRM**

*Type: draftCR For: Endorsement  
 36.133 v16.10.0 CR- rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Postponed.**

**R4-2114304 CR on remaining issues in Rel-16 eMTC RRM R17**

*Type: draftCR For: Endorsement  
 36.133 v17.2.0 CR- rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn.**

##### 6.2.3.2 RRM performance requirements

### 6.3 Rel-16 UE feature list maintenance

**R4-2112261 On Mandatory GP Signaling**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

## 7 Rel-17 maintenance for both NR and LTE

## 8 Rel-17 spectrum related Work Items for NR

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**Email discussion: [100-e][214] Spectrum\_RRM**

**R4-2115204 Email discussion summary: [100-e][214] Spectrum\_RRM**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115389 (from R4-2115204).**

**R4-2115389 Email discussion summary: [100-e][214] Spectrum\_RRM**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**1st round email discussion conclusions**

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| [R4-2114465](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114465.zip) | Analysis of RRM requirements for FR2 FWA for band n259 | Ericsson | Noted |  |
| [R4-2114466](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_100-e/Docs/R4-2114466.zip) | RRM requirements for FR2 FWA for band n259 in 38.133 | Ericsson | Revised |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115430 | RRM requirements for FR2 FWA for band n259 in 38.133 | Ericsson | Agreed | The CR will be presented at RAN#93-e for approval since WI can be closed. CR number is needed. |

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### 8.40 Introduction of FR2 FWA UE with maximum TRP of 23dBm for band n259

#### 8.40.2 RRM performance requirements

**R4-2114465 Analysis of RRM requirements for FR2 FWA for band n259**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper analyzes the RRM core and performance requirements for FR2 FWA UE with maximum TRP of 23dBm for band n259

**Decision: Noted.**

**R4-2114466 RRM requirements for FR2 FWA for band n259 in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The CR contains RRM core and performance requirements for FR2 FWA UE with maximum TRP of 23dBm for band n259

**Decision: Revised to R4-2115330 (from R4-2114466).**

**R4-2115330 RRM requirements for FR2 FWA for band n259 in 38.133**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: B (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The CR contains RRM core and performance requirements for FR2 FWA UE with maximum TRP of 23dBm for band n259

**Decision: Not pursued.**

**R4-2115430 RRM requirements for FR2 FWA for band n259 in 38.133**

*Type: CR For: Agreement  
 38.133 v17.2.0 CR- rev Cat: B (Rel-17)  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Agreed.**

#### 8.40.3 Others

## 9 Rel-17 non-spectrum related work items for NR

### 9.3 RF requirements enhancement for NR frequency range 1 (FR1)

#### 9.3.3 RRM core requirements

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**Email discussion: [100-e][215] NR\_RF\_FR1\_enh\_RRM\_NWM**

**R4-2115205 Email discussion summary: [100-e][215] NR\_RF\_FR1\_enh\_RRM\_NWM**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115390 (from R4-2115205).**

**R4-2115390 Email discussion summary: [100-e][215] NR\_RF\_FR1\_enh\_RRM\_NWM**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115331 | WF on R17 NR FR1 RF enhancement RRM | Huawei, HiSilicon |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115331 | WF on R17 NR FR1 RF enhancement RRM | Huawei, HiSilicon | Approved |  |

**WF/LS for approval**

**R4-2115331 WF on R17 NR FR1 RF enhancement RRM**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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##### 9.3.3.1 Tx switching requirements

**R4-2112185 RRM DL interruption requirements at UE switching between two uplink carriers and two uplink bands**

*Type: discussion For: Decision  
 Source: CMCC*

**Decision: Noted.**

**R4-2112229 DL interruption requirements for Rel-17 Tx switching**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted.**

**R4-2113142 Discussion on RRM requirements for UL switching in Rel-17**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113844 Discussion on DL interruption of R17 Tx switching enhancements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

### 9.4 NR RF requirement enhancements for frequency range 2 (FR2)

#### 9.4.6 RRM core requirements

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**Email discussion: [100-e][216] NR\_RF\_FR2\_req\_enh2\_RRM**

**R4-2115206 Email discussion summary: [100-e][216] NR\_RF\_FR2\_req\_enh2\_RRM**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115391 (from R4-2115206).**

**R4-2115391 Email discussion summary: [100-e][216] NR\_RF\_FR2\_req\_enh2\_RRM**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 17th)**

**Issue 1-1-1: MRTD principles in FR2 inter-band CA**

* Agreements in GTW at RAN4#99-e meeting:
  + Option 1: MRTD shall not be larger than “CP length - UE Rx beam switch time - 2 x DL timing error” and the max SCS is 120kHz
  + Option 2: MRTD of 3us for inter-band CA in FR2 under CBM with a note to stating if the MRTD exceed [TBD us or CP or CP/2] a performance degradation is expected for the first N symbols of the slot
    - N is FFS
    - FFS if degradation applies to each slot
    - Example requirement:

|  |  |
| --- | --- |
| ***Frequency Range of the pair of carriers*** | ***Maximum receive timing difference (µs)*** |
| *FR1* | *33* |
| *FR2* | *8 note1* |
| *FR2* | *3 note2* |
| *Between FR1 and FR2* | *25* |
| *Note1:      This requirement applies to the UE capable of independent beam management for FR2 inter-band CA.*  *Note2:      This requirement applies to the UE capable of common beam management for FR2 inter-band CA. If the receive time difference exceeds [the cyclic prefix length of that SCS], demodulation performance degradation is expected for the first N symbols of the slot.* | |

* + Option 3: Introduce UE capability to support
    - MRTD = [260ns] and/or MRTD = [3us]
  + Further study the candidate options and investigate at least the following open issues
    - Impact of UE RX beam switching and AGC periodicity restrictions on the performance
    - Candidate RRM requirements and performance impacts for the case of MRTD larger than “CP length - UE Rx beam switch time - 2 x DL timing error” and below 3us
* Proposals
  + Option 1: MRTD shall not be larger than “CP length – UE Rx beam switch time – 2 x DL timing error” and the max SCS is 120kHz (Xiaomi, Mediatek, vivo, Qualcomm, OPPO)
  + Option 2: MRTD of 3us for inter-band CA in FR2 under CBM with a note to stating if the MRTD exceed [TBD us or CP or CP/2] a performance degradation is expected for the first N symbols of the slot (Docomo, Qualcomm, ZTE, Ericsson, Nokia, Huawei)
    - Option 2a: MRTD of 3us for inter-band CA in FR2 with a note to recommend UE which is under CBM conditions to switch its beam during the scheduled instances provided by Network (Intel)
  + Option 3: Introduce UE capability to support MRTD = [260ns] and/or MRTD = [3us] (vivo, OPPO)
  + ~~Option 4: 260us (LG)~~
  + ~~Option 5: 3us (Huawei)~~
  + ~~Option 6: Do not define any requirements for CBM UEs for FR2 inter-band CA, if there is no consensus on option 1-3. (vivo)~~
* Discussion
  + Chair: Can Option 3 be considered as a compromise?
  + Apple: How does the network know the actual MRTD? Can it use the capabilities?
    - Vivo: Network does not need to know the exact MRTD. It needs to know the range.
  + Nokia: Option 2 or 2a. Option 3 does not move us forward. Difficult for NW to know MRTD at the UE side.
  + Huawei: Option 2.
  + E///: Option 2a with some scheduling restrictions is preferred. General Option 2 leads to unspecified demodulation impact.
  + QC: Original preference is Option 1. We can support Option 2 as well. For Option 3 – UE with 3us still needs performance degradation. No need capability.
  + Xiaomi: Can consider Option 3 to move forward. Need to clarify behavior.
  + MTK: For Option 2 – different channels will have different TCI and UE will need to make switching for RX switching. In this case further degradation is expected.
  + LGE: For Option 3 with 3us we’ll need performance degradation. Can compromise to Option 2.
  + Vivo: For Option 2 the performance degradation needs to be addressed. If it is addressed then we can compromise to Option 2.
  + Intel: For Option 3 with 3us we’ll still need to specify performance degradation like in Option 2. For 260ns capability, based on NW vendors such UEs will not be scheduled at all and capability becomes useless. Prefer Option 2 or 2a. Need to control performance degradation (e.g. restrictions on PDCCH scheduling).
  + Apple: ok to work in the direction of Option 2. Typically when we say performance degradation then this means we have no requirements.
  + QC: If we go with Option 2, then we need to work on further refinement.
* Agreements:
  + MRTD for inter-band CA in FR2 under CBM is 3us
    - For the receive time difference below X us no performance degradation is expected
    - For the receive time difference equal or higher than X us a performance degradation is allowed
      * Degradation of UE demodulation and [RRM] performance is allowed.
        + Note: companies are encouraged to bring more analysis on Demodulation and RRM performance impacts.
      * FFS on the performance degradation including affected symbols, slots
      * FFS on solutions to reduce performance degradation and whether and how to introduce restrictions for UE Rx beam change
        + Option 1: Use network scheduled/controlled instances for UE Rx beam change
        + Other options not precluded
    - X is FFS
      * Option 1: CP
      * Option 2: CP/2
      * Option 3: CP length – UE Rx beam switch time – 2 x DL timing error
      * Option 4: CP length – UE Rx beam switch time
      * Other options not excluded

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115332 | WF on RRM requirements for FR2 Inter-band DL CA and UL CA | Nokia |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115332 | WF on RRM requirements for FR2 Inter-band DL CA and UL CA | Nokia | Approved |  |

**WF/LS for approval**

**R4-2115332 WF on RRM requirements for FR2 Inter-band DL CA and UL CA**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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##### 9.4.6.1 Inter-band DL CA requirements for CBM

**R4-2112426 Further discussion on RRM requirements for FR2 inter-band DL CA**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

###### 9.4.6.1.1 MRTD requirements

**R4-2112052 Discussions on Inter-band DL CA MRTD requirements for CBM**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Decision: Noted.**

**R4-2112339 Discussion on MRTD for FR2 inter-band CA based on CBM**

*Type: discussion For: (not specified)  
 Source: LG Electronics*

**Abstract:**

It discusses MRTD requirements for CBM based FR2 inter-band CA.

**Decision: Noted.**

**R4-2112484 Discussion on CBM MRTD requirement for FR2 inter-band DL CA**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2112637 Further views on RRM requirements for inter-band DL CA in NR FR2**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112702 MRTD requirements for CBM based Inter-band DL CA**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2113200 Discussion on MRTD requirements for inter-band DL CA in FR2**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113267 Other RRM requirements for FR2 inter-band DL CA enhancements**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113524 Support up to 3 us MRTD**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this contribution we develop why at least 3us MRTD is feasible from both from a network perspective and a UE perspective, for co-located deployments.

**Decision: Noted.**

**R4-2113816 Discussion on MRTD requirements for FR2 inter-band DL CA with CBM**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114017 Discussion on FR2 inter-band DL CA MRTD requirements for CBM capable UE**

*Type: discussion For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2114192 Discussion on ways to reduce performance degradation for MRTD=3us for CBM UEs**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

###### 9.4.6.1.2 Other RRM requirements

**R4-2112703 RRM requirements for CBM based Inter-band DL CA**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2113268 MRTD requirements for FR2 inter-band DL CA enhancements**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113507 Discussion on RRM requirements for FR2 inter-band CA for CBM**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

We provide our views on RRM requirements for FR2 inter-band CA for CBM UE.

**Decision: Noted.**

**R4-2113817 Discussion on RRM requirements for FR2 inter-band DL CA with CBM**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114018 Discussion on RRM for FR2 RF**

*Type: discussion For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

##### 9.4.6.2 Inter-band UL CA for IBM

**R4-2112704 Inter-band UL CA for IBM**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2113508 RRM requirements of FR2 inter-band UL CA for IBM**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

We provide our views on RRM requirements of FR2 inter-band UL CA for IBM UE

**Decision: Noted.**

**R4-2113818 Discussion on RRM impacts for FR2 inter-band UL CA with IBM**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114019 Discussion on inter-band UL CA for IBM**

*Type: discussion For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

##### 9.4.6.3 UL gaps for self-calibration and monitoring

**R4-2112089 UL gaps for Tx power management RRM aspect**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2112705 UL gaps for self-calibration and monitoring**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2114016 Network impact of UE FR2 UL Gap for UE Tx power enhancements**

*Type: discussion For: Discussion  
 Source: No*

*kia, Nokia Shanghai Bell*

**Decision: Noted.**

### 9.8 Enhancement for NR high speed train scenario in FR1

#### 9.8.1 General

#### 9.8.2 RRM core requirements

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**Email discussion: [100-e][217] NR\_HST\_FR1\_enh\_RRM**

**R4-2115207 Email discussion summary: [100-e][217] NR\_HST\_FR1\_enh\_RRM**

*Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115392 (from R4-2115207).**

**R4-2115392 Email discussion summary: [100-e][217] NR\_HST\_FR1\_enh\_RRM**

*Type: other For: Information  
 Source: Moderator (CMCC)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 20th)**

Issue 2-1: whether to define the enhancement for inter-frequency measurement in idle mode for HST

* Background: Agreements in RAN4 #98-bis-e (R4-2105793):
  + Define RRC Connected state inter-frequency measurement enhancements
    - Support of HST inter-frequency measurement enhancements is up to UE capability. Details are FFS
  + FFS whether enhancements for RRC IDLE inter-frequency measurements are needed
* Proposals
  + Option 1 (QC, CATT, CMCC, OPPO, Ericsson, vivo, HW, MTK, Xiaomi, Intel): Yes
  + Option 2 (MTK, Apple, Nokia): No
  + Option 3 (Apple): introducing a dedicated UE capability indicating the support of inter-frequency measurement in idle mode for HST
* Discussion
  + Apple: Can compromise to a separate capability for IDLE mode
  + MTK: Not sure if there is a strong need for inter-freq measurement from operator perspective
  + CMCC: See necessity to have this.
  + Nokia: Prefer Option 2. Option 1 is ok but have concerns on benefits.
  + Huawei: Option 1
  + QC: Agree with Huawei/CMCC. For capability prefer to have a single one for Connected/Idle mode
  + E///: Option 1.
  + vivo: Same view with QC that 1 capability is enough
  + Apple: Not ready to accept. Not convinced on benefits in IDLE mode. The most typical is intra-frequency.
  + Chair: come back in the 2nd round
* Tentative agreements:
  + Define the enhancement for inter-frequency measurement in IDLE mode
  + Define separate UE capabilities for support of HST Connected and Idle mode inter-frequency measurement enhancements

Issue 2-5: measurement delay requirement for inter-frequency measurement with MG in HST in connected state for HST

* Proposals
  + Option 1 (QC, Nokia):

|  |  |
| --- | --- |
| **Condition NOTE1,2** | **T SSB\_measurement\_period\_inter** |
| No DRX | Max(200ms, 6 × Max(MGRP, SMTC period)) × CSSFinter |
| DRX cycle≤ 160ms | max(200ms, ceil(6 x M2 Note 3) x max(SMTC period,DRX cycle)) x CSSFintra |
| 160ms < DRX cycle≤ 320ms | ceil(5 x M2 Note 3 x Kp) x max(SMTC period,DRX cycle) |
| DRX cycle>320ms | ceil( Y Note 4 x Kp ) x DRX cycle x CSSFintra |
| NOTE 1: DRX or non DRX requirements apply according to the conditions described in clause 3.6.1  NOTE 2: In EN-DC operation, the parameters, timers and scheduling requests referred to in clause 3.6.1 are for the secondary cell group. The DRX cycle is the DRX cycle of the secondary cell group.  NOTE 3: M2 = 1.5 if SMTC periodicity > 40 ms, otherwise M2=1  NOTE 4: Y=3 when SMTC <= 40ms, Y=5 when SMTC > 40ms | |

* + Option 2 (CATT, HW):

|  |  |
| --- | --- |
| **Condition NOTE1,2** | **T SSB\_measurement\_period\_inter** |
| No DRX | Max(200ms, 8 × Max(MGRP, SMTC period)) × CSSFinter |
| DRX cycle ≤ 160ms | Max(200ms, Ceil(8 × M2) × Max(MGRP, SMTC period, DRX cycle)) × CSSFinter |
| 160ms < DRX cycle≤ 320ms | Max(200ms, Ceil(7 × M2) × Max(MGRP, SMTC period, DRX cycle)) × CSSFinter |
| DRX cycle > 320ms | Y × DRX cycle × CSSFinter |
| NOTE 1: DRX or non DRX requirements apply according to the conditions described in clause 3.6.1  NOTE 2: In EN-DC operation, the parameters, timers and scheduling requests referred to in clause 3.6.1 are for the secondary cell group. The DRX cycle is the DRX cycle of the secondary cell group.  NOTE 3: When high speed is not configured, M2 = 1.5. When high speed is configured, M2 = 1.5 if SMTC periodicity > 40 ms, otherwise M2=1.  NOTE 4: Y1= 6 when SMTC <= 40ms, Y1= 8 when SMTC > 40ms | |

* + Option 3 (Apple)

|  |  |
| --- | --- |
| Condition NOTE1,2 | T SSB\_measurement\_period\_inter |
| No DRX | Max(200ms, Ceil(8\*M2/1.5) \* Max(MGRP, SMTC period)) \* CSSFinter |
| DRX cycle≤ 160ms | Max(200ms, Ceil(8 \* M2 Note 3) \* Max(MGRP, SMTC period, DRX cycle)) \* CSSFinter |
| 160ms <DRX cycle ≤ 320ms | Max(200ms, Ceil(8\*M2/1.5 – 1)\* Max(MGRP, SMTC period, DRX cycle)) \* CSSFinter |
| DRX cycle > 320ms | Y Note 4 \* DRX cycle \* CSSFinter |
| NOTE 1:  DRX or non DRX requirements apply according to the conditions described in clause 3.6.1  NOTE 2:  In EN-DC operation, the parameters, timers and scheduling requests referred to in clause 3.6.1 are for the secondary cell group. The DRX cycle is the DRX cycle of the secondary cell group.  NOTE 3:  M2 = 1.5 if SMTC periodicity > 40 ms, otherwise M2=1  NOTE 4:  Y= Ceil(8\*M2/1.5 – 2) when SMTC <= 40ms, Y= Ceil(8\*M2/1.5 – 1) when SMTC > 40ms | |

* + Option 4 (CMCC)

|  |  |
| --- | --- |
| DRX cycle | T SSB\_measurement\_period\_intra |
| No DRX | max(200ms, 6 × Max(MGRP, SMTC period)) × CSSFinter |
| DRX cycle≤ 160ms | max(200ms, ceil(M2 Note 2 x 6) x max(MGRP, SMTC period, DRX cycle)) x CSSFinter |
| 160ms < DRX cycle≤ 320ms | ceil(5 x M2 Note 2) x DRX cycle x CSSFinter |
| DRX cycle>320ms | Y Note 3 x DRX cycle x CSSFinter |
| NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is the one used by the cell being identified  NOTE 2: M2 = 1.5 if SMTC periodicity > 40 ms, otherwise M2=1  NOTE 3: Y= 4 when SMTC <= 40ms, Y= 6 when SMTC > 40ms | |

* + Option 5 (MTK, OPPO, vivo):

|  |  |
| --- | --- |
| **Condition NOTE1,2** | **T SSB\_measurement\_period\_inter** |
| No DRX | Max(200ms, 8 × Max(MGRP, SMTC period)) × CSSFinter |
| DRX cycle ≤ 320ms | Max(200ms, Ceil(8 × M2 Note 3) × Max(MGRP, SMTC period, DRX cycle)) × CSSFinter |
| DRX cycle > 320ms | 4 × M2 Note 3× DRX cycle × CSSFinter |
| NOTE 1: DRX or non DRX requirements apply according to the conditions described in clause 3.6.1  NOTE 2: In EN-DC operation, the parameters, timers and scheduling requests referred to in clause 3.6.1 are for the secondary cell group. The DRX cycle is the DRX cycle of the secondary cell group.  NOTE 3: When RRM enhancement for high speed is not configured, M2 = 1.5; When RRM enhancement for high speed is configured, M2 = 1.5 if SMTC periodicity > 40 ms;,otherwise M2=1. | |

* + Option 6 (Ericsson, Nokia):

|  |  |
| --- | --- |
| **Condition NOTE1,2** | **T SSB\_measurement\_period\_inter** |
| No DRX | Max(200ms, 5 × Max(MGRP, SMTC period)) × CSSFinter |
| DRX cycle≤ 160ms | Max(200ms, Ceil(5 × M2 Note 3) × Max(MGRP, SMTC period, DRX cycle)) × CSSFinter |
| 160 ms ≤DRX cycle ≤ 320ms | 4 × M2 Note 3× DRX cycle × CSSFinter |
| DRX cycle > 320ms | Y Note 4 × DRX cycle × CSSFinter |
| NOTE 1: DRX or non DRX requirements apply according to the conditions described in clause 3.6.1  NOTE 2: In EN-DC operation, the parameters, timers and scheduling requests referred to in clause 3.6.1 are for the secondary cell group. The DRX cycle is the DRX cycle of the secondary cell group.  NOTE 3: M2 = 1.5 if SMTC periodicity > 40 ms; otherwise M2=1  NOTE 4: Y=3 when SMTC <= 40ms, Y=5 when SMTC > 40ms | |

* + Recommended WF (QC, CMCC

|  |  |
| --- | --- |
| DRX cycle | T SSB\_measurement\_period\_intra for FR1 HST |
| No DRX | max(200ms, 6 × Max(MGRP, SMTC period)) × CSSFinter |
| DRX cycle≤ 160ms | max(200ms, ceil(M2 Note 2 x 6) x max(MGRP, SMTC period, DRX cycle)) x CSSFinter |
| 160ms < DRX cycle≤ 320ms | ceil(6 x M2 Note 2) x DRX cycle x CSSFinter |
| DRX cycle>320ms | 4 x M2 Note 2 x DRX cycle x CSSFinter |
| NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is the one used by the cell being identified  NOTE 2: M2 = 1.5 if SMTC periodicity > 40 ms, otherwise M2=1 | |

* Summary
  + Some companies propose to reuse LTE-NR inter-RAT measurement requirements for HST (8 samples are proposed).
  + Some companies propose to reuse intra-frequency measurement requirements for HST (5 samples are proposed).
  + some companies propose intermediate value between intra-frequency requirements and LTE-NR inter-RAT measurement requirements, but the detailed values are different
* Discussion
  + N1
    - HW/MTK/CATT/vivo: 8 samples
    - CMCC, QC, E///, Nokia: 6 is a compromise.
    - CMCC: Ceil(8\*M2/1.5) can be another compromise (i.e. 6 for small SMTC and 8 for longer SMTC)
* Agreements:

|  |  |
| --- | --- |
| DRX cycle | T SSB\_measurement\_period\_intra for FR1 HST |
| No DRX | max(200ms, N1 × Max(MGRP, SMTC period)) × CSSFinter  N1 = 7 |
| DRX cycle ≤ 160ms | max(200ms, ceil(N2) x max(MGRP, SMTC period, DRX cycle)) x CSSFinter  N2 = 7 x M2 |
| 160ms < DRX cycle ≤ 320ms | ceil(N3) x DRX cycle x CSSFinter  N3 = 7 x M2 |
| DRX cycle>320ms | N4x DRX cycle x CSSFinter  N4 = 5 |
| NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is the one used by the cell being identified  NOTE 2: M2 = 1.5 if SMTC periodicity > 40 ms, otherwise M2=1 | |

**GTW session (August 27th)**

Issue 2-1: whether to define the enhancement for inter-frequency measurement in idle mode for HST

* Agreements
  + Define the enhancement for inter-frequency measurement in IDLE mode for HST
    - Support of HST Idle mode inter-frequency measurement enhancements is an optional UE feature without capability signalling.
    - UEs not supporting inter-frequency measurement enhancements shall meet the existing inter-frequency measurement requirements

Issue 2-5: measurement delay requirement for inter-frequency measurement with MG in HST in connected state for HST

* Agreements:

|  |  |
| --- | --- |
| DRX cycle | T SSB\_measurement\_period\_intra for FR1 HST |
| No DRX | max(200ms, N1 × Max(MGRP, SMTC period)) × CSSFinter  N1 = 7 |
| DRX cycle ≤ 160ms | max(200ms, ceil(N2) x max(MGRP, SMTC period, DRX cycle)) x CSSFinter  N2 = 7 x M2 |
| 160ms < DRX cycle ≤ 320ms | ceil(N3) x DRX cycle x CSSFinter  N3 = 7 x M2 |
| DRX cycle>320ms | N4x DRX cycle x CSSFinter  N4 = 4 x M2 |
| NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is the one used by the cell being identified  NOTE 2: M2 = 1.5 if SMTC periodicity > 40 ms, otherwise M2=1 | |

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115333 | WF on RRM for FR1 HST | CMCC |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115333 | WF on RRM for FR1 HST | CMCC | Return to |  |

**WF/LS for approval**

**R4-2115333 WF on RRM for FR1 HST**

*Type: other For: Approval  
 Source: CMCC*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115435 (from R4-2115333).**

**R4-2115435 WF on RRM for FR1 HST**

*Type: other For: Approval  
 Source: CMCC*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115439 (from R4-2115435).**

**R4-2115439 WF on RRM for FR1 HST**

*Type: other For: Approval  
 Source: CMCC*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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##### 9.8.2.1 UE RRM core requirements for CA scenario

**R4-2112257 On NR FR1 HST RRM Requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

###### 9.8.2.1.1 Intra-frequency measurements

**R4-2111951 Discussion on remaining issues for intra-frequency measurement for NR FR1 HST RRM enhancement**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112072 On R17 FR1 HST intra-frequency measurement**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2112507 Discussion on NR HST RRM enhancement for CA**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2112523 Discussion on Rel-17 HST in FR1 for intra-frequency measurement**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2113269 Intra-frequency measurement requirements for Rel17 FR1 HST**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113540 Discussion on intra-frequency measurement requirements for NR FR1 HST**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113831 Discussion on intra-frequency measurements for FR1 HST**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114422 Discussion on various RRM aspects for FR1 HST CA**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

###### 9.8.2.1.2 Inter-frequency measurements

**R4-2111952 Discussion on remaining issues for inter-frequency measurement for NR FR1 HST RRM enhancement**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112073 On R17 FR1 HST inter-frequency measurement**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2112506 Discussion on NR HST RRM enhancement for inter-frequency measurement**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2112524 Discussion on Rel-17 HST in FR1 for inter-frequency measurement**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2113270 Inter-frequency measurement requirements for Rel17 FR1 HST**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113324 Inter-frequency measurements for HST RRM FR1**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Inter-frequency measurements for HST RRM FR1

**Decision: Noted.**

**R4-2113541 Discussion on inter-frequency measurement requirements for NR FR1 HST**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113832 Discussion on inter-frequency measurements for FR1 HST**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114423 Discussion on inter-frequency measurements for FR1 HST CA**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

###### 9.8.2.1.3 Other

**R4-2111953 Discussion on other remaining issues for NR FR1 HST RRM enhancement**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112074 On remaining issues for R17 FR1 HST**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2112505 Discussion on general requirements for FR1 HST RRM**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2112525 Discussion on Rel-17 HST in FR1 for general issue**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2113271 General RRM requirements for Rel17 FR1 HST**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113325 Other RRM requirements enhancement for NR HST in FR1**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

other RRM requirements enhancement for NR HST in FR1

**Decision: Noted.**

**R4-2113542 Discussion on R17 NR FR1 HST RRM requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113833 Discussion on remaining issues in FR1 HST**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

#### 9.8.3 UE demodulation requirements (38.101-4)

### 9.9 NR support for high speed train scenario in FR2

#### 9.9.4 RRM core requirements

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**Email discussion: [100-e][218] NR\_HST\_FR2\_RRM\_1**

**R4-2115208 Email discussion summary: [100-e][218] NR\_HST\_FR2\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115393 (from R4-2115208).**

**R4-2115393 Email discussion summary: [100-e][218] NR\_HST\_FR2\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115431 (from R4-2115393).**

**R4-2115431 Email discussion summary: [100-e][218] NR\_HST\_FR2\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 18th)**

**Issue 2-1-1: RX beam number reduction**

* Proposals
  + Proposal 1(OPPO): Decrease UE RX beam number to reduce measurement delay under proper SNR condition.
  + Proposal 2 (ZTE): Smaller RX beam number/scaling factor will relax the restriction on DRX cycle.
  + Proposal 3 (ZTE): From the point of cell identification, smaller RX beam number can enhance the requirements, so as to satisfy the need of HST scenario.
  + Proposal 4 (Ericsson): Increasing RX beam number above one per panel has no effect on the issue with SNR drop in multiple scenarios (Scenario B + Uni-directional, Scenario B + Bi-directional, Scenario A + Uni-directional).
  + Proposal 5 (Qualcomm): Number of Rx beams in FR2 HST is not fewer than 8. Search and measurement requirement enhancement of reducing Rx sweeping factor based only on number of Rx beam analysis is not feasible.
* Discussion
  + QC: Companies proposals on RX beam reduction come from link budget analysis. More beams can improve the performance. For mobility side, the reduction of number of beams is not the only point. There are no issues with large number of beams.
  + Intel: We have not observed performance improvement for Scenario A with large number of beams.
  + Samsung: Need to split the discussion into Scenario A and B. Scenario A – 1 or 2 beams are fine. Scenario B is more complex. Proposal from Qualcomm is to define upper limit the RRM requirements delay and then allow UE using larger number of beams. Prefer to exclude Scenario B due to no operator requests.
  + OPPO: Reduction of the number of RX beams is an efficient way to improve RRM performance.
  + CATT: Agree to reduce RX beams but proposals are quite generic. It depends on different scenarios.
  + Nokia: Scenario B was agreed to be included based on prior WF. Need to clarify if we are talking about fine/rough beams.
    - Nokia: we assume fine beams
    - Intel: for link budget we assume fine beams. Same beams used for RRM and data. No need for additional rough beams for RRM.
    - Samsung: Same view as Intel
    - QC: For link budget we use fine beams with 15 beams. For RRM we assume smaller number of beams.
  + Apple: Scenario A is much easier comparing to Scenario B. Can discuss separately.
  + CMCC: To Samsung, what is the motivation and meaning to exclude Scenario B?
    - Samsung: For Scenario B we are trying to reuse the infrastructure of FR1 HST deployments. We have some concerns on the use case. Also, there are some technical issues with this one. So, we can deprioritize it in Rel-17 if we cannot reach conclusions.
  + E///: Share same views with Samsung. Link budget analysis should be the basis for decision. Do not need that many RX beams.
* Agreements:
  + RX beam number for RRM requirements definition
    - Define two set of requirements for Scenario A and Scenario B in terms of number of RX beams per UE
      * Scenario A: [2] RX beams for all scenarios
      * Scenario B: [6] RX beams for all scenarios
      * FFS on feasibility and methods to differentiate scenarios from UE perspective
      * FFS if different UE capabilities shall be used for Scenario A and B support
    - Note: if there is insignificant difference between Scenario A and B requirements, then further discussion on unified requirements can take place

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115334 | WF on FR2 HST RRM (part 1) | Nokia |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2114568 | LS on UE capability and network signalling | Nokia, Nokia Shaghai Bell | Not Pursued | The preparation of LS is pending on the outcomes of ongoing discussions. |
| R4-2112264 | LS on Beam Management Enhancement Signaling | Qualcomm | Not Pursued | Need to wait agreement on the corresponding issues. |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115334 | WF on FR2 HST RRM (part 1) | Nokia | Approved |  |

**WF/LS for approval**

**R4-2115334 WF on FR2 HST RRM (part 1)**

*Type: other For: Approval  
 Source: Nokia*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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**Email discussion: [100-e][219] NR\_HST\_FR2\_RRM\_2**

**R4-2115209 Email discussion summary: [100-e][219] NR\_HST\_FR2\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115394 (from R4-2115209).**

**R4-2115394 Email discussion summary: [100-e][219] NR\_HST\_FR2\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 26th)**

**Sub-topic 1-2: Uplink timing**

* Proposals
  + Option 1: Introducing one shot TA adjustment
    - 1A: Network-controlled one-shot TA adjustment, i.e., based on the existing time alignment adjustment command.
    - 1B: One shot large TA adjustment performed autonomously by the CPE.
  + Option 2: Introducing deployment / implementation-based solution in Rel-17 and consider other WG impact in future release.
* WF proposal
  + It is recognized that introducing large TA adjustment command will have other WG impact which is out of scope of current WI. Solutions with other WG impact can be only discussed if WID is updated by involving other WG.
  + RAN4 will further study the below options which were identified as no impact to other WG to address uplink timing issues
    - Option 1: One shot UE autonomous large uplink timing adjustment
    - Option 2: Other implementation/deployment based on solution
* Discussion
  + Nokia: Our preference is to find solution in RAN4 but we are not sure it is feasible. Autonomous UL timing adjustment needs to be evaluated.
  + Samsung: RAN1/2 are not included in the WI scope. If we want to include other WGs then a revision is required.
* Agreements:
  + RAN4 will further study the below options to address uplink timing issues
    - Option 1: One shot UE autonomous large uplink timing adjustment
    - Option 2: Other implementation/deployment based on solution
* Session chair: Other WG impacts are not in the scope of the latest FR2 HST WID and whether new solutions with RAN1/2 impacts shall be defined require RAN decision. The discussion shall focus on RAN4 solutions and additional discussion can take place if it is identified that RAN4 solutions are not feasible.

**Sub-topic 2-3: TCI state switching delay requirements**

* WF proposal
* RAN4 will further study 1280ms duration for known condition
* RAN4 will further study the TCI switching delay requirements
  + Option 1: Reuse the existing TCI switching delay requirements for known condition
  + Option 2: NW triggered TCI switching to avoid sharp SNR drop
* Further enhancement on TCI switching delay based on Rel-17 TCI design shall be discussed in FeMIMO WI.
* Agreements
  + RAN4 will further study 1280ms duration for known condition
  + RAN4 will further study the TCI switching delay requirements
    - Option 1: Reuse the existing TCI switching delay requirements for known condition
    - Option 2: NW triggered TCI switching to avoid sharp SNR drop
  + Further enhancement on TCI switching delay based on Rel-17 TCI design can be discussed in FeMIMO WI.

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115335 | WF on FR2 HST RRM (part 2) | Samsung |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115335 | WF on FR2 HST RRM (part 2) | Samsung | Approved |  |

**WF/LS for approval**

**R4-2115335 WF on FR2 HST RRM (part 2)**

*Type: other For: Approval  
 Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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**R4-2112264 On NR FR2 HST RRM Requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

##### 9.9.4.1 General

**R4-2112498 Discussion on general RRM requirements for FR2 HST**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2113213 General RRM requirements for HST FR2**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113326 General requirements impacted for HST FR2**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

General requirements impacted for HST FR2

**Decision: Noted.**

**R4-2114467 Detailed simulation analysis for FR2 HST**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution, we provide an extended set of system simulation results including scenarios with DPS.

**Decision: Noted.**

**R4-2114568 LS on UE capability and network signalling for Rel-17 NR HST RRM**

*Type: LS out For: Approval  
 to RAN2  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

##### 9.9.4.2 Number of RX beams

**R4-2111954 Discussion on number of RX beams for HST RRM in FR2**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112091 Discussion on number of Rx beam for FR2 HST**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2113214 Discussion on RX beam number for HST FR2**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113272 Discussion on the Rx beams in RRM requirement**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113329 Number of RX beams for HST FR2**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Number of RX beams for HST FR2

**Decision: Noted.**

**R4-2113834 Discussion on number of Rx beam for FR2 HST**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114186 Discussion on the number of RX beams for FR2 HST**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

##### 9.9.4.3 RRC Idle/Inactive and connected state mobility requirements

**R4-2111955 Discussion on RRC Idle/Inactive and connected state mobility requirements for HST RRM in FR2**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112092 Discussion on mobility requirement for FR2 HST**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2112499 Discussion on mobility requirements for FR2 HST**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2113215 Discussion on RRC Idle Inactive and Connected state mobility requirements for HST FR2**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113273 Discussion on mobility requirements for FR2 HST**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113328 RRC Idle/Inactive and connected state mobility requirements for HST FR2**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

RRC Idle/Inactive and connected state mobility requirements for HST FR2

**Decision: Noted.**

**R4-2113835 Discussion on RRC Idle/Inactive and connected state mobility requirements for HST in FR2**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 9.9.4.4 Timing requirements

**R4-2111956 Discussion on timing requirements for HST RRM in FR2**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112093 Discussion on timing requirement for FR2 HST**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2113176 Timing requirements for FR2 HST**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2113216 Discussion on Timing Requirement for HST FR2**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113274 Discussion on timing requirements for FR2 HST**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2114180 On timing adjustment at beam change**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Our views on open issues in timing adjustment at beam change in HST FR2.

**Decision: Noted.**

**R4-2114187 Discussion on timing requirements for HST FR2**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2114561 On HST FR2 UL Timing Requirements**

*Type: discussion For: Discussion  
 Source: Nokia Germany*

**Decision: Noted.**

##### 9.9.4.5 Signalling characteristics requirements

**R4-2111957 Discussion on Signalling characteristics requirements for HST RRM in FR2**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112094 Discussion on signaling characteristic requirement for FR2 HST**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2113330 Signalling characteristics requirements for HST FR2**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Signalling characteristics requirements for HST FR2

**Decision: Noted.**

**R4-2113836 Discussion on signaling characteristics requirements for high speed train scenario in FR2**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114188 Discussion on the TCI state switching issue in HST FR2**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

##### 9.9.4.6 Measurement procedure requirements

**R4-2111958 Discussion on measurement procedure requirements for HST RRM in FR2**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112095 Discussion on measurement procedure requirement for FR2 HST**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2113327 Measurement procedure requirements for HST FR2**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Measurement procedure requirements for HST FR2

**Decision: Noted.**

**R4-2113837 Discussion on RRM requirements for high speed train scenario in FR2**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114586 Discussion on RRM measurement requirements for FR2 HST**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

### 9.10 Further RRM enhancement for NR and MR-DC

#### 9.10.1 General

#### 9.10.2 RRM core requirements

##### 9.10.2.1 SRS antenna port switching

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**Email discussion: [100-e][220] NR\_RRM\_enh2\_1**

**R4-2115210 Email discussion summary: [100-e][220] NR\_RRM\_enh2\_1**

*Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115395 (from R4-2115210).**

**R4-2115395 Email discussion summary: [100-e][220] NR\_RRM\_enh2\_1**

*Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 17th)**

**Issue 1-1-1: whether scheduling restriction requirement would be defined in RRM for SRS antenna port switching**

* Proposals
  + Option 1 (CATT, QC, CMCC): Don't define the scheduling restriction on symbols before and after SRS transmission for the cell with SRS antenna port switching and on SRS transmit symbols.
  + Option 1a (Huawei):
    - The impact of SRS AS on aggressor CC shall be considered based on the SRS AS resource instead of the fixed 6 OFDM symbols.
    - No need to define scheduling restriction on SRS AS carrier on symbols before and after SRS AS resource. Performance degradation on these symbols could be expected.
  + Option 2: Yes
    - Option 2a (Apple, MTK): RAN4 to agree that one OFDM symbol before and after the SRS antenna port switching shall be introduced as scheduling restriction for FR1, that is, UE has scheduling restriction to not transmit PUCCH/PUSCH/SRS or not receive SSB/PDCCH/PDSCH/TRS/CSI-RS for CQI on 1 data symbol before SRS transmission and 1 data symbol after SRS transmission.
    - Option 2b (vivo):
      * For FR1, specify scheduling restriction before and after the symbol(s) for SRS transmission, at least when the antenna port is switched, for the cell with SRS antenna port switching in R17.
      * RAN4 further discuss whether the scheduling restriction on the same carrier is specified in TS 38.133 or in RAN1 specs via LS to RAN1.
      * If RAN4 concludes necessity of clarifying the position of the transient period, it should be the 1 symbol before and the 1 symbol after the symbol(s) used for SRS transmission.
    - Option 2c (LG): Introduce scheduling restriction for one OFDM symbol before and after SRS antenna port switching for FR1, and no scheduling restriction after SRS antenna port switching is needed in case of the SRS resource is configured in the last symbol of the slot and the next slot is downlink.
    - Option 2d (OPPO): The scheduling restriction shall be defined before and after SRS transmission considering the 15 us SRS antenna switching time.
    - Option 2e (Ericsson): Scheduling restrictions are to be introduced for the case where there is no gap between PUSCH and SRS.
* Discussion
  + QC: We agree that signal cannot be transmitted. RF session defined transient period. Do we need additional scheduling restrictions? What about other cases with transient periods?
  + Vivo: RAN1 has some guard period. Need to have a common understanding if transient period means that we cannot have staggering first.
  + MTK: We would like to check if RF spec restricts any scheduling for the symbols. 1a can be also ok
  + LGE: RF spec does not define scheduling behavior.
  + Huawei: RF specs do not imply scheduling constraints and we suggest to specify that performance degradation is expected.
  + CMCC: It is up to NW scheduling whether to schedule UE during the transient period. We can add some clarification on performance degradation.
  + Apple: Agree with CMCC that NW can still schedule UE. 1a can be a good compromise.
  + CATT: Same view as Huawei and CMCC. Do we need to add same restriction for Demod as well?
  + Intel: Prefer Option 1
  + OPPO: Prefer Option 2a
  + Nokia: Based on RF specs the duration of transient period depends on SCS. Should we consider SCS dependency for scheduling restriction?
    - Apple: difficult to judge the exact degradation for different SCS
  + Nokia: How to capture this in spec?
    - Huawei: we have some examples for DAPS
* Agreements:
  + Do not define the scheduling restriction on symbols before and after SRS transmission for the cell with SRS antenna port switching and on SRS transmit symbols in Rel-17
    - Performance degradation on these symbols can be expected
    - FFS how to capture this in TS 38.133

**Issue 1-3-1: Interruption requirement applicability**

* Proposals
  + Option 1 (Apple, QC, MTK, Intel, OPPO): SRS antenna switching interruptions on both DL and UL applies to the band combinations signaled in *txSwitchImpactToRx* or *txSwitchWithAnotherBand*.
  + Option 2 (CATT, vivo, Xiaomi, Nokia, HW): *txSwitchImpactToRx* indicates the SRS antenna port switching impact to DL only, and *txSwitchWithAnotherBand* indicates the SRS antenna port switching impact to UL only.
* Chair: TS 38.306
  + *- txSwitchImpactToRx* indicates the entry number of the first-listed band with UL (see NOTE) in the band combination that affects this DL, which is mandatory with capability signaling;
  + *- txSwitchWithAnotherBand* indicates the entry number of the first-listed band with UL (see NOTE) in the band combination that switches together with this UL, which is mandatory with capability signaling.
* Discussion
  + Apple: Can compromise to Option 2. If both DL and UL are affected then UE can include the combination in both sets.
  + QC: If DL is interrupted then there will be impact on UL. If UL is interrupted then there will be impact on DL. So, no need to differentiate the two cases.
  + vivo: the issue is relevant to test case design and we can have a new test case design
  + OPPO: Share same concerns as QC. When we discuss interruption we typically assume interruptions on both DL and UL.
  + MTK: Same view as QC.
  + Huawei: In the test case we cannot differentiate interruptions in the test. Same time this is not the reason to change the definition.
  + Intel: Same view as QC.
  + Nokia: For test cases we can define interruptions separately.
* Chair: Common understanding that *txSwitchImpactToRx* indicates the SRS antenna port switching impact to DL only, and *txSwitchWithAnotherBand* indicates the SRS antenna port switching impact to UL only. No common understanding if interruptions should be limited to one direction (DL or UL) or both DL and UL. Recommend to continue discussion.

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115336 | WF on further RRM enhancement for NR and MR-DC - SRS antenna port switching | Apple |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115336 | WF on further RRM enhancement for NR and MR-DC - SRS antenna port switching | Apple | Approved |  |

**WF/LS for approval**

**R4-2115336 WF on further RRM enhancement for NR and MR-DC - SRS antenna port switching**

*Type: other For: Approval  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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**R4-2111926 Further discussion on SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2111927 The requirements for SRS antenna port switching**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: B (Rel-17)  
  
 Source: CATT*

**Abstract:**

Session Chair: Draft CR R4-2111927 will not be treated

**Decision: Noted.**

**R4-2112124 Discussion on SRS antenna port switching**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2112177 Discussion on RRM requirements for SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112256 On SRS antenna switching**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2112414 Further discussion on RRM requirements for SRS antenna switching**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2112512 Discussion on SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2112522 Discussion on SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2112675 Discussion on interruption due to SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2112877 Interruption requirements at SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113138 Discussion about SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113275 RRM requirements for SRS ant port switch**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2114139 Discussion on requirements for SRS antenna switching**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2114174 On RRM requirements for SRS antenna port switching**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Our views on open issues in SRS antenna port switching.

**Decision: Noted.**

##### 9.10.2.2 HO with PSCell

================================================================================

**Email discussion: [100-e][221] NR\_RRM\_enh2\_2**

**R4-2115211 Email discussion summary: [100-e][221] NR\_RRM\_enh2\_2**

*Type: other For: Information  
 Source: Moderator (vivo)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115396 (from R4-2115211).**

**R4-2115396 Email discussion summary: [100-e][221] NR\_RRM\_enh2\_2**

*Type: other For: Information  
 Source: Moderator (vivo)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 17th)**

**Issue 2-2-1a: Condition of parallel processing without considering RACH**

* Proposals
  + Option 1a (Apple):
    - In HO with PSCell for NR-DC to NR-DC, if SMTC of target unknown PSCell is configured in targetcellSMTC-SCG-r16, sequential processing shall be assumed; otherwise, parallel processing shall be assumed.
    - In HO with PSCell for NR-DC to NR-DC, if SMTC of target unknown PSCell is not configured in either targetcellSMTC-SCG-r16 or reconfigurationWithSync,
      * UE uses the SMTC in the MO having the same SSB frequency and subcarrier spacing as target PSCell if either source PCell or source PSCell configured this MO, or
      * UE uses the SMTC in the MO from source PCell if both source PCell and source PSCell configured MOs having the same SSB frequency and subcarrier spacing as target PSCell, or
      * UE assumes 5ms as SSB periodicity for target PSCell if neither source PCell nor source PSCell configured MOs having the same SSB frequency and subcarrier spacing as the target PSCell.
    - In HO with PSCell for NR SA to EN-DC, if SMTC of target unknown PSCell is configured in targetcellSMTC-SCG-r16, sequential processing shall be assumed; otherwise, parallel processing shall be assumed.
    - In HO with PSCell for NR SA to EN-DC, if SMTC of target unknown PSCell is not configured in either targetcellSMTC-SCG-r16 or reconfigurationWithSync,
      * UE uses the SMTC in the MO having the same SSB frequency and subcarrier spacing as target PSCell, or
      * UE assumes 5ms as SSB periodicity for target PSCell if source PCell didn’t configure MO having the same SSB frequency and subcarrier spacing as the target PSCell.
    - In HO with PSCell for EN-DC to EN-DC, parallel processing shall be assumed.
    - In HO with PSCell for EN-DC to EN-DC, if SMTC of target unknown PSCell is not configured in RRCConnectionReconfiguration,
      * UE uses the SMTC in the MO having the same SSB frequency and subcarrier spacing as target NR PSCell if either source LTE PCell or source NR PSCell configured this MO, or
      * UE uses the SMTC in the MO from source LTE PCell if both source LTE PCell and source NR PSCell configured MOs having the same SSB frequency and subcarrier spacing as target NR PSCell, or
      * UE assumes 5ms as SSB periodicity for target NR PSCell if neither source LTE PCell nor source NR PSCell configured MOs having the same SSB frequency and subcarrier spacing as the target NR PSCell.
    - In HO with PSCell for NE-DC to NE-DC, parallel processing shall be assumed.
  + Option 1b (CMCC):
    - For the case that targetCellSMTC-SCG-r16 is configured, the timeline for HO with PSCell can be partially sequential
    - For other cases except the configuration of targetCellSMTC-SCG-r16, parallel processing is assumed.
  + Option 1c (Huawei):
    - For HO with PSCell in NR-DC, cell searching and fine timing tracking shall be performed sequentially when targetCellSMTC-SCG is configured.
  + Option 1d (MTK):
    - For NR-DC to NR-DC, sequential processing cell search and timing sync is needed when targetCellSMTC-SCG is configured.
    - Otherwise, parallel processing is assumed
  + Option 2a (CATT, Xiaomi, ZTE, Ericsson, Nokia):
    - Parallel processing shall be the baseline for delay requirements
  + Option 2b (vivo):
    - Take parallel processing for R17 HO with PSCell for all procedure including RACH, and for all configurations including the case that ‘targetcellSMTC-SCG-r16’ is configured
  + Option 2c (Intel):
    - After RRC processing, parallel processing including RACH can be performed for PCell HO and PSCell addition.
  + Option 2d (OPPO):
    - PCell HO and PSCell addition, without considering RA procedures and Tprocessing, are performed in parallel independently.
* Discussion
  + Chair: discuss NR-DC to NR-DC case first
  + Apple: RAN2 agreed CR last meeting and include targetcellSMTC-SCG-r16 and reconfigurationWithSync
  + MTK: Agree with Apple. Network needs to consider different combinations of targetcellSMTC-SCG-r16 and reconfigurationWithSync configurations
  + Huawei: Need to decide if we consider new Rel-16 configuration (targetCellSMTC-SCG) or not.
  + QC: Agree with Huawei. Would like to check infra vendors feedback on targetCellSMTC-SCG.
  + E///: When targetCellSMTC-SCG is used then we can use sequential processing for unknown cells
  + Nokia: Parallel processing shall be baseline
  + Vivo: Understand logic behind option 1. Prefer not to define requirement when targetcellSMTC-SCG-r16 is only configured.
  + Intel: Need feedback from network vendors if scenario is typical. When the target PSCell is known then we can assume parallel processing
* Agreements:
  + In HO with PSCell for NR-DC to NR-DC
    - Parallel processing shall be the baseline for delay requirements
    - Sequential processing shall be assumed for the following cases
      * Case 1: If SMTC of target unknown PSCell is configured in targetcellSMTC-SCG-r16 but not configured in reconfigurationWithSync.
      * Sequential processing is used for cell search and [timing sync]. FFS if additional margin shall be added.

**Issue 2-4-3: RACH occasion on NR-U CC for HO with PSCell**

* Proposals:
  + Option 1 (Ericsson):
    - RAN4 to further study whether RA for spCell on unlicensed carrier with CCA shall be prioritized over RA for spCell on licensed carrier, once CCA is successful.
  + Option 2 (CATT, Apple):
    - The NR-U scenario is out of scope of this WID, no need to discuss.
* Discussion
  + E///: we have one specific requirement.
  + Apple: Should we consider impact on DL. Suggest to limit to EN-DC to EN-DC case
  + QC: Support Option 1. Operator interest.
  + vivo: PSCell addition requirements need to be added. Prefer to handle in Rel-18.
* Agreement: Continue discussion on RACH occasion on NR-U CC for HO with PSCell in RAN4 #101e
  + Prioritize EN-DC to EN-DC scenario
  + Companies are encouraged to provide inputs on the candidate requirements
  + FFS whether to introduce requirements

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115337 | WF on further RRM enhancement for NR and MR-DC – HO with PSCell | vivo |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115337 | WF on further RRM enhancement for NR and MR-DC – HO with PSCell | vivo | Approved |  |

**WF/LS for approval**

**R4-2115337 WF on further RRM enhancement for NR and MR-DC – HO with PSCell**

*Type: other For: Approval  
 Source: vivo*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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**R4-2111928 Further discussion on HO with PSCell**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2111929 The requirements for HO with PSCell**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: B (Rel-17)  
  
 Source: CATT*

**Decision: Withdrawn.**

**R4-2112125 Discussion on RRM requirement for handover with PSCell**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2112178 Discussion on RRM requirements for HO with PSCell**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112419 Further discussion on RRM requirements for handover with PSCell**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2112501 Discussion on HO with PSCell**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2113139 Discussion about HO with PSCell**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113202 Discussion on requirements for HO with PSCell**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113276 RRM requirements for HO with PSCell**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2114140 Discussion on requirements for HO with PSCell**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2114152 Discussion on HO with PSCell**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2114175 On RRM requirements for handover with PSCell**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Our views on open issues in Handover with PSCell.

**Decision: Noted.**

**R4-2114213 discussion on HO with PSCell**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

discussion on HO with PSCell

**Decision: Noted.**

**R4-2114429 Views on HO w PSCell**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Updates on requirements due to RAN2 LS and progress

**Decision: Noted.**

##### 9.10.2.3 PUCCH SCell activation/deactivation

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**Email discussion: [100-e][222] NR\_RRM\_enh2\_3**

**R4-2115212 Email discussion summary: [100-e][221] NR\_RRM\_enh2\_3**

*Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115397 (from R4-2115212).**

**R4-2115397 Email discussion summary: [100-e][221] NR\_RRM\_enh2\_3**

*Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 17th)**

**Sub-topic 1-1 Ending point of PUCCH SCell activation for invalid TA case**

* Proposals
  + Option 1: (CATT)
    - The point when UE transmits PRACH on PUCCH Scell
  + Option 2: (NTT DOCOMO, Apple, Xiaomi, CMCC, MTK, vivo, ZTE, OPPO, Huawei, Ericsson)
    - The point when UE transmits valid CSI report on the target PUCCH SCell
  + Option 3: (Nokia)
    - The point of RACH completion
* Discussion
  + CATT: For Option 1 – the rationale is that this point corresponds to the situation when UE can use both DL and UL.
  + Nokia: From scheduling availability perspective Msg 3 is a sufficient point for gNB to be able to perform scheduling
  + QC: For this case the NW perspective the CSI feedback is needed to assess the link quality
  + Apple: RACH completion does not mean that UE can start DL/UL operation. Valid CSI is a conservative approach to let NW know that UE is ready.
  + MediaTek: Same view as QC and Apple.
  + vivo: Option 2
  + CATT: what was the rationale in LTE?
  + Nokia: There is some difference in LTE/NR and we cannot simply follow LTE.
  + CATT: can compromise to Option 2.
  + Apple/QC: NW is not precluded to schedule UE before completion of CSI feedback. To ensure that DL signals can be received CSI feedback should be provided.
  + Nokia: still have concerns
  + Chair: come back in the 2nd round to make final decision.
* Tentative agreements:
  + The point when UE transmits valid CSI report on the target PUCCH SCell

**GTW session (August 26th)**

**Sub-topic 1-1 Ending point of PUCCH SCell activation for invalid TA case**

* Agreements:
  + The point when UE transmits valid CSI report on the target PUCCH SCell
    - Note: Network is not precluded to schedule UE with DL/UL transmission before the ending point but UE performance is not guaranteed

**LS on beam information of PUCCH Scell in PUCCH SCell activation procedure**

Session chair: Discus till Fri. Return to in Final round.

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115338 | WF on further RRM enhancement for NR and MR-DC - PUCCH SCell activation/deactivation requirements | CATT |  |
| R4-2115339 | LS on beam information of PUCCH Scell in PUCCH SCell activation procedure | Huawei |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115338 | WF on further RRM enhancement for NR and MR-DC - PUCCH SCell activation/deactivation requirements | CATT | Approved |  |
| R4-2115339 | LS on beam information of PUCCH Scell in PUCCH SCell activation procedure | Huawei | Return to | To be handled in GTW |

**WF/LS for approval**

**R4-2115338 WF on further RRM enhancement for NR and MR-DC - PUCCH SCell activation/deactivation requirements**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115339 LS on beam information of PUCCH Scell in PUCCH SCell activation procedure**

*Type: LS out For: Approval  
 to RAN1, RAN2  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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**R4-2111930 Further discussion on PUCCH SCell activation\_deactivation**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2111931 The requirements for PUCCH SCell activation\_deactivation**

*Type: draftCR For: Endorsement  
 38.133 v17.2.0 CR- rev Cat: B (Rel-17)  
  
 Source: CATT*

**Decision: Withdrawn.**

**R4-2112053 Discussions on PUCCH SCell Activation/Deactivation delay requirements**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Decision: Noted.**

**R4-2112126 Discussion on PUCCH SCell activation and deactivation**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2112420 Further discussion on SCell activation and deactication requirements for PUCCH SCell**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2112510 Discussion on PUCCH SCell activation/deactivation**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2112521 Discussion on PUCCH SCell activation and deactivation**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2112638 Further views on PUCCH SCell activation and deactivation**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112701 PUCCH SCell activation and deactivation**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2112876 Discussion on the activation delay for deactivated PUCCH SCell**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113201 Discussion on PUCCH SCell activation and deactivation**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113277 RRM requirements for PUCCH SCell ActivationDeactivation**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2114141 Discussion on requirements for PUCCH SCell activation**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2114176 On RRM requirements for SCell (de)activation with PUCCH**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Our views on open issues in SCell activation/deactivation with PUCCH.

**Decision: Noted.**

### 9.11 NR and MR-DC measurement gap enhancements

#### 9.11.1 General

#### 9.11.2 RRM core requirements

##### 9.11.2.1 Pre-configured MG pattern(s)

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**Email discussion: [100-e][224] NR\_MG\_enh\_2**

**R4-2115214 Email discussion summary: [100-e][224] NR\_MG\_enh\_2**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115398 (from R4-2115214).**

**R4-2115398 Email discussion summary: [100-e][224] NR\_MG\_enh\_2**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 18th)**

**Issue 2-2: How pre-configured MGs can be activated/deactivated**

* Proposals
  + Option 1a (Ericsson, Xiaomi, CMCC, ZTE) Autonomously/implicitly triggered by BWP switching DCI/Timer.
  + Option 1b (MTK) Autonomously/implicitly triggered by finishing the following network commands and procedures: BWP switching, adding/removing any measurement object(s), adding/releasing/changing a PSCell, activating/de-activating any SCell(s).
  + Option 1c (Huawei) Autonomously/implicitly triggered by
    - BWP switching or
    - other RRC procedures that could trigger a change in need for MG, e.g.
      * RRC (re)configuration of MO
      * RRC (re)configuration of serving cells
      * SCell activation and deactivation
  + Option 2a (Intel, Qualcomm, vivo, OPPO, Apple, Xiaomi, [MTK]) the pre-configured MG activation/deactivation is triggered by the BWP switch and under the control by the NW via its RRC configuration message.
  + Option 2b (CATT, Nokia) the pre-configured MG activation/deactivation is triggered by the BWP switch and under the control of the DCI for triggering BWP switch or new DCI/MAC CE/RRC after BWP switch
* Discussion
  + Apple: Not clear on difference on 1a and 2a. For 2a an explicit flag for pre-MG configuration is expected. If so, we support it.
  + MTK: For Option 1 UE will check the frequency location of SSB and its SSB. For Option 2, the NW will just say in BWP configuration if UE should use the gap or not. We think that Option 1 is sufficient. Can be fine with Option 2A.
  + QC: Option 2a asks to provide NW indication if pre-MG is used for the specific BWP. 2b can reduce the latency.
  + E///: Option 1. Rules are sufficient. We still need to define the rules if the signalling is defined.
  + Huawei: Option 1. Benefits of additional signalling are not clear. The signalling cannot work for some cases like SCell activation
  + Xiaomi: Option 2a can reduce UE complexity
  + CATT: Option 2b. Other RRC procedures are out of scope of this WI. 1 bit indication can be included in DCI.
  + Nokia: Option 2b. For Option 2a – it is not very clear.
  + CMCC: No strong preference. Can we consider both solutions (i.e. handle the cases when network does provide and does not provide assistance)?
  + OPPO/vivo: Option 2a
  + ZTE: Support Option 1.
* Agreements:
  + The pre-configured MG activation/deactivation is triggered by the DCI/Timer based BWP switch
    - FFS if additional conditions for pre-configured MG activation/deactivation shall be considered
  + NW can control activation/deactivation of pre-configured MG for the specific BWP
    - Option 1: via its RRC configuration message
    - Option 2: via DCI or MAC configurations
  + Additional explicit rules for pre-configured MG autonomous activation/deactivation shall be defined for the case when signalling is not provided
  + UE capability on the support of NW-controlled and autonomous pre-configured MG activation/deactivation mechanisms can be further discussed

**GTW session (August 26th)**

How pre-configured MGs can be activated/deactivated

* 1st round agreement
  + NW can control activation/deactivation of pre-configured MG for the specific BWP
    - Option 1: via its RRC configuration message
    - Option 2: via DCI or MAC configurations
* Discussion
  + Session chair: possible RAN1/2 impacts shall be clarified due to approaching Rel-17 completion, especially in RAN1
  + E///: There are two cases. At the time of configuration it is more straightforward to use RRC. The question on the latter moment. We are open to different alternatives.
  + Intel: Based on 2nd round most companies accept Option 1 and other options can be considered as enhancements.
  + vivo: Option 1.
  + QC: prefer Option 1. For Option 2 MAC CE is preferred
  + MTK: Option 1.
* Agreements
  + The pre-configured MG activation/deactivation is triggered by the DCI/Timer based BWP switch
    - FFS if additional conditions for pre-configured MG activation/deactivation shall be considered
  + NW can control activation/deactivation of pre-configured MG
    - RRC-based activation/deactivation method is supported.
      * Network can indicate activation/deactivation status per BWP
      * Details of signalling are FFS.
    - FFS if MAC CE based activation/deactivation method is supported
  + Additional explicit rules for pre-configured MG autonomous activation/deactivation shall be defined for the case when signalling is not provided
  + UE capability on the support of NW-controlled and autonomous pre-configured MG activation/deactivation mechanisms can be further discussed
  + Companies are encouraged to bring inputs on the conditions when NW-based activation/deactivation and explicit rules for activation/deactivation are used

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115340 | WF on R17 NR MG enhancements – Pre-configured MG | Intel |  |
| R4-2115341 | LS on R17 NR MG enhancements – Pre-configured MG | Huawei, vivo | Can decide whether need to send LS to RAN2 up to the final agreements after 2nd round discussion. |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115340 | WF on R17 NR MG enhancements – Pre-configured MG | Intel | Approved |  |
| R4-2115341 | LS on R17 NR MG enhancements – Pre-configured MG | Huawei, vivo | Return to | To be handled in GTW |

**WF/LS for approval**

**R4-2115340 WF on R17 NR MG enhancements – Pre-configured MG**

*Type: other For: Approval  
 Source: Intel Corporation*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115341 LS on R17 NR MG enhancements – Pre-configured MG**

*Type: LS out For: Approval  
 to RAN2  
 Source: Huawei, vivo*

**Abstract:**

**Discussion:**

Chair: Return in the final round. Extend discussion till Fri.

**Decision: Revised to R4-2115438 (from R4-2115341).**

**R4-2115438 LS on R17 NR MG enhancements – Pre-configured MG**

*Type: LS out For: Approval  
 to RAN2  
 Source: Huawei, vivo*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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**R4-2111995 Discussion on pre-configured MG pattern**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112069 Further consideration on Pre-MG pattern**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2112392 Discussion on pre-configured gap**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2112421 Further discussion on pre-configured MG pattern for NR**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2112509 Discussion on pre-configured MG pattern(s)**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2112639 Further views on pre-configured MG patterns**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113150 Discussion on pre-configured measurement gap**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113208 Views on pre-configured MG patterns**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113278 On pre-configured MG pattern(s) for NR\_MG\_enh**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2114063 Discussion on Pre-configured MG patterns**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Discussion on pre-configured MG patterns for NR

**Decision: Noted.**

**R4-2114305 Discussion on pre-configured MG**

*Type: LS out For: Approval  
 to RAN2  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114427 Further views on pre-configured MG pattern(s)**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Supporting explicit indication of BWP and MG association

**Decision: Noted.**

**R4-2114445 Further analysis of pre-configured measurement gap pattern**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

This document further analyzes RRM requirements for pre-configured MG in NR and MR-DC

**Decision: Noted.**

##### 9.11.2.2 Multiple concurrent and independent MG patterns

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**Email discussion: [100-e][223] NR\_MG\_enh\_1**

**R4-2115213 Email discussion summary: [100-e][223] NR\_MG\_enh\_1**

*Type: other For: Information  
 Source: Moderator (MediaTek)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115399 (from R4-2115213).**

**R4-2115399 Email discussion summary: [100-e][223] NR\_MG\_enh\_1**

*Type: other For: Information  
 Source: Moderator (MediaTek)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 18th)**

**Issue 2-1: UE behavior without association between gap and dedicated use cases**

* Proposals
  + Option 1: ZTE, OPPO, Nokia, QC
    - Fallback to legacy behaviour, e.g., concurrent MG is applicable for all MOs and all RS for which the UE need gap assistance
  + Option 2: vivo
    - All MOs which require measurement gaps share all configured maps equally
  + Option 3: Apple
    - If some MO can be covered by more than one MGP and the association between MGP and dedicated use case(s) is not provided, define requirements based on the assumption that each layer is measured with the MGP with longest MGRP
  + Option 4: Huawei
    - The association should be mandatory, when concurrent MGs are configured
  + Option 5: CATT, MTK
    - Leave it low priority in this release
  + Option 6: Xiaomi
    - Up to UE implementation
  + Option 7: Ericsson
    - UE will perform the measurements only in default MGP once the association isn’t provided for concurrent gaps.
* Discussion
  + E///: Option 4 is fine.
  + CATT: Same view as E///. Need to wait for RAN2 design
  + Apple: Option 4 is also acceptable.
  + vivo: Option 4 is ok.
  + Nokia: Option 1 or 4
  + Intel: same as Nokia
  + Chair: the LS may include additional details on RAN4 understanding on frequency layers and dedicated use cases. Common understanding that frequency layer includes Positioning layer.
* Agreements:
  + When concurrent MGs are configured, the association between concurrent MGs and frequency layers (dedicated use case(s)) to be measured shall be RRC configured
    - If it is not feasible from RAN2 perspective to ensure that association between concurrent MGs and frequency layers to be measured is always provided, then additional solution can be discussed on how to handle this use case.

**Issue 4-1: Rule for colliding gap occasions, if one of FO, FPO, PFO, PPO cases is introduced**

* Proposals
  + Option 1: CATT, [Apple], Xiaomi, Huawei
    - Define a sharing factor between 2 gaps, e.g., given X% gap sharing, the measurement w.r.t. one gap will share roughly X% of the time, while the other gap shares the remaining
  + Option 2: LGE
    - Consider priority when measuring only in one MG in occasions where the two MGs are overlapped.
    - Consider gap sharing if each priority for two MGs is same
  + Option 3: MTK, Xiaomi, Nokia
    - Only priority rule, e.g., UE will only do the measurement w.r.t. the gap with higher priority on all colliding occasions.
  + Option 3a: QC
    - Per-UE MG takes higher priority than per-FR MG for case2 when two MGs of different types overlap.
  + Option 4: Ericsson
    - Define a general ~~cancel~~ rule for UE on
      * which of the two gaps shall be keep, and
      * what is the condition to apply the rule
* Discussion
  + E///: Option 4
  + QC: Option 3a
  + LGE: Network shall indicate priority. Prefer Option 3.
  + Apple: Do not think 3a is a complete solution and need to handle other cases. To LGE, we are fine for network to indicate priority, but Option 1 is the first preferences.
  + Vivo: Similar view as Apple
  + OPPO: Option 1 and Option 3 are valid
  + Intel: For Option 4, need to understand how we identify proximity of different UE gaps.
  + Chair: Continue discussion. Aim to down-select candidate options.

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115342 | WF on R17 NR MG enhancements - Multiple concurrent and independent MG patterns | MediaTek inc. |  |
| R4-2115343 | LS on R17 NR MG enhancements – Concurrent MG | CATT, MediaTek inc. |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115342 | WF on R17 NR MG enhancements - Multiple concurrent and independent MG patterns | MediaTek inc. | Approved |  |
| R4-2115343 | LS on R17 NR MG enhancements – Concurrent MG | CATT, MediaTek inc. | Approved |  |

**WF/LS for approval**

**R4-2115342 WF on R17 NR MG enhancements - Multiple concurrent and independent MG patterns**

*Type: other For: Approval  
 Source: MediaTek inc.*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115343 LS on R17 NR MG enhancements – Concurrent MG**

*Type: LS out For: Approval  
 to RAN2; Cc: RAN1  
 Source: CATT, MediaTek inc.*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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**R4-2111996 Discussion on multiple concurrent and independent MG patterns**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2111997 Draft LS on association between multiple MG patterns and use cases**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112070 On multiple concurrent and independent MG patterns**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2112340 Discussion on multiple concurrent and independent MG patterns**

*Type: discussion For: (not specified)  
 Source: LG Electronics*

**Abstract:**

It discusses issues related to multiple concurrent and independent MG patterns.

**Decision: Noted.**

**R4-2112393 Discussion on concurrent gaps**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2112422 Further discussion on multiple concurrent and independent MG patterns for NR**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2112502 Discussion on multiple concurrent and independent MG patterns**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2112640 On multiple concurrent and independent MG patterns**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113151 Discussion on multiple and independent concurrent measurement gaps**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113209 Views on multiple concurrent and independent MGs**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113279 On multiple concurrent and independent MG patterns for NR\_MG\_enh**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113637 Discussion on Multiple concurrent MG patterns**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses concurrent gaps

**Decision: Noted.**

**R4-2114023 Discussion on concurrent measurement gaps**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2114306 Discussion on multiple concurrent MGs**

*Type: LS out For: Approval  
 to RAN2  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114426 Further views on multiple concurrent and independent MG**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Supporting compatibility of position measurement with multiple concurrent gap

**Decision: Noted.**

##### 9.11.2.3 Network Controlled Small Gap

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**Email discussion: [100-e][225] NR\_MG\_enh\_3**

**R4-2115215 Email discussion summary: [100-e][225] NR\_MG\_enh\_3**

*Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115400 (from R4-2115215).**

**R4-2115400 Email discussion summary: [100-e][225] NR\_MG\_enh\_3**

*Type: other For: Information  
 Source: Moderator (Apple)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 26th)**

**Issue 2-1: supported NCSG patterns in R17**

* Agreement in the 1st round:
  + No need to introduce NCSG patterns corresponding to legacy MG patterns #24 and #25.
  + It is FFS whether to introduce NCSG patterns with longer repetition periodicity (>160ms).
* Open issues:
  + Corresponding minimum MGL
    - Option 1: 1.5ms
    - Option 2: 3ms
    - Option 3: 5.5ms
    - Option 4: 4ms for FR1 and 3.5ms for FR2
    - Option 5: 3ms for FR1 and 1.5ms for FR2
    - Option 6: Define NCSG patterns corresponding to legacy patterns #0~#23. Allow UE to separately indicate support of each NCSG pattern (some patterns can be mandatory if UE supports NCSG)
  + Corresponding minimum MGRP
    - Option 1: 20ms
    - Option 2: 40ms
    - Option 3: Define NCSG patterns corresponding to legacy patterns #0~#23. Allow UE to separately indicate support of each NCSG pattern (some patterns can be mandatory if UE supports NCSG)
* Status

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Gap Pattern Id | Measurement Gap Length (MGL, ms) | Measurement Gap Repetition Period  (MGRP, ms) | Whether to define corresponding NCSG pattern | |
| Proponent | Opponent |
| 0 | 6 | 40 | MTK, CMCC, ZTE, Oppo, Ericsson, Nokia |  |
| 1 | 6 | 80 | MTK, CMCC, ZTE, Oppo, Ericsson, Nokia |  |
| 2 | 3 | 40 | MTK, CMCC, ZTE | CATT, Nokia, Huawei |
| 3 | 3 | 80 | MTK, CMCC, ZTE | CATT, Nokia, Huawei |
| 4 | 6 | 20 | MTK, CMCC, ZTE, Oppo, Nokia | Vivo, Intel |
| 5 | 6 | 160 | MTK, CMCC, ZTE, Oppo, Nokia |  |
| 6 | 4 | 20 | MTK, CMCC, ZTE, Nokia | Vivo, Intel |
| 7 | 4 | 40 | MTK, CMCC, ZTE, Nokia |  |
| 8 | 4 | 80 | MTK, CMCC, ZTE, Nokia |  |
| 9 | 4 | 160 | MTK, CMCC, ZTE, Nokia |  |
| 10 | 3 | 20 | MTK, CMCC, ZTE | CATT, Vivo, Intel, Nokia, Huawei |
| 11 | 3 | 160 | MTK, CMCC, ZTE | CATT, Nokia, Huawei |
| 12 | 5.5 | 20 | MTK, CMCC, ZTE, Oppo, Nokia | Vivo, Intel |
| 13 | 5.5 | 40 | MTK, CMCC, ZTE, Oppo, Ericsson, Nokia |  |
| 14 | 5.5 | 80 | MTK, CMCC, ZTE, Oppo, Ericsson, Nokia |  |
| 15 | 5.5 | 160 | MTK, CMCC, ZTE, Oppo, Nokia |  |
| 16 | 3.5 | 20 | MTK, CMCC, ZTE, Nokia | Vivo, Intel |
| 17 | 3.5 | 40 | MTK, CMCC, ZTE, Nokia |  |
| 18 | 3.5 | 80 | MTK, CMCC, ZTE, Nokia |  |
| 19 | 3.5 | 160 | MTK, CMCC, ZTE, Nokia | Vivo, Intel |
| 20 | 1.5 | 20 | MTK, CMCC, ZTE | CATT, Nokia, Huawei |
| 21 | 1.5 | 40 | MTK, CMCC, ZTE | CATT, Nokia, Huawei |
| 22 | 1.5 | 80 | MTK, CMCC, ZTE | CATT, Nokia, Huawei |
| 23 | 1.5 | 160 | MTK, CMCC, ZTE | CATT, Nokia, Huawei |
| ~~24~~ | ~~10~~ | ~~80~~ |  | ~~MTK, CMCC, ZTE, Intel, Nokia, Huawei~~ |
| ~~25~~ | ~~20~~ | ~~160~~ |  | ~~MTK, CMCC, ZTE, Intel, Nokia, Huawei~~ |
| x | y | 256/320/512/640/1024/1280ms | QC |  |

* Agreements:
  + Define NCSG patterns corresponding to legacy patterns #0~#23
  + FFS how to indicate the support of NCSG patterns
  + A subset of mandatory NCSG patterns for UEs supporting NCSG will be defined. FFS on the set of mandatory NCSG patterns.

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115344 | WF on R17 NR MG enhancement - NCSG | Apple |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115344 | WF on R17 NR MG enhancement - NCSG | Apple | Approved |  |

**WF/LS for approval**

**R4-2115344 WF on R17 NR MG enhancement - NCSG**

*Type: other For: Approval  
 Source: Apple*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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**R4-2111998 Discussion on Network Controlled Small Gap (NCSG)**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112071 On network controlled small gap**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2112394 Discussion on NCSG**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2112503 Discussion on Network Controlled Small Gap**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2112641 Further views on network controlled small gap patterns**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113152 Discussion on NCSG**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113210 Views on NCSG**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113280 On NCSG for NR\_MG\_enh**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2114064 Discussion on Network Controlled Small Gaps for NR**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Discussion on introduction of NCSG for NR

**Decision: Noted.**

**R4-2114307 Discussion on NCSG**

*Type: LS out For: Approval  
 to RAN2  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114428 Further views on network controlled small gap**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Choice of VIL and other key issues

**Decision: Noted.**

**R4-2114446 Further analysis of network controlled small gap**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

This document further analyzes RRM requirements for NCSG in NR and MR-DC

**Decision: Noted.**

### 9.13 Solutions for NR to support non-terrestrial networks (NTN)

#### 9.13.5 RRM core requirements

================================================================================

**Email discussion: [100-e][226] NR\_NTN\_solutions\_RRM\_1**

**R4-2115216 Email discussion summary: [100-e][226] NR\_NTN\_solutions\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115401 (from R4-2115216).**

**R4-2115401 Email discussion summary: [100-e][226] NR\_NTN\_solutions\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 19th)**

**Issue #1-1-1 MR-DC and CA**

* Proposals
  + (CATT, Ericsson): Do not consider MR-DC/CA for measurement and mobility
* Agreements:
  + RAN4 does not consider MR-DC/CA for measurement and mobility in Rel-17

**Issue #1-1-4 TN-NTN**

* Proposals
  + (Qualcomm (for Idle/Inactive mode), Ericsson, LGE): Consider TN-NTN mobility
* Recommended WF
  + For RRC Idle/Inactive mode, RAN4 to consider TN-NTN measurement/mobility requirement
  + For RRC Connected, further discussion on whether to consider or deprioritize TN-NTN measurement/mobility requirement development
* Agreements:
  + For RRC Idle/Inactive mode
    - Define measurement/mobility requirements within NTN
    - Define measurement/mobility requirements for TN-NTN
    - Note: Inactive mode decision can be revisited in case the use case is deprioritized in other WGs
  + For RRC Connected
    - Define measurement/mobility requirements within NTN
    - FFS whether to define measurement/mobility requirements for TN-NTN

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115345 | WF on RRM requirements for NTN measurement and mobility | Qualcomm |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115345 | WF on RRM requirements for NTN measurement and mobility | Qualcomm | Approved |  |

**WF/LS for approval**

**R4-2115345 WF on RRM requirements for NTN measurement and mobility**

*Type: other For: Approval  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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**Email discussion:** **[100-e][227] NR\_NTN\_solutions\_RRM\_2**

**R4-2115217 Email discussion summary: [100-e][227] NR\_NTN\_solutions\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (Xiaomi)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115402 (from R4-2115217).**

**R4-2115402 Email discussion summary: [100-e][227] NR\_NTN\_solutions\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (Xiaomi)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 19th)**

**Reply LS for the incoming LS (R1-2102263)**

Chair: recommend to provide response LS summarizing the current agreements and status of discussion.

**Issue 2-2-1: The composites should be considered for initial transmit timing requirement in NTN (Te\_NTN).**

* Proposals
  + Option 1: (CATT, Apple, CMCC, Xiaomi, LGE, OPPO, QC)
    - UE position estimation error
    - Serving-satellite position estimation error
    - The current UE transmit timing error requirement defined in TS38.133
  + Option 1a: (Apple commented in 1st round discussion)
    - The framework of Te\_NTN = legacy Te + 2\*GNSS accuracy + 2\*Serving-satellite position estimation error
  + Option 2: (MTK)
    - Legacy Te
    - UE specific TA estimation error (without ephemeris uncertainty nor GNSS inaccuracy)
    - The GNSS accuracy and serving-satellite position estimation error can be considered as the assumption when defining the requirement of Te,NTN.
  + Option 3: (THALES)
    - The accuracy of UE specific TA estimation (N\_(TA,UE-specific)) and self-estimated TA common (N\_(TA,common)) is counted into the UE transmit timing error requirement.
  + Recommended WF
    - The framework of Te\_NTN = legacy Te + GNSS accuracy + Serving-satellite position estimation error.
* Discussion
  + Thales: Is N\_(TA,common) included in the Te\_SAT (satellite position estimation error)?
    - Apple: We did not count and it is controlled by network. This is similar principle to legacy requirements
    - CATT: same understanding with Apple
    - E///: we can include it into the overall budget
  + Apple: We suggested to use scaling factor 2x. We suggest to count RTT error rather than one direction
  + MTK: We may need to clarify the 3rd component
  + Intel: agree with Apple that we should have more description of the Te\_GNSS
* Agreements:
  + Te\_NTN = Te + Te\_GNSS + Te\_SAT
    - Te is the legacy timing error
    - Te\_GNSS is the GNSS accuracy
      * Note: Te\_GNSS shall include the total RTT error
      * FFS how to derive Te\_GNSS from the GNSS positioning accuracy
    - Te\_SAT is the serving-satellite position estimation error
      * Note: Te\_SAT shall include the total RTT error
    - FFS if the equation shall be included into the specification or only Te\_NTN values shall be included

**Issue 2-2-3: GNSS accuracy assumption for timing requirements?**

* Proposals
  + Option 1: (CATT)
    - Nominal accuracy of GNSS, i.e. 30m
  + Option 2: (Apple, Xiaomi, Huawei, QC, MTK)
    - 2-D position error is 50m as the baseline
  + Option 3: (CMCC)
    - Use 50m position error for worst-case and 20m as the typical case for GNSS position error assumption
  + Option 4: (OPPO)
    - 100m
  + Option 5: (Ericsson)
    - A UE specific margin on top of existing UE initial access requirement will correspond to a positioning error requirement of ±70 m for SCS = 15 kHz in UL to ±5 m for SCS = 120 kHz in UL. The feasibility of SCS = 120 kHz or higher has to be further investigated.
* Discussion
  + Apple: Need to add 120kHz. We have FR2 case for Te requirements.
  + QC: FR2 is not precluded. We consider different type of devices. We can include 120kHz.
  + LGE: In RF session FR2 band will be discussed in the next release.
  + Thales: FR2 work shall continue after March 2022. It is important to include 120kHz into the discussion.
    - Chair: Recommend prioritizing FR1 discussion for RRM to comply with plenary decisions.
* Agreements:
  + GNSS accuracy assumption for timing requirements
    - For UL SCS = 15 kHz and 30 kHz: 2-D position error is 50m
    - For UL SCS = 60kHz in FR1: FFS

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115346 | WF on timing requirements for NR NTN | Xiaomi |  |
| R4-2115347 | Reply LS on NTN UL time and frequency synchronization requirements | Xiaomi | To：RAN1 |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115346 | WF on timing requirements for NR NTN | Xiaomi | Approved |  |
| R4-2115347 | Reply LS on NTN UL time and frequency synchronization requirements | Xiaomi | Approved |  |

**WF/LS for approval**

**R4-2115346 WF on timing requirements for NR NTN**

*Type: other For: Approval  
 Source: Xiaomi*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115347 Reply LS on NTN UL time and frequency synchronization requirements**

*Type: LS out For: Approval  
 to RAN1  
 Source: Xiaomi*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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##### 9.13.5.1 General and RRM requirements impacts

**R4-2111935 Further discussion on RRM requirements for NTN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112485 Discussion on general RRM requirements in NTN**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2112706 General and RRM requirements impacts**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2113140 Discussion on the general and mobility requirements for NR NTN UE**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113331 General and RRM requirements for NTN**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

General and RRM requirements for NTN

**Decision: Noted.**

**R4-2114308 Discussion on general issues for NTN RRM**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 9.13.5.2 GNSS-related requirements

**R4-2111936 Further Discussion on GNSS-related requirements**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112205 Discussion on NTN GNSS related issues**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2112707 GNSS-related requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2113523 UE positioing and timing requirements**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion about impact on total timing error budget due to prositining.

**Decision: Noted.**

**R4-2114309 Discussion on GNSS for NTN RRM**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114416 NTN – GNSS requirements**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

In this contribution we focus on the impact of GNSS accuracy on the UE requirements.

**Decision: Noted.**

##### 9.13.5.3 Mobility requirements

**R4-2111937 Discussion on mobility requirements for NTN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112127 Discussion on mobility for NR NTN**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2112423 Further discussion on mobility requirements for NR NTN**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2112680 Discussion on mobility related measurement for NR NTN**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2112708 Mobility requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2113281 Discussion on mobility requirements for NR NTN**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113333 Mobility requirements for NTN**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Mobility requirements for NTN

**Decision: Noted.**

**R4-2113842 Discussion on mobility requirements in NTN**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 9.13.5.4 Timing requirements

**R4-2111740 Discussion on timing requirements for NR NTN**

*Type: discussion For: (not specified)  
 Source: FGI, Asia Pacific Telecom, III, ITRI*

**Decision: Noted.**

**R4-2111938 Further discussion on timing requirements for NTN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112128 Discussion on timing requirements for NR NTN**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2112206 Discussion on NTN timing requirements**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2112424 Further discussion on timing requirements for NR NTN**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2112486 Discussion on timing requirements in NTN**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2112682 Discussion on timing requirements for NR NTN**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2112709 Timing requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2113141 Discussion on the timing requirements for NR NTN UE**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113203 Discussion on timing requirements for NTN**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113282 Discussion on timing requirements for NR NTN**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113453 Reply LS on NTN UL time and frequency synchronization requirements**

*Type: LS out For: Approval  
 to RAN1  
 Source: CATT*

**Decision: Noted.**

**R4-2113521 Timing requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

RRM timing requirements for UE.

**Decision: Noted.**

**R4-2113522 Reply LS to RAN1: LS on NTN UL time and frequency synchronization requirements (Timing)**

*Type: LS out For: Approval  
 to RAN1  
 Source: Ericsson*

**Abstract:**

Draft Reply LS to RAN1 regarding UE timing requirements.

**Decision: Noted.**

**R4-2113819 Discussion on NTN timing related requirements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114417 NTN - interaction between closed and open loop TA adjustments**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2114420 NTN UL Timing Accuracy**

*Type: discussion For: Discussion  
 Source: THALES*

**Abstract:**

The goal of this contribution is therefore to further clarify NTN UL timing synchronization requirements to be considered by NTN RAN4 work.

**Decision: Noted.**

##### 9.13.5.5 Measurement procedure requirements

**R4-2111939 Discussion on measurement procedure requirements for NTN**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112189 Discussion on NTN RRM measurement requirements**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2112425 Further discussion on measurement requirements for NR NTN**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2112487 Discussion on measurement requirements in NTN**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2112710 Measurement procedure requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2112894 Discussion on measurement procedure for NR NTN**

*Type: discussion For: (not specified)  
 Source: LG Electronics UK*

**Decision: Noted.**

**R4-2113332 Measurement requirements for NTN**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Measurement requirements for NTN

**Decision: Noted.**

**R4-2113843 Discussion on measurement requirements in NTN**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

### 9.14 UE Power Saving Enhancements

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**Email discussion: [100-e][228] NR\_UE\_pow\_sav\_enh\_RRM**

**R4-2115218 Email discussion summary: [100-e][228] NR\_UE\_pow\_sav\_enh\_RRM**

*Type: other For: Information  
 Source: Moderator (MediaTek)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115403 (from R4-2115218).**

**R4-2115403 Email discussion summary: [100-e][228] NR\_UE\_pow\_sav\_enh\_RRM**

*Type: other For: Information  
 Source: Moderator (MediaTek)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 23rd)**

Issue 2-1: Low mobility criteria

* Proposals:
  + Option 1: Reuse R16 low mobility criterion. (CATT, Apple, vivo, Qualcomm, Nokia, MTK, Ericsson, Intel, Xiaomi, oppo, ZTE)
    - Option 1a: Low mobility state for operating relaxed RLM/BFD is determined based on RSRP measurement variation.
  + Option 2: based on the SINR variation (Huawei, CMCC, MTK)
  + Option 3: based on the RSRP variation and SINR variation (ZTE, CMCC)
* Discussion
  + MTK: Option 2 is more appropriate. We can compromise to Option 1.
  + Huawei: Does Option 1 mean that the metric is L3 RSRP?
  + CMCC: Prefer Option 2 since mobility will be affected by interference as well. SINR variation is a more reliable metric.
  + E///: For Option 2 – we have several criteria – one for low mobility and the other is the good serving cell quality criteria. We need to have both. SINR can be used for the serving cell criteria.
  + vivo: Option 1. It should be L3 RSRP.
  + QC: Agree with E/// and vivo.
  + Nokia: Option 1. The simplest solution. In Rel-16 we defined RSRP variation on a cell level and her we should consider a bit different RSRP for RLM.
  + ZTE: Agree that single metric cannot completely reflect UE mobility. It can be a compromise.
  + Intel: Our original preference is Option 2. Can be ok with Option 1. Need to also consider good quality criteria and consider SINR variation.
  + MTK: Ok with Option 1.
  + Huawei: For this item we are considering RLM/BFD. UE is not supposed to perform RSRP measurements on RLM/BFD RS.
    - QC: we assume that the measurements are not required to be based on RLM/BFD RS. Any RS should be fine.
    - vivo: same view as QC
    - MTK: RSRP measurement needs to be performed on serving cell SSB.
    - E///: Exact RS can be further discussed
  + CMCC: Can go with Option 1 if SINR variation is also considered for good serving cell criteria.
* Agreements:
  + Low mobility criteria
    - Reuse Rel-16 low mobility criterion based on L3 RSRP measurement variation.
      * FFS the RSs for L3 RSRP measurement

Issue 3-1: SINR definition for good serving cell quality criteria

* Proposals:
  + Option 1: reuse the legacy definition of the SINR for radio link quality evaluation of RLM/BFD.
  + Option 2: L3-SINR. RSRQ and RSRP can also be used as serving cell quality metric for UE that does not support the optional L3-SINR measurement.
* Discussion
  + Apple: There is no legacy definition. Need to reuse definition in RAN1 specs as one option.
  + Nokia: we may not need to specify exact SINR and can rename it.
  + QC: MTK proposed an alternative approach which can solve the concerns. For SS-SINR or CSI-SINR – these measurements are not mandatory.

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115348 | WF on RLM/BFD relaxation for UE Power Saving enhancements | MediaTek Inc. |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2112179 | LS on criteria for RLM/BFD relaxation | vivo, MediaTek Inc. | Revised |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115348 | WF on RLM/BFD relaxation for UE Power Saving enhancements | MediaTek Inc. | Approved |  |
| R4-2112179 | LS on criteria for RLM/BFD relaxation | vivo, MediaTek Inc. | Approved |  |

**WF/LS for approval**

**R4-2115348 WF on RLM/BFD relaxation for UE Power Saving enhancements**

*Type: other For: Approval  
 Source: MediaTek Inc.*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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#### 9.14.1 General

**R4-2112179 LS on criteria for RLM/BFD relaxation**

*Type: LS out For: Approval  
 to RAN2, cc RAN1  
 Source: vivo*

**Decision: Revised to R4-2115349 (from R4-2112179).**

**R4-2115349 LS on criteria for RLM/BFD relaxation**

*Type: LS out For: Approval  
 to RAN2, cc RAN1  
 Source: vivo, MediaTek*

**Decision: Approved.**

#### 9.14.2 UE measurements relaxation for RLM and/or BFD

**R4-2111959 Further discussion on RLM/BFD relaxation for UE power saving enhancement**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112090 UE measurements relaxation for RLM and/or BFD**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2112180 Discussion on R17 RLM and BFD relaxation for NR**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112204 Discussion on RLMBFD relaxation for NR power saving enhancement**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2112259 On Power Saving RRM Requirement**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2112413 Further discussion on UE measurements relaxation for RLM and/or BFD**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2112878 Discussion about RLM/BFD measurement relaxation**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113137 Discussions on UE power saving for RLM and BM**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113820 Further discussion on RLM/BFD measurement relaxation**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2113887 On RLM and RLF relaxation for UE power saving**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2114081 Discussions on UE power saving for RLM and BM**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussions on remaining issues of UE power saving requirements.

**Decision: Noted.**

**R4-2114153 Evaluation on Rel-17 RLM/BFD measurement relaxation**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

### 9.15 NR Sidelink enhancement

#### 9.15.8 RRM core requirements

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**Email discussion: [100-e][229] NR\_SL\_enh\_RRM**

**R4-2115219 Email discussion summary: [100-e][229] NR\_SL\_enh\_RRM**

*Type: other For: Information  
 Source: Moderator (LG Electronics)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115404 (from R4-2115219).**

**R4-2115404 Email discussion summary: [100-e][229] NR\_SL\_enh\_RRM**

*Type: other For: Information  
 Source: Moderator (LG Electronics)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 24th)**

Issue 1-2-5: UE dropping requirements of Selection/reselection of V2X Synchronization Reference Source

* Proposals
  + Need further discussion on UE dropping for the purpose of selection of V2X synchronization reference with SL-DRX for synchronous case and asynchronous case
    - whether or not UE is allowed to drop V2X transmission
    - whether or not UE is allowed to drop V2X reception
* Moderator: All most companies think that UE dropping is needed to be considered for both synchronization case and asynchronization case due to SL-DRX. However, whether the dropping is for UE Tx or UE Rx or both is not yet clarified. So, further discussion is needed for it.
* Discussion
  + QC: Both V2X TX/RX dropping shall be allowed in case UE is performance asynch search. For Sync search UE is not allowed data RX dropping.
  + Huawei: For Sync case UE is allowed to drop SLSS
  + LGE: for SL-DRX – we do not need to consider TX dropping.
    - QC: during DRX off time UE does not make transmission
  + QC: TX dropping requirement need to take into account SL-DRX and how to account this is FFS.
* Agreements:
  + Selection/reselection of V2X Synchronization Reference Source with SL-DRX
    - Asynchronous case: UE is allowed to drop V2X reception for the purpose selection/reselection of V2X Synchronization Reference Source
    - FFS if TX dropping requirement shall be defined and how to take into account SL-DRX

Issue 1-2-6: Interruption to WAN due to SL-DRX

* Proposals
  + Option 1: Consider Rel-16 EN-DC interruption requirement as starting point
    - interruptions can occur due to tuning ON/OFF SL RF
      * at transitions between active and non-active during SL-DRX
      * at transitions from non-SL-DRX to SL-DRX
    - Consider to avoid interruptions during certain occasions
  + Option 2: Consider interruption requirements during LTE ProSe as reference
    - Consider to avoid interruptions during certain occasions such as while onDurationTimer is running, during paging reception.
    - If interruptions are allowed on NR WAN, the maximum allowed interruption rate, length and location of the interruption should be known
* Moderator: 2 options were recommended for discussion. Majority view is option 1. One company suggested option 2. So, further discussion is needed to decide which option.
* Discussion
  + LGE: for LTE ProSe SL-DRX was not considered
  + Ericsson: For Option 2 – in our understanding LTE ProSe requirements also apply for DRX case. Can combine Option 1 and 2.
  + QC: For Option 2 first bullet, how can UE control it for Mode 2?
  + LGE: LTE ProSe is applicable for DRX case, but DRX is configured for Uu link and not PC5.
  + E///: For LTE ProSe the DRX is configured for Uu. We would like to avoid impact on WAN. To QC – we need to have more discussion on how to handle Mode 1 and Mode 2. At least for some cases we can minimize interruptions.
  + QC: we are open to discuss how to combine Option 1 and 2.

Issue 1-2-7: Interruption to SL due to Uu DRX

* Proposals
  + Consider Rel-16 EN-DC interruption requirement as starting point
* Discussion
  + E///: are we considering the case when the RX chain is shared between SL and Uu?
  + LGE: RX chain is different.
  + vivo: Based on Rel-16 different RF chains are used. Is it limited to Rel-16 scenarios? Scenario shall be clarified
  + LGE: It is different from Rel-16. For Rel-17 same band is allowed for SL and Uu transmission. So, interruption is needed for Rel-17.
  + vivo: Agree that it may be needed.
* Agreements:
  + FFS for specific scenarios for interruption to SL due to Uu DRX
  + Consider Rel-16 EN-DC interruption requirement as starting point

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115350 | WF on NR SL enhancements RRM requirements | LG Electronics |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115350 | WF on NR SL enhancements RRM requirements | LG Electronics | Approved |  |

**WF/LS for approval**

**R4-2115350 WF on NR SL enhancements RRM requirements**

*Type: other For: Approval  
 Source: LG Electronics*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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**R4-2111960 Further considerations on RRM requirements for Sidelink enhancement**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112260 On NR SL RRM Requirement Scope**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2112338 RRM requirements for NR SL enhancement**

*Type: discussion For: (not specified)  
 Source: LG Electronics*

**Abstract:**

It discusses RRM core requirements for Rel-17 NR SL enhancement.

**Decision: Noted.**

**R4-2112418 Discussion on RRM requirements for NR sidelink enhancement**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2112555 Further discussion on RRM impacts for sidelink enhancement**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113283 Discussion on RRM core requirements for NR SL**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113821 Discussion on RRM impacts for R17 NR V2X enhancement**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114082 Discussions on Sidelink RRM requirements**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussions on sidelink RRM requirements.

**Decision: Noted.**

### 9.16 Extending current NR operation to 71GHz

#### 9.16.7 RRM core requirements

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**Email discussion: [100-e][230] NR\_ext\_to\_71GHz\_RRM\_1**

**R4-2115220 Email discussion summary: [100-e][230] NR\_ext\_to\_71GHz\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115405 (from R4-2115220).**

**R4-2115405 Email discussion summary: [100-e][230] NR\_ext\_to\_71GHz\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Qualcomm)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 20th)**

Issue 1-1-1: Deployment scenarios

* Proposals
  + Proposal 1 (Vivo, LGE, Huawei, CMCC): RAN4 works on RRM requirements for standalone single-carrier and multi-carrier operation in FR2-2 first.
    - CA/DC with FR1 and FR2-1 can be further discussed and specified after corresponding band-combinations are introduced in RF session. (Vivo, LGE, Huawei)
  + Proposal 2a (Ericsson): Prioritize non-standalone scenario where new band is used for SCell while PCell belongs to FR1(high priority) and FR2-1 band
  + Proposal 2b (Ericsson): RRM requirements of FR2-2 as SCG are examined without influence by the type of cell in MCG. If differentiation in requirements is necessary, DC/CA with FR1 and DC/CA with FR2-1 are needed to be checked separately.
  + Proposal 3 (Intel): De-prioritize the following deployment scenarios
    - FR2-2 CA/DC with anchor on FR2-1
    - NE-DC scenario with NR operating in FR2-2
  + Proposal 4 (Nokia, QC, Intel): Prioritize the following deployment scenarios:
    - Standalone CA/DC in FR2-2
    - FR2-2 CA and DC with anchor on FR1
    - EN-DC
* Discussion
  + LGE: SA DC scope is unclear. RF session focus on single band requirement so far. SA single carrier can be our first priority as well.
  + CMCC: For SA CA – do we mean single carrier should be completed first. Do not need DC in FR2-2. Equal priority between FR2-2 CA and DC with anchor on FR1
  + vivo: RRM requirements shall be specified for the band combinations specified in the same release. RF session requirements are focused on the single carrier. Also have concern on workload.
  + QC: For SA we do not need DC. Although we don’t have FR1-FR2-2 BCs we do not see the problem, but still can wait. For FR1-FR2-2 DC is more likely
  + Nokia: We should start the work asap if we want to complete in time. SA CA and FR2-2 with anchor in FR1 is important.
  + Apple: We need decision from RF room before we proceed with any CA/DC requirements.
  + Intel: For RRM requirements we do not differentiate BC-specific requirements. We should conclude our priorities from the RRM perspective (not RF). We should not expect we can come back later to specify additional requirements.
  + Ericsson: Tentative agreement is fine. Requirements for scenarios with anchor can reduce the workload.
* Agreements:
  + Define the requirements for the following deployment scenarios with equal priority:
    - Standalone single carrier and CA in FR2-2
    - FR2-2 CA and DC with anchor on FR1
      * Note: the scenario may be further adjusted pending further discussion in the RF session

Issue 1-2-1: Rx beam sweeping scaling factor

* Proposals
  + Proposal 1 (LGE, Huawei): RAN4 to consider defining new scaling factor for Rx beam sweeping in FR2-1
  + Proposal 2 (Nokia, Ericsson, QC, CMCC, Intel): RAN4 to reuse the scaling factor from FR2-1 for operation in FR2-2 as a starting point
  + Proposal 3 (Mediatek, Vivo, Apple, CMCC, Intel): RAN4 to further study (based on SLS etc.) whether new scaling factor is needed for FR2-2 considering the trade-off between link coverage and measurement delay
* Discussion
  + LGE: fine with suggestion. How to address the power classes.
  + Apple: Rx beam sweeping scaling factor is one of the critical factors
* Agreements:
  + Rx beam sweeping scaling factor
    - Further study whether new scaling factor is needed for FR2-2 considering RF session conclusions on UE antenna array assumptions and UE power classes and the difference with FR2-1 assumptions
    - Rx beam sweeping factor from FR2-1 can be used as a starting point for analysis

Issue 2-1-1: General principles in defining the Te requirements

* Recommended WF
  + Considering multiple very different proposals on this topic, it is important to first agree on some basic principles in defining the Te requirements. As noted by most of the companies, it is quite challenging for the UE to meet the Te requirements with high SCS of SSB and UL signals. The following questions needs to be addressed before specifying the exact Te values
    - 1) How much percent of UL CP length Te can occupy without impacting UL system performance?
      * Note two UEs may have the same amount of Te in plus and minus direction.
    - 2) How much channel delay spread for this band needs to be accounted for?
      * The general understanding is in this frequency band, the cell coverage is expected to be even smaller than current FR2 bands and even finer beams are going to be used to increase beamforming gain. As such, the channel delay spread is expected to be smaller than that for other FR2 bands.
    - 3) Check the possible combinations of SSB SCS and UL signal SCS for FR2-2 and discuss if it is possible to rule out some of the combinations if UE implementation turns out to be too challenging? E.g.
      * 120kHz SSB SCS and 480/960kHz UL signal SCS
      * Uplink signal SCS is greater than SSB SCS for 52.6-71GHz
    - 4) Is any input from RF is needed to assist the discussion?
* Discussion
  + Apple: 1) Suggest companies to consider different option for UL CP length; 2) channel delay spread shall be considered. E/// provided a good reference. 3) we can start with equal SCS as the first priority. No requirements for 960kHz.
  + Nokia: 1) the best option is to follow the same principles for FR1 and FR2-1. The performance is affected not by delay spread but there may be impact on BS Demod performance due to Te; 3) we prefer to keep all options for now
  + vivo: 1) Percentage of UL CP length Te has impact on UE Te margin. Need to consider other solutions to allow UE to have Te > CP (e.g. scheduling restrictions).
* Tentative agreements
  + Further study percentage of UL CP length Te can occupy without impacting UL system performance?
    - Option 1: Keep the Te within the same percentage of the CP length as existing SCS
    - Option 2: 30%
    - Option 3: 50%
    - Option 4: 60%
  + Further study achievable Te from UE perspective
  + Study different combinations of SSB SCS and UL signal SCS for FR2-2

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115351 | WF on NR extension to 71 GHz – RRM - Part 1 | Qualcomm |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115351 | WF on NR extension to 71 GHz – RRM - Part 1 | Qualcomm | Approved |  |

**WF/LS for approval**

**R4-2115351 WF on NR extension to 71 GHz – RRM - Part 1**

*Type: other For: Approval  
 Source: Qualcomm*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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**Email discussion: [100-e][231] NR\_ext\_to\_71GHz\_RRM\_2**

**R4-2115221 Email discussion summary: [100-e][231] NR\_ext\_to\_71GHz\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115406 (from R4-2115221).**

**R4-2115406 Email discussion summary: [100-e][231] NR\_ext\_to\_71GHz\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (Intel)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 20th)**

Issue 1-1-1: BWP switching delay for FR2-2

* Proposals
  + Proposal 1 (Ericsson, Intel, MTK, LGE, QC, Apple, OPPO): Follow 600us and 2000us switching delay for Type 1 and Type 2 respectively
  + Proposal 2 (vivo, CMCC, OPPO): RAN4 to study if shorter BWP can be considered for 52.6G-71GHz.
  + Proposal 2a (Nokia, CMCC, OPPO): RAN4 to study if BWP delay reduction for Type 2 UEs is possible for the operation on 480 and 960 kHz SCS.
* Discussion
  + Apple: would like to have clarity. For BWP reduction we are open to discuss and we need RF experts to get involved.
  + Nokia: The priority is to have 600us.
* Agreements:
  + As baseline, follow 600us and 2000us switching delay for Type 1 and Type 2 respectively
  + FFS: if BWP delay reduction is possible for the operation on 480 and 960 kHz SCS.

Issue 1-1-2: Number of slots for DCI and timer based BWP switch delay for Type 1 UEs for 480kHz and 960kHz respectively

* Proposals
  + Option 1 (Apple, vivo, Nokia, Ericsson, Intel, LGE, QC, CMCC, OPPO): 20 and 39
  + Option 2 (Huawei, Apple): 24 and 48
  + Option 3 (MTK): 22 and 41
* Discussion
  + vivo: the main difference is how values are calculated. We add 3 symbols for PDCCH scheduling. This is how the original values were derived.
  + MTK: Same view with vivo. 22 and 41 slots are needed
    - Intel: what is the background?
    - MTK: Need extra 3 symbols for PDCCH which corresponds to 1 slot.
    - Intel: 20 and 39 already include 3 symbols
    - MTK: 20 and 39 consider rounding?
    - Apple: 3 symbols were taken into account in Option 1
  + Nokia: For Option 1 companies followed the same principles as for legacy. Also, we are considering single carrier here.
  + Apple: would like to understand issue raised by Huawei on cross-carrier scheduling
  + E///: Huawei’s concern should be considered in the next round discussion
  + QC: It is not clear how timer-based scheduling is relevant to cross-carrier scheduling. Also, for cross-carrier scheduling we previously took into account the time difference between the cells.
  + Chair: continue discussion in the 2nd round

Issue 1-1-3: Number of slots for DCI and timer based BWP switch delay for Type 2 Ues for 480kHz and 960kHz respectively

* Proposals
  + Option 1 (Apple, Huawei): 72 and 144
  + Option 2 (vivo, Ericsson, Intel, LGE, QC, Apple, CMCC, Nokia, OPPO): 65 and 129
  + Option 3 (Nokia): 64 and 128
* Discussion
  + TBA
* Agreements:
  + TBA

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115352 | WF on NR extension to 71 GHz – RRM - Part 2 | Intel |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115352 | WF on NR extension to 71 GHz – RRM - Part 2 | Intel | Approved |  |

**WF/LS for approval**

**R4-2115352 WF on NR extension to 71 GHz – RRM - Part 2**

*Type: other For: Approval  
 Source: Intel Corporation*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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##### 9.16.7.1 General and RRM requirements impacts

**R4-2112488 Discussion on RRM requirements in FR2-2**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2112548 Further discussion on RRM impacts for extending NR operation to 71GHz**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112683 Discussion on RRM measurement requirements for extension to 71GHz**

*Type: discussion For: Discussion  
 Source: LG Electronics Inc.*

**Decision: Noted.**

**R4-2113220 Discussion on RRM requirements for extension to 71 GHz**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113334 General and RRM requirements for extending NR operation to 71GHz**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

General and RRM requirements for extending NR operation to 71GHz

**Decision: Noted.**

**R4-2114142 Discussion on general RRM impacts for extending NR operation to 71GHz**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2114189 Discussion on general aspects for NR 52.6 – 71 GHz RRM**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

##### 9.16.7.2 Timing requirements

**R4-2112135 UE transmit timing for NR operation in 52.6GHz - 71GHz**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2112559 Disscussion on timing for 52.6-71GHz**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113221 Discussion on RRM timing requirements for extension to 71 GHz**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113518 Timing requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Analysis of UE TDD ON/OFF and other timing requirements.

**Decision: Noted.**

**R4-2113519 Reply LS to RAN1: LS on beam switching gap for 60 GHz band**

*Type: LS out For: Approval  
 to RAN1  
 Source: Ericsson*

**Abstract:**

Feedback to RAN1 on TDD ON/OFF switch time.

**Decision: Noted.**

**R4-2114143 Discussion on timing requirements for exntending NR operation to 71GHz**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2114573 Impact of higher SCS on timing accuracy requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Abstract:**

In this paper, we discuss the impact of 480/960kHz SCS on UE transmit timing accuracy requirements

**Decision: Noted.**

##### 9.16.7.3 Interruption requirements

**R4-2112560 Disscussion on interruption for 52.6-71GHz**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113222 Discussion on interruption requirements for extension to 71 GHz**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113336 Interruption requirements for extending NR operation to 71GHz**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Interruption requirements for extending NR operation to 71GHz

**Decision: Noted.**

**R4-2114144 Discussion on interruption requirements for extending NR operation to 71GHz**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2114190 Interruption requirements for NR 52.6 – 71 GHz**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2114572 Impact of higher SCS on interruptions requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Abstract:**

In this paper, we discuss the impact of 480/960kHz SCS on some of the interruption requirements in NR-SA mode

**Decision: Noted.**

##### 9.16.7.4 Active BWP switching delay requirements

**R4-2112136 Active BWP switch delay for NR operation in 52.6GHz - 71GHz**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2112561 Disscussion on BWP swiching delay for 52.6-71GHz**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113223 Discussion on Active BWP switching delay requirements for extension to 71 GHz**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113335 Active BWP switching requirements for extending NR operation to 71GHz**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Active BWP switching requirements for extending NR operation to 71GHz

**Decision: Noted.**

**R4-2114145 Discussion on BWP switching requirements for extending NR operation to 71GHz**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2114191 Discussion on BWP switching delay for NR 52.6 – 71 GHz**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

##### 9.16.7.5 Measurement gap interruption requirements

**R4-2112562 Disscussion on measurement gap interruption for 52.6-71GHz**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113224 Discussion on measurement gap requirements for extension to 71 GHz**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113337 Measurement gap interruption requirements for extending NR operation to 71GHz**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Measurement gap interruption requirements for extending NR operation to 71GHz

**Decision: Noted.**

**R4-2114146 Discussion on measurement gap interruption requirements for extending NR operation to 71GHz**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

### 9.17 Enhancements to Integrated Access and Backhaul (IAB) for NR

#### 9.17.3 RRM core requirements

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**Email discussion: [100-e][232] NR\_IAB\_enh\_RRM**

**R4-2115222 Email discussion summary: [100-e][232] NR\_IAB\_enh\_RRM**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115407 (from R4-2115222).**

**R4-2115407 Email discussion summary: [100-e][232] NR\_IAB\_enh\_RRM**

*Type: other For: Information  
 Source: Moderator (ZTE)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 19th)**

**Topic #2: Reply to RAN3 LS R3-212981, LS on Inter-donor migration**

Issue 2-1: Can Alternative 1 be supported?

* Proposals
  + Option 1: Alternative 1 can be supported without impact to RAN4 specification TS 38.133. (Samsung, Ericsson)
* Discussion
  + Nokia: Need to clarify how the split of resources works
  + E///: From RAN4 resources perspective it does not matter the way how they are split
  + Samsung: Separate physical resources means that the full flow is separate. Not sure that such clarifications are needed in the reply.
* Agreements:
  + Alternative 1 can be supported without impact to RAN4 specification TS 38.133.

Issue 2-2: Q1: Whether the current specification enables a RRC CONNECTED UE remains connected, while observing the change of NCGI, and no change to the PCI?

* Proposals
  + Option 1: No RAN4 requirement is impacted if NCGI changes while PCI remains unchanged. However, during NCGI acquisition time if the NCGI changes then the UE may not meet NCGI acquisition delay requirements defined in clause 9.11, TS 38.133. (Ericsson)
* Discussion
  + Huawei: Agree with revised version from E///. We think that solution itself is problematic and it should be clarified which node sends NCGI update.
  + Nokia: Have concerns on Alternative 2. There may be different approaches how to make virtual DUs. Impact on RRM is expected. We would like to ask question in the reply LS on details of Alt 2.
  + E///: Agree with Huawei and Nokia that Alt 2 is challenging. We are ok to ask more details.
  + ZTE: Similar views as E///.
  + Samsung: Same view as ZTE and E///. Just share understanding from RAN4 perspective. We never considered backhaul link changes.
  + Intel: The meaning of proposal is confusing and it should be clarified.
  + QC: From a RAN4 perspective if PHY parameters do not change UE can stay connected.
* Conclusion: Provide RAN4 LS reply in this meeting. 1) Include Agreements for Alt 1; 2) Provide the initial assessment on RAN4 impacts and ask for clarifications if needed.
* Chair: Return in the 2nd round
* Agreements:
  + Current RAN4 specifications do not define whether a RRC CONNECTED UE remains connected, while observing the change of NCGI, and no change to the PCI
    - During NCGI acquisition time if the NCGI changes then the UE may not meet NCGI acquisition delay requirements defined in clause 9.11, TS 38.133.
* Tentative agreements:
  + - From RAN4 perspective if PHY parameters do not change RRC CONNECTED UE can remain connected

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115353 | WF on IAB enhancement RRM | ZTE Corporation |  |
| R4-2115354 | Reply LS on inter-donor migration | ZTE Corporation | To: RAN\_3; Cc: RAN\_1, RAN\_2 |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115353 | WF on IAB enhancement RRM | ZTE Corporation | Approved |  |
| R4-2115354 | Reply LS on inter-donor migration | ZTE Corporation | Approved |  |

**WF/LS for approval**

**R4-2115353 WF on IAB enhancement RRM**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115354 Reply LS on inter-donor migration**

*Type: LS out For: Approval  
 to RAN3, cc RAN1, RAN2  
 Source: ZTE Corporation*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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**R4-2112869 Discussion on RAN3 LS for inter-donor migration**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Noted.**

**R4-2113149 Further discussion on RRM requirements for eIAB**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113875 On eIAB RRM**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2114147 Discussion on RRM requirements for eIAB**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2114463 Analysis of RRM requirements for enhanced IAB**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper analyzes the impact of RRM on IAB enhancement

**Decision: Noted.**

**R4-2114464 LS response on Inter-donor migration**

*Type: LS out For: Approval  
 to RAN3, cc RAN1, RAN2  
 Source: Ericsson*

**Abstract:**

The paper analyzes and provides response to RAN3 LS in R3-212981

**Decision: Noted.**

**R4-2114546 Considerations on Rel. 17 IAB enhanced RRM Core Requirements**

*Type: discussion For: Discussion  
 Source: Nokia Germany*

**Abstract:**

In the paper, we mainly focus on the discussion of the RRM impact of Case #6 timing. Additionally, CA/DC and interference management are treated briefly.

**Decision: Noted.**

### 9.19 Further enhancements on MIMO for NR

#### 9.19.3 RRM core requirements

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**Email discussion: [100-e][233] NR\_feMIMO\_RRM**

**R4-2115223 Email discussion summary: [100-e][233] NR\_feMIMO\_RRM**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115408 (from R4-2115223).**

**R4-2115408 Email discussion summary: [100-e][233] NR\_feMIMO\_RRM**

*Type: other For: Information  
 Source: Moderator (Samsung)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 19th)**

**Topic #4: Reply LS on TCI state updates for L1/L2 centric inter-cell mobility**

* Proposals
  + Proposal 1: On question 1, RAN4 to reply to RAN3 as following.

Non-serving cell is also a serving cell on which UE data is scheduled along with serving cell in inter-cell multi-TRP operation model. From RAN4 perspective, this is the assumption we make to define RRM requirements (e.g., interruption requirements, link recovery requirements, etc.) in RAN4.

* + Proposal 2: On Question 2 and 3, RAN4 to reply to RAN3 saying RAN4 is not involved in the definitions or procedures described in the question 2 and 3.
* Discussion
  + E///: there is a clear action from RAN3 to RAN4.
  + QC: non-serving cell needs further discussion
  + Chair: Discuss in the 2nd round. RAN4 can send the LS to make RAN4 impacts clear.

**Topic #1: RRM requirements impact**

* Proposals
  + Proposal 1: No impact on RRM requirement for mTRP for PDCCH, PUCCH and PUSCH (MediaTek)
  + Proposal 2: To revise the “L1/L2 centric inter-cell mobility” to “L1-centric inter-cell beam management” (Nokia)
  + Proposal 3: RAN4 requirements assuming simultaneous reception channel/RS with different QCL type D can be postponed to further release unless request from RAN1 is received. (Samsung)
  + Proposal 4: No requirement for 8 antenna ports unless the full set of requirements for 8 antenna ports is defined in RAN4 (Samsung)
  + Proposal 5: For L1-RSRP measurements in FR2, the existing measurement restriction requirements in Rel-16 cannot be reused for multi-TRP transmission in R17 and RAN4 shall study new measurement restriction requirements for multi-TRP transmission. (Huawei)
  + Proposal 6: RAN4 study whether to introduce the sharing factor for multiple beam pairs/groups into L1-RSRP measurement period requirements. (Huawei)
  + Proposal 7: It is suggested that the existing L1-RSRP measurement accuracy requirements can be applied for multi-TRP transmission in Rel-17. (Huawei)
  + Proposal 8: The existing scheduling restriction requirements for L1-RSRP measurements can be applied in Rel-17 (Huawei)
  + Proposal 9: For CSI enhancement in R17 feMIMO, no impact on RRM requirement. (MediaTek)
* Conclusion: It is common understanding that RAN4 needs to follow RAN plenary guidance and consider “inter-cell beam management” instead of “L1/L2 centric inter-cell mobility”
* Agreements:
  + No impact on RRM requirement for
    - Enhancements for PDCCH, PUCCH and PUSCH for multi-TRP
    - CSI enhancement
  + No RRM requirement will be defined for 8 RX antenna ports
* Tentative agreements:
  + Do not define RAN4 requirements for simultaneous reception of channel/RS with different QCL type D ~~unless a request from RAN1 is received~~
    - Note: come back in the 2nd round

**Topic #2: Multi-beam operation**

Sub-topic 2-1: Unified TCI for DL and UL

* Proposals
  + Proposal 1: RAN4 needs to specify the TCI switching delay requirements for joint TCI with UL and DL and separated TCI for UL.
  + Proposal 2: RAN4 needs to specify the delay requirements for TCI switch between joint and separate TCI state indication methods (Ericsson)
  + Proposal 3: RAN4 needs to specify the TCI switching for non-serving cell (Nokia, Apple)
  + Proposal 4: RAN4 shall study how to capture the TCI state switching delay requirements for Rel-17 unified TCI indication (Huawei)
    - Option 1: Reuse the existing structure of TCI state switching delay requirements and uplink spatial relation switch delay requirements.
    - Option 2: Introduce a new section for Rel-17 unified TCI indication.
      * FFS whether to separately define for different command types
      * FFS whether to separately define for different TCIs
  + Proposal 5: RAN4 needs to specify the requirements for PL-RS update under unified TCI framework (Samsung, Intel, Qualcomm)
* Discussion
  + TBA
* Agreements:
  + Specify TCI switching delay requirements for
    - Joint TCI with UL and DL
    - Separate TCI for UL
    - FFS: TCI for DL
  + Specify the requirements for PL-RS update under unified TCI framework

Sub-topic 2-2: L1 centric inter-cell beam management

* Proposals
  + Proposal 1: RAN4 needs to specify the intra-frequency L1-RSRP measurement requirements for non-serving cells (Samsung, Nokia, Apple, MTK, Intel, Ericsson, Huawei, Qualcomm)
  + Proposal 2: RAN4 needs to specify the intra-frequency L1-RSRP measurement accuracy requirements for non-serving cells (MTK)
  + Proposal 3: For inter-cell beam management, requirement will be defined if UE only measure one L1-RSRP from one cell. There is no requirement if UE receive multiple L1-RSRP simultaneously (Intel).
  + Proposal 4: To guarantee UE’s mobility performance, RAN4 shall agree that PCell/PSCell’s L1-RSRP measurement delay shall not be impacted by NSC measurements. (Ericsson)
  + Proposal 5: It is suggested that UE only performs L1-RSRP measurements on the identified non-serving cell(s) (Huawei)
* Discussion
  + TBA
* Agreements:
  + TBA

**Topic #3: Link recovery procedure for FR2 serving cells**

* WID objective
  + Investigate if the requirements on link recovery procedure is suitable for FR2 serving cells [RAN4]
* Proposals
  + Option 1: To investigate if the existing link recovery requirements applicable for FR2 serving cell where either mobility is high or the longer DRX cycles, e.g. >320ms, are used (vivo)
  + Option 2: To specify the requirements for TRP specific BFD/CBD/BFR requirements assuming up to 2 RS set configured for BFD and CBD (Huawei, Ericsson)
  + Option 3: Others
* Discussion
  + Samsung: vivo’s interpretation makes sense.
  + Nokia: Same view with Samsung. Also support Option 2 and include RLM.
  + Qualcomm: Option 1 is more for high-mobility. Do not see much motivation to consider this for handheld in FeMIMO scope.
  + E///: For Option 1 we share same view with QC. High-mobility is considered in FR2 HST item.
  + Apple: We are not sure which scenario is considered for this objective. Further clarifications are needed for this objective.
  + Vivo: Option 2 may be relevant to Topic #1 on simultaneous receptions
* Chair: Continue discussion in the 2nd round. If no consensus reached, further clarifications on WID objective need to be discussed in RAN

**GTW session (August 26th)**

**Topic #1: RRM requirements impact**

* Proposals
  + RAN4 will further study the impact to RRM requirements for simultaneous reception of channel/RS with different QCL type D.
    - RAN4 is supposed to conclude the RRM impact for simultaneous reception of channel/RS with QCL type D in RAN4 #101-e
* Discussion
  + QC: prefer to remove deadline
  + Apple: Need to align with RF session. In RF we will not consider this. Need to drop the related discussion.
    - Samsung: RF room has similar agreement.
  + Intel: Suggest not to discuss. Based on previous meeting agreement we prioritized multi-beam but this topic was not in the scope.
  + Nokia: We are ok to take baseline that UE receives 1 panel at a time. Prefer to remove the 2nd bullet.
  + Samsung: Multi-beam is already supported for a long time in RAN1.
  + QC: In RAN1 104b simultaneous reception was introduced.
  + Apple: Moderator WF is reasonable. Postpone to the next release is one option
* Agreements
  + Further study whether to define RRM requirements and RRM impacts for simultaneous reception of chan nel/RS with different QCL type D
    - RAN4 is supposed to conclude whether to define RRM requirements and RRM impacts for simultaneous reception of channel/RS with QCL type D in RAN4 #101-e

**Topic #3: Link recovery procedure for FR2 serving cells**

* Discussion
* Agreements

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115355 | WF on FeMIMO RRM | Samsung | WF is supposed to capture the agreements and open issues for overlall RRM impact and multi-beam opearation |
| R4-2115356 | WF on link recovery procedure for FR2 serving cells | vivo |  |
| R4-2115357 | Reply LS on TCI state updates for L1/L2 centric inter-cell mobility | Ericsson |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115355 | WF on FeMIMO RRM | Samsung | Return to |  |
| R4-2115356 | WF on link recovery procedure for FR2 serving cells | vivo | Return to | To be handled in GTW |
| R4-2115426 | LS on Rel-17 FeMIMO WI objective on link recovery procedure in FR2 serving cell | vivo | Return to | To be handled in GTW |
| R4-2115357 | Reply LS on TCI state updates for L1/L2 centric inter-cell mobility | Ericsson | Approved |  |

**WF/LS for approval**

**R4-2115355 WF on FeMIMO RRM**

*Type: other For: Approval  
 Source: Samsung*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115356 WF on link recovery procedure for FR2 serving cells**

*Type: other For: Approval  
 Source: vivo*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115434 (from R4-2115356).**

**R4-2115434 WF on link recovery procedure for FR2 serving cells**

*Type: other For: Approval  
 Source: vivo*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115357 Reply LS on TCI state updates for L1/L2 centric inter-cell mobility**

*Type: LS out For: Approval  
 to RAN3, cc RAN1, RAN2  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115426 LS on Rel-17 FeMIMO WI objective on link recovery procedure in FR2 serving cell**

*Type: LS out For: Approval  
 to RAN  
 Source: vivo*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115433 (from R4-2115426).**

**R4-2115433 LS on Rel-17 FeMIMO WI objective on link recovery procedure in FR2 serving cell**

*Type: LS out For: Approval  
 to RAN, cc RAN1  
 Source: vivo*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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##### 9.19.3.1 General and RRM requirements impacts

**R4-2112181 Discussion on FeMIMO RRM impacts**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112530 Discussion on general and RRM requirements impacts in R17 feMIMO**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2112601 Discussion on feMIMO general and RRM requirements impacts**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113307 Impact to RRM requirements for further enhancements on MIMO**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted.**

**R4-2113509 Reply LS to RAN3 on TCI state updates for L1/L2 centric inter-cell mobility**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

We provide our views on the response to be sent to RAN3 LS R3-212879

**Decision: Noted.**

**R4-2113822 Discussion on beam management requirements for R17 NR FeMIMO**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 9.19.3.2 Multi-beam operation enhancement

**R4-2112109 Discussion on RRM requirements for L1/L2 Centric Mobility and Unified TCI**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted.**

**R4-2112182 Discussion on RRM impacts from Multi-beam operation enhancements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112531 Discussion on multi-beam operation enhancement in R17 feMIMO**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2113136 Discussions on Rel-17 Multi-beam operation enhancement impact on RRM**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113510 Discussion on RRM requirements for multi-beam operation in FeMIMO**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

We discuss RRM requirements for multi-beam operation in FeMIMO

**Decision: Noted.**

**R4-2113823 Discussion on multi-beam operation enhancements for R17 NR FeMIMO**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114419 On L1/L2 centric non-serving cell measurements**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This paper has discussed L1-RSRP measurements within and outside SMTC windows

**Decision: Noted.**

**R4-2114430 Views on RRM impacts of feMIMO multi-beam operation enhancement**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Qualcomm CDMA Technologies*

**Abstract:**

Views on feMIMO scope, impacts

**Decision: Noted.**

##### 9.19.3.3 Link recovery procedure for FR2 serving cells

**R4-2113511 Discussion on TRP specific link recovery procedures in FeMIMO**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

We discuss link recovery requirements for multi-beam operation of FeMIMO

**Decision: Noted.**

**R4-2113543 Discussion on Link recovery procedure for FR2 serving cells**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113824 Discussion on link recovery requirements for R17 NR FeMIMO**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

### 9.20 Support of reduced capability NR devices

#### 9.20.3 RRM core requirements

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**Email discussion: [100-e][234] NR\_redcap\_RRM\_1**

**R4-2115224 Email discussion summary: [100-e][234] NR\_redcap\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115409 (from R4-2115224).**

**R4-2115409 Email discussion summary: [100-e][234] NR\_redcap\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 23rd)**

**Sub-topic 1-4: Inter-RAT LTE in IDLE/INACTIVE states**

Issue 1-4-1: Inter-RAT LTE in IDLE/INACTIVE states

* Candidate options:
  + Option 1 (Huawei, Apple, Intel, Oppo, Vivo, MTK, Nokia): RAN4 defines inter-RAT RRM requirements on LTE for RedCap UE in Rel-17
  + Option 2 (CMCC, Ericsson, Xiaomi): Do not define inter-RAT RRM requirements for RedCap UE in Rel-17.
* Discussion
  + CMCC: Need to understand the scenario and LTE UE category. Need to discuss both 1RX and 2RX cases.
  + E///: Same view as CMCC. We should not define requirements for 1RX LTE. 2RX may be fine. We prefer no new LTE requirements.
  + QC: LTE support is needed. We do have 1RX support for LTE (e.g. Cat 1bis).
  + Xiaomi: We can compromise to Option 1.
  + Nokia: Prefer Option 1. RedCap can support 1RX and 2RX.
  + Intel: IDLE stat mobility is important. If RedCap UE has LTE capabilities, then we need to define requirements. Agree that we do not need to improve the existing LTE requirements.
  + Apple: Cat1bis can be a good baseline
* Agreements:
  + Define inter-RAT LTE RRM requirements in IDLE/INACTIVE and CONNECTED states
    - For 2RX capable RedCap UEs
      * Use 2RX inter-RAT LTE requirements defined in TS 38.133 as baseline
    - For 1RX capable RedCap UEs
      * Use LTE Cat1bis requirements in TS 36.133 as baseline
  + FFS whether and how to define inter-RAT NR RRM requirements for LTE UEs with RedCap capabilities in IDLE/INACTIVE and CONNECTED states

**Sub-topic 1-5: Inter-RAT LTE in CONNECTD state**

Issue 1-5-1: Inter-RAT LTE in CONNECTED state

* Candidate options:
  + Option 1 (Huawei, Apple, Intel, Oppo, Vivo, MTK, Nokia): RAN4 defines inter-RAT RRM requirements on LTE for RedCap UE in Rel-17
  + Option 2 (CMCC, Ericsson, Xiaomi): Do not define inter-RAT RRM requirements for RedCap UE in Rel-17.
* Discussion
  + E///, QC, MTK: follow same conclusions as in 1-4-1

**Issue 1-10-1: Assumptions on UE**

* Proposals
  + Proposal 1: When RAN4 defines the RRM requirement, it shall further consider the following factors for UE complexity reduction:
    - Single RF path is expected based on RF agreement
    - Single searcher is expected given that there is no CA support as agreed in R4-2108359.
  + Proposal 2: “For RedCap UE with 2 receive branches, the release 15 NR UE measurement requirements are reused that are not affected by the reduced BW.”
* Discussion
  + CMCC: For single searcher, we would kike t check if future RedCap UEs may support CA and larger number of searchers.
  + Huawei: What is the meaning of “Single RF path”? There is no definition in the current spec. For single searcher – it is a reasonable assumption for single carrier capable UE and it will affect CSSF calculation.
  + E///: To CMCC – in current release UE does not support CA. Further enhancements can be considered in the future. For Single RF path – this is a general description and limited impact in RF session.
  + Apple: Agree with single carrier and single searcher. For Single RF path – agree with MTK and we can avoid to discuss inter-frequency measurements without gap.
  + QC: For Proposal 2 – what is the intention? We think that we do not need to differentiate the requirements between 1RX and 2RX UEs.
    - E///: WID supports 1RX and 2RX UEs and motivation is to clarify how to handle such UEs.
    - QC: Propose to define minimum requirements based on 1RX only.
    - CMCC: Disagree. There are different types of UEs and need 1RX and 2RX requirements
    - E///: Same view as CMCC
    - Huawei: Agree with CMCC
    - MTK: Agree with CMCC that both 2RX and 1RX shall be defined. For 2RX we can reuse the existing requirements.
    - QC: we are fine with that
* Agreements:
  + Define separate set of requirements for 1RX and 2RX capable RedCap UEs
    - For RedCap UEs using 2 RX branches
      * Use Release 15 NR UE measurement requirements for single carrier operation as baseline
      * Single searcher is assumed
    - For RedCap UE using 1 RX branches
      * Define a new set of RRM requirements for single carrier operation
      * Single searcher is assumed
    - Note: the changes related to reduced BW and HD-FDD shall be further discussed

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115358 | WF on RedCap RRM requirements | Ericsson |  |
| R4-2115359 | Simulation assumptions for RedCap cell detection performance | vivo |  |
| R4-2115360 | Simulation assumptions for RedCap SSB based RRM measurement performance | Huawei, HiSilicon |  |
| R4-2115361 | Simulation assumptions for RedCap RLM and BFD performance | Ericsson |  |
| R4-2115362 | Simulation assumptions for RedCap L1 RSRP measurement performance | Ericsson |  |
| R4-2115363 | Simulation assumptions for RedCap PBCH detection | vivo |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115358 | WF on RedCap RRM requirements | Ericsson | Approved |  |
| R4-2115359 | Simulation assumptions for RedCap cell detection performance | vivo | Approved |  |
| R4-2115360 | Simulation assumptions for RedCap SSB based RRM measurement performance | Huawei, HiSilicon | Approved |  |
| R4-2115361 | Simulation assumptions for RedCap RLM and BFD performance | Ericsson | Approved |  |
| R4-2115362 | Simulation assumptions for RedCap L1 RSRP measurement performance | Ericsson | Approved |  |
| R4-2115363 | Simulation assumptions for RedCap PBCH detection | vivo | Approved |  |

**WF/LS for approval**

**R4-2115358 WF on RedCap RRM requirements**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115359 Simulation assumptions for RedCap cell detection performance**

*Type: other For: Approval  
 Source: vivo*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115360 Simulation assumptions for RedCap SSB based RRM measurement performance**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115361 Simulation assumptions for RedCap RLM and BFD performance**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115362 Simulation assumptions for RedCap L1 RSRP measurement performance**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115363 Simulation assumptions for RedCap PBCH detection**

*Type: other For: Approval  
 Source: vivo*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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**Email discussion: [100-e][235] NR\_redcap\_RRM\_2**

**R4-2115225 Email discussion summary: [100-e][235] NR\_redcap\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (vivo)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115410 (from R4-2115225).**

**R4-2115410 Email discussion summary: [100-e][235] NR\_redcap\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (vivo)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 23rd)**

**Issue 1-1-2: Whether prioritizing the eDRX requirements for FR1 and de-prioritizing the eDRX requirements for FR2.**

* Proposals
  + Option 1: Yes (Apple, MTK, CMCC, ZTE, QC )
  + Option 2: No (Ericsson)
  + Option 3: FFS (OPPO, Huawei, Xiaomi, vivo)
* Discussion
  + Huawei: For FR2 there are multiple samples used for serving cell. There may be different approaches how to split the samples across PTW. We prefer to further study the FR2 aspects.
  + E///: Both FR1 and FR2 are needed. Ok to have FFS.
  + MTK: Benefits of eDRX for FR2 are negligible. FR2 can be deprioritized.
* Agreements:
  + Define eDRX requirements for FR1
  + FFS whether to define eDRX requirements for FR2

**Issue 2-1-3:  Mechanism for R17 RedCap UE in IDLE/Inactive mode**

* Proposals
  + Option 1a: reuse the same mechanism of R16 RRM relaxation, in particular either using a fixed scaling factor (value for FFS) or using a period of time (value for FFS), without EMR in power saving WI for R17 RedCap UE in IDLE/Inactive mode
  + Option 2: FFS
* Discussion
  + QC: We are fine with 1a. We may have different scaling factors.
* Agreements:
  + Reuse the same mechanism as Rel-16 RRM measurement relaxation in IDLE/Inactive mode
    - Method 1: Using scaling factors (value for FFS)
    - Method 2: Using a period of time (value for FFS)
    - Criteria for using Method 1 and/or 2 are FFS
    - Note: EMR is not supported by RedCap UEs and the relaxation mechanisms related to EMR carriers do not apply to RedCap

**Issue 2-1-4: Relaxation when stationary criteria is satisfied**

* Proposals
  + Option 1: use scaling factor (one or multiple and fixed/non-fixed for FFS) (MTK Eric xiaomi QC)
    - Option 1a: if single criteria (stationarity or not-at-cell-edge) is fulfilled, use K1\_RedCap /K2\_RedCap to relax the RRM requirement. K1\_RedCap /K2\_RedCap has the similar applicability condition as K1/K2 in R16 power saving WI, and FFS on the values for K1\_RedCap /K2\_RedCap (Apple Huawei)
    - Option 1b: When the stationarity criterion is configured, the scaling factor based RRM relaxation principle in Rel-16 should be considered firstly (vivo)
    - Option 1c: The requirements for R16 low mobility criterion can be used as baseline for Rel-17 stationary criterion, with a larger scaling factor (e.g., K2＞3) due to different Rel-17 thresholds. (oppo Huawei)
    - Option 1d:  For stationary scenario, RRM measurement relaxation with larger scaling factor of measurement interval than R16 low mobility is applied - The scaling factor is fixed (Huawei)
  + Option 2: Relax by at least one hour - During Idle/Inactive mode, when a UE is configured with and fulfils the stationarity criterion, then irrespective of other criteria being configured and/or fulfilled, it may relax the neighbour cell measurements by at-least one hour. Exact value is FFS (QC)
  + Option 3: FFS (CMCC)
  + Option 4: if stationarity criteria is fulfilled, use K1\_RedCap /K2\_RedCap to relax the RRM requirement. K1\_RedCap /K2\_RedCap has the similar applicability condition as K1/K2 in R16 power saving WI,
    - K1\_RedCap is a fixed factor and its value > 3; FFS on the values for K2\_RedCap
* Discussion
  + TBA
* Agreements:
  + TBA

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115364 | WF on R17 Redcap eDRX enhancements and RRM measurement relaxations | vivo |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115364 | WF on R17 Redcap eDRX enhancements and RRM measurement relaxations | vivo | Approved |  |

**WF/LS for approval**

**R4-2115364 WF on R17 Redcap eDRX enhancements and RRM measurement relaxations**

*Type: other For: Approval  
 Source: vivo*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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##### 9.20.3.1 General and RRM requirements impacts

**R4-2112129 Impact of RedCap on RRM requirements**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2112191 Discussion on RRM impacts for reduced capability NR devices**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2112643 Considerations on RRM impacts of Redcap**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113148 Further discussion on RRM requirements for RedCap UE in Rel-17**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113284 General RRM requirements for Redcap UE**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113845 Discussion on general RRM requirements impacts for RedCap UE**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2113865 On general aspects of RedCap RRM**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113947 General and RRM requirements impacts**

*Type: discussion For: Decision  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2114068 On scope of RRM core requirements for RedCap**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Discussion on RRM core requirements for NR\_redcap

**Decision: Noted.**

**R4-2114084 Discussions on scope and general requirements for RedCap**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussions on scope and general requirements for RedCap

**Decision: Noted.**

**R4-2114490 on BWP switching time for Redcap UE**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 9.20.3.2 UE complexity reduction

**R4-2112130 Discussion on UE complexity reduction for RedCap**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2112415 Discussion on RRM requirements for UE complexity reduction for RedCap**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2112644 Considerations on UE complexity reduction for Redcap**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113285 UE complexity reduction for Redcap UE**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113846 Discussion on RRM requirements due to UE complexity reduction**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2113847 Simulation assumption for measurement accuracy for RedCap UE with 1 RX**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2113866 On complexity reduction for RedCap UEs**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113955 UE complexity reduction**

*Type: discussion For: Decision  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2114083 Discussion on UE complexity reduction**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution, we will further discuss on UE complexity reduction for RedCap UE.

**Decision: Noted.**

**R4-2114575 RRM impact of complexity reduction features**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Abstract:**

In this paper we discuss the RRM impact of UE complexity reduction features for RedCap UE

**Decision: Noted.**

##### 9.20.3.3 Extended DRX enhancements

**R4-2112131 Discussion on RRM requirement with eDRX for RedCap**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2112416 Discussion on RRM requirements for extended DRX enhancements for RedCap**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2112645 Considerations for eDRX enhancement for Redcap**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113286 Extended DRX enhancements for Redcap UE**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113848 Discussion on Extended DRX enhancements for RedCap UE**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2113867 On Extended DRX enhancements for RedCap UEs**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113956 Extended DRX enhacnements**

*Type: discussion For: Decision  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2114085 Discussions on eDRX requirements for RedCap**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

RAN4 to start discussing the measurement requirements for UE configured with eDRX as agreed in [1]. In this contribution, we discuss and provide our view on this topic.

**Decision: Noted.**

**R4-2114574 eDRX enhancements for RedCap UE**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Abstract:**

In this paper we discuss eDRX enhancements for RedCap UE

**Decision: Noted.**

##### 9.20.3.4 RRM measurement relaxations

**R4-2112132 Discussion on RRM measurement relaxations for RedCap**

*Type: discussion For: Discussion  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: Apple*

**Decision: Noted.**

**R4-2112417 Discussion on RRM measurement relaxations for RedCap UE**

*Type: discussion For: Discussion  
 Source: Xiaomi*

**Decision: Noted.**

**R4-2112646 Considerations for RRM relaxation for Redcap**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113287 RRM measurement relaxations for Reduced Capability UE**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113849 Discussion on RRM measurement relaxations for RedCap UE**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2113868 Discussions on RRM measurement relaxations for RedCap UEs**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113972 RRM measurements relaxation**

*Type: discussion For: Decision  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2114069 On RRM measurement relaxation for neighbouring cells**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Discussion on RRM relaxation for NR\_redcap

**Decision: Noted.**

**R4-2114086 Discussions on relaxed mesurment requirements for RedCap**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

RAN4 to start discussing relaxed measurement requirements for RedCap as agreed in [1]. In this contribution, we discuss and provide our view on this topic.

**Decision: Noted.**

**R4-2114576 RRM relaxations enhancements for RedCap UE**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Abstract:**

In this paper we discuss RRM relaxations enhancements for RedCap UE

**Decision: Noted.**

### 9.21 Positioning enhancements for NR

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**Email discussion: [100-e][236] NR\_pos\_enh\_RRM\_1**

**R4-2115226 Email discussion summary: [100-e][236] NR\_pos\_enh\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115411 (from R4-2115226).**

**R4-2115411 Email discussion summary: [100-e][236] NR\_pos\_enh\_RRM\_1**

*Type: other For: Information  
 Source: Moderator (Ericsson)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 24th)**

**Topic #2: Latency reduction of positioning measurement**

Issue 2-1-0: How to define low latency enhancements due to reduced number of processing samples with regards to Rel-16 accuracy requirements

* Proposals
  + Option 1 (Intel, CMCC, Ericsson, Huawei, CATT, ZTE, QC):
    - For Rel-17 low latency enhancement, Rel-16 accuracy requirements shall be held.
  + Option 2 (Nokia):
    - For Rel-17 low latency enhancement, RAN4 can consider Rel-16 accuracy requirement relaxation (i.e. considering more margin to Rel-16 requirement.)
* Discussion
  + Intel: RAN4 does not need to define any requirements relaxation and need to focus on identifying specific conditions.
  + CMCC: Not ok with Option 2. Prefer not to have any relaxations. WID has objectives on accuracy improvement and we would like to check if latency reduction and accuracy improvement shall be considered jointly.
  + Nokia: Option 2. High accuracy and low latency are independent. Low latency is quite similar to URLLC use case. We cannot achieve both.
  + E///: Option 1. Low latency implicitly improved E2E positioning accuracy.
  + Huawei: Option 1 shall be our target. However, we cannot guarantee that we can keep accuracy for all cases. Small degradation can be acceptable. No need to consider accuracy improvement and latency reduction jointly.
  + vivo: Too early to conclude. There is tradeoff between accuracy and latency. No need to consider accuracy improvement and latency reduction jointly.
  + CATT: Option 1.
  + ZTE: Option 1. Agree with vivo that there is some tradeoff. Enhancements are possible and enhanced algorithms can be considered.
  + QC: Same view as Huawei. There are different use cases and under certain conditions we can accept relaxation of accuracy. Option 1 can be a baseline.
  + Nokia: We can agree that the goal will be to keep the R16 requirements.
  + QC: Accuracy improvement can be considered using timing mitigation techniques.
  + vivo: Agree with Nokia. If we keep Rel-16 accuracy, then we need to sacrifice side conditions. Not sure if this is a good choice but we can accept this.
* Agreements:
  + Low latency enhancement
    - It is RAN4 understanding that the reduction of the number of DL PRS processing samples is possible under certain conditions
      * In some cases the reduction of the number of DL PRS processing samples is feasible under assumption of relaxation of the Rel-16 NR positioning accuracy requirements for the existing side conditions (e.g. SINR, PRS configurations, channel models, etc.)
      * In some cases the reduction of the number of DL PRS processing samples is feasible under assumption of keeping Rel-16 NR positioning accuracy requirements and for the case of using different side conditions (e.g. SINR, PRS configurations, channel models, etc.)
    - For Rel-17 low latency NR Positioning requirements definition the goal is to meet the existing Rel-16 NR positioning accuracy requirements
      * FFS whether to consider limited relaxations of requirements for specific scenarios

Issue 2-1-4: RAN4 focus to evaluate impact of reducing number of processing samples

* Proposals
  + Option 1: (Huawei)
    - To allow unified framework that allows reduction of processing samples for all PRS bandwidths, consider reduction of samples based on analysis of  high Ês/Iot side condition paired with low PRS bandwidth (≤ 32 PRB)
  + Option 2: (vivo)
    - Impact of reducing number of processing samples based on analysis of low Ês/Iot side condition or higher Ês/Iot side condition paired with low PRS bandwidth (≤ 32 PRB)
  + Option 3: (Intel, E///)
    - RAN4 should explore different options: higher Ês/Iot conditions for all PRS bandwidths, larger BW but existing side conditions and favorable channel model
* Discussion
  + E///: We need to list options
* Agreements:
  + Further study the impact of reducing number of processing samples
    - Number of processing PRS samples: 1, 2, 3, 4 (reference / R16 assumptions)
    - PRS BW: FFS
    - SNR conditions:
      * Option 1: Rel-16 SNR side conditions
      * Option 2: Higher SNR side conditions than in Rel-16
    - Channel models:
      * Option 1: Rel-16 channel models
      * Option 2: LOS channel models (e.g., TDL-D, TDL-E)
    - Note: other parameters and options are not precluded

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115365 | WF on Rel-17 positioning enhancements RRM – Part 1 | Ericsson | WF document to capture agreements from thread |
| R4-2115366 | Reply LS on PRS processing samples | RAN4 | To: RAN1 |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115365 | WF on Rel-17 positioning enhancements RRM – Part 1 | Ericsson | Approved |  |
| R4-2115366 | Reply LS on PRS processing samples | Ericsson | Approved |  |

**WF/LS for approval**

**R4-2115365 WF on Rel-17 positioning enhancements RRM – Part 1**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115366 Reply LS on PRS processing samples**

*Type: LS out For: Approval  
 to RAN1  
 Source: Ericsson*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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**Email discussion: [100-e][237] NR\_pos\_enh\_RRM\_2**

**R4-2115227 Email discussion summary: [100-e][237] NR\_pos\_enh\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115412 (from R4-2115227).**

**R4-2115412 Email discussion summary: [100-e][237] NR\_pos\_enh\_RRM\_2**

*Type: other For: Information  
 Source: Moderator (CATT)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 24th)**

**Topic #1: UE Rx/Tx and/or gNB Rx/Tx timing delay mitigation**

Issue 1-1-2 Clarification about “DL measurement” in the definition of UE Rx TEGs.

* Proposals
  + Option 1: (Huawei)
    - “DL measurements” in the definition of Rx TEGs refers to TOA measurements
  + Option 2: (CATT, vivo, Nokia)
    - “DL measurements” in the definition of Rx TEGs refers to RSTD measurements
  + Option 3: (Ericsson)
    - Wait for RAN1 clarification.
* RAN1 Agreement:
  + Subject to UE capability, support a UE to include one UE Rx TEG ID for the RSTD reference time and one UE Rx TEG ID for each DL RSTD measurement (including each additional DL RSTD measurement), in a DL TDOA measurement report. These UE Rx TEG IDs can be the same or different.
  + Note: RSTD reference time is related to the DL\_PRS\_Reference\_Info IE
* Discussion
  + QC: Our interpretation is Option 1. We can also clarify with RAN1 as well.
  + Nokia: For Option 1 it is not clear what should be measured at the RX side.
    - Huawei: One example is that reference and target cells are measured using different antennas and TOA measurements are associated with different TEGs.
  + Huawei: RAN4 does not need to discuss it.
  + E///: Same view as Huawei and QC.
  + CATT: Agree with Huawei and we don’t need to change RAN1 definition.
  + vivo: No need to discuss in RAN4. It is ok to ask for clarification.
  + Intel: Option 1.
  + Nokia: We are ok with Option 1 given the clarification from Huawei
  + Session chair: come back in the 2nd round (vivo will check if Option 2 is acceptable).
* Tentative agreements:
  + Option 1: Send LS to RAN1 to clarify the TEG definition and whether the TEG is associated with DL TOA or RSTD measurements
  + Option 2: It is RAN4 understanding that “DL measurements” in the definition of Rx TEGs refers to TOA measurements (i.e., reference cell and target cell TOA measurements can be associated with different TEGs)

Issue 1-1-1 Framework of TEG

* Proposals
  + Common understanding: TEG framework enables association information without limiting implementation to ensure that the timing error difference between measurements/transmissions associated to the same TEG are within a certain margin.
* RAN1 definition: (in LS R4-2107610)
  + UE Rx ‘timing error group’ (UE Rx TEG): A UE Rx TEG is associated with one or more DL measurements, which have the Rx timing errors within a certain margin.
  + TRP Tx ‘timing error group’ (TRP Tx TEG): A TRP Tx TEG is associated with the transmissions of one or more DL PRS resources, which have the Tx timing errors within a certain margin.
* Discussion
  + TBA
* Agreements:
  + Common understanding: TEG framework enables association information without limiting implementation to ensure that the timing error difference between measurements/transmissions associated to the same TEG are within a certain margin.

Issue 1-2-1 Feasibility of TEGs for timing error mitigation mechanism

* Proposals
  + Option 1: (CATT, Nokia)
    - UE/TRP may group the timing error based on RF chains and antenna panel, such that timing errors in the same group are within certain margin. Timing error grouping method and criterion with margin need to be further discussed.
  + Option 1a: (Ericsson)
    - UE/TRP may group the timing error based on RF chains and antenna panel, such that timing errors differences in the same group are within certain margin. Timing error grouping method and criterion with margin need to be further discussed.
  + Option 2: (ZTE)
    - UE/TRP may group the timing error based on RF chains and antenna panel, such that timing errors in the same group are within certain margin. However the UE/TRP may not be able to ensure that timing errors are within the same margin
  + Option 3: (vivo, Huawei, Qualcomm)
    - RAN4 confirms the timing error mitigation mechanism defined by RAN1 is feasible for both UE Rx/Tx and gNB Rx/Tx.
    - The timing error grouping is UE implementation dependent and no specific UE behaviour is need to be specified.
* Discussion
  + QC: We think that grouping is up to TRP/UE implementation. Additional consideration on grouping can be considered.
  + ZTE: can agree with Option 1a.
  + Huawei: Agree on feasibility. We do not need to define specific implementations.
  + Intel: There may be other criteria for TEG grouping
  + E///: We prefer to define some criteria. Otherwise TRP/UE behavior cannot be controlled.
  + Nokia: Agree with QC. Measurement and grouping are RX implementation specific. Another question is whether we need to define the requirements.
  + vivo: Agree with Huawei. We already agree that TEG association is up to UE implementation. We are ok to study if some specific RRM requirements are needed.
  + CATT: TEG is feasible.
* Agreements:
  + Confirm that the timing error mitigation mechanism defined by RAN1 is feasible for both UE Rx/Tx and gNB Rx/Tx.
  + UE/TRP may group the timing errors for UE/TRP Rx/Tx (e.g., based on RF chains and antenna panel) such that timing error difference in the same group is within a certain margin
  + FFS on RRM requirements for timing error mitigation mechanism, timing error grouping method, criteria and margin. FFS if any specific UE behavior will be defined.

Issue 1-2-2 The values of timing error margins associated with TEGs.

* Proposals
  + Option 1: (Qualcomm, CATT, vivo, Ericsson)
    - It is within RAN4 scope to recommend a useful range of values for timing error margins associated with TEGs.
  + Option 1a: (Qualcomm, Ericsson)
    - Configuring TEGs with different timing error margins, subject to UE capability, should be supported.
  + Option 2: (Huawei, Intel, Nokia)
    - FFS

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115367 | WF on Rel-17 positioning enhancements RRM – Part 2 | CATT |  |
| R4-2115368 | Reply LS on gNB/UE Rx/Tx timing error mitigation | CATT | Reply to: RAN1 |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115367 | WF on Rel-17 positioning enhancements RRM – Part 2 | CATT | Approved |  |
| R4-2115368 | Reply LS on gNB/UE Rx/Tx timing error mitigation | CATT | Approved |  |

**WF/LS for approval**

**R4-2115367 WF on Rel-17 positioning enhancements RRM – Part 2**

*Type: other For: Approval  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115368 Reply LS on gNB/UE Rx/Tx timing error mitigation**

*Type: LS out For: Approval  
 to RAN1  
 Source: CATT*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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#### 9.21.1 General

**R4-2112549 Reply LS on PRS processing samples**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

#### 9.21.2 RRM core requirements

##### 9.21.2.1 General and RRM requirements impacts

**R4-2111999 Discssion on PRS processing samples**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112550 Further discussion on general RRM requirements impacts for positioning enhancement**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

##### 9.21.2.2 UE Rx/Tx and/or gNB Rx/Tx timing delay mitigation

**R4-2112000 Discussion on UE Rx/Tx and/or gNB Rx/Tx timing delay mitigation**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112551 Discussion on timing delay mitigation**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112598 Discussion on UE Rx/Tx and/or gNB Rx/Tx timing delay mitigation**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113157 Discussion on timing delay mitigating for NR positioning enhancement**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113874 UE Rx/Tx and gNB Rx/Tx timing delay mitigation**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2114051 Reply LS on on UE/TRP Tx/Rx Timing Errors**

*Type: discussion For: Approval  
 Source: Ericsson*

**Abstract:**

This contribution discusses UE/TRP Tx/Rx Timing Errors based on incoming LS from RAN1 and proposes a reply LS

**Decision: Noted.**

**R4-2114198 On UE Rx/Tx timing error mitigation**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2114310 Discussion on timing error mitigation for positioning**

*Type: LS out For: Approval  
 to RAN1  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 9.21.2.3 Latency reduction of positioning measurement

**R4-2112001 Discussion on latency reduction of positioning measurement**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112508 Discussion on latency reduction of positioning measurement**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2112552 Discussion on latency reduction of positioning measurement**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112599 Discussion on latency reduction of positioning measurement**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113158 Discussion on latency reduction for NR positioning enhancement**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113876 On latency reduction of positioning measurement**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2114052 Reply LS on PRS processing samples**

*Type: discussion For: Approval  
 Source: Ericsson*

**Abstract:**

This contribution discusses PRS processing samples based on incoming LS from RAN1 and proposes a reply LS

**Decision: Noted.**

**R4-2114199 On latency reduction of NR positioning measurements**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2114311 Discussion on latency reduction for positioning**

*Type: LS out For: Approval  
 to RAN1  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 9.21.2.4 Measurement in RRC\_INACTIVE state

**R4-2112002 Discussion on measurement in RRC\_INACTIVE state**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2112553 Discussion on measurement in RRC\_INACTIVE state**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112600 Discussion on measurement in RRC\_INACTIVE state**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2113877 Positioning measurements in RRC\_INACTIVE state**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2114053 On positioning in RRC\_inactive**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses positioning in RRC\_inactive

**Decision: Noted.**

**R4-2114312 Discussion on PRS measurement in RRC\_INACTIVE**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 9.21.2.5 Impact on existing UE positioning and RRM requirements

**R4-2112554 Discussion on impact to existing UE positioning and RRM requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113880 Impact on existing UE positioning and RRM requirements**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2114313 Discussion on new MGP for positioning**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114462 Impact on RRM and positioning requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

The paper analyzes the impact of RRM on positioning requirements and vice versa

**Decision: Noted.**

##### 9.21.2.6 Enhancements of A-GNSS positioning

**R4-2112003 Discussion on enhancements of A-GNSS positioning**

*Type: discussion For: Discussion  
 Source: CATT*

**Decision: Noted.**

**R4-2113873 On A-GNSS positioning enhancement**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2114314 Discussion on A-GNSS enhancement in Rel-17 positioning**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

### 9.22 Multi-Radio Dual-Connectivity enhancements

#### 9.22.1 General

#### 9.22.2 RRM core requirements

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**Email discussion: [100-e][238] LTE\_NR\_DC\_enh2\_RRM**

**R4-2115228 Email discussion summary: [100-e][238] LTE\_NR\_DC\_enh2\_RRM**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115413 (from R4-2115228).**

**R4-2115413 Email discussion summary: [100-e][238] LTE\_NR\_DC\_enh2\_RRM**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 23rd)**

Issue 1-1-2: Minimum gap length between the RS symbol(s) for AGC and the RS symbols for time/frequency acquisition

* Background:

|  |
| --- |
| SCell to be activated is known and belongs to FR1 and if the measurement period of the SCell being activated is larger than [2400ms].   * + Temporary RS can be used for AGC     - 1 burst (2-slot with four CSI-RS resources) is required   + Temporary RS can be used for time/frequency tracking     - 1 separate burst (2-slot with four CSI-RS resources) is required in addition to the one burst required for AGC   + Minimum gap between the RS symbol(s) for AGC and the RS symbols for time/frequency acquisition is needed to account for UE AGC application time delay. |

* Proposals
  + Option 1 (Apple, Huawei, OPPO, MTK):
    - 2 slots for 15kHz and 30kHz
    - 3 slots for 60kHz
  + Option 2 (Qualcomm, vivo, Ericsson, MTK): 2 slots
  + Option 3 (Apple, Huawei): depending on UE reported capability
* Discussion
  + Nokia: Fixed number. Option 1 or 2.
  + Apple: 1 additional slot will not make a huge difference.
  + QC: No great difference between Option 1 and 2. Option 1 may somewhat reduce network flexibility.
  + vivo: Typical AGC implementation has symbol-level duration to make estimation and apply values.
  + MTK: Same view with Nokia. Option 3 will overcomplicate.
  + OPPO: Prefer no UE capability. We proposed tighter value but can compromise to Option 1.
  + Huawei: It depends on timelines of UE implementation.
  + QC: Not big difference. 60kHz use case is URLLC and UE is supposed to make fast processing. Can compromise to Option 1.
  + E///: can compromise to Option 1.
  + vivo: ok with Option 1.
* Agreements:
  + 15kHz and 30kHz: 2 slots
  + 60kHz: 3 slots

Issue 1-2: If Scell measurement cycle is larger than 160ms (or if the measurement period of the Scell being activated is larger than [2400ms], depending on Issue 1-1-1), whether the UE requires to receive another RS transmitted also on the other activated serving cell in the same band in the same slot?

* Proposals
  + Option 1 (vivo, Qualcomm, Intel, Huawei, Nokia, Ericsson):
    - These RSs are not required to be transmitted/received in the same slot
  + Option 2 (Apple, MTK):
    - These RSs are required to be transmitted/received in the same slot
  + Option 3 (Apple, Huawei):
    - UE reports capability which indicates whether UE requires to receive another RS transmitted also on the other activated serving cell in the same band in the same slot.
* Discussion
  + MTK: If Option 1 is agreed, then UE needs to follow shorter requirements. We should define the requirements for the worst case. If the RS are not transmitted in the same slot, then AGC gain can be overestimated.
  + vivo: Do not think Option 2 is the worst case. We think Option 1 and 2 are different solutions.
  + Apple: In Rel-15 the assumptions were based Option 2. Option 2 may have better accuracy.
  + QC: Option 2 is baseline in Rel-15 for SCell activation. For new requirements with enhanced SCell activation. Option 2 will limit network flexibility and may negatively affect latency.
  + Huawei: In Rel-17 the situation has changed. The motivation is to reduce the latency. From implementation perspective Option 1 is ok.
  + OPPO: Ok with Option 1.
  + Huawei: for the Option 1 UE can make AGC based on serving cell RS and not wait for the RS in the SCell.
  + Apple: Option 2 has restrictions but still doable.
  + MTK: For Option 1 – can we specify that some performance degradation is allowed?
    - Apple: agree that it can be one possible solution. The reported CQI may not be very accurate.
  + OPPO: Performance degradation is not expected for Option 1.
  + QC: We cannot accept MTK proposal for now.
  + E///: To Apple, we are not checking that UE is reporting optimum CQI.
  + QC: we can be ok under clarification from E///
  + MTK: For Option 1 we assume that UE may report inaccurate CQI
  + QC: we can be ok.
  + Chair: come back in the 2nd round GTW
* Tentative agreements:
  + From RAN4 perspective
    - The RSs on the other activated serving cell in the same band are not required to be transmitted in the same slot
    - UE is not required to receive another RS transmitted also on the other activated serving cell in the same band in the same slot
    - UE may report inaccurate non-zero CQI in case the RS are not transmitted in the same slot

Issue 1-3-1: Whether RAN4 need to specify requirements for Option 2 in LS [R4-2107609]

* Background: The following LS was sent from RAN1 to RAN4 [R4-2107609], the content is duplicated as below:

|  |
| --- |
| * Overall Description:   + With respect to efficient SCell activation for NR CA, RAN1 would like to inform RAN4 the following RAN1 agreement,   + Agreement     - For efficient activation of Scells     - Option 1a: MAC CE(s) contained in a single PDSCH to trigger both Scell activation and corresponding temporary RS(s)       * Details FFS including timeline design for receiving temporary RS   Note: Separate from the support of Option 1a, it is up to RAN4 whether or not to consider an activation time enhancement for Option 2 without requiring further RAN1 work   * + - Option 2: A Rel-15/16 Scell activation MAC-CE to trigger Scell activation and a Rel-15/16 DCI to trigger corresponding Rel-15/16 A-TRS(s) |

* Proposals
  + Option 1(vivo, Apple, Huawei, OPPO, ZTE, MTK): No, RAN4 only specify requirements for option 1a in LS [R4-2107609].
  + Option 2 (Qualcomm, Ericsson): Yes, RAN4 specify requirements for both option 1a and option 2 in LS [R4-2107609]
* Discussion
  + TBA
* Agreements:
  + TBA

**GTW session (August 27th)**

Issue 1-3-1: Whether RAN4 need to specify requirements for Option 2 in LS [R4-2107609]

* Proposals
  + Option 1(vivo, OPPO, ZTE, MTK, Nokia, Huawei): No, RAN4 only specify requirements for option 1a in LS [R4-2107609].
  + Option 1a (Apple, Huawei, QC, E///, Intel): Prioritize option 1a, and FFS on Option 2 in LS [R4-2107609].
  + Option 2 (Qualcomm, Ericsson, Nokia): Yes, RAN4 specify requirements for both option 1a and option 2 in LS [R4-2107609]
* Discussion
  + E///: Prefer to include both Option 1 and 2
  + QC: We prefer to do both
  + Intel: Prefer 1a
  + ZTE: We prefer not to define requirements for Option 2 in the original LS. Option 2 will require a lot of efforts in RAN4
  + Nokia: We are not against Option 2.
* Agreements
  + RAN4 will specify requirements for Option 1a in LS R4-2107609
  + FFS whether RAN4 will specify requirements for Option 2 in LS R4-2107609
    - Companies are encouraged to bring inputs on RRM requirements impacts

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115369 | WF on Rel-17 further Multi-RAT Dual-Connectivity enhancements | Huawei, HiSilicon |  |
| R4-2115370 | Reply LS on temporary RS for efficient SCell activation in NR CA | Huawei, HiSilicon | To: RAN1, RAN2; |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115369 | WF on Rel-17 further Multi-RAT Dual-Connectivity enhancements | Huawei, HiSilicon | Approved |  |
| R4-2115370 | Reply LS on temporary RS for efficient SCell activation in NR CA | Huawei, HiSilicon | Approved |  |
| R4-2115418 | LS on efficient activation/de-activation mechanism for one SCG | Huawei, HiSilicon | Return to | To be handled in GTW |

**WF/LS for approval**

**R4-2115369 WF on Rel-17 further Multi-RAT Dual-Connectivity enhancements**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115436 (from R4-2115369).**

**R4-2115436 WF on Rel-17 further Multi-RAT Dual-Connectivity enhancements**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115370 Reply LS on temporary RS for efficient SCell activation in NR CA**

*Type: LS out For: Approval  
 to RAN1, RAN2  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115418 LS on efficient activation/de-activation mechanism for one SCG**

*Type: LS out For: Approval  
 to RAN2  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115437 (from R4-2115418).**

**R4-2115437 LS on efficient activation/de-activation mechanism for one SCG**

*Type: LS out For: Approval  
 to RAN2  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115440 (from R4-2115437).**

**R4-2115440 LS on efficient activation/de-activation mechanism for one SCG**

*Type: LS out For: Approval  
 to RAN2  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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##### 9.22.2.1 General and RRM requirements impacts

**R4-2113143 Discussion on RRM aspects of MR-DC enhancements in Rel-17**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2113838 General RRM requirements impacts due to Multi-Radio Dual-Connectivity enhancements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 9.22.2.2 Efficient activation/de-activation mechanism for SCells

**R4-2112075 On efficient activation/de-activation mechanism for SCells**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2112642 On temporary RS for efficient SCell activation in NR CA**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2112698 Efficient activation and deactivation mechanism for SCells**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2113839 Discussion on efficient activation/de-activation mechanism for Scells**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2113883 On temporary RS for efficient SCell activation**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2114020 Discussion on efficient activation/de-activation mechanism for Scells**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2114154 Discussion on temporary RS**

*Type: discussion For: Discussion  
 Source: MediaTek inc.*

**Decision: Noted.**

**R4-2114177 On efficient activation/deactivation mechanism for SCells**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Our views on open issues in Efficient activation/deactivation mechanism for SCells

**Decision: Noted.**

##### 9.22.2.3 Efficient activation/de-activation mechanism for one SCG

**R4-2112076 On efficient activation/de-activation mechanism for one SCG**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2112699 Efficient activation and deactivation mechanism for one SCG**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2113840 Discussion on efficient activation/de-activation mechanism for one SCG**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114021 Discussion on Efficient activation/de-activation mechanism for one SCG**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2114178 On efficient activation/deactivation mechanism for one SCG**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Our views on open issues in Efficient activation/deactivation mechanism for SCG.

**Decision: Noted.**

##### 9.22.2.4 Conditional PSCell change and addition

**R4-2112077 On conditional PSCell change and addition**

*Type: discussion For: (not specified)  
 Source: Apple*

**Decision: Noted.**

**R4-2112700 Conditional PSCell change and addition**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

**R4-2113841 Discussion on conditional PSCell change and addition**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2113886 Conditional PSCell change and addition**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2114022 Discussion on conditional PSCell change and addition**

*Type: discussion For: Discussion  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2114179 On conditional PSCell change and addition**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Our views on open issues in Conditional PSCell change and addition.

**Decision: Noted.**

### 9.23 Enhanced IIoT and URLLC support

#### 9.23.1 General

#### 9.23.2 RRM core requirements

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**Email discussion: [100-e][239] NR\_IIOT\_URLLC\_enh\_RRM**

**R4-2115229 Email discussion summary: [100-e][239] NR\_IIOT\_URLLC\_enh\_RRM**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115414 (from R4-2115229).**

**R4-2115414 Email discussion summary: [100-e][239] NR\_IIOT\_URLLC\_enh\_RRM**

*Type: other For: Information  
 Source: Moderator (Nokia)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 24th)**

**Topic #3: Reference point for Te requirements**

Sub-topic 3-1: How to capture the reference point for Te requirements

* RAN4 #99e
  + Agreement (from agreed WF R4-2108368):
    - Sub topic 2-1, Issue 2-1: The reference point/downlink timing refer of the first path at the UE.
      * Agreement:
        + The reference point/downlink timing refer of the first path at the UE.
    - Sub topic 2-3, Issue 2-4: It should be clarified that the reference point/downlink timing refer to the signal of the first path being received/arrives at the UE antenna
      * Tentative agreement:
        + it should be clarified that the reference point/downlink timing refer to the signal of the first path being received/arrives at the UE antenna
  + The tentative outcome from the GTW in RAN4#99 was following TP:
    - Tentative agreements
      * The downlink timing is defined as the time, when the first path in time of the corresponding downlink frame from the reference cell [arrives/is received] at the UE antenna
* Issue 3-1: Whether to include ‘antenna’ in the definition or not
  + 1st round agreement: Agree on Option 1: Use ‘antenna’ in definition as proposed in the tentative TP
* Issue 3-2: Whether to use ‘detected’, ‘detectable’ or not mention either
  + Proposals
    - Option 1: Use ‘detected’ in definition text
    - Option 3: Do not mention neither ‘detected’ nor ‘detectable’ in the definition text
* Issue 3-3: Whether to include ‘Received’, ‘arrives’ or ‘true arrival’ in the definition no company supported use of ‘True arrival’ and no company objected to no longer consider ‘true arrival’
  + Proposals
    - Option 1: Use ‘received’ in definition (vivo)
    - Option 2: Use ‘arrives’ in definition (E///, Intel, Nokia, Huawei)
  + Discussion
    - vivo: Current definition is crystal clear. “Is received” is more clear.
    - E///: We think that as long as spec is unclear, there is sufficient justification to fix it.
      * vivo: We are not clear on what the is ambiguity. Do we also want to change LTE spec.
    - Intel: Agree with E///. To vivo – can you please clarify what is the harm if we include “arrives”?
      * vivo: What is the harm to keep existing wording?
    - vivo: there is no difference between “arrives” and “is received”. The latter is more clear to us.
    - E///: we are discussing the reference point which is not relevant to the UE implementation. It is not smth what UE can control.
      * vivo: we do not define requirements from TE perspective.
    - Intel: Same view as E///. Issue was triggered by RAN1 LS and current wording in RAN4 specs caused misinterpretation in RAN1.
      * vivo: This is a Rel-15 CR and not relevant to RAN1 LS.
    - Nokia: “Arrives” is preferred. Received can be associated with UE behavior.
    - Huawei: Agree with E/// and Intel that current wording in the spec is ambiguous. Support to change it. The technical question is whether current requirement include all scenarios. Agree with vivo technical analysis. Suggest to clarify that Te requirements under LOS/AWGN conditions under high SNR to make sure that we do not affect current requirements
    - ZTE: We can remove detected and keep “is received” as a compromise.
    - E///: Te requirements cannot be met in all conditions. General requirements can be met in some typical conditions.
    - Apple: Keep “detected”
    - Chair: Return in the 2nd round
* Tentative agreements:
* Update the definition of DL timing as follows: *The downlink timing is defined as the time, when the first [****~~detected~~****] path in time of the corresponding downlink frame from the reference cell [~~arrives~~/is received] at the UE antenna*
  + Note: The agreement above does not have impact on the Te accuracy requirements. In certain fading conditions UE may not meet the requirements. ~~UE is expected to meet the Te accuracy requirements at least for the side conditions provided in TS 38.133.~~ ~~UE may not meet the requirements for other side conditions including SNR and channel models.~~

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115371 | WF on NR\_IIOT\_URLLC\_enh\_RRM | Nokia, Nokia Shanghai Bell |  |
| R4-2115372 | LS on UE transmit timing error | ZZZ | To: RAN\_1 |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2114252 | CR on measurement requirements, Scell activation and definition of reference point for UL timing 38133 | Huawei, HiSilicon | Revised |  |
| R4-2114447 | Correction to reference point defintion for UE timing in TS 38.133 | Ericsson, Nokia, Intel | Revised |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2114447 | Correction to reference point defintion for UE timing in TS 38.133 | Ericsson, Nokia, Intel | Return to | To be handled in GTW |
| R4-2115371 | WF on NR\_IIOT\_URLLC\_enh\_RRM | Nokia, Nokia Shanghai Bell | Approved |  |
| R4-2115372 | LS on UE transmit timing error | Huawei | Return to | To be handled in GTW |

**WF/LS for approval**

**R4-2115371 WF on NR\_IIOT\_URLLC\_enh\_RRM**

*Type: other For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

**Discussion:**

**Decision: Approved.**

**R4-2115372 LS on UE transmit timing error**

*Type: LS out For: Approval  
 to RAN1   
 Source: Huawei*

**Abstract:**

**Discussion:**

**Decision: Noted.**

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##### 9.23.2.1 General and RRM requirements impacts

**R4-2112556 RRM impacts overview for IIoT/URLLC support for NR**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113144 Further discussion on RRM requirements for IIoT and URLLC in Rel-17**

*Type: discussion For: Discussion  
 Source: Intel Corporation*

**Decision: Noted.**

**R4-2114027 Discussion of RRM impact for PUCCH carrier switching**

*Type: discussion For: (not specified)  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2114315 Discussion on RRM impacts of PUCCH carrier switching**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 9.23.2.2 Propagation delay compensation enhancements

**R4-2112214 Discussion on propagation delay enhancement**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2112557 Discussion on propagation delay compensation enhancements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113520 Propagation Delay Compensation Enhancements for Time Synchronization**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Analysis of different propagation delay methods using delay budgets. In particular TA based and RTT based methods.

**Decision: Noted.**

**R4-2113981 Propagation delay compensation enhancements**

*Type: discussion For: Decision  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2114029 Status of Propagation delay compensation enhancements and expected RAN4 impacts**

*Type: discussion For: (not specified)  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2114316 Discussion on RRM impacts of PDC enhancements**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

##### 9.23.2.3 Reference point for Te requirements

**R4-2112215 Discussion on reference point of UE transmit timing error**

*Type: discussion For: Discussion  
 Source: CMCC*

**Decision: Noted.**

**R4-2112558 Discussion on reference point for Te requirements**

*Type: discussion For: Discussion  
 Source: vivo*

**Decision: Noted.**

**R4-2113288 Reference point for Te requirements for NR\_IIOT\_URLLC\_enh**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113882 Discussion on the reference point for Te requirements**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

**R4-2113982 Reference point for Te requirements**

*Type: discussion For: Decision  
 38.133 v CR- rev Cat: (Rel-17)  
  
 Source: MediaTek Inc.*

**Decision: Noted.**

**R4-2114009 Further discussion of the reference point for UE transmit timing requirement**

*Type: discussion For: Approval  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted.**

**R4-2114317 Discussion on reference point for Te requirements**

*Type: LS out For: Approval  
 to RAN1  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2114450 LS response on UE transmit timing error**

*Type: LS out For: Approval  
 to RAN1  
 Source: Ericsson, Intel*

**Abstract:**

This document further analyze the remaining issue of the reference point definition for UE timing error requirements. It is continuation of LS response to RAN1 in R4-2105850.

**Decision: Noted.**

### 9.24 NR Sidelink Relay

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**Email discussion: [100-e][240] NR\_SL\_relay\_RRM**

**R4-2115230 Email discussion summary: [100-e][240] NR\_SL\_relay\_RRM**

*Type: other For: Information  
 Source: Moderator (OPPO)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115415 (from R4-2115230).**

**R4-2115415 Email discussion summary: [100-e][240] NR\_SL\_relay\_RRM**

*Type: other For: Information  
 Source: Moderator (OPPO)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 26th)**

Issue 2-7: Whether to use DRX for delay requirements of relay discovery and (re)selection

* Proposals
  + Option 1: DRX is not precluded from R17 NR SL relay WID. R17 NR SL relay WID can follow or reuse both R16 SL and R17 SL’s agreements as baseline.
  + Option 2: The relay requirements should be defined without assuming DRX. R17 NR SL relay WID is just based on R16 SL procedure.
  + Option 3: FFS. Depend on RAN2’s decision whether to consider DRX.
* Discussion
  + OPPO: will wait for RAN2 decision and if needed will request clarifications in the plenary
  + QC: RAN2 decided that there is no special consideration for SL Relay for DRX design
  + E///: Option 2 is reasonable
  + ZTE: Option 2.
  + Session chair: continue discussion

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115373 | WF on NR Sidelink Relay RRM | OPPO |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-2113289 | Work Plan for NR Sidelink Relay RRM | OPPO | Agreeable |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115373 | WF on NR Sidelink Relay RRM | OPPO | Approved |  |

**WF/LS for approval**

**R4-2115373 WF on NR Sidelink Relay RRM**

*Type: other For: Approval  
 Source: OPPO*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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#### 9.24.1 General and work plan

**R4-2113289 Work Plan for NR Sidelink Relay RRM**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Approved.**

#### 9.24.2 RRM core requirements

**R4-2112258 On NR SL relay RRM Requirement Scope**

*Type: discussion For: Discussion  
 Source: Qualcomm, Inc.*

**Decision: Noted.**

**R4-2113290 RRM requirements for NR Sidelink Relay**

*Type: discussion For: Discussion  
 Source: OPPO*

**Decision: Noted.**

**R4-2113825 Discussion on RRM impacts for R17 NR sidelink relay**

*Type: discussion For: Discussion  
 Source: Huawei, HiSilicon*

**Decision: Noted.**

**R4-2113881 Initial discussions on RRM requirements for sidelink relay**

*Type: discussion For: Discussion  
 Source: ZTE Corporation*

**Decision: Noted.**

## 10 Rel-17 Study Items for NR

## 11 Rel-17 Work Items for LTE

### 11.8 Additional enhancements for NB-IoT and LTE-MTC

#### 11.8.4 RRM core requirements

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**Email discussion: [100-e][241] NB\_IOTenh4\_LTE\_eMTC6\_RRM**

**R4-2115231 Email discussion summary: [100-e][241] NB\_IOTenh4\_LTE\_eMTC6\_RRM**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Revised to R4-2115416 (from R4-2115231).**

**R4-2115416 Email discussion summary: [100-e][241] NB\_IOTenh4\_LTE\_eMTC6\_RRM**

*Type: other For: Information  
 Source: Moderator (Huawei)*

**Abstract:**

**Discussion:**

**Decision: Noted.**

**GTW session (August 20th)**

Issue 1-1-5: Multiple carriers for neighbour cell measurements.

* Proposals
  + Option 1a: The UE shall support neighbour cell measurements on at least same number of carriers in CONNECTED mode as in IDLE mode.
  + Option 1b: For neighbour cell measurement in connected state, UE shall be able to monitoring at least the carrier which is same as the serving carrier and at least two carriers which are different from the serving carrier. Then detection/measurement delay shall be scaled by the number of carriers.
  + Option 1c: The UE shall support neighbour cell measurements on at least same number of carriers in CONNECTED mode as in IDLE mode, including the carrier which is same as the serving carrier and at least two carriers which are different from the serving carrier. Then detection and measurement delay shall be scaled by the number of carriers
* Discussion
  + Nokia: 1c is ok. Clarification on the number of carrier should be done – supported number of carriers
    - Huawei: prefer “measured”
    - E///: same view as Huawei
  + QC: Not much clarity from RAN2 on their solutions. Do we need to decide on number of carriers now. We assume this is optional. Replace “at least” to “up to”
  + Huawei: RAN2 has already agreed it is optional. We prefer “at least”
* Agreements:
  + The UE with the support of CONNECTED mode neighbor cell measurements shall support neighbour cell measurements on at least same number of carriers in CONNECTED mode as in IDLE mode, including the carrier which is same as the serving carrier and at least two carriers, which are different from the serving carrier.
  + Detection and measurement delay shall be scaled by the number of measured carriers
  + Note: it is RAN4 understanding that support of CONNECTED mode neighbor cell measurements is an optional UE capability

Issue 1-1-4: Intra-frequency and inter-frequency measurement.

* Proposals
  + Option 1: RAN4 should prioritize requirements for intra-frequency neighbor cell measurements in connected mode regardless of whether the serving frequency is anchor carrier or non-anchor carrier.
* Discussion
  + QC: 1) the prioritization does not depend on whether serving freq is anchor / non-anchor 2) intra-freq shall be prioritized
  + Nokia: Prioritization is not clear. Does not it mean that we shall prioritize the measurements? We are ok to prioritize intra-freq measurements and need study.
  + Huawei: We have agreed that measurement delay shall be scaled, so this means that UE shall be capable to measure.
  + E///: For prioritization we need to define both. For measurements prioritization we prefer not to specify it and leave up to UE implementation.
  + QC: Ok with no prioritization.

**1st round email discussion conclusions**

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Comments** |
| R4-2115374 | WF on RRM requirements for Rel-17 NB-IoT and LTE-MTC | Huawei, HiSilicon |  |

**2nd round email discussion conclusions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Decision** | **Comments** |
| R4-2115374 | WF on RRM requirements for Rel-17 NB-IoT and LTE-MTC | Huawei, HiSilicon | Approved |  |

**WF/LS for approval**

**R4-2115374 WF on RRM requirements for Rel-17 NB-IoT and LTE-MTC**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Abstract:**

**Discussion:**

**Decision: Approved.**

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##### 11.8.4.1 Neighbour cell measurement in RRC Connected state for NB-IoT

**R4-2114088 Discussions on RRM requirements for release 17 WI on eMTC and NB-IoT**

*Type: other For: Discussion  
 Source: Ericsson*

**Abstract:**

In this contribution we discuss and provide our view on the open issues identified in [1].

**Decision: Noted.**

**R4-2114148 Discussion on RRM requirements for Rel-17 NB-IoT**

*Type: discussion For: Discussion  
 Source: Huawei, Hisilicon*

**Decision: Noted.**

**R4-2114201 On NB-IoT neighbor cell measurements in RRC\_CONNECTED**

*Type: discussion For: Discussion  
 Source: Qualcomm Incorporated*

**Decision: Noted.**

#### 11.8.5 Others

## 12 Liaison and output to other groups

## 13 Revision of the Work Plan

## 14 Any other business

### 14.1 Celebration of RAN4#100 meeting

## 15 Close of the E-meeting

Report prepared by: MCC

## Annex A Post-meeting RRM maintenance Big CRs

**[post-100-e][201] Big CR to TS 36.133 on LTE RRM maintenance**

**R4-2115441 Big CR to TS 36.133: LTE RRM maintenance (Rel-13)**

*Type: CR For: Agreement  
 36.133 v13.21.0 CR-7130 rev Cat: F (Rel-13)  
 Source: MCC, Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2115442 Big CR to TS 36.133: LTE RRM maintenance (Rel-14)**

*Type: CR For: Agreement  
 36.133 v14.19.0 CR-7131 rev Cat: F (Rel-14)  
 Source: MCC, Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2115443 Big CR to TS 36.133: LTE RRM maintenance (Rel-15)**

*Type: CR For: Agreement  
 36.133 v15.14.0 CR-7132 rev Cat: F (Rel-15)  
 Source: MCC, Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2115444 Big CR to TS 36.133: LTE RRM maintenance (Rel-16)**

*Type: CR For: Agreement  
 36.133 v16.10.0 CR-7133 rev Cat: A (Rel-16)  
 Source: MCC, Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2115445 Big CR to TS 36.133: LTE RRM maintenance (Rel-17)**

*Type: CR For: Agreement  
 36.133 v17.2.0 CR-7133 rev Cat: A (Rel-17)  
 Source: MCC, Huawei, HiSilicon*

**Decision: Agreed.**

**[post-100-e][202] Big CR to TS 36.171 on requirements maintenance**

**R4-2115446 Big CR to TS 36.171** **on requirements maintenance (Rel-15)**

*Type: CR For: Agreement  
 36.171 v15.1.0 CR-0023 rev Cat: F (Rel-15)  
 Source: MCC, Nokia*

**Decision: Agreed.**

**R4-2115447 Big CR to TS 36.171: LTE RRM maintenance (Rel-16)**

*Type: CR For: Agreement  
 36.171 v16.2.0 CR-0024 rev Cat: F (Rel-16)  
 Source: MCC, Nokia*

**Decision: Agreed.**

**[post-100-e][203] Big CR to TS 38.171 on requirements maintenance**

**R4-2115448 Big CR to TS 38.171** **on requirements maintenance (Rel-15)**

*Type: CR For: Agreement  
 38.171 v15.3.0 CR-0014 rev Cat: F (Rel-15)  
 Source: MCC, Spirent*

**Decision: Agreed.**

**R4-2115449 Big CR to TS 38.171: LTE RRM maintenance (Rel-16)**

*Type: CR For: Agreement  
 38.171 v16.1.0 CR-0015 rev Cat: F (Rel-16)  
 Source: MCC, Spirent*

**Decision: Agreed.**

**[post-100-e][204] Big CR to TS 38.133: NR\_newRAT-Core maintenance**

**R4-2115450 Big CR to TS 38.133: NR\_newRAT-Core maintenance (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.14.0 CR-2197 rev Cat: F (Rel-15)  
 Source: MCC, Apple*

**Decision: Agreed.**

**R4-2115451 Big CR to TS 38.133: NR\_newRAT-Core maintenance (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.8.0 CR-2198 rev Cat: F (Rel-16)  
 Source: MCC, Apple*

**Decision: Agreed.**

**R4-2115452 Big CR to TS 38.133: NR\_newRAT-Core maintenance (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.2.0 CR-2199 rev Cat: A (Rel-17)  
 Source: MCC, Apple*

**Decision: Agreed.**

**[post-100-e][205] Big CR to TS 38.133: NR\_newRAT-Perf maintenance Part 1**

**R4-2115453 Big CR to TS 38.133: NR\_newRAT-Perf maintenance Part 1 (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.14.0 CR-2200 rev Cat: F (Rel-15)  
 Source: MCC, Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2115454 Big CR to TS 38.133: NR\_newRAT-Perf maintenance Part 1 (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.8.0 CR-2201 rev Cat: F (Rel-16)  
 Source: MCC, Huawei, HiSilicon*

**Decision: Agreed.**

**R4-2115455 Big CR to TS 38.133: NR\_newRAT-Perf maintenance Part 1 (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.2.0 CR-2202 rev Cat: A (Rel-17)  
 Source: MCC, Huawei, HiSilicon*

**Decision: Agreed.**

**[post-100-e][206] Big CR to TS 38.133: NR\_newRAT-Perf maintenance Part 2**

**R4-2115456 Big CR to TS 38.133: NR\_newRAT-Perf maintenance Part 2 (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.14.0 CR-2203 rev Cat: F (Rel-15)  
 Source: MCC, Ericsson*

**Decision: Agreed.**

**R4-2115457 Big CR to TS 38.133: NR\_newRAT-Perf maintenance Part 2 (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.8.0 CR-2204 rev Cat: F (Rel-16)  
 Source: MCC, Ericsson*

**Decision: Agreed.**

**R4-2115458 Big CR to TS 38.133: NR\_newRAT-Perf maintenance Part 2 (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.2.0 CR-2205 rev Cat: F (Rel-17)  
 Source: MCC, Ericsson*

**Decision: Agreed.**

**[post-100-e][207] Big CR to TS 38.133: NR\_newRAT-Perf maintenance Part 3**

**R4-2115459 Big CR to TS 38.133: NR\_newRAT-Perf maintenance Part 3 (Rel-15)**

*Type: CR For: Agreement  
 38.133 v15.14.0 CR-2206 rev Cat: F (Rel-15)  
 Source: MCC, Ericsson*

**Decision: Agreed.**

**R4-2115460 Big CR to TS 38.133: NR\_newRAT-Perf maintenance Part 3 (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.8.0 CR-2207 rev Cat: F (Rel-16)  
 Source: MCC, Ericsson*

**Decision: Agreed.**

**R4-2115461 Big CR to TS 38.133: NR\_newRAT-Perf maintenance Part 3 (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.2.0 CR-2208 rev Cat: F (Rel-17)  
 Source: MCC, Ericsson*

**Decision: Agreed.**

**[post-100-e][208] Big CR to TS 38.133: NR\_unlic maintenance Part 1**

**R4-2115462 Big CR to TS 38.133: NR\_unlic maintenance Part 1 (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.8.0 CR-2209 rev Cat: F (Rel-16)  
 Source: MCC, Nokia*

**Decision: Agreed.**

**R4-2115463 Big CR to TS 38.133: NR\_unlic maintenance Part 1 (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.2.0 CR-2210 rev Cat: A (Rel-17)  
 Source: MCC, Nokia*

**Decision: Agreed.**

**[post-100-e][209] Big CR to TS 38.133: NR\_unlic maintenance Part 2**

**R4-2115464 Big CR to TS 38.133: NR\_unlic maintenance Part 2 (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.8.0 CR-2211 rev Cat: F (Rel-16)  
 Source: MCC, vivo*

**Decision: Agreed.**

**R4-2115465 Big CR to TS 38.133: NR\_unlic maintenance Part 2 (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.2.0 CR-2212 rev Cat: A (Rel-17)  
 Source: MCC, vivo*

**Decision: Agreed.**

**[post-100-e][210] Big CR to TS 38.133: NR\_pos maintenance**

**R4-2115466 Big CR to TS 38.133: NR\_pos maintenance (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.8.0 CR-2213 rev Cat: F (Rel-16)  
 Source: MCC, Intel Corporation*

**Decision: Agreed.**

**R4-2115467 Big CR to TS 38.133: NR\_pos maintenance (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.2.0 CR-2214 rev Cat: F (Rel-17)  
 Source: MCC, Intel Corporation*

**Decision: Agreed.**

**[post-100-e][211] Big CR to TS 38.133: Rel-16 WIs RRM maintenance Part 1**

**R4-2115468 Big CR to TS 38.133: Rel-16 WIs RRM maintenance Part 1 (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.8.0 CR-2215 rev Cat: F (Rel-16)  
 Source: MCC, OPPO*

**Decision: Agreed.**

**R4-2115469 Big CR to TS 38.133: Rel-16 WIs RRM maintenance Part 1 (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.2.0 CR-2216 rev Cat: A (Rel-17)  
 Source: MCC, OPPO*

**Decision: Agreed.**

**[post-100-e][212] Big CR to TS 38.133: Rel-16 WIs RRM maintenance Part 2**

**R4-2115470 Big CR to TS 38.133: Rel-16 WIs RRM maintenance Part 2 (Rel-16)**

*Type: CR For: Agreement  
 38.133 v16.8.0 CR-2217 rev Cat: F (Rel-16)  
 Source: MCC, CATT*

**Decision: Agreed.**

**R4-2115471 Big CR to TS 38.133: Rel-16 WIs RRM maintenance Part 2 (Rel-17)**

*Type: CR For: Agreement  
 38.133 v17.2.0 CR-2218 rev Cat: F (Rel-17)  
 Source: MCC, CATT*

**Decision: Agreed.**