**3GPP TSG-RAN WG4 Meeting #110-bis R4-24xxxxx**

**Changsha, China, 15 – 19 April 2024**

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

**DRAFT Meeting Report  
for  
TSG RAN WG4  
meeting: 110**

**Athens, Greece, 26/02/2024 to 01/03/2024**

Report generated on Friday, 2024-02-23 14:51 UTC

Contents:

1 Opening of the meeting 10

2 Meeting agenda, arrangement and meeting report 10

3 Incoming LS 10

4 Up to Rel-16 maintenance for LTE and NR 15

4.1 UE RF requirements 15

4.2 BS RF requirements and BS conformance testing 39

4.3 UE/BS EMC requirements 50

4.4 RRM requirements 55

4.5 Demodulation and CSI requirements 77

4.6 OTA and TRP/TRS test aspects 81

4.7 Rel-15/16 TEI 81

4.8 Moderator summary and conclusions (for Agenda 4) 84

5 Rel-17 maintenance for LTE and NR 84

5.1 Rel-17 spectrum related WI maintenance 84

5.1.1 Bands introduced in Rel-17 and related requirements 84

5.1.2 NR/LTE/MR-DC basket WIs 88

5.1.3 Others 92

5.2 Rel-17 non-spectrum related WI maintenance 94

5.2.1 UE RF requirements 94

5.2.2 BS RF requirements and BS conformance testing 100

5.2.3 RRM requirements 109

5.2.4 Demodulation and CSI requirements 139

5.2.5 OTA and TRP/TRS test aspects 142

5.3 Rel-17 TEI 143

5.4 Moderator summary and conclusions (for Agenda 5) 149

6 Rel-18 maintenance for LTE and NR 150

6.1 Rel-18 spectrum related WI maintenance 150

6.1.1 Rel-18 band combinations for concurrent operation of NR/LTE Uu bands/band combinations and one NR/LTE V2X PC5 band 150

6.1.2 High power UE (power class 1.5) for NR TDD bands 150

6.1.3 Rel-18 downlink interruption for NR and EN-DC band combinations at dynamic Tx switching 151

6.1.4 Adding new NR FDD bands for RedCap in Rel-18 151

6.1.5 Enhancement for 700/800/900MHz band combinations 151

6.1.6 Additional LTE bands for UE categories M1/M2/NB1/NB2 in Rel-18 152

6.1.6.1 UE RF requirements 152

6.1.6.2 BS RF and MSR requirements 152

6.1.7 Introduction of evolved shared spectrum bands 152

6.1.8 New bands and BW allocation for 5G terrestrial broadcast - part 2 152

6.1.9 New FDD Bands using the uplink from n28 and the downlink of n75 and n76 154

6.1.9.1 UE RF requirements 154

6.1.9.2 BS RF requirements 154

6.1.9.3 RRM requirements 154

6.1.10 Introduction of 900 MHz NR Band in the US 154

6.1.10.1 UE RF requirements 154

6.1.10.2 BS RF requirements (resubmitted CR) 154

6.1.10.3 RRM requirements 154

6.1.11 Introduction of 900 MHz LTE Band in the US 154

6.1.12 Introduction of the satellite L-/S-band 154

6.1.12.1 UE RF requirements 154

6.1.12.2 SAN RF requirements 155

6.1.12.3 RRM requirements 155

6.1.13 Introduction of a new FDD band (L+S band) for IoT NTN operation 155

6.1.13.1 UE RF requirements (resubmitted CR) 155

6.1.13.2 SAN RF requirements (resubmitted CR) 155

6.1.13.3 RRM core requirements (resubmitted CR) 156

6.1.14 Introduction of NR bands n31 and n72 156

6.1.14.1 UE RF requirements (resubmitted CR) 156

6.1.14.2 BS RF requirements and conformance testing (resubmitted CR) 156

6.1.14.3 RRM core and performance requirements 156

6.1.15 Other WIs related to bands introduced in Rel-18 156

6.2 Rel-18 non-spectrum related WI maintenance 156

6.2.1 NR Channel raster enhancement 156

6.2.1.1 UE and BS channel raster 156

6.2.1.1.1 Channel raster for TN 157

6.2.1.1.2 Channel raster for NTN 158

6.2.1.2 UE capability 159

6.2.2 NB-IoT/eMTC core & perf. requirements for NTN 159

6.2.2.1 SAN RF requirement and conformance testing 159

6.2.2.2 UE RF requirement 160

6.2.2.3 RRM requirement 161

6.2.2.4 Demodulation requirements 164

6.2.3 In-Device Co-existence (IDC) enhancements for NR and MR-DC 166

6.2.4 Low NR band 4Rx for handheld UE and 3Tx for inter-band UL CA and EN-DC 166

6.2.4.1 Enhancements for 4Rx at low frequency band (<1GHz) 166

6.2.4.2 Enhancements of 3Tx for band combinations with two bands 166

6.2.5 BS and UE EMC enhancements maintenance 168

6.2.5.1 BS EMC enhancements 168

6.2.5.2 UE EMC enhancements 168

6.2.6 NR Support for UAV 168

6.2.7 Enhanced LTE Support for UAV 170

6.2.8 Other dedicated Rel-18 WIs 170

6.2.8.1 UE RF requirements 171

6.2.8.2 BS RF requirements 172

6.2.8.3 RRM requirements 172

6.2.8.4 OTA aspects 172

6.3 Rel-18 TEI 173

6.3.1 2Rx non-REDCAP XR devices 173

6.3.2 Others 175

6.4 Moderator summary and conclusions (for Agenda 6) 175

7 Rel-18 on-going spectrum related WIs for NR 177

7.1 Issues arising from basket WIs but not subject to block approval 177

7.1.1 UE RF requirements 177

7.1.1.1 Band combinations with UL configurations including intra-band ULCA with IMD or triple beat issues 177

7.1.1.2 Others 179

7.1.2 Moderator summary and conclusions 180

7.2 Moderator summary and conclusions (for basket WI AI 7.3 to AI 7.25 ) 180

7.3 Rel-18 Dual Connectivity (DC) of 1 band LTE (1DL/1UL) and 1 NR band (1DL/1UL) 182

7.3.1 Rapporteur input (WID/TR/big CR) 182

7.3.2 UE RF requirements without FR2 band 182

7.3.3 UE RF requirements with FR2 band 183

7.4 Rel-18 Dual Connectivity (DC) of 2 bands LTE inter-band CA (2DL/1UL) and 1 NR band (1DL/1UL) 183

7.4.1 Rapporteur input (WID/TR/big CR) 183

7.4.2 UE RF requirements without FR2 band 183

7.4.3 UE RF requirements with FR2 band 185

7.5 Rel-18 WID on DC of x bands LTE inter-band CA (x=3,4,5) and 1 NR band 185

7.5.1 Rapporteur input (WID/TR/big CR) 185

7.5.2 UE RF requirements without FR2 band 185

7.5.3 UE RF requirements with FR2 band 186

7.6 Rel-18 WID: DC of x bands (x=1,2,3,4) LTE inter-band CA (xDL/1UL) and 2 bands NR inter-band CA (2DL/1UL) 186

7.6.1 Rapporteur input (WID/TR/big CR) 186

7.6.2 UE RF requirements without FR2 band 187

7.6.3 UE RF requirements with FR2 band 191

7.7 Rel-18 Dual Connectivity (DC) of x bands (x=1,2,3) LTE inter-band CA (xDL/1UL) and y bands NR inter-band CA (yDL/1UL) 191

7.7.1 Rapporteur input (WID/TR/big CR) 191

7.7.2 UE RF requirements without FR2 band 191

7.7.3 UE RF requirements with FR2 band 192

7.8 Rel-18 WID: DC of x LTE bands and y NR bands with z bands DL and 3 bands UL (x=1, 2, 3, 4, y=1, 2; 3<=z<=6) 192

7.8.1 Rapporteur input (WID/TR/big CR) 192

7.8.2 UE RF requirements without FR2 band 192

7.8.3 UE RF requirements with FR2 band 192

7.9 Rel-18 NR intra band Carrier Aggregation for xCC DL/yCC UL including contiguous and non-contiguous spectrum (x>=y) 193

7.9.1 Rapporteur input (WID/TR/big CR) 193

7.9.2 UE RF requirements for FR1 (resubmitted CR) 194

7.9.3 UE RF requirements for FR2 194

7.10 Rel-18 NR Inter-band Carrier Aggregation/Dual Connectivity for 2 bands DL with x bands UL (x=1,2) 195

7.10.1 Rapporteur input (WID/TR/big CR) 195

7.10.2 UE RF requirements without FR2 band 196

7.10.3 UE RF requirements with FR2 band 200

7.11 Rel-18 NR Inter-band Carrier Aggregation/Dual Connectivity for 3 bands DL with x bands UL (x=1,2) 202

7.11.1 Rapporteur input (WID/TR/big CR) 202

7.11.2 UE RF requirements without FR2 band 203

7.11.3 UE RF requirements with FR2 band 207

7.12 Rel-18 NR Inter-band Carrier Aggregation/Dual Connectivity for y bands DL with x bands UL (y=4,5,6, x=1,2) 207

7.12.1 Rapporteur input (WID/TR/big CR) 207

7.12.2 UE RF requirements without FR2 band 208

7.12.3 UE RF requirements with FR2 band 209

7.13 Rel-18 Band combinations for SA NR supplementary uplink (SUL), NSA NR SUL, NSA NR SUL with UL sharing from the UE perspective (ULSUP) 210

7.13.1 Rapporteur input (WID/TR/big CR) 210

7.13.2 UE RF requirements 210

7.14 NR CA band combinations with two SUL cells in Rel-18 211

7.14.1 Rapporteur input (WID/TR/big CR) 211

7.14.2 UE RF requirements 211

7.15 High-power UE operation for fixed-wireless/vehicle-mounted use cases in LTE bands and NR bands 212

7.15.1 Rapporteur input (WID/TR/big CR) 212

7.15.2 UE RF requirements 212

7.16 High power for FR1 for DC\_R18\_xBLTE\_yBNR\_zDLnUL with power class PC2 and PC1.5 213

7.16.1 Rapporteur input (WID/TR/big CR) 213

7.16.2 UE RF requirements 213

7.17 High power UE for FR1 for NR\_CA\_R18\_intra with power class 2 and 1.5 on TDD band(s) 215

7.17.1 Rapporteur input (WID/TR/big CR) 215

7.17.2 UE RF requirements with PC2 and PC1.5 216

7.18 High power UE for FR1 NR inter-band CA/DC or SUL band combination with y DL-x UL and PCm (m<3) and high power on TDD 216

7.18.1 Rapporteur input (WID/TR/big CR) 216

7.18.2 UE RF requirements with PC2 and PC1.5 216

7.19 High power UE for FR1 for inter-band NR\_CADC\_R18\_yBDL\_xBUL with power class 2 on single carrier uplink on FDD band 221

7.19.1 Rapporteur input (WID/TR/big CR) 221

7.19.2 UE RF requirements 222

7.20 High power UE for FR1 for FDD single band(s) with PC2 224

7.20.1 Rapporteur input (WID/TR/big CR) 224

7.20.2 UE RF requirements (resubmitted CR) 224

7.21 Additional NR bands for UL-MIMO in Rel-18 226

7.21.1 Rapporteur input (WID/TR/big CR) 226

7.21.2 UE RF requirements 227

7.22 Adding new channel bandwidth(s) support to existing NR bands 227

7.22.1 Rapporteur input (WID/TR/big CR) 227

7.22.2 UE RF requirements 227

7.22.3 BS RF requirements 228

7.23 Simultaneous Rx/Tx inter-band combinations for NR CA/DC, NR SUL and LTE/NR DC in Rel-18 228

7.23.1 Rapporteur input (WID/TR/big CR) 228

7.23.2 Identification of simultaneous Rx/Tx capability for band combinations and UE RF requirements 228

7.24 4Rx support for NR FR1 bands (<2.6GHz) in Rel-18 229

7.24.1 Rapporteur input (WID/TR/big CR) 229

7.24.2 UE RF requirements 230

7.25 3Tx NR inter-band UL Carrier Aggregation (CA) and EN-DC 230

7.25.1 Rapporteur input (WID/TR/big CR) 230

7.25.2 UE RF requirements with PC2 and PC1.5 230

8 Rel-18 on-going non-spectrum related work items for NR 231

8.1 Further RF requirements enhancement for NR and EN-DC in FR1 231

8.1.1 UE RF requirements maintenance 231

8.1.1.1 4Tx UE RF requirements 231

8.1.1.2 8Rx UE RF requirements (resubmitted CR) 232

8.1.1.3 Lower MSD for inter-band CA/EN-DC/DC combinations 233

8.1.2 RRM performance requirements 234

8.1.2.1 RLM test cases to support 8Rx 234

8.1.3 Demodulation and CSI requirements 234

8.1.3.1 8Rx UE demodulation and CSI 235

8.1.3.1.1 General aspects 235

8.1.3.1.2 PDSCH requirements 236

8.1.3.1.3 SDR requirements 239

8.1.3.1.4 CQI reporting requirements 239

8.1.3.2 4Tx BS demodulation 239

8.1.4 Moderator summary and conclusions 239

8.2 NR RF requirements enhancement for FR2, Phase 3 240

8.2.1 UL 256QAM core requirements maintenance 240

8.2.2 Beam correspondence requirements maintenance for RRC\_INACTIVE and initial access 241

8.2.2.1 Beam correspondence requirement applicability 241

8.2.2.2 UE beam type and DRX implications 242

8.2.2.3 Beam correspondence test issues 242

8.2.3 BS demodulation requirements 242

8.2.3.1 UL 256QAM performance requirements 242

8.2.4 Moderator summary and conclusions 244

8.3 Requirement for NR FR2 multi-Rx chain DL reception 245

8.3.1 UE RF requirements maintenance for simultaneous DL reception with up to 4 layer MIMO 245

8.3.2 RRM core requirements maintenance for simultaneous DL reception from different directions 246

8.3.2.1 General aspects 247

8.3.2.2 L1-RSRP measurement delay 248

8.3.2.3 RLM and BFD/CBD requirements 250

8.3.2.4 Scheduling/measurement restrictions 251

8.3.2.5 TCI state switching delay with dual TCI 253

8.3.2.6 Receive timing difference between different directions 254

8.3.3 RRM performance requirements 255

8.3.4 Demodulation performance and CSI requirements 257

8.3.4.1 General aspects 257

8.3.4.2 PDSCH requirements 259

8.3.4.3 PMI reporting requirements 260

8.3.5 Moderator summary and conclusions 261

8.4 Even Further RRM enhancement for NR and MR-DC 262

8.4.1 RRM core requirements maintenance for FR2 SCell activation delay reduction 262

8.4.2 RRM core requirements maintenance for FR1-FR1 NR-DC 264

8.4.3 RRM performance requirements for FR2 SCell activation delay reduction 264

8.4.4 RRM performance requirements for FR1-FR1 NR DC 266

8.4.5 Moderator summary and conclusions 267

8.5 Further enhancements on NR and MR-DC measurement gaps and measurements without gaps 268

8.5.1 RRM core requirements maintenance for pre-configured MGs, multiple concurrent MGs and NCSG 268

8.5.1.1 Case 1 requirements (Pre-configured MG and concurrent MG) 269

8.5.1.2 Case 2 requirements (NCSG and concurrent MG) 271

8.5.2 RRM core requirements maintenance for measurements without gaps 273

8.5.2.1 Measurement without gaps for UEs reporting NeedForGapsInfoNR 273

8.5.2.2 Inter-RAT measurement without gap 275

8.5.3 RRM performance requirements for pre-configured MGs, multiple concurrent MGs and NCSG 277

8.5.4 RRM performance requirements for measurements without gaps 279

8.5.5 Moderator summary and conclusions 280

8.6 Completion of specification support for bandwidth part operation without restriction in NR 280

8.6.1 RRM core requirements maintenance 280

8.6.2 RRM performance requirements 282

8.6.3 Moderator summary and conclusions 283

8.7 Support of intra-band non-collocated EN-DC/NR-CA deployment 283

8.7.1 UE RF requirements maintenance 283

8.7.2 RRM Core requirements maintenance 286

8.7.3 RRM performance requirements 286

8.7.4 Demodulation performance requirements 287

8.7.5 Moderator summary and conclusions 288

8.8 Enhanced NR support for high speed train scenario in frequency range 2 289

8.8.1 RRM core requirement maintenance 289

8.8.2 RRM performance requirements 290

8.8.3 Demodulation performance requirements 292

8.8.3.1 General and channel modelling 292

8.8.3.2 PDSCH requirements with CA 292

8.8.3.3 PDSCH requirements with multi-Rx Chain DL reception 292

8.8.4 Moderator summary and conclusions 294

8.9 Air-to-ground network for NR 295

8.9.1 FR1 co-existence requirements maintenance for ATG network 295

8.9.2 UE RF requirements maintenance 295

8.9.2.1 Tx requirements 295

8.9.2.2 Rx requirements 296

8.9.3 BS RF requirements maintenance 296

8.9.4 BS RF conformance testing requirements 297

8.9.5 RRM core requirements maintenance 298

8.9.6 RRM performance requirements 299

8.9.7 Demodulation performance requirements 302

8.9.7.1 General aspects 302

8.9.7.2 UE demodulation performance and CSI requirements 302

8.9.7.3 BS demodulation performance requirements 304

8.9.8 Moderator summary and conclusions 306

8.10.1 System parameter maintenance 307

8.10.2 UE RF requirement maintenance 308

8.10.3 BS RF requirement maintenance 309

8.10.4 RRM core requirement maintenance 309

8.10.5 RRM performance requirements 311

8.10.6 Demodulation performance requirements 312

8.10.6.1 UE demodulation performance and CSI requirements 312

8.10.6.2 BS demodulation performance requirements 314

8.10.7 Moderator summary and conclusions 315

8.11 Enhancement of TRP and TRS requirements and test methodologies 316

8.11.1 Enhancement maintenance of test methodology 316

8.11.1.1 Anechoic chamber test methodology 316

8.11.1.2 Reverberation chamber test methodology 318

8.11.1.3 MU assessment 319

8.11.1.4 Testing time reduction 319

8.11.2 Performance requirements 319

8.11.3 Moderator summary and conclusions 320

8.12 Enhancement of Multiple Input Multiple Output Over-the-Air test methodology and requirements for NR UEs 321

8.12.1 FR2 MIMO OTA test methodology enhancement maintenance 321

8.12.2 FR1 MIMO OTA test methodology enhancement maintenance 321

8.12.3 Performance requirements 323

8.12.4 Moderator summary and conclusions 324

8.13 NR demodulation performance evolution 324

8.13.1 General aspects 324

8.13.2 Advanced receiver to cancel inter-user interference for MU-MIMO 324

8.13.2.1 Receiver assumption and NWA signaling 324

8.13.2.2 Test parameters and simulation results 326

8.13.3 Absolute physical layer throughput requirements with link adaptation 328

8.13.4 Moderator summary and conclusions 328

8.14 Expanded and improved NR positioning 328

8.14.1 RF requirements maintenance 328

8.14.2 RRM core requirements maintenance 329

8.14.2.1 General aspects 329

8.14.2.2 SL Positioning 329

8.14.2.3 LPHAP use case 331

8.14.2.4 RedCap Positioning 333

8.14.2.5 PRS/SRS bandwidth aggregation 335

8.14.2.6 Carrier Phase Positioning 336

8.14.3 RRM performance requirements 338

8.14.3.1 SL Positioning 338

8.14.3.2 LPHAP use case 339

8.14.3.3 RedCap Positioning 340

8.14.3.4 PRS/SRS bandwidth aggregation 341

8.14.3.5 Carrier Phase Positioning 342

8.14.4 Moderator summary and conclusions 343

8.15 Multi-carrier enhancements for NR 344

8.15.1 Maintenance for switching time and other RF aspects up to 3 or 4 bands 344

8.15.1.1 UL Tx switching with single TAG 345

8.15.1.2 UL Tx switching with multiple TAGs (CRs corresponding to RAN discussion can be submitted in this agenda) 346

8.15.2 RRM core requirements maintenance 346

8.15.3 RRM performance requirements 346

8.15.4 Moderator summary and conclusions 347

8.16 Further NR mobility enhancements 347

8.16.1 RRM Core requirements maintenance 347

8.16.1.1 L1/L2 based inter-cell mobility 347

8.16.1.1.1 General aspects and scenarios 348

8.16.1.1.2 L1-RSRP measurement requirements 350

8.16.1.1.3 L1/L2 inter-cell mobility delay requirements 352

8.16.1.1.4 Others 354

8.16.1.2 NR-DC with selective activation of cell groups via L3 enhancements 356

8.16.1.3 Improvement on SCell/SCG setup delay 356

8.16.1.4 Enhanced CHO configurations 358

8.16.2 RRM performance requirements 358

8.16.2.1 L1/L2 based inter-cell mobility 358

8.16.2.2 Other RRM performance requirements 359

8.16.3 Moderator summary and conclusions 361

8.17 Dual Tx/Rx Multi-SIM for NR 361

8.17.1 RRM requirements maintenance for Rel-17 MUSIM gaps 361

8.17.1.1 General aspects 362

8.17.1.2 Collisions handling and others 363

8.17.2 RRM performance requirements 365

8.17.3 Moderator summary and conclusions 366

8.18 NR NTN enhancement 366

8.18.1 General aspects 366

8.18.1.1 System parameters 366

8.18.1.2 Regulatory information 367

8.18.1.3 Others 367

8.18.2 Co-existence study for above 10GHz bands 367

8.18.3 SAN RF requirements 368

8.18.4 SAN RF conformance testing requirements 369

8.18.5 UE RF requirements 369

8.18.5.1 Tx RF requirements 370

8.18.5.2 Rx RF requirements 372

8.18.5.3 PUSCH DMRS bundling requirements and others 373

8.18.6 RRM core requirements 374

8.18.6.1 NR-NTN RRM requirements in above 10 GHz bands 374

8.18.6.2 Network verified UE location 377

8.18.6.3 NTN-TN and NTN-NTN mobility and service continuity enhancements 378

8.18.7 RRM performance requirements 380

8.18.8 Demodulation performance requirements 381

8.18.8.1 SAN demodulation performance requirements 381

8.18.8.2 UE demodulation performance and CSI requirements 382

8.18.9 Moderator summary and conclusions 383

8.19 Further NR coverage enhancements 384

8.19.1 UE RF requirements maintenance 384

8.19.1.1 Enhancement of increasing UE power high limit for CA and DC 385

8.19.1.2 Enhancement to reduce MPR/PAR 386

8.19.2 BS demodulation performance requirements 387

8.19.3 Moderator summary and conclusions 390

8.20 NR Network-controlled Repeaters 390

8.20.1 RF core requirements maintenance 390

8.20.1.1 RF requirements for NCR-Fwd 391

8.20.1.2 RF requirements for NCR-MT 392

8.20.2 EMC core requirements maintenance 393

8.20.3 RF conformance testing 393

8.20.4 RRM core requirements maintenance 394

8.20.5 RRM performance requirements 394

8.20.6 Demodulation performance requirements 394

8.20.7 Moderator summary and conclusions 397

8.21 NR MIMO evolution for downlink and uplink 398

8.21.1 UE RF requirements maintenance for simultaneous transmission with multi-panel (STxMP) 398

8.21.1.1 Configured transmitted power 399

8.21.1.2 Other UE RF requirements 399

8.21.2 RRM core requirements maintenance 400

8.21.2.1 RRM requirements impacts 400

8.21.2.2 Timing requirements for UL multi-DCI multi-TRP with two TAs 401

8.21.2.3 Unified TCI framework 402

8.21.3 RRM performance requirements 404

8.21.4 Demodulation performance requirements 405

8.21.4.1 UE demodulation performance and CSI requirements 405

8.21.4.2 BS demodulation performance requirements 406

8.21.5 Moderator summary and conclusions 407

8.22 NR sidelink evolution 408

8.22.1 UE RF requirements maintenance 408

8.22.1.1 Sidelink on a single unlicensed spectrum 408

8.22.1.1.1 System parameters (channel bandwidth, channel arrangement) 409

8.22.1.1.2 Tx requirements 409

8.22.1.1.3 Rx requirements 411

8.22.1.2 Con-current operation on Uu and sidelink 411

8.22.1.3 Sidelink CA 411

8.22.1.4 Co-channel coexistence for LTE sidelink and NR sidelink 413

8.22.2 RRM core requirements maintenance 413

8.22.2.1 Sidelink CA 413

8.22.2.2 SL unlicensed operation and others 413

8.22.3 RRM performance requirements 414

8.22.4 UE demodulation performance requirements 415

8.22.5 Moderator summary and conclusions 416

8.23 Enhanced support of reduced capability NR devices 417

8.23.1 UE RF requirements maintenance 417

8.23.2 RRM core requirements maintenance 418

8.23.3 RRM performance requirements 419

8.23.4 Demodulation performance requirements 420

8.23.4.1 UE demodulation performance and CSI requirements 420

8.23.4.2 BS demodulation performance requirements 421

8.23.5 Moderator summary and conclusions 421

8.24 Enhanced NR Sidelink Relay 422

8.24.1 RRM core requirements maintenance 422

8.24.2 RRM performance requirements 422

8.24.3 Moderator summary and conclusions 423

8.25 Mobile IAB (Integrated Access and Backhaul) for NR 424

8.25.1 Co-existence requirements maintenance 424

8.25.2 RF core requirements maintenance 424

8.25.3 RF conformance testing 424

8.25.4 RRM core requirements maintenance 426

8.25.5 RRM performance requirements 426

8.25.6 Demodulation performance requirements 427

8.25.7 Moderator summary and conclusions 427

8.26 Network energy saving for NR 428

8.26.1 BS conformance testing requirements 428

8.26.2 RRM core requirements maintenance 428

8.26.2.1 RRM requirements impacts 429

8.26.2.2 SSB-less SCell operation 430

8.26.3 RRM performance requirements 432

8.26.4 UE demodulation performance and CSI requirements 434

8.26.5 Moderator summary and conclusions 435

8.27 Enhancement of NR dynamic spectrum sharing 435

8.27.1 General aspects 435

8.27.2 UE demodulation performance requirements 435

8.27.3 Moderator summary and conclusions 437

9 Rel-18 on-going work Items for LTE 437

9.1 Rel-18 LTE-Advanced Carrier Aggregation for x bands (2<=x<= 6) DL with y bands (y=1, 2) UL 437

9.1.1 Rapporteur input (WID/TR/big CR) 437

9.1.2 UE RF requirements for 1 UL 438

9.1.2.1 Requirements with specific issues 438

9.1.2.2 Requirements without specific issues 438

9.1.3 UE RF requirements for 2UL 439

9.1.3.1 Requirements with specific issues 439

9.1.3.2 Requirements without specific issues 439

9.1.4 Moderator summary and conclusions 439

9.2 Introduction of the Extended L-band (UL 1668-1675, DL 1518-1525) for IoT NTN 439

9.2.1 General aspects (TR) 439

9.2.2 Band definition and system parameters 439

9.2.3 UE RF requirements (resubmitted CR) 439

9.2.4 SAN RF requirements (resubmitted CR) 440

9.2.5 RRM core requirements (resubmitted CR) 440

9.2.6 Moderator summary and conclusions 440

9.3 High Power UE (Power Class 2) for LTE FDD Band 14 440

9.3.1 General aspects (TR/big CR) 440

9.3.2 UE RF requirements 441

9.3.2.1 Tx requirements 441

9.3.2.2 Rx requirements 442

9.3.3 Release independency 442

9.3.4 Moderator summary and conclusions 442

9.4 IoT (Internet of Things) NTN (non-terrestrial network) enhancements 442

9.4.1 UE RF requirements maintenance 442

9.4.2 SAN RF requirements maintenance 442

9.4.3 RRM core requirements maintenance 442

9.4.4 RRM performance requirements 444

9.4.5 Demodulation performance requirements 444

9.4.6 Moderator summary and conclusions 445

10 Rel-18 feature list 446

11 Rel-19 on-going non-spectrum related work items for NR 447

11.1 Artificial Intelligence (AI)/Machine Learning (ML) for NR Air Interface 447

11.1.1 General aspects 447

11.1.2 Testability and interoperability issues for beam management 448

11.1.3 Testability and interoperability issues for positioning accuracy enhancement 450

11.1.4 Testability and interoperability issues for CSI compression and CSI prediction 452

11.1.5 Moderator summary and conclusions 453

12 Liaison output to other groups and related issues 453

12.1 R18 related 455

12.1.1 LS on combination of HST and RRM relaxation (R2-2311435) 455

12.1.2 Others 456

12.2 R17 related 457

12.2.1 Power class related topics 457

12.2.2 Others 461

12.3 R15, R16 related 463

12.3.1 Reply LS on update for “interBandMRDC-WithOverlapDL-Bands-r16” in 38.306 (R2-2309218) 463

12.3.2 Reply LS on power scaling and PHR in 38.213 (R1-2310555) 463

12.3.3 Others 463

12.4 Moderator summary and conclusions 463

13 RAN task and other topics 464

13.1 Release independency specification (36.307, 38.307) 464

13.2 Co-existence for existing mobile networks caused by band n101 468

14 Revision of the Work Plan 472

15 Any other business 477

16 Close of the meeting 479

## 1 Opening of the meeting

The Chair Xizeng Dai (Huawei) opened the meeting at RAN4#110 on 26/02/2024 at 09:00.

Thomas Chapman provided the welcome speech.

**Intellectual Property Rights Declaration Policy**

The attention of the delegates to the meeting of this Technical Specification Group was drawn to the fact that 3GPP Individual Members have the obligation under the IPR Policies of their respective Organizational Partners to inform their respective Organizational Partners of Essential IPRs they become aware of.

The delegates were asked to take note that they were thereby invited:

- to investigate whether their organization or any other organization owns IPRs which were, or were likely to become Essential in respect of the work of 3GPP.

- to notify their respective Organizational Partners of all potential IPRs, e.g., for ETSI, by means of the IPR Information Statement and the Licensing declaration forms.

**Statement regarding competition law**

The attention of the delegates to the meeting was drawn to the fact that 3GPP activities were subject to all applicable antitrust and competition laws and that compliance with said laws was therefore required by any participant of the meeting, including the Chair and Vice-Chairs and were invited to seek any clarification needed with their legal counsel. The leadership would conduct the present meeting with impartiality and in the interests of 3GPP. Delegates were reminded that timely submission of work items in advance of TSG/WG meetings was important to allow for full and fair consideration of such matters.

**Meeting arrangements**

The meeting was conducted in three parallel sessions; Main session, RRM session, and BS RF Test Demod session. The Main session was chaired by RAN4 Chair Xizeng Dai (Huawei), RRM session was chaired by RAN4 Vice Chair Shan Yang (China Telecom), and BS RF Test Demod session was chaired by RAN4 Vice Chair Gene Fong (Qualcomm). The sessions were further broken down into separate GTW sessions (separate meeting rooms in F2F meeting). Webinar sessions were made available for online particpants.

Note: One or two additional offline(s) / adhoc session(s) may be scheduled according to RAN conclusion. Total three parallel GTW sessions would be scheduled. Plus, any additonal Offline(s) / ad hoc sesion(s) = ad hoc room or breakout room in F2F meeting.

**Check-in for Registered Delegates**

The attention of the delegates to this meeting was drawn to the fact that it is not permitted to check in other delegates on their behalf. In the even of technical difficulties preventing check in, delegates are encouraged to contact in person MCC.

**Ordinary E-meeting participation**

Attendance at ordinary e-meetings now counts towards accrual and maintenance of voting rights.

- A delegate is deemed to have attended a given meeting if they confirm their participation by check in. If a delegate does not check in during the meeting, it shall be assumed that the individual did not attend.

**Face-to-Face meeting with one-way remote participation (going forward there is no longer two-way remote)**

When it is a face-to-face (ordinary) meeting with one-way remote participation.

- In a meeting designated as face to face (ordinary), those participating remotely are not to be counted toward quorum or attendance, and are not allowed to vote

**F2F network usage conditions**

The PCG has laid down the following network usage conditions as provided below:

**Users shall not use the network to engage in illegal activities. This includes activities such as copyright violation, hacking, espionage or any other activity that may be prohibited by local laws**.

**Users shall not engage in non-work related activities that consume excessive bandwidth** or cause significant degradation of the performance of the network.

Since the **network is a shared resource**, users should exercise some basic etiquette when using the 3GPP network at a meeting. It is understood that high bandwidth applications such as downloading large files or video streaming might be required for business purposes, but delegates should be strongly discouraged in performing these activities for personal use. Downloading a movie or doing something in an interactive environment for personal use essentially wastes bandwidth that others need to make the meeting effective. The meeting Chair should remind end users that the network is a shared resource; the more one user grabs, the less there is for another. Email and its attachments already take up significant bandwidth (certain email programs are not very bandwidth efficient). In case of need the chair can ask the delegates to restrict IT usage to things that are essential for the meeting itself.

**1. DON’T place your WiFi device in ad-hoc mode**

**2. DON’T set up a personal hotspot in the meeting room**

**3. DO try 802.11a if your WiFi device supports it**

**4. DON’T manually allocate an IP address**

**5. DON’T be a bandwidth hog by streaming video, playing online games, or downloading huge files**

**6. DON’T use packet probing software which clogs the local network (e.g., packet sniffers or port scanners)**

**Recording of RAN4 Meeting**

Recording of the GoToWebinar sessions of the present meeting is strictly prohibited. No individual or entity – including the speakers and/or the authors – may electronically record any portion of the meeting without prior written consent of the Chair and all the RAN4 meeting participants.

**Snapshot of contributions type areas submitted in 3GU before the start of the meeting: Total: 2952**

**Figure 1: Breakdown of contributions type areas for RAN4#110 pre-meeting**

At the beginning of the meeting, there are 1086 CRs (102 was either withdrawn/revised) that have been submitted to the meeting.

- For Rel-15, there are 55 CRs submitted under agenda item 4, 5 and 6.

- For Rel-16, there are 124 CRs submitted under agenda item 4, 5 and 6.

- For Rel-17, there are 317 CRs submitted under agenda item 4, 5 and 6.

- For Rel-18, there are 588 CRs submitted

- There are 80 CAT B CRs

- There are 508 CAT A, D and F CRs

## 2 Meeting agenda, arrangement and meeting report

## 3 Incoming LS

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TDoc** | **Title** | **Release** | **WI** | **Source** | **Action** | **Decision** |
| R4-2400004 | Reply LS on CPP | Rel-18 | NR\_pos\_enh2-Core | RAN1 |  |  |
| R4-2400005 | Reply LS on L1 measurements in LTM | Rel-18 | NR\_Mob\_enh2-Core | RAN1 | From a RAN1 point of view, the UE does not need to know the SMTC of the candidate cells in order to perform L1 measurements.  **ACTIONS:**  RAN1 kindly asks RAN2 and RAN4 to take the above information into account. |  |
| R4-2400006 | Reply LS on monitoring of paging occasions for CG-SDT with HD-FDD RedCap UEs | Rel-17 | NR\_redcap-Core, NR\_SmallData\_INACTIVE-Core | RAN1 | RAN1#115 discussed the LSs received from RAN2 and RAN4 on monitoring of paging occasions for CG-SDT with HD-FDD RedCap UEs.  • RAN1 confirms RAN2’s understanding that there is no need to specify restrictions on gNB configuration to avoid partial overlap between PO and CG-SDT transmission for HD-UE.  • RAN1 confirms that there is no need to specify RAN4 requirements for the case with full overlap between PO and CG-SDT transmission within the SI modification period for HD-UE.  • This means that it is up to gNB responsibility to leave at least one PO for SI update monitoring in modification window.  **ACTIONS:**  RAN1 respectfully requests RAN2 and RAN4 to take the above into account in their future work. |  |
| R4-2400007 | Response on LS on the system parameters for NTN above 10 GHz | Rel-18 | NR\_NTN\_enh-Core | RAN1 | To help RAN1 progressing on the topic, it would be appreciated if RAN4 could provide the iming requirements for supporting NR over NTN in bands defined by FR2-NTN.  **ACTIONS:**  RAN1 respectfully asks RAN4 to provide a response to the above request in order to aid the RAN1 discussions related to timing accuracy requirements.  **Conclusion:**  For operation in FR2-NTN, the value range in ms for K\_offset and K-MAC shall be the same as for Rel-17 NR over NTN. |  |
| R4-2400008 | LS On Relative Phase/Power Error Requirements within Port Groups for 8TX UE | Rel-18 | NR\_MIMO\_evo\_DL\_UL | RAN1 | In RAN1#115, RAN1 continued the discussion on aspects related to specifications of uplink MIMO precoding for 8TX UEs, and made two agreements.  **ACTIONS:**  RAN1 would like to inform RAN4 about the above agreements, and respectfully request RAN4 to consider definition of relative phase and power error requirements within the port groups for 8TX UEs. |  |
| R4-2400009 | LS on Rel-18 RAN1 UE features list for LTE after RAN1#115 | Rel-18 | IoT\_NTN\_enh | RAN1 |  |  |
| R4-2400010 | LS on Rel-18 RAN1 UE features list for NR after RAN1#115 | Rel-18 | NR\_MIMO\_evo\_DL\_UL, NR\_pos\_enh2, Netw\_Energy\_NR, NR\_netcon\_repeater, NR\_NTN\_enh, NR\_Mob\_enh2, NR\_SL\_enh2, NR\_redcap\_enh, NR\_MC\_enh, NR\_XR\_Enh, NR\_FR1\_lessthan\_5MHz\_BW, NR\_DSS\_enh, NR\_BWP\_wor, NR\_cov\_enh2, TEI18 | RAN1 |  |  |
| R4-2400011 | LS on Rel-18 higher-layers parameter list | Rel-18 | NR\_MIMO\_evo\_DL\_UL-Core, NR\_pos\_enh2-Core, Netw\_Energy\_NR, NR\_Mob\_enh2, IoT\_NTN\_enh-Core, TEI18 | RAN1 |  |  |
| R4-2400012 | LS on inter-frequency neighbour cells supporting NR dedicated spectrum less than 5 MHz for FR1 | Rel-18 | NR\_FR1\_lessthan\_5MHz\_BW | RAN1 | According to current specifications, SIB4 indicates the inter-frequency neighbour cell(s) with the dl-CarrierFreq corresponding to a GSCN value. If a common neighbour cell list is indicated, which includes the cell(s) using the legacy (Rel-17) GSCN value in Table 5.4.3.1-1 of TS38.101-1 and the cell(s) using new GSCN values (introduced in Rel-18) in Table 5.4.3.1-2 and Table 5.4.3.1-3 of TS38.101-1, the UEs not supporting the new GSCN values will receive dl-CarrierFreq which do not correspond to the Rel-17 GSCN values.  **Q1:** Does RAN2/RAN4 expect any backward compatibility issue for a UE not supporting less than 5MHz but provided with a neighbour cell with SSB on the new GSCN value in the scenario described above or other similar scenarios if any?  **Q2:** If the answer to Question 1 is Yes, is it possible for RAN2 to define a scheme to avoid the backward compatibility issue?  **ACTIONS:**  RAN1 respectfully requests RAN2/RAN4 to take the provided information into account and provide the answers to the questions. |  |
| R4-2400013 | LS on updates to the Rel-18 RAN1 UE features list for NR after RAN1#115 | Rel-18 | NR\_MIMO\_evo\_DL\_UL, NR\_pos\_enh2, Netw\_Energy\_NR, NR\_netcon\_repeater, NR\_NTN\_enh, NR\_Mob\_enh2, NR\_SL\_enh2, NR\_redcap\_enh, NR\_MC\_enh, NR\_XR\_Enh, NR\_FR1\_lessthan\_5MHz\_BW, NR\_DSS\_enh, NR\_BWP\_wor, NR\_cov\_enh2, TEI18 | RAN1 |  |  |
| R4-2400014 | LS on Rel-18 higher-layers parameter list | Rel-18 | Netw\_Energy\_NR-Core | RAN1 |  |  |
| R4-2400015 | Response LS on PEMAX,CA for SL CA | Rel-18 | NR\_SL\_enh2-Core | RAN2 | RAN2 thanks RAN4 for the LS on a capability of UE power class and IE on PEMAX,CA for NR SL CA. For issue 1 on a capability of UE power class, RAN2 will define the capability according to the stable version of feature description. For issue2, RAN2 understands that Alt.2 is consistent with the principle of defining PEMAX,CA for NR UL CA in TS 38.101. Additionally, adopting Alt.2 can give the network more flexibility in controlling PCMAX of NR SL CA. Therefore, RAN2 agreed to take Alt.2 to define the PEMAX,CA for NR SL CA  **ACTIONS:**  RAN2 respectfully asks RAN4 to take the above information into account in the related work |  |
| R4-2400016 | Reply LS on frequencyInfo for NR SL RSRP measurements | Rel-16 | 5G\_V2X\_NRSL-Core | RAN2 |  |  |
| R4-2400017 | Reply LS on network assistant signalling for advanced receivers | Rel-18 | NR\_demod\_enh3-Core | RAN2 | RAN2 thanks RAN4 for the LS on network assistant signalling for advanced receivers. And the RRC CR capturing the requested assistant information is agreed in R2-2313704.  **ACTIONS:**  RAN2 respectfully asks RAN4 to take the above information into account and provide feedback if necessary. |  |
| R4-2400018 | LS on applicability of maximum aggregated bandwidth UE capabilities to intra-band FR1 CA. | Rel-18 | NR\_BCS4-Core | RAN2 | As per RAN4 input, RAN2 so far agreed to introduce UE capabilities for maximum aggregated bandwidth. These UE capabilities can be signalled per inter-band FR1 band combination.  Q1: Can the new maximum aggregated bandwidth UE capabilities be applied generically to intra-band FR1 CA as well as inter-band FR1 CA?  **ACTIONS:**  RAN2 would like to ask RAN4 to take the information in this LS into account, and answer the RAN2 question. |  |
| R4-2400019 | LS to RAN4 on Intra-band non-collocated NR-CA. EN-DC | Rel-18 | NonCol\_intraB\_ENDC\_NR\_CA-Core | RAN2 | At the RAN2#124 meeting (Chicago, November 2023), RAN2 made 4 agreements on Intra-band non-collocated NR-CA. EN-DC:  **1.** For UEs supporting new capability, adopt default type2 for nonCollocatedTypeMRDC-r18.  **2.** For UEs supporting new capability, adopt default type2 for nonCollocatedTypeNR-CA-r18.  **3.** RAN2 agree to remove Editor’s note for MTTD RAN4 spec reference for Type1.  **4.** The new RRC signaling would not be applied to the FDD-FDD inter-band EN-DC with overlapping or partially overlapping bands.  **ACTIONS:**  RAN2 would be very grateful if RAN4 could take the above RAN2 agreements into account. |  |
| R4-2400020 | LS on UAV UE capabilities and NS values | Rel-18 | NR\_UAV-Core | RAN2 | RAN2 would like to confirm that an NR UE capability to indicate that the UE supports Rel-18 UAV enhancements will be introduced.  RAN2 has further discussed the RRC details of NS value signalling. RAN2 has agreed to provide a UAV-specific NS value in NR-NS-PmaxValueAerial-r18. However, RAN2 has not concluded if NR-NS-PmaxValueAerial-r18 shall also comprise additionalPmax-r18 (similarly to how the additionalPmax-r18 is provided in NR-NS-PmaxValue).  **ACTION:**  RAN2 respectfully asks RAN4 to take into consideration RAN2 decision on UAV capabilities. RAN4 is also respectfully asked to clarify whether it is needed to have additionalPmax-r18 in NR-NS-PmaxValueAerial-r18. |  |
| R4-2400021 | Reply LS to RAN4 on BWP operation without restriction | Rel-18 | NR\_BWP\_wor-Core | RAN2 | RAN2 has discussed the Option C (i.e. NCD-SSB) and concluded:  - Capture the behavior that UE shall report no gap and no interruption/no NCSG for intra-frequency measurement in RRC specification.  - Capture the restriction for NCD-SSB measurement to be only applicable for PCell.  **ACTIONS:**  Capture the restriction for NCD-SSB measurement to be only applicable for PCell. |  |
| R4-2400022 | LS on UL Tx switching | Rel-18 | NR\_MC\_enh-Core | RAN2 | For Rel-18 UL Tx switching, RAN2 achieved the following agreements in RAN2 #124 meeting:  - RAN2 confirms that Rel-18 signalling can configure 2 bands UL Tx switching for a band pair that the UE supports according to the Rel-18 band pair list UE capability  - -RAN2 assumes that “if switching2T-Mode-r18 IE is configured for a band pair, then 2Tx-2Tx switching period of this band pair will be considered as the input for switching period calculation  **ACTION:**  AN2 respectfully asks RAN4 to take the above RAN2 agreements into account and feedback to RAN2 in case there is any concern on agreement 1 or agreement 2. |  |
| R4-2400023 | LS on mobility enhancements for IoT NTN UEs | Rel-18 | IoT\_NTN\_enh-Core | RAN2 | RAN2 would like to inform RAN4 about the following relevant agreements made during RAN2#124 on mobility enhancements for IoT NTN UEs:  - For NB-IoT NTN, it is up to UE implementation which frequencies to be measured/prioritized in RRC\_CONNECTED  - eMTC UEs in NTN should use MeasObject(s) for performing measurements based on time/location criteria.  **ACTIONS:**  RAN2 kindly asks RAN4 to take the information above into consideration. |  |
| R4-2400024 | LS on RAN2 agreements for satellite switch with resync | Rel-18 | NR\_NTN\_enh-Core | RAN2 | RAN2 also agreed to support hard satellite switch (non-overlapping satellite coverage at switching time) and soft satellite switch (overlapping satellite coverage at switching time).  - For soft satellite switch, RAN2 would like to get feedback on the feasibility that a UE supporting soft satellite switch can start synchronizing to the DL of the SpCell served by the target satellite while still being connected to the source satellite (without any simultaneous communication with the source and the target satellites).  **ACTIONS:**  RAN2 respectfully asks RAN4 to take the above agreements into account for their further corresponding work, and provide feedback on the feasibility of UE to perform the downlink synchronization with the target satellite and keep the communication with the source satellite of the same serving cell simultaneously in soft satellite switch. |  |
| R4-2400025 | LS on defining the missing relative angular offsets and UE gain-related parameters for different power classes | Rel-18 |  | RAN5 | RAN5 has identified below RAN4 parameters that aren’t defined for power classes 1, 5, and 6 in TS 38.133 v18.3.0. Due to this, several test cases and work items cannot be completed in RAN5 TS 38.533. The missing list of parameters from TS 38.133 is provided.  **ACTIONS:**  RAN5 would like to kindly ask RAN4 to define the missing relative angular offset and UE gain-related parameters for power classes 1, 5, and 6 which are identified in section 1. Early feedback will help complete impacted RRM test cases in TS 38.533. |  |
| R4-2400333 | Parameters of terrestrial component of IMT for sharing and  compatibility studies in the frequency bands 4 400-4 800 MHz,  7 125-8 400 MHz and 14.8-15.35 GHz |  |  | WP5D | WP 5D is seeking technical and operational characteristics of terrestrial IMT systems that would operate in frequency bands of 4 400-4 800 MHz, 7 125-8 400 MHz and 14.8-15.35 GHz being considered under WRC-27 AI 1.7, including the evolution of IMT through advances in technology and spectrally efficient techniques.  **ACTION:**  WP 5D kindly asks initial response on this information by June 2024 meeting of WP 5D, deadline for inputs is 13th June 2024 (1600 UTC). |  |
| R4-2400334 | LS to 3GPP RAN4 on in-block output power requirements for bands n100 and n101 and on additional unwanted emission limits for band n100 |  |  | WG FM | WG FM confirms that section 6.6.4.2.5.7 in TS 38.104 needs to be withdrawn.  **ACTIONS:**  WG FM invites 3GPP to proceed with the withdrawal from TS 38.104 of both, in-block output power requirements for bands n100 and n101 and of additional unwanted emission limits for band n100. |  |
| R4-2402265 | Availability of Addendum 1 to Circular Letter 5/LCCE/109 |  |  | WP5D | During its 45th meeting of Working Party (WP) 5D, Addendum 1 to the Circular Letter was developed (see attachment at the end) to announce the reception by ITU-R of a submission of a new proposal for candidate radio interface technology (RIT) and to invite the formation of Independent Evaluation Groups (IEGs) and the subsequent submission of evaluation reports on this new candidate RIT according to the established detailed timeline.  Working Party 5D has reviewed the candidate technology proposed from Proponent Nufront to its 45th meeting under Step 3 of the IMT-2020 submission and evaluation process, and acknowledged this submission as “complete” in conformance with section 5 of Report ITU-R M.2411:  **ACTIONS:**  Working Party 5D expects to receive the final evaluation reports from the IEGs on this IMT-2020 candidate technology RIT by its 48th meeting (February 2025), and the IEGs are encouraged to provide interim evaluation reports for the 47th meeting (October 2024). Potential Independent Evaluation Groups are requested to register with ITU-R no later than 13th June 2024 to better enable dialog between the IEGs and Proponent Nufront in order to meet the planned deadlines. |  |

## 3A Topic Summary (pre-meeting)

This agenda item is only for at-meeting-generated content related to topic summary.

### 3A.1 Main session topic summaries

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TDoc | Title | Source | Type | For | Abstract | Agenda item | TDoc Status | Decision |
| R4-2401060 | Topic summary for [110][101] Upto\_R16\_UERF\_maintenance | Moderator(OPPO) | other | Information | [110][100] Main Session | 4.8 | reserved |  |
| R4-2401061 | Topic summary for [110][102] R17\_UERF\_maintenance | Moderator(Mediatek) | other | Information | [110][100] Main Session | 5.4 | reserved |  |
| R4-2401062 | Topic summary for [110][103] R18\_UERF\_maintenance | Moderator(Meta) | other | Information | [110][100] Main Session | 6.4 | reserved |  |
| R4-2401063 | Topic summary for [110][104] NR\_2Rx\_XR | Moderator(Apple) | other | Information | [110][100] Main Session | 6.4 | reserved |  |
| R4-2401064 | Topic summary for [110][105] NR\_Baskets\_Part\_1 | Moderator(Skyworks) | other | Information | [110][100] Main Session | 7.1.2 | reserved |  |
| R4-2401065 | Topic summary for [110][106] NR\_Baskets\_Part\_2 | Moderator(Nokia) | other | Information | [110][100] Main Session | 7.2 | reserved |  |
| R4-2401066 | Topic summary for [110][107] NR\_Baskets\_Part\_3 | Moderator(Ericsson) | other | Information | [110][100] Main Session | 7.2 | reserved |  |
| R4-2401067 | Topic summary for [110][108] LTE\_Baskets | Moderator(Huawei) | other | Information | [110][100] Main Session | 9.1.4 | reserved |  |
| R4-2401068 | Topic summary for [110][109] LTE\_NR\_HPUE\_FWVM | Moderator(Nokia) | other | Information | [110][100] Main Session | 7.2 | reserved |  |
| R4-2401069 | Topic summary for [110][110] HPUE\_Basket\_EN-DC | Moderator(Ericsson) | other | Information | [110][100] Main Session | 7.2 | reserved |  |
| R4-2401070 | Topic summary for [110][111] HPUE\_Basket\_Intra-CA\_TDD | Moderator(Huawei) | other | Information | [110][100] Main Session | 7.2 | reserved |  |
| R4-2401071 | Topic summary for [110][112] HPUE\_Basket\_inter-CA\_SUL | Moderator(China Telecom) | other | Information | [110][100] Main Session | 7.2 | reserved |  |
| R4-2401072 | Topic summary for [110][113] HPUE\_Basket\_FDD | Moderator(China Unicom) | other | Information | [110][100] Main Session | 7.2 | reserved |  |
| R4-2401073 | Topic summary for [110][114] LTE\_NR\_Other\_WI | Moderator(Huawei) | other | Information | [110][100] Main Session | 7.2 | reserved |  |
| R4-2401074 | Topic summary for [110][115] NR\_3Tx-4Rx\_WI | Moderator(OPPO) | other | Information | [110][100] Main Session | 7.2 | reserved |  |
| R4-2401075 | Topic summary for [110][116] IoT\_NTN\_extLband | Moderator(Inmarsat) | other | Information | [110][100] Main Session | 9.2.6 | reserved |  |
| R4-2401076 | Topic summary for [110][117] HPUE\_LTE\_FDD\_B14 | Moderator(AT&T) | other | Information | [110][100] Main Session | 9.3.4 | reserved |  |
| R4-2401077 | Topic summary for [110][118] FR1\_enh2\_part1 | Moderator(Huawei) | other | Information | [110][100] Main Session | 8.1.4 | reserved |  |
| R4-2401078 | Topic summary for [110][119] FR1\_enh2\_part2 | Moderator(Vivo) | other | Information | [110][100] Main Session | 8.1.4 | reserved |  |
| R4-2401079 | Topic summary for [110][120] FR1\_enh2\_part3 | Moderator(NTT DOCOMO) | other | Information | [110][100] Main Session | 8.1.4 | reserved |  |
| R4-2401080 | Topic summary for [110][121] FR2\_enh\_req\_Ph3\_part1 | Moderator(Nokia) | other | Information | [110][100] Main Session | 8.2.4 | reserved |  |
| R4-2401081 | Topic summary for [110][122] FR2\_enh\_req\_Ph3\_part2 | Moderator(Xiaomi) | other | Information | [110][100] Main Session | 8.2.4 | reserved |  |
| R4-2401082 | Topic summary for [110][123] FR2\_multiRx\_UERF\_part1 | Moderator(Qualcomm) | other | Information | [110][100] Main Session | 8.3.5 | reserved |  |
| R4-2401083 | Topic summary for [110][124] NonCol\_intraB | Moderator(KDDI) | other | Information | [110][100] Main Session | 8.7.5 | reserved |  |
| R4-2401084 | Topic summary for [110][125] NR\_ATG\_UERF\_part1 | Moderator(CMCC) | other | Information | [110][100] Main Session | 8.9.8 | reserved |  |
| R4-2401085 | Topic summary for [110][126] NR\_ATG\_UERF\_part2 | Moderator(Huawei) | other | Information | [110][100] Main Session | 8.9.8 | reserved |  |
| R4-2401086 | Topic summary for [110][127] NR\_FR1\_lessthan\_5MHz\_BW | Moderator(Nokia) | other | Information | [110][100] Main Session | 8.10.7 | reserved |  |
| R4-2401087 | Topic summary for [110][128] NR\_pos\_enh2\_UERF | Moderator(CATT) | other | Information | [110][100] Main Session | 8.14.4 | reserved |  |
| R4-2401088 | Topic summary for [110][129] NR\_MC\_enh\_UERF | Moderator(China Telecom) | other | Information | [110][100] Main Session | 8.15.4 | reserved |  |
| R4-2401089 | Topic summary for [110][130] NR\_NTN\_enh\_UERF | Moderator(ZTE) | other | Information | [110][100] Main Session | 8.18.9 | reserved |  |
| R4-2401090 | Topic summary for [110][131] NR\_cov\_enh2\_part1 | Moderator(Huawei) | other | Information | [110][100] Main Session | 8.19.3 | reserved |  |
| R4-2401091 | Topic summary for [110][132] NR\_cov\_enh2\_part2 | Moderator(Nokia) | other | Information | [110][100] Main Session | 8.19.3 | reserved |  |
| R4-2401092 | Topic summary for [110][133] NR\_MIMO\_evo\_DL\_UL\_UERF | Moderator(Samsung) | other | Information | [110][100] Main Session | 8.21.5 | reserved |  |
| R4-2401093 | Topic summary for [110][134] NR\_SL\_enh2\_UERF\_part1 | Moderator(OPPO) | other | Information | [110][100] Main Session | 8.22.5 | reserved |  |
| R4-2401094 | Topic summary for [110][135] NR\_SL\_enh2\_UERF\_part2 | Moderator(LGE) | other | Information | [110][100] Main Session | 8.22.5 | reserved |  |
| R4-2401095 | Topic summary for [110][136] NR\_SL\_enh2\_UERF\_part3 | Moderator(Huawei) | other | Information | [110][100] Main Session | 8.22.5 | reserved |  |
| R4-2401096 | Topic summary for [110][137] NR\_redcap\_enh\_UERF | Moderator(Ericsson) | other | Information | [110][100] Main Session | 8.23.5 | reserved |  |
| R4-2401097 | Topic summary for [110][138] Netw\_Energy\_NR | Moderator(Huawei) | other | Information | [110][100] Main Session | 8.26.5 | reserved |  |
| R4-2401098 | Topic summary for [110][139] IoT\_NTN\_enh\_UERF | Moderator(Mediatek) | other | Information | [110][100] Main Session | 9.4.6 | reserved |  |
| R4-2401099 | Topic summary for [110][140] NR\_LTE\_Rel-18\_feature\_list | Moderator(CMCC) | other | Information | [110][100] Main Session | 10 | reserved |  |
| R4-2401100 | Topic summary for [110][141] NR\_AIML\_air | Moderator(Qualcomm) | other | Information | [110][100] Main Session | 11.1.5 | reserved |  |
| R4-2401101 | Topic summary for [110][142] NR\_reply\_LS\_UE\_RF | Moderator(Apple) | other | Information | [110][100] Main Session | 12.4 | reserved |  |
| R4-2401102 | Topic summary for [110][143] NR\_power\_class | Moderator(Samsung) | other | Information | [110][100] Main Session | 12.4 | reserved |  |
| R4-2401103 | Topic summary for [110][144] Release\_indep | Moderator(Nokia) | other | Information | [110][100] Main Session | 13 | reserved |  |
| R4-2401104 | Topic summary for [110][145] n101\_coexist | Moderator(Ericsson) | other | Information | [110][100] Main Session | 13 | reserved |  |
| R4-2401105 | Topic summary for [110][146] ITU\_WP5D\_LSReply | Moderator(Ericsson) | other | Information | [110][100] Main Session | 12.4 | reserved |  |

### 3A.2 RRM session topic summaries

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TDoc | Title | Source | Type | For | Abstract | Agenda item | TDoc Status | Decision |
| R4-2400737 | Topic summary for [110][201] Maintenance\_up\_to\_R16 | Moderator(Huawei) | other | Information | [110][200] RRM Session | 4.8 | reserved |  |
| R4-2400738 | Topic summary for [110][202] Maintenance\_R17\_R18 | Moderator (Apple) | other | Information | [110][200] RRM Session | 5.4 | reserved |  |
| R4-2400739 | Topic summary for [110][203] LTE\_NBIOT\_eMTC\_NTN\_req | Moderator (MediaTek) | other | Information | [110][200] RRM Session | 6.4 | reserved |  |
| R4-2400740 | Topic summary for [110][204] NR\_ENDC\_ RF\_FR1\_enh2 | Moderator (NTT DoCoMo) | other | Information | [110][200] RRM Session | 8.1.4 | reserved |  |
| R4-2400741 | Topic summary for [110][205] FR2\_multiRx\_part1 | Moderator (vivo) | other | Information | [110][200] RRM Session | 8.3.5 | reserved |  |
| R4-2400742 | Topic summary for [110][206] FR2\_multiRx\_part2 | Moderator (Ericsson) | other | Information | [110][200] RRM Session | 8.3.5 | reserved |  |
| R4-2400743 | Topic summary for [110][207] NR\_RRM\_enh3\_part1 | Moderator (Apple) | other | Information | [110][200] RRM Session | 8.4.5 | reserved |  |
| R4-2400744 | Topic summary for [110][208] NR\_RRM\_enh3\_part2 | Moderator (OPPO) | other | Information | [110][200] RRM Session | 8.4.5 | reserved |  |
| R4-2400745 | Topic summary for [110][209] NR\_MG\_enh2\_part1 | Moderator (MediaTek) | other | Information | [110][200] RRM Session | 8.5.5 | reserved |  |
| R4-2400746 | Topic summary for [110][210] NR\_MG\_enh2\_part2 | Moderator (Intel) | other | Information | [110][200] RRM Session | 8.5.5 | reserved |  |
| R4-2400747 | Topic summary for [110][211] NR\_BWP\_wor | Moderator (vivo) | other | Information | [110][200] RRM Session | 8.6.3 | reserved |  |
| R4-2400748 | Topic summary for [110][212] NonCol\_intraB\_ENDC\_NR\_CA | Moderator (Huawei) | other | Information | [110][200] RRM Session | 8.7.5 | reserved |  |
| R4-2400749 | Topic summary for [110][213] NR\_HST\_FR2\_enh\_part1 | Moderator (Nokia) | other | Information | [110][200] RRM Session | 8.8.4 | reserved |  |
| R4-2400750 | Topic summary for [110][214] NR\_HST\_FR2\_enh\_part2 | Moderator (Samsung) | other | Information | [110][200] RRM Session | 8.8.4 | reserved |  |
| R4-2400751 | Topic summary for [110][215] NR\_ATG | Moderator (CMCC) | other | Information | [110][200] RRM Session | 8.9.8 | reserved |  |
| R4-2400752 | Topic summary for [110][216] NR\_FR1\_lessthan\_5MHz\_BW | Moderator (Nokia) | other | Information | [110][200] RRM Session | 8.10.7 | reserved |  |
| R4-2400753 | Topic summary for [110][217] NR\_pos\_enh2\_part1 | Moderator (Ericsson) | other | Information | [110][200] RRM Session | 8.14.4 | reserved |  |
| R4-2400754 | Topic summary for [110][218] NR\_pos\_enh2\_part2 | Moderator (CATT) | other | Information | [110][200] RRM Session | 8.14.4 | reserved |  |
| R4-2400755 | Topic summary for [110][219] NR\_pos\_enh2\_part3 | Moderator (Huawei) | other | Information | [110][200] RRM Session | 8.14.4 | reserved |  |
| R4-2400756 | Topic summary for [110][220] NR\_MC\_enh | Moderator (Huawei) | other | Information | [110][200] RRM Session | 8.15.4 | reserved |  |
| R4-2400757 | Topic summary for [110][221] NR\_Mob\_enh2\_part1 | Moderator (MediaTek) | other | Information | [110][200] RRM Session | 8.16.3 | reserved |  |
| R4-2400758 | Topic summary for [110][222] NR\_Mob\_enh2\_part2 | Moderator (Apple) | other | Information | [110][200] RRM Session | 8.16.3 | reserved |  |
| R4-2400759 | Topic summary for [110][223] NR\_DualTxRx\_MUSIM | Moderator (vivo) | other | Information | [110][200] RRM Session | 8.17.3 | reserved |  |
| R4-2400760 | Topic summary for [110][224] NR\_NTN\_enh | Moderator (Qualcomm) | other | Information | [110][200] RRM Session | 8.18.9 | reserved |  |
| R4-2400761 | Topic summary for [110][225] NR\_netcon\_repeater | Moderator (ZTE) | other | Information | [110][200] RRM Session | 8.20.7 | reserved |  |
| R4-2400762 | Topic summary for [110][226] NR\_MIMO\_evo\_DL\_UL | Moderator (Samsung) | other | Information | [110][200] RRM Session | 8.21.5 | reserved |  |
| R4-2400763 | Topic summary for [110][227] NR\_SL\_enh2\_part1 | Moderator (LGE) | other | Information | [110][200] RRM Session | 8.22.5 | reserved |  |
| R4-2400764 | Topic summary for [110][228] NR\_SL\_enh2\_part2 | Moderator (OPPO) | other | Information | [110][200] RRM Session | 8.22.5 | reserved |  |
| R4-2400766 | Topic summary for [110][230] NR\_SL\_relay\_enh | Moderator (LGE) | other | Information | [110][200] RRM Session | 8.24.3 | reserved |  |
| R4-2400767 | Topic summary for [110][231] NR\_mobile\_IAB | Moderator (Qualcomm) | other | Information | [110][200] RRM Session | 8.25.7 | reserved |  |
| R4-2400768 | Topic summary for [110][232] Netw\_Energy\_NR | Moderator (Huawei) | other | Information | [110][200] RRM Session | 8.26.5 | reserved |  |
| R4-2400769 | Topic summary for [110][233] IoT\_NTN\_enh | Moderator (MediaTek) | other | Information | [110][200] RRM Session | 9.4.6 | reserved |  |
| R4-2400770 | Topic summary for [110][234] Reply\_LS | Moderator (Apple) | other | Information | [110][200] RRM Session | 12.4 | reserved |  |
| R4-2400737 | Topic summary for [110][201] Maintenance\_up\_to\_R16 | Moderator(Huawei) | other | Information | [110][200] RRM Session | 4.8 | reserved |  |

### 3A.3 BSRF\_Demod session topic summaries

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TDoc | Title | Source | Type | For | Abstract | Agenda item | TDoc Status | Decision |
| R4-2402641 | Topic summary for [110][301] BSRF\_Maintenance | Moderator (Ericsson) | other | Information | [110][300] BDaT Session | 6.4 | reserved |  |
| R4-2402642 | Topic summary for [110][302] NR\_ATG\_BSRF\_Maintenance | Moderator (ZTE) | other | Information | [110][300] BDaT Session | 8.9.8 | reserved |  |
| R4-2402643 | Topic summary for [110][303] NR\_FR1\_lessthan\_5MHz\_BW\_BSRF\_Maintenance | Moderator (Nokia) | other | Information | [110][300] BDaT Session | 8.10.7 | reserved |  |
| R4-2402644 | Topic summary for [110][304] NR\_LTE\_EMC\_enh | Moderator (Ericsson) | other | Information | [110][300] BDaT Session | 6.4 | reserved |  |
| R4-2402645 | Topic summary for [110][305] NR\_NTN\_enh\_Part1 | Moderator (Thales) | other | Information | [110][300] BDaT Session | 8.18.9 | reserved |  |
| R4-2402646 | Topic summary for [110][306] NR\_NTN\_enh\_Part2 | Moderator (Ericsson) | other | Information | [110][300] BDaT Session | 8.18.9 | reserved |  |
| R4-2402647 | Topic summary for [110][307] NR\_NTN\_enh\_Part3 | Moderator (Samsung) | other | Information | [110][300] BDaT Session | 8.18.9 | reserved |  |
| R4-2402648 | Topic summary for [110][308] NR\_netcon\_repeater\_RF | Moderator (ZTE) | other | Information | [110][300] BDaT Session | 8.20.7 | reserved |  |
| R4-2402649 | Topic summary for [110][309] NR\_netcon\_repeater\_RFConformance | Moderator (CATT) | other | Information | [110][300] BDaT Session | 8.20.7 | reserved |  |
| R4-2402650 | Topic summary for [110][310] NR\_mobile\_IAB\_RF | Moderator (Qualcomm) | other | Information | [110][300] BDaT Session | 8.25.7 | reserved |  |
| R4-2402651 | Topic summary for [110][311] Demod\_Maintenance | Moderator (Nokia) | other | Information | [110][300] BDaT Session | 6.4 | reserved |  |
| R4-2402652 | Topic summary for [110][312] RF\_FR1\_enh2\_Demod | Moderator (Huawei) | other | Information | [110][300] BDaT Session | 8.1.4 | reserved |  |
| R4-2402653 | Topic summary for [110][313] NR\_RF\_FR2\_req\_Ph3\_Demod | Moderator (Nokia) | other | Information | [110][300] BDaT Session | 8.2.4 | reserved |  |
| R4-2402654 | Topic summary for [110][314] NR\_FR2\_multiRX\_DL\_Demod | Moderator (Qualcomm) | other | Information | [110][300] BDaT Session | 8.3.5 | reserved |  |
| R4-2402655 | Topic summary for [110][315] NonCol\_intraB\_ENDC\_NR\_CA\_Demod | Moderator (Ericsson) | other | Information | [110][300] BDaT Session | 8.7.5 | reserved |  |
| R4-2402656 | Topic summary for [110][316] NR\_HST\_FR2\_enh\_Demod | Moderator (Samsung) | other | Information | [110][300] BDaT Session | 8.8.4 | reserved |  |
| R4-2402657 | Topic summary for [110][317] NR\_ATG\_Demod | Moderator (CMCC) | other | Information | [110][300] BDaT Session | 8.9.8 | reserved |  |
| R4-2402658 | Topic summary for [110][318] NR\_FR1\_lessthan\_5MHz\_BW\_demod | Moderator (Nokia) | other | Information | [110][300] BDaT Session | 8.10.7 | reserved |  |
| R4-2402659 | Topic summary for [110][319] NR\_demod\_enh3\_Part1 | Moderator (CTC) | other | Information | [110][300] BDaT Session | 8.13.4 | reserved |  |
| R4-2402660 | Topic summary for [110][320] NR\_NTN\_enh\_SAN\_UE\_demod | Moderator (Huawei) | other | Information | [110][300] BDaT Session | 8.18.9 | reserved |  |
| R4-2402661 | Topic summary for [110][321] NR\_cov\_enh2\_demod | Moderator (CTC) | other | Information | [110][300] BDaT Session | 8.19.3 | reserved |  |
| R4-2402662 | Topic summary for [110][322] NR\_netcon\_repeater\_Demod | Moderator (ZTE) | other | Information | [110][300] BDaT Session | 8.20.7 | reserved |  |
| R4-2402663 | Topic summary for [110][323] NR\_MIMO\_evo\_DL\_UL\_demod | Moderator (Samsung) | other | Information | [110][300] BDaT Session | 8.21.5 | reserved |  |
| R4-2402664 | Topic summary for [110][324] NR\_SL\_enh2\_demod | Moderator (LGE) | other | Information | [110][300] BDaT Session | 8.22.5 | reserved |  |
| R4-2402665 | Topic summary for [110][325] NR\_redcap\_enh\_demod | Moderator (Ericsson) | other | Information | [110][300] BDaT Session | 8.23.5 | reserved |  |
| R4-2402666 | Topic summary for [110][326] NR\_mobile\_IAB\_demod | Moderator (Ericsson) | other | Information | [110][300] BDaT Session | 8.25.7 | reserved |  |
| R4-2402667 | Topic summary for [110][327] Netw\_Energy\_NR\_demod | Moderator (Huawei) | other | Information | [110][300] BDaT Session | 8.26.5 | reserved |  |
| R4-2402668 | Topic summary for [110][328] NR\_DSS\_enh | Moderator (Ericsson) | other | Information | [110][300] BDaT Session | 8.27.3 | reserved |  |
| R4-2402669 | Topic summary for [110][329] IoT\_NTN\_Demod | Moderator (MediaTek) | other | Information | [110][300] BDaT Session | 9.4.6 | reserved |  |
| R4-2402670 | Topic summary for [110][330] OTA\_Maintenance | Moderator (Keysight) | other | Information | [110][300] BDaT Session | 6.4 | reserved |  |
| R4-2402671 | Topic summary for [110][331] NR\_FR1\_TRP\_TRS\_enh | Moderator (vivo) | other | Information | [110][300] BDaT Session | 8.11.3 | reserved |  |
| R4-2402672 | Topic summary for [110][332] NR\_MIMO\_OTA\_enh | Moderator (CAICT) | other | Information | [110][300] BDaT Session | 8.12.4 | reserved |  |

## 4 Up to Rel-16 maintenance for LTE and NR

**Guidance for maintenance agendas (AI 4, AI 5 and AI 6)**

The following guidance are provided for AI 4, AI5 and AI6:

- For maintenance agenda AI 4 (up to Rel-16), AI 5 (Rel-17) and AI 6 (Rel-18), formal CRs are expected and multiple formal CRs per company in the lowest agenda are allowed. For tracking the changes easily, it expected that one batch of CRs (Cat-F/A/…) will just cover a single topic/WI rather than multiple topics/WIs and Cat-F CR with corresponding Cat-A CRs needs be submitted under the same agenda.

- When submitting contributions to AI 4, AI 5 and AI 6.1.15/AI 6.2.8, please add (WI\_code) in the beginning of titles for both discussion files and CRs to facilitate moderators and session chairs handling.

- When reserving the tdoc number, please use the correct WI code rather than simply using TEI and fill the column of “Related WIs” in your reservation spreadsheet. If you submit a CR with TEI as WI code, please inform session chair.

- The contributions corresponding to incoming LS for Rel-17 and Rel-18 are expected to be submitted in AI 12, if there is a dedicated agenda in AI 12.

### 4.1 UE RF requirements

### 4.2 BS RF requirements and BS conformance testing

**R4-2400047 (TEI15) Correction for 38.141-1 R15: declaration and table number**

*Type: CR For: Agreement  
 38.141-1 v15.15.0 CR-0403 rev Cat: F (Rel-15)  
  
 Source: CATT*

**Decision: Not pursued**

**R4-2400048 (TEI15) Correction for 38.141-1 R16: declaration and table number**

*Type: CR For: Agreement  
 38.141-1 v16.18.0 CR-0404 rev Cat: A (Rel-16)  
  
 Source: CATT*

**Decision: Withdrawn**

**R4-2400049 (TEI15) Correction for 38.141-1 R17: declaration and table number**

*Type: CR For: Agreement  
 38.141-1 v17.12.0 CR-0405 rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Revised to R4-2403020 (from R4-2400049)**

Moderator: This should be changed to Cat F

Ericsson: If we find technical errors, then Rel-15 CR could be ok. If editorial only, Rel-17 onwards is ok.

**R4-2403020 (NR\_newRAT-Perf) Correction for 38.141-1 R17: declaration and table number**

*Type: CR For: Agreement  
 38.141-1 v17.12.0 CR-0405 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400050 (TEI15) Correction for 38.141-1 R18: declaration and table number**

*Type: CR For: Agreement  
 38.141-1 v18.4.0 CR-0406 rev Cat: A (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400077 (TEI15) Correction for TS 38.104 R15**

*Type: CR For: Agreement  
 38.104 v15.19.0 CR-0552 rev Cat: F (Rel-15)  
  
 Source: CATT*

**Decision: Not pursued**

**R4-2400078 (TEI15) Correction for TS 38.104 R16**

*Type: CR For: Agreement  
 38.104 v16.18.0 CR-0553 rev Cat: A (Rel-16)  
  
 Source: CATT*

**Decision: Withdrawn**

**R4-2400079 (TEI15) Correction for TS 38.104 R17**

*Type: CR For: Agreement  
 38.104 v17.12.0 CR-0554 rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Revised to R4-2403021 (from R4-2400079)**

**R4-2403021 (NR\_newRAT-Core) Correction for TS 38.104 R17**

*Type: CR For: Agreement  
 38.104 v17.12.0 CR-0554 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400080 (TEI15) Correction for TS 38.104 R18**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0555 rev Cat: A (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400580 CR to TS 38.104 on correction of radiated performance requirement (Rel-16)**

*Type: CR For: Agreement  
 38.104 v16.18.0 CR-0559 rev Cat: F (Rel-16)  
  
 Source: Murata Manufacturing Co Ltd.*

**Decision: Revised to R4-2403075 (from R4-2400580)**

**R4-2403075 CR to TS 38.104 on correction of radiated performance requirement (Rel-16)**

*Type: CR For: Agreement  
 38.104 v16.18.0 CR-0559 rev Cat: F (Rel-16)  
  
 Source: Murata Manufacturing Co Ltd.*

**Decision: Agreed**

Moderator: This should be reviewed by BS demod experts

**R4-2400581 CR to TS 38.104 on correction of radiated performance requirement (Rel-17)**

*Type: CR For: Agreement  
 38.104 v17.12.0 CR-0560 rev Cat: A (Rel-17)  
  
 Source: Murata Manufacturing Co Ltd.*

**Decision: Agreed**

**R4-2400582 CR to TS 38.104 on correction of radiated performance requirement (Rel-18)**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0561 rev Cat: A (Rel-18)  
  
 Source: Murata Manufacturing Co Ltd.*

**Decision: Agreed**

**R4-2400653 (NR\_IAB-Perf) CR for TS 38.176-1, Correction on IAB-MT Output power dynamics test requirements**

*Type: CR For: Agreement  
 38.176-1 v16.7.0 CR-0044 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Germany*

**Decision: Agreed**

**R4-2400656 (NR\_IAB-Perf) CR for TS 38.176-2, Correction on IAB-MT Output power dynamics test requirements**

*Type: CR For: Agreement  
 38.176-2 v16.8.0 CR-0047 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Germany*

**Decision: Revised to R4-2403022 (from R4-2400656)**

**R4-2403022 (NR\_IAB-Perf) CR for TS 38.176-2, Correction on IAB-MT Output power dynamics test requirements**

*Type: CR For: Agreement  
 38.176-2 v16.8.0 CR-0047 rev Cat: F (Rel-16)  
  
 Source: Qualcomm Germany, Ericsson, Nokia*

**Decision: Agreed**

**R4-2400674 (LTE\_LAA-Perf) CR to TS 36.141 on correction of base station output power for Band 46**

*Type: CR For: Agreement  
 36.141 v15.19.0 CR-1380 rev Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Add carrier frequency 4.2GHz < f = 6.0GHz in the base station output power.

**Decision: Revised to R4-2403023 (from R4-2400674)**

**R4-2403023 (LTE\_LAA-Perf) CR to TS 36.141 on correction of base station output power for Band 46**

*Type: CR For: Agreement  
 36.141 v15.19.0 CR-1380 rev Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell*

Abstract:

Add carrier frequency 4.2GHz < f = 6.0GHz in the base station output power.

**Decision: Agreed**

**R4-2400675 (LTE\_LAA-Perf) CR to TS 36.141 on correction of base station output power for Band 46**

*Type: CR For: Agreement  
 36.141 v16.18.0 CR-1381 rev Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Add carrier frequency 4.2GHz < f = 6.0GHz in the base station output power.

**Decision: Agreed**

**R4-2400676 (LTE\_LAA-Perf) CR to TS 36.141 on correction of base station output power for Band 46**

*Type: CR For: Agreement  
 36.141 v17.11.0 CR-1382 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Add carrier frequency 4.2GHz < f = 6.0GHz in the base station output power.

**Decision: Agreed**

**R4-2400677 (LTE\_LAA-Perf) CR to TS 36.141 on correction of base station output power for Band 46**

*Type: CR For: Agreement  
 36.141 v18.3.0 CR-1383 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

Add carrier frequency 4.2GHz < f = 6.0GHz in the base station output power.

**Decision: Agreed**

**R4-2400678 (NR\_unlic-Perf) CR to TS 38.141-1 on corrections of measurement uncertainties, test tolerances and requirements for bands n46, n96 and n102**

*Type: CR For: Agreement  
 38.141-1 v16.18.0 CR-0408 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

1) Correct the errors in the tables of the measurement uncertainties regarding the notes for bands n46, n96 and n102.

2) Include the measurement uncertainties of base station output power and transmitter OFF power for bands n46, n96 and n102 in the test t

**Decision: Revised to R4-2403024 (from R4-2400678)**

**R4-2403024 (NR\_unlic-Perf) CR to TS 38.141-1 on corrections of measurement uncertainties, test tolerances and requirements for bands n46 and n96f**

*Type: CR For: Agreement  
 38.141-1 v16.18.0 CR-0408 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

Abstract:

1) Correct the errors in the tables of the measurement uncertainties regarding the notes for bands n46, n96 and n102.

2) Include the measurement uncertainties of base station output power and transmitter OFF power for bands n46, n96 and n102 in the test t

**Decision: Agreed**

**R4-2400679 (NR\_unlic-Perf) CR to TS 38.141-1 on corrections of measurement uncertainties, test tolerances and requirements for bands n46, n96 and n102**

*Type: CR For: Agreement  
 38.141-1 v17.12.0 CR-0409 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

1) Correct the errors in the tables of the measurement uncertainties regarding the notes for bands n46, n96 and n102.

2) Include the measurement uncertainties of base station output power and transmitter OFF power for bands n46, n96 and n102 in the test t

**Decision: Revised to R4-2403025 (from R4-2400679)**

**R4-2403025 (NR\_unlic-Perf) CR to TS 38.141-1 on corrections of measurement uncertainties, test tolerances and requirements for bands n46, n96 and n102**

*Type: CR For: Agreement  
 38.141-1 v17.12.0 CR-0409 rev Cat: F (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

Abstract:

1) Correct the errors in the tables of the measurement uncertainties regarding the notes for bands n46, n96 and n102.

2) Include the measurement uncertainties of base station output power and transmitter OFF power for bands n46, n96 and n102 in the test t

**Decision: Agreed**

**R4-2400680 (NR\_unlic-Perf) CR to TS 38.141-1 on corrections of measurement uncertainties, test tolerances and requirements for bands n46, n96 and n102**

*Type: CR For: Agreement  
 38.141-1 v18.4.0 CR-0410 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

1) Correct the errors in the tables of the measurement uncertainties regarding the notes for bands n46, n96 and n102.

2) Include the measurement uncertainties of base station output power and transmitter OFF power for bands n46, n96 and n102 in the test t

**Decision: Agreed**

**R4-2402110 (NR\_IAB) Discussion on IAB-MT scaling**

**Decision: Noted**

**Decision:** The document was **not treated**.

**R4-2402111 (NR\_IAB-Core)CR for TS 38.174, Correction on scaling factor for IAB-MT type 1-O**

*Type: CR For: Agreement  
 38.174 v16.9.0 CR-0099 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2403026 (NR\_IAB-Core)CR for TS 38.174, Correction on scaling factor for IAB-MT type 1-O**

*Type: CR For: Agreement  
 38.174 v16.9.0 CR-0099 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn**

**R4-2402112 (NR\_IAB-Core)CR for TS 38.174, Correction on scaling factor for IAB-MT type 1-O**

*Type: CR For: Agreement  
 38.174 v17.6.0 CR-0100 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402113 (NR\_IAB-Core) CR for TS 38.174, Correction on scaling factor for IAB-MT type 1-O**

*Type: CR For: Agreement  
 38.174 v18.3.0 CR-0101 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402114 (NR\_IAB-Perf) CR for TS 38.176-1, Correction due to scaling factor for IAB-MT type 1-O changes**

*Type: CR For: Agreement  
 38.176-1 v16.7.0 CR-0048 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2403027 (NR\_IAB-Perf) CR for TS 38.176-1, Correction due to scaling factor for IAB-MT type 1-O changes**

*Type: CR For: Agreement  
 38.176-1 v16.7.0 CR-0048 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn**

**R4-2402115 (NR\_IAB-Perf) CR for TS 38.176-1, Correction due to scaling factor for IAB-MT type 1-O changes**

*Type: CR For: Agreement  
 38.176-1 v17.7.0 CR-0049 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402116 (NR\_IAB-Perf) CR for TS 38.176-1, Correction due to scaling factor for IAB-MT type 1-O changes**

*Type: CR For: Agreement  
 38.176-1 v18.3.0 CR-0050 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402117 (NR\_IAB-Perf) CR for TS 38.176-2, Implimentaion of scaling factor for IAB-MT type 1-O**

*Type: CR For: Agreement  
 38.176-2 v16.8.0 CR-0051 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2403028 (NR\_IAB-Perf) CR for TS 38.176-2, Implimentaion of scaling factor for IAB-MT type 1-O**

*Type: CR For: Agreement  
 38.176-2 v16.8.0 CR-0051 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Withdrawn**

**R4-2402118 (NR\_IAB-Perf) CR for TS 38.176-2, Implimentaion of scaling factor for IAB-MT type 1-O**

*Type: CR For: Agreement  
 38.176-2 v17.7.0 CR-0052 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402119 (NR\_IAB-Perf) CR for TS 38.176-2, Implimentaion of scaling factor for IAB-MT type 1-O**

*Type: CR For: Agreement  
 38.176-2 v18.3.0 CR-0053 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402120 (MB\_MSR\_RF) CR to 37.104: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 37.104 v16.19.0 CR-1009 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2403029 (from R4-2402120)**

**R4-2403029 (MB\_MSR\_RF) CR to 37.104: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 37.104 v16.19.0 CR-1009 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402121 (MB\_MSR\_RF) CR to 37.104: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 37.104 v17.11.0 CR-1010 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402122 (MB\_MSR\_RF) CR to 37.104: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 37.104 v18.4.0 CR-1011 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402123 (MB\_MSR\_RF) CR to 37.141: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 37.141 v16.20.0 CR-1080 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2403030 (from R4-2402123)**

**R4-2403030 (MB\_MSR\_RF) CR to 37.141: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 37.141 v16.20.0 CR-1080 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402124 (MB\_MSR\_RF) CR to 37.141: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 37.141 v17.12.0 CR-1081 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402125 (MB\_MSR\_RF) CR to 37.141: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 37.141 v18.4.0 CR-1082 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402126 (MB\_MSR\_RF) CR to 38.104: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 38.104 v16.18.0 CR-0570 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2403031 (from R4-2402126)**

**R4-2403031 (MB\_MSR\_RF) CR to 38.104: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 38.104 v16.18.0 CR-0570 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402127 (MB\_MSR\_RF) CR to 38.104: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 38.104 v17.12.0 CR-0571 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402128 (MB\_MSR\_RF) CR to 38.104: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0572 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402129 (MB\_MSR\_RF) CR to 38.141-1: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 38.141-1 v16.18.0 CR-0416 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2403032 (from R4-2402129)**

**R4-2403032 (MB\_MSR\_RF) CR to 38.141-1: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 38.141-1 v16.18.0 CR-0416 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402130 (MB\_MSR\_RF) CR to 38.141-1: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 38.141-1 v17.12.0 CR-0417 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402131 (MB\_MSR\_RF) CR to 38.141-1: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 38.141-1 v18.4.0 CR-0418 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402132 (MB\_MSR\_RF) CR to 36.104: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 36.104 v16.15.0 CR-4991 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2403033 (from R4-2402132)**

**R4-2403033 (MB\_MSR\_RF) CR to 36.104: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 36.104 v16.15.0 CR-4991 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402133 (MB\_MSR\_RF) CR to 36.104: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 36.104 v17.11.0 CR-4992 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402134 (MB\_MSR\_RF) CR to 36.104: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 36.104 v18.4.0 CR-4993 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402135 (MB\_MSR\_RF) CR to 36.141: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 36.141 v16.18.0 CR-1384 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Revised to R4-2403034 (from R4-2402135)**

**R4-2403034 (MB\_MSR\_RF) CR to 36.141: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 36.141 v16.18.0 CR-1384 rev Cat: F (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402136 (MB\_MSR\_RF) CR to 36.141: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 36.141 v17.11.0 CR-1385 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402137 (MB\_MSR\_RF) CR to 36.141: clarification on requirements for BS capable of multi-band operation**

*Type: CR For: Agreement  
 36.141 v18.3.0 CR-1386 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402232 (NR\_newRAT-Perf) CR to TS37.145-2: Addition of the missing band n70**

*Type: CR For: Agreement  
 37.145-2 v15.16.0 CR-0373 rev Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Decision: Agreed**

**R4-2403035 (NR\_newRAT-Perf) CR to TS37.145-2: Addition of the missing band n70**

*Type: CR For: Agreement  
 37.145-2 v15.16.0 CR-0373 rev Cat: F (Rel-15)  
  
 Source: ZTE Corporation*

**Decision: Withdrawn**

**R4-2402233 (NR\_newRAT-Perf) CR to TS37.145-2: Addition of some missing band numbers**

*Type: CR For: Agreement  
 37.145-2 v16.16.0 CR-0374 rev Cat: F (Rel-16)  
  
 Source: ZTE Corporation*

**Decision: Agreed**

**R4-2402234 (NR\_newRAT-Perf) CR to TS37.145-2: Addition of some missing band numbers**

*Type: CR For: Agreement  
 37.145-2 v17.10.0 CR-0375 rev Cat: F (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Agreed**

**R4-2403036 (NR\_newRAT-Perf) CR to TS37.145-2: Addition of some missing band numbers**

*Type: CR For: Agreement  
 37.145-2 v17.10.0 CR-0375 rev Cat: F (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Withdrawn**

**R4-2402235 (NR\_newRAT-Perf) CR to TS37.145-2: Addition of some missing band numbers**

*Type: CR For: Agreement  
 37.145-2 v18.4.0 CR-0376 rev Cat: A (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Agreed**

**R4-2402282 CR to 38.104: Correction on transmitter intermodulation additional requirements (Rel-15)**

*Type: CR For: Agreement  
 38.104 v15.19.0 CR-0580 rev Cat: F (Rel-15)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2403067 CR to 38.104: Correction on transmitter intermodulation additional requirements (Rel-15)**

*Type: CR For: Agreement  
 38.104 v15.19.0 CR-0580 rev Cat: F (Rel-15)  
  
 Source: NEC*

**Decision: Withdrawn**

**R4-2402283 CR to 38.104: Correction on transmitter intermodulation additional requirements (Rel-16)**

*Type: CR For: Agreement  
 38.104 v16.18.0 CR-0581 rev Cat: A (Rel-16)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2402284 CR to 38.104: Correction on transmitter intermodulation additional requirements (Rel-17)**

*Type: CR For: Agreement  
 38.104 v17.12.0 CR-0582 rev Cat: A (Rel-17)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2402285 CR to 38.104: Correction on transmitter intermodulation additional requirements (Rel-18)**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0583 rev Cat: A (Rel-18)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2402286 CR to 38.141-1: Correction on transmitter intermodulation additional requirements (Rel-15)**

*Type: CR For: Agreement  
 38.141-1 v15.15.0 CR-0419 rev Cat: F (Rel-15)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2402287 CR to 38.141-1: Correction on transmitter intermodulation additional requirements (Rel-16)**

*Type: CR For: Agreement  
 38.141-1 v16.18.0 CR-0420 rev Cat: A (Rel-16)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2402288 CR to 38.141-1: Correction on transmitter intermodulation additional requirements (Rel-17)**

*Type: CR For: Agreement  
 38.141-1 v17.12.0 CR-0421 rev Cat: A (Rel-17)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2402289 CR to 38.141-1: Correction on transmitter intermodulation additional requirements (Rel-18)**

*Type: CR For: Agreement  
 38.141-1 v18.4.0 CR-0422 rev Cat: A (Rel-18)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2402798 (TEI16) Proposals on clean-up and improvements on BS specifications**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Proposals for improvements on BS conformance testing specifications

**Decision: Noted**

**R4-2402238 (NR\_unlic\_enh-Core) CR to TS 38.104 Rel-16 NR-U Nominal channel spacing**

*Type: For: Agreement  
   
 Source: Nokia, Skyworks Solutions, Inc.*

**Decision: Postponed**

### 4.3 UE/BS EMC requirements

**R4-2401150 (NR\_newRAT-Perf)CR on TS 38.114 clause 4.4 Exclusion band R18**

*Type: CR For: Agreement  
 38.114 v18.0.0 CR-0010 rev Cat: A (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Agreed**

**R4-2401151 (NR\_newRAT-Perf)CR on TS 38.114 clause 4.4 Exclusion band R17**

*Type: CR For: Agreement  
 38.114 v17.4.0 CR-0011 rev Cat: F (Rel-17)  
  
 Source: ZTE Corporation*

**Decision: Agreed**

**R4-2402578 Overview of the EMC specifications simplification proposals for Rel-19**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Abstract:**

In this contribution we provide an overview of the EMC specifications simplification proposals for Rel-19, with the purpose of offline discussion among interested companies and offline comments collection.

**Decision: Noted**

**R4-2402579 EMC specifications simplification proposals for Rel-19: skeleton for merged EMC specification for UE (EUTRA, NR)**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Abstract:**

In this contribution we provide the very first attempt to present potential skeleton of the future EMC specifications for UEs (EUTRA UE, NR UE), with the aim to collect offline comments before March RAN meeting, when RAN4 Rel-19 package will be approved.

**Decision: Noted**

**R4-2402580 EMC specifications simplification proposals for Rel-19: skeleton for merged EMC specification for network nodes**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Abstract:**

In this contribution we provide the very first attempt to present potential skeleton of the future EMC specifications for all the network nodes (EUTRA BS, MSR BS, AAS BS, NR BS, NR repeater, IAB), with the aim to collect offline comments before March RAN

**Decision: Noted**

**R4-2402598 (LTE-RF) CR to TS 36.113: clarification on the limit value for the step frequency case, Rel-15**

*Type: CR For: Agreement  
 36.113 v15.6.0 CR-0093 rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In this CR we provide clarification for the selection of the limit values for the step frequency. The proposed approach is reused from CISPR 32, annex I.

**Decision: Revised to R4-2402954 (from R4-2402598)**

**R4-2402954 (LTE-RF) CR to TS 36.113: clarification on the limit value for the step frequency case, Rel-15**

*Type: CR For: Agreement  
 36.113 v15.6.0 CR-0093 rev Cat: F (Rel-15)  
  
 Source: Huawei, HiSilicon*

Abstract:

In this CR we provide clarification for the selection of the limit values for the step frequency. The proposed approach is reused from CISPR 32, annex I.

**Decision: Agreed**

Ericsson: We would like to discuss offline

**R4-2402599 (LTE-RF) CR to TS 36.113: clarification on the limit value for the step frequency case, Rel-16**

*Type: CR For: Agreement  
 36.113 v16.4.0 CR-0094 rev Cat: A (Rel-16)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In this CR we provide clarification for the selection of the limit values for the step frequency. The proposed approach is reused from CISPR 32, annex I.

**Decision: Agreed**

**R4-2402600 (LTE-RF) CR to TS 36.113: clarification on the limit value for the step frequency case, Rel-17**

*Type: CR For: Agreement  
 36.113 v17.2.0 CR-0095 rev Cat: A (Rel-17)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In this CR we provide clarification for the selection of the limit values for the step frequency. The proposed approach is reused from CISPR 32, annex I.

**Decision: Agreed**

**R4-2402601 (LTE-RF) CR to TS 36.113: clarification on the limit value for the step frequency case, Rel-18**

*Type: CR For: Agreement  
 36.113 v18.0.0 CR-0096 rev Cat: A (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In this CR we provide clarification for the selection of the limit values for the step frequency. The proposed approach is reused from CISPR 32, annex I.

**Decision: Agreed**

**R4-2402764 (NR\_newRAT-Perf) CR to TS 36.113 on update of FRC used in performance criteria**

*Type: CR For: Agreement  
 36.113 v16.4.0 CR-0097 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Update of FRC used in performance criteria. Parsing Failure: Release number wrong on CR cover for TDoc R4-2402764. Database value : Rel-16. CR cover value : 16. A revision will be required.

**Decision: Withdrawn**

**R4-2402765 (NR\_newRAT-Perf) CR to TS 36.113 on update of FRC used in performance criteria**

*Type: CR For: Agreement  
 36.113 v17.2.0 CR-0098 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Update of FRC used in performance criteria

**Decision: Agreed**

**R4-2402766 (NR\_newRAT-Perf) CR to TS 36.113 on update of FRC used in performance criteria**

*Type: CR For: Agreement  
 36.113 v18.0.0 CR-0099 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Update of FRC used in performance criteria

**Decision: Agreed**

**R4-2402767 (NR\_newRAT-Perf) CR to TS 37.113 on update of FRC used in performance criteria**

*Type: CR For: Agreement  
 37.113 v16.5.0 CR-0137 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Update of FRC used in performance criteria. Parsing Failure: Release number wrong on CR cover for TDoc R4-2402767. Database value : Rel-16. CR cover value : 16. A revision will be required.

**Decision: Withdrawn**

**R4-2402768 (NR\_newRAT-Perf) CR to TS 37.113 on update of FRC used in performance criteria**

*Type: CR For: Agreement  
 37.113 v17.3.0 CR-0138 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

Update of FRC used in performance criteria

**Decision: Agreed**

**R4-2402769 (NR\_newRAT-Perf) CR to TS 37.113 on update of FRC used in performance criteria**

*Type: CR For: Agreement  
 37.113 v18.0.0 CR-0139 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Update of FRC used in performance criteria

**Decision: Agreed**

**R4-2402770 (NR\_newRAT-Perf) CR to TS 38.113 on introduction of NR with in-band NB-IoT**

*Type: CR For: Agreement  
 38.113 v16.9.0 CR-0070 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

NR with in-band NB-IoT has been introduced in 38.104 and 38.141-1, but not included in 38.113. This CR is to introduce NR with in-band NB-IoT. Parsing Failure: Release number wrong on CR cover for TDoc R4-2402770. Database value : Rel-16. CR cover value :

**Decision: Withdrawn**

**R4-2402771 (NR\_newRAT-Perf) CR to TS 38.113 on introduction of NR with in-band NB-IoT**

*Type: CR For: Agreement  
 38.113 v17.5.0 CR-0071 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

NR with in-band NB-IoT has been introduced in 38.104 and 38.141-1, but not included in 38.113. This CR is to introduce NR with in-band NB-IoT.

**Decision: Agreed**

**R4-2402772 (NR\_newRAT-Perf) CR to TS 38.113 on introduction of NR with in-band NB-IoT**

*Type: CR For: Agreement  
 38.113 v18.1.0 CR-0072 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

NR with in-band NB-IoT has been introduced in 38.104 and 38.141-1, but not included in 38.113. This CR is to introduce NR with in-band NB-IoT.

**Decision: Agreed**

**R4-2402773 [LTE-RF, TEI15] On the open issues regarding EMC TC simplification**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Provide feedback on open issues regarding TC simplification for EMC specs

**Decision: Noted**

ZTE: Agree with the proposals, makes the specification more readable for all readers

Ericsson: EMC spec should be self-contained. Should not need to read and understand the RF spec.

Nokia: Agree with ZTE and Ericsson:

Huawei: EMC specification was never self-contained. We rely on other external bodies for the specs. Proposal to refer to specific RF test configurations.

**R4-2402794 (NR\_newRAT-Perf) CR to TS 36.113 on update of FRC used in performance criteria**

*Type: CR For: Agreement  
 36.113 v16.4.0 CR-0100 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Update of FRC used in performance criteria

**Decision: Revised to R4-2402951 (from R4-2402794)**

**R4-2402951 (NR\_newRAT-Perf) CR to TS 36.113 on update of FRC used in performance criteria**

*Type: CR For: Agreement  
 36.113 v16.4.0 CR-0100 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

Abstract:

Update of FRC used in performance criteria

**Decision: Agreed**

**R4-2402795 (NR\_newRAT-Perf) CR to TS 37.113 on update of FRC used in performance criteria**

*Type: CR For: Agreement  
 37.113 v16.5.0 CR-0140 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

Update of FRC used in performance criteria

**Decision: Revised to R4-2402952 (from R4-2402795)**

**R4-2402952 (NR\_newRAT-Perf) CR to TS 37.113 on update of FRC used in performance criteria**

*Type: CR For: Agreement  
 37.113 v16.5.0 CR-0140 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

Abstract:

Update of FRC used in performance criteria

**Decision: Agreed**

**R4-2402796 (NR\_newRAT-Perf) CR to TS 38.113 on introduction of NR with in-band NB-IoT**

*Type: CR For: Agreement  
 38.113 v16.9.0 CR-0073 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

NR with in-band NB-IoT has been introduced in 38.104 and 38.141-1, but not included in 38.113. This CR is to introduce NR with in-band NB-IoT.

**Decision: Revised to R4-2402953 (from R4-2402796)**

**R4-2402953 (NR\_newRAT-Perf) CR to TS 38.113 on introduction of NR with in-band NB-IoT**

*Type: CR For: Agreement  
 38.113 v16.9.0 CR-0073 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

Abstract:

NR with in-band NB-IoT has been introduced in 38.104 and 38.141-1, but not included in 38.113. This CR is to introduce NR with in-band NB-IoT.

**Decision: Agreed**

### 4.4 RRM requirements

### 4.5 Demodulation and CSI requirements

**R4-2400308 (NR\_newRAT-Perf) Correction to FR2 SDR requirements**

*Type: CR For: Agreement  
 38.101-4 v15.20.0 CR-0467 rev Cat: F (Rel-15)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed**

**R4-2400309 (NR\_newRAT-Perf) Correction to FR2 SDR requirements**

*Type: CR For: Agreement  
 38.101-4 v16.15.0 CR-0468 rev Cat: A (Rel-16)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed**

**R4-2400310 (NR\_newRAT-Perf) Correction to FR2 SDR requirements**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0469 rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed**

**R4-2400311 (NR\_newRAT-Perf) Correction to FR2 SDR requirements**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0470 rev Cat: A (Rel-18)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed**

**R4-2400312 (NR\_DL256QAM\_FR2-Perf) Correction to CSI reference measurement channels**

*Type: CR For: Agreement  
 38.101-4 v16.15.0 CR-0471 rev Cat: F (Rel-16)  
  
 Source: Rohde & Schwarz*

**Decision: Not pursued**

**R4-2400313 (NR\_DL256QAM\_FR2-Perf) Correction to CSI reference measurement channels**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0472 rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Withdrawn**

**R4-2400314 (NR\_DL256QAM\_FR2-Perf) Correction to CSI reference measurement channels**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0473 rev Cat: A (Rel-18)  
  
 Source: Rohde & Schwarz*

**Decision: Withdrawn**

**R4-2400315 (NR\_DL256QAM\_FR2-Perf) Correction to 256QAM CQI reporting**

*Type: CR For: Agreement  
 38.101-4 v16.15.0 CR-0474 rev Cat: F (Rel-16)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed**

**R4-2400316 (NR\_DL256QAM\_FR2-Perf) Correction to 256QAM CQI reporting**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0475 rev Cat: A (Rel-17)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed**

**R4-2400317 (NR\_DL256QAM\_FR2-Perf) Correction to 256QAM CQI reporting**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0476 rev Cat: A (Rel-18)  
  
 Source: Rohde & Schwarz*

**Decision: Agreed**

**R4-2400892 (NR\_newRAT-Perf) 38.101-4 wrong values in RMC**

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

**Decision: Noted**

**R4-2400893 (NR\_newRAT-Perf) CR for 38.101-4 on correction of wrong values in RMC (Rel-15, Cat F)**

*Type: CR For: Agreement  
 38.101-4 v15.20.0 CR-0481 rev Cat: F (Rel-15)  
  
 Source: Nokia, Nokia Shanghai Bell, Ericsson*

**Decision: Merged**

**R4-2400894 (NR\_newRAT-Perf) CR for 38.101-4 on correction of wrong values in RMC (Rel-16, Cat A)**

*Type: CR For: Agreement  
 38.101-4 v16.15.0 CR-0482 rev Cat: A (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell, Ericsson*

**Decision: Merged**

**R4-2400895 (NR\_newRAT-Perf) CR for 38.101-4 on correction of wrong values in RMC (Rel-17, Cat A)**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0483 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell, Ericsson*

**Decision: Merged**

**R4-2400896 (NR\_newRAT-Perf) CR for 38.101-4 on correction of wrong values in RMC (Rel-18, Cat A)**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0484 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell, Ericsson*

**Decision: Merged**

**R4-2401742 (NR\_unlic-Perf) Correction of configuration for NR-U CQI reporting requirements (R16)**

*Type: CR For: Agreement  
 38.101-4 v16.15.0 CR-0492 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects the configuration parameters for NR-U CQI reporting test.

**Decision: Revised to R4-2403073 (from R4-2401742)**

**R4-2403073 (NR\_unlic-Perf) Correction of configuration for NR-U CQI reporting requirements (R16)**

*Type: CR For: Agreement  
 38.101-4 v16.15.0 CR-0492 rev Cat: F (Rel-16)  
  
 Source: Ericsson*

Abstract:

This CR corrects the configuration parameters for NR-U CQI reporting test.

**Decision: Agreed**

**R4-2401743 (NR\_unlic-Perf) Correction of configuration for NR-U CQI reporting requirements (R17)**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0493 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects the configuration parameters for NR-U CQI reporting test.

**Decision: Revised to R4-2403074 (from R4-2401743)**

**R4-2403074 (NR\_unlic-Perf) Correction of configuration for NR-U CQI reporting requirements (R17)**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0493 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

This CR corrects the configuration parameters for NR-U CQI reporting test.

**Decision: Agreed**

**R4-2401744 (NR\_unlic-Perf) Correction of configuration for NR-U CQI reporting requirements (R18)**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0494 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects the configuration parameters for NR-U CQI reporting test.

**Decision: Agreed**

**R4-2402549 (NR\_newRAT-Perf) CR to TS38.101-4: Corrections on FRC definition (Rel-15)**

*Type: CR For: Agreement  
 38.101-4 v15.20.0 CR-0501 rev Cat: F (Rel-15)  
  
 Source: MediaTek inc., Huawei, HiSilicon*

**Decision: Revised to R4-2403053 (from R4-2402549)**

**R4-2403053 (NR\_newRAT-Perf) CR to TS38.101-4: Corrections on FRC definition (Rel-15)**

*Type: CR For: Agreement  
 38.101-4 v15.20.0 CR-0501 rev Cat: F (Rel-15)  
  
 Source: MediaTek inc., Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402550 (NR\_newRAT-Perf) CR to TS38.101-4: Corrections on FRC definition (Rel-16)**

*Type: CR For: Agreement  
 38.101-4 v16.15.0 CR-0502 rev Cat: F (Rel-16)  
  
 Source: MediaTek inc., Huawei, HiSilicon*

**Decision: Revised to R4-2403054 (from R4-2402550)**

**R4-2403054 (NR\_newRAT-Perf) CR to TS38.101-4: Corrections on FRC definition (Rel-16)**

*Type: CR For: Agreement  
 38.101-4 v16.15.0 CR-0502 rev Cat: F (Rel-16)  
  
 Source: MediaTek inc., Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402551 (NR\_newRAT-Perf) CR to TS38.101-4: Corrections on FRC definition (Rel-17)**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0503 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc., Huawei, HiSilicon*

**Decision: Revised to R4-2403055 (from R4-2402551)**

**R4-2403055 (NR\_newRAT-Perf) CR to TS38.101-4: Corrections on FRC definition (Rel-17)**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0503 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc., Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402552 (NR\_newRAT-Perf) CR to TS38.101-4: Corrections on FRC definition (Rel-18)**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0504 rev Cat: F (Rel-18)  
  
 Source: MediaTek inc., Huawei, HiSilicon*

**Decision: Revised to R4-2403056 (from R4-2402552)**

**R4-2403056 (NR\_newRAT-Perf) CR to TS38.101-4: Corrections on FRC definition (Rel-18)**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0504 rev Cat: F (Rel-18)  
  
 Source: MediaTek inc., Huawei, HiSilicon*

**Decision: Agreed**

**R4-2402722 (NR\_IAB-Perf) Reference Table Correction in 38.174**

*Type: CR For: Agreement  
 38.174 v16.9.0 CR-0102 rev Cat: F (Rel-16)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Agreed**

**R4-2402723 (NR\_IAB-Perf) Reference Table Correction in 38.174**

*Type: CR For: Agreement  
 38.174 v17.6.0 CR-0103 rev Cat: A (Rel-17)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Agreed**

**R4-2402724 (NR\_IAB-Perf) Reference Table Correction in 38.174**

*Type: CR For: Agreement  
 38.174 v18.3.0 CR-0104 rev Cat: A (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Agreed**

### 4.6 OTA and TRP/TRS test aspects

**R4-2400449 TDOC for Total power dynamic range (TPDR)**

*Type: discussion For: Approval  
 38.104 v CR- rev Cat: (Rel-18)  
  
 Source: Charter Communications, Inc*

**Decision: Withdrawn**

**R4-2400490 Discussions on change request for Total power dynamic range (TPDR)**

*Type: discussion For: Approval  
 38.104 v CR- rev Cat: (Rel-16)  
  
 Source: Charter Communications, Inc*

**Abstract:**

Correcting some numbers in Total power dynamic range (TPDR). MCC: Filename is missing in the zip file.

**Decision: Noted**

**R4-2400491 CR for Total power dynamic range (TPDR)**

*Type: draftCR For: Endorsement  
 38.104 v16.18.0 CR- rev Cat: (Rel-16)  
  
 Source: Charter Communications, Inc*

**Abstract:**

CR for Total power dynamic range (TPDR). MCC: There are CR coversheet issues with the draftCR. The Moderator recommended that this draftCR be reviewed and possible changed to a formal CR, if agreeable by the Session Chair. It is also recommended to change

**Decision: Noted**

Nokia: Need to check rounding values

NEC: Rounding is not a good way. We suggest rounding down.

Charter: There was time pressure in Rel-17 and a 0.3 dB error was created.

Ericsson: Rounding down. Prefer to come back next meeting.

### 4.7 Rel-15/16 TEI

### 4.8 Moderator summary and conclusions (for Agenda 4)

## 5 Rel-17 maintenance for LTE and NR

**Guidance for maintenance agendas (AI 4, AI 5 and AI 6)**

The following guidance are provided for AI 4, AI5 and AI6:

- For maintenance agenda AI 4 (up to Rel-16), AI 5 (Rel-17) and AI 6 (Rel-18), formal CRs are expected and multiple formal CRs per company in the lowest agenda are allowed. For tracking the changes easily, it expected that one batch of CRs (Cat-F/A/…) will just cover a single topic/WI rather than multiple topics/WIs and Cat-F CR with corresponding Cat-A CRs needs be submitted under the same agenda.

- When submitting contributions to AI 4, AI 5 and AI 6.1.15/AI 6.2.8, please add (WI\_code) in the beginning of titles for both discussion files and CRs to facilitate moderators and session chairs handling.

- When reserving the tdoc number, please use the correct WI code rather than simply using TEI and fill the column of “Related WIs” in your reservation spreadsheet. If you submit a CR with TEI as WI code, please inform session chair.

- The contributions corresponding to incoming LS for Rel-17 and Rel-18 are expected to be submitted in AI 12, if there is a dedicated agenda in AI 12.

### 5.1 Rel-17 spectrum related WI maintenance

#### 5.1.1 Bands introduced in Rel-17 and related requirements

#### 5.1.2 NR/LTE/MR-DC basket WIs

#### 5.1.3 Others

### 5.2 Rel-17 non-spectrum related WI maintenance

#### 5.2.1 UE RF requirements

#### 5.2.2 BS RF requirements and BS conformance testing

**R4-2400034 (NR\_6GHz-Core) CR for TS 38.104, Correction on reference of PREFSENS for in-band blocking and out-of-band blocking for band n104**

*Type: CR For: Agreement  
 38.104 v17.12.0 CR-0550 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Abstract:**

MCC: This was changed to AI 5.2.2 by Chair request. Chair: This should be treated under email thread [301].

**Decision: Agreed**

**R4-2400035 (NR\_NTN\_solutions-Core) CR for TS 38.108, Correction on general SAN transmitter spurious emission limits in FR1**

*Type: CR For: Agreement  
 38.108 v17.6.0 CR-0050 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400036 (NR\_NTN\_solutions-Core) CR for TS 38.108, Correction on general SAN transmitter spurious emission limits in FR1**

*Type: CR For: Agreement  
 38.108 v18.1.0 CR-0051 rev Cat: A (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400037 (NR\_NTN\_solutions-Perf) CR for TS 38.181, Correction on general SAN transmitter spurious emission limits in FR1**

*Type: CR For: Agreement  
 38.181 v17.3.0 CR-0013 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400038 (NR\_NTN\_solutions-Perf) CR for TS 38.181, Correction on general SAN transmitter spurious emission limits in FR1**

*Type: CR For: Agreement  
 38.181 v18.0.0 CR-0014 rev Cat: A (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400059 (NR\_repeaters-Perf) CR for TS 38.115-1, Correction on manufacturer declarations**

*Type: CR For: Agreement  
 38.115-1 v17.4.0 CR-0025 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400060 (NR\_repeaters-Perf) CR for TS 38.115-1, Correction on manufacturer declarations**

*Type: CR For: Agreement  
 38.115-1 v18.3.0 CR-0026 rev Cat: A (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400061 (NR\_repeaters-Perf) CR for TS 38.115-2, Correction on BS related description issues**

*Type: CR For: Agreement  
 38.115-2 v17.4.0 CR-0011 rev Cat: F (Rel-17)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400062 (NR\_IAB-Core) CR for TS 38.174, Correction on BS related description issues**

*Type: CR For: Agreement  
 38.174 v16.9.0 CR-0096 rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400063 (NR\_IAB-Core) CR for TS 38.174, Correction on BS related description issues**

*Type: CR For: Agreement  
 38.174 v17.6.0 CR-0097 rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400064 (NR\_IAB-Core) CR for TS 38.174, Correction on BS related description issues**

*Type: CR For: Agreement  
 38.174 v18.3.0 CR-0098 rev Cat: A (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400065 (NR\_IAB-Perf) CR for TS 38.176-1, Correction on Classes for IAB-DU**

*Type: CR For: Agreement  
 38.176-1 v16.7.0 CR-0041 rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400066 (NR\_IAB-Perf) CR for TS 38.176-1, Correction on Classes for IAB-DU**

*Type: CR For: Agreement  
 38.176-1 v17.7.0 CR-0042 rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400067 (NR\_IAB-Perf) CR for TS 38.176-1, Correction on Classes for IAB-DU**

*Type: CR For: Agreement  
 38.176-1 v18.3.0 CR-0043 rev Cat: A (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400068 (NR\_IAB-Perf) CR for TS 38.176-2, Correction on Classes for IAB-DU**

*Type: CR For: Agreement  
 38.176-2 v16.8.0 CR-0044 rev Cat: F (Rel-16)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400069 (NR\_IAB-Perf) CR for TS 38.176-2, Correction on Classes for IAB-DU**

*Type: CR For: Agreement  
 38.176-2 v17.7.0 CR-0045 rev Cat: A (Rel-17)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400070 (NR\_IAB-Perf) CR for TS 38.176-2, Correction on Classes for IAB-DU**

*Type: CR For: Agreement  
 38.176-2 v18.3.0 CR-0046 rev Cat: A (Rel-18)  
  
 Source: CATT*

**Decision: Agreed**

**R4-2400578 CR to TS 38.104 for editorial corrections of operating bands (Rel-17)**

*Type: CR For: Agreement  
 38.104 v17.12.0 CR-0557 rev Cat: F (Rel-17)  
  
 Source: Murata Manufacturing Co Ltd.*

**Decision: Agreed**

**R4-2400579 CR to TS 38.104 for editorial corrections of operating bands (Rel-18)**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0558 rev Cat: A (Rel-18)  
  
 Source: Murata Manufacturing Co Ltd.*

**Decision: Agreed**

**R4-2400654 (NR\_IAB-Perf) CR for TS 38.176-1, Correction on IAB-MT Output power dynamics test requirements**

*Type: CR For: Agreement  
 38.176-1 v17.7.0 CR-0045 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Germany*

**Decision: Agreed**

**R4-2400657 (NR\_IAB-Perf) CR for TS 38.176-2, Correction on IAB-MT Output power dynamics test requirements**

*Type: CR For: Agreement  
 38.176-2 v17.7.0 CR-0048 rev Cat: A (Rel-17)  
  
 Source: Qualcomm Germany*

**Decision: Agreed**

**R4-2401289 Discussion on Tx intermodulation requirements maintenance in band n79**

*Type: discussion For: Discussion  
 Source: NTT DOCOMO, INC.*

**Abstract:**

MCC: The author requested to withdraw this contribution this meeting.

**Decision: Withdrawn**

**R4-2401290 (NR\_bands\_R17\_BWs-Core) CR for Tx intermodulation core requirements in band n79**

*Type: CR For: Agreement  
 38.104 v17.12.0 CR-0567 rev Cat: F (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Abstract:**

MCC: The author requested to withdraw this contribution this meeting.

**Decision: Withdrawn**

**R4-2401291 (NR\_bands\_R17\_BWs-Core) CR for Tx intermodulation requirements in band n79**

*Type: CR For: Agreement  
 38.141-1 v17.12.0 CR-0415 rev Cat: F (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Abstract:**

MCC: The author requested to withdraw this contribution this meeting.

**Decision: Withdrawn**

**R4-2401292 (NR\_bands\_R17\_BWs-Core) CR for OTA Tx intermodulation requirements in band n79**

*Type: CR For: Agreement  
 38.141-2 v17.12.0 CR-0567 rev Cat: F (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Abstract:**

MCC: The author requested to withdraw this contribution this meeting.

**Decision: Withdrawn**

**R4-2402294 CR to 38.106: NR repeater transmitter spurious emissions requirements (rel-17)**

*Type: CR For: Agreement  
 38.106 v17.7.0 CR-0063 rev Cat: F (Rel-17)  
  
 Source: NEC*

**Decision: Revised to R4-2403068 (from R4-2402294)**

**R4-2403068 CR to 38.106: NR repeater transmitter spurious emissions requirements (rel-17)**

*Type: CR For: Agreement  
 38.106 v17.7.0 CR-0063 rev Cat: F (Rel-17)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2402295 CR to 38.106: NR repeater transmitter spurious emissions requirements (rel-18)**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0064 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Revised to R4-2403069 (from R4-2402295)**

**R4-2403069 CR to 38.106: NR repeater transmitter spurious emissions requirements (rel-18)**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0064 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2402296 CR to 38.115-1: NR repeater transmitter spurious emissions requirements (rel-17)**

*Type: CR For: Agreement  
 38.115-1 v17.4.0 CR-0027 rev Cat: F (Rel-17)  
  
 Source: NEC*

**Decision: Revised to R4-2403070 (from R4-2402296)**

**R4-2403070 CR to 38.115-1: NR repeater transmitter spurious emissions requirements (rel-17)**

*Type: CR For: Agreement  
 38.115-1 v17.4.0 CR-0027 rev Cat: F (Rel-17)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2402297 CR to 38.115-1: NR repeater transmitter spurious emissions requirements (rel-18)**

*Type: CR For: Agreement  
 38.115-1 v18.3.0 CR-0028 rev Cat: A (Rel-18)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2402298 CR to 38.115-2: NR repeater transmitter spurious emissions requirements (rel-18)**

*Type: CR For: Agreement  
 38.115-2 v17.4.0 CR-0012 rev Cat: F (Rel-17)  
  
 Source: NEC*

**Decision: Revised to R4-2403071 (from R4-2402298)**

**R4-2403071 CR to 38.115-2: NR repeater transmitter spurious emissions requirements (rel-18)**

*Type: CR For: Agreement  
 38.115-2 v17.4.0 CR-0012 rev Cat: F (Rel-17)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2402299 CR to 38.141-2: Measurement uncertainty for OBW in FR2-2 (Rel-17)**

*Type: CR For: Agreement  
 38.141-2 v17.12.0 CR-0571 rev Cat: F (Rel-17)  
  
 Source: NEC*

**Decision: Not pursued**

**R4-2402300 CR to 38.141-2: Measurement uncertainty for OBW in FR2-2 (Rel-18)**

*Type: CR For: Agreement  
 38.141-2 v18.4.0 CR-0572 rev Cat: A (Rel-18)  
  
 Source: NEC*

**Decision: Withdrawn**

**R4-2402473 (TEI17) CR to TS 38.104: Clean up of operating band definitions tables in subclause 5.2**

*Type: CR For: Agreement  
 38.104 v17.12.0 CR-0589 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The reason for change is to clean up Table 5.2-1 and Table 5.2-2 to follow the same format used in TS 37.104. With this format the operating band table information can parsed and imported using conventional scientific software directly into simulators.

**Decision: Agreed**

Ericsson: Intention to make the tables easy to read by software

Nokia: This should be only for Rel-18

**R4-2402474 (TEI17) CR to TS 38.104: Clean up of operating band definitions tables in subclause 5.2**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0590 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

The reason for change is to clean up Table 5.2-1 and Table 5.2-2 to follow the same format used in TS 37.104. With this format the operating band tables information can parsed and imported using conventional scientific software directly into simulators.

**Decision: Agreed**

**R4-2402476 ( OTA\_BS\_testing-Perf) CR to TR 37.941: Corrections and final touch related to the introduction of FR2-2**

*Type: CR For: Agreement  
 37.941 v17.2.0 CR-0051 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

A part of the final touch with respect to the introdution of support up to 71 GHz for NR a CR with some improvements to TR 37.941 have been created.

**Decision: Agreed**

**R4-2402477 (NR\_ext\_to\_71GHz-Perf) CR to TS 38.141-2: Improvements of information related to test certainty and test tolerence in Subclause 4.1.2.2, Subclause 4.1.2.3, Annex C.1 and Annex C.2**

*Type: CR For: Agreement  
 38.141-2 v17.12.0 CR-0575 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects and harmonize the specification with relation to information added to support FR2-2. Currently, the editorial format used for requirements applicable for FR1, FR2-1 and FR2-2 differ in many places. With this CR a final update with improvm

**Decision: Revised to R4-2403047 (from R4-2402477)**

**R4-2403047 (NR\_ext\_to\_71GHz-Perf) CR to TS 38.141-2: Improvements of information related to test certainty and test tolerence in Subclause 4.1.2.2, Subclause 4.1.2.3, Annex C.1 and Annex C.2**

*Type: CR For: Agreement  
 38.141-2 v17.12.0 CR-0575 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

This CR corrects and harmonize the specification with relation to information added to support FR2-2. Currently, the editorial format used for requirements applicable for FR1, FR2-1 and FR2-2 differ in many places. With this CR a final update with improvm

**Decision: Agreed**

**R4-2402478 (NR\_ext\_to\_71GHz-Perf) CR to TS 38.141-2: Improvements of information related to test certainty and test tolerence in Subclause 4.1.2.2, Annex C.1 and Annex C.2**

*Type: CR For: Agreement  
 38.141-2 v18.4.0 CR-0576 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR corrects and harmonize the specification with relation to information added to support FR2-2. Currently, the editorial format used for requirements applicable for FR1, FR2-1 and FR2-2 differ in many places. With this CR a final update with improvm

**Decision: Agreed**

**R4-2402479 (AAS\_BS\_LTE\_UTRA-Core) CR to TS 37.105: Correction of OBUE requirement applicability in Table 6.6.5.2.2-0**

*Type: CR For: Agreement  
 37.105 v15.18.0 CR-0283 rev Cat: F (Rel-15)  
  
 Source: Ericsson*

**Abstract:**

The applicability table for OBUE requirement for BC1 and BC3 wide area BS is improved to be complete. The current version have an incorrect references to non defined requirement table.

**Decision: Agreed**

**R4-2402480 (AAS\_BS\_LTE\_UTRA-Core) CR to TS 37.105: Correction of OBUE requirement applicability in Table 6.6.5.2.2-0**

*Type: CR For: Agreement  
 37.105 v16.14.0 CR-0284 rev Cat: A (Rel-16)  
  
 Source: Ericsson*

**Abstract:**

The applicability table for OBUE requirement for BC1 and BC3 wide area BS is improved to be complete. The current version have an incorrect references to non defined requirement table.

**Decision: Agreed**

**R4-2402481 (AAS\_BS\_LTE\_UTRA-Core) CR to TS 37.105: Correction of OBUE requirement applicability in Table 6.6.5.2.2-0**

*Type: CR For: Agreement  
 37.105 v17.8.0 CR-0285 rev Cat: A (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

The applicability table for OBUE requirement for BC1 and BC3 wide area BS is improved to be complete. The current version have an incorrect references to non defined requirement table.

**Decision: Agreed**

**R4-2402482 (AAS\_BS\_LTE\_UTRA-Core) CR to TS 37.105: Correction of OBUE requirement applicability in Table 6.6.5.2.2-0**

*Type: CR For: Agreement  
 37.105 v18.3.0 CR-0286 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

The applicability table for OBUE requirement for BC1 and BC3 wide area BS is improved to be complete. The current version have an incorrect references to non defined requirement table.

**Decision: Agreed**

**R4-2402536 Discussion on Tx intermodulation requirements maintenance in band n79**

*Type: discussion For: Discussion  
 Source: NTT DOCOMO, INC.*

**Decision: Noted**

**R4-2402537 (NR\_bands\_R17\_BWs-Core) CR for Tx intermodulation core requirements in band n79**

*Type: CR For: Agreement  
 38.104 v17.12.0 CR-0591 rev Cat: F (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Decision: Revised to R4-2403048 (from R4-2402537)**

**R4-2403048 (NR\_bands\_R17\_BWs-Core) CR for Tx intermodulation core requirements in band n79**

*Type: CR For: Agreement  
 38.104 v17.12.0 CR-0591 rev Cat: F (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Decision: Postponed**

NEC: We would like to understand why 15 kHz SCS is applied. This is not aligned with the regulatory requirement in Japan.

**R4-2402538 (NR\_bands\_R17\_BWs-Core) CR for Tx intermodulation requirements in certain region**

*Type: CR For: Agreement  
 38.141-1 v17.12.0 CR-0427 rev Cat: F (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Decision: Revised to R4-2403049 (from R4-2402538)**

**R4-2403049 (NR\_bands\_R17\_BWs-Core) CR for Tx intermodulation requirements in certain region**

*Type: CR For: Agreement  
 38.141-1 v17.12.0 CR-0427 rev Cat: F (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Decision: Postponed**

**R4-2402539 (NR\_bands\_R17\_BWs-Core) CR for OTA Tx intermodulation requirements in band n79**

*Type: CR For: Agreement  
 38.141-2 v17.12.0 CR-0577 rev Cat: F (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Decision: Revised to R4-2403050 (from R4-2402539)**

**R4-2403050 (NR\_bands\_R17\_BWs-Core) CR for OTA Tx intermodulation requirements in band n79**

*Type: CR For: Agreement  
 38.141-2 v17.12.0 CR-0577 rev Cat: F (Rel-17)  
  
 Source: NTT DOCOMO, INC.*

**Decision: Postponed**

**R4-2402540 (NR\_bands\_R17\_BWs-Core) CR for Tx intermodulation core requirements in band n79 R18 mirror**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0592 rev Cat: A (Rel-18)  
  
 Source: NTT DOCOMO, INC.*

**Abstract:**

mirror CR

**Decision: Revised to R4-2403080 (from R4-2402540)**

**R4-2403080 (NR\_bands\_R17\_BWs-Core) CR for Tx intermodulation core requirements in band n79 R18 mirror**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0592 rev Cat: A (Rel-18)  
  
 Source: NTT DOCOMO, INC.*

Abstract:

mirror CR

**Decision: Revised**

**R4-2402541 (NR\_bands\_R17\_BWs-Core) CR for Tx intermodulation requirements in band n79 R18 mirror**

*Type: CR For: Agreement  
 38.141-1 v18.4.0 CR-0428 rev Cat: A (Rel-18)  
  
 Source: NTT DOCOMO, INC.*

**Abstract:**

mirror CR

**Decision: Revised to R4-2403081 (from R4-2402541)**

**R4-2403081 (NR\_bands\_R17\_BWs-Core) CR for Tx intermodulation requirements in band n79 R18 mirror**

*Type: CR For: Agreement  
 38.141-1 v18.4.0 CR-0428 rev Cat: A (Rel-18)  
  
 Source: NTT DOCOMO, INC.*

Abstract:

mirror CR

**Decision: Revised**

**R4-2402542 (NR\_bands\_R17\_BWs-Core) CR for OTA Tx intermodulation requirements in band n79 R18 mirror**

*Type: CR For: Agreement  
 38.141-2 v18.4.0 CR-0578 rev Cat: A (Rel-18)  
  
 Source: NTT DOCOMO, INC.*

**Abstract:**

mirror CR

**Decision: Revised to R4-2403082 (from R4-2402542)**

**R4-2403082 (NR\_bands\_R17\_BWs-Core) CR for OTA Tx intermodulation requirements in band n79 R18 mirror**

*Type: CR For: Agreement  
 38.141-2 v18.4.0 CR-0578 rev Cat: A (Rel-18)  
  
 Source: NTT DOCOMO, INC.*

Abstract:

mirror CR

**Decision: Revised**

#### 5.2.3 RRM requirements

#### 5.2.4 Demodulation and CSI requirements

**R4-2400633 (NR\_HST\_FR2-Perf) FR2 HST DPS Model Clarification (R17)(Cat.F)**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0477 rev Cat: F (Rel-17)  
  
 Source: QUALCOMM Incorporated*

**Decision: Agreed**

**R4-2400635 (NR\_DL1024QAM\_FR1-Perf) Add New Es value for EVM=2.5% (R17)(Cat.F)**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0478 rev Cat: F (Rel-17)  
  
 Source: QUALCOMM Incorporated*

**Abstract:**

Adjust Es power level to account for Tx EVM agreement for 1024QAM tests

**Decision: Revised to R4-2403072 (from R4-2400635)**

**R4-2403072 (NR\_DL1024QAM\_FR1-Perf) Add New Es value for EVM=2.5% (R17)(Cat.F)**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0478 rev Cat: F (Rel-17)  
  
 Source: QUALCOMM Incorporated*

Abstract:

Adjust Es power level to account for Tx EVM agreement for 1024QAM tests

**Decision: Agreed**

**R4-2400636 (NR\_perf\_enh-Perf) Correct FRC for R.PDSCH.1-18.1 FDD (R17)(Cat.F)**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0479 rev Cat: F (Rel-17)  
  
 Source: QUALCOMM Incorporated*

**Decision: Agreed**

**R4-2401217 [NR\_NTN\_solutions-Perf] CR to 38.101-5 Remove square brackets from Doppler values for NR NTN**

*Type: CR For: Agreement  
 38.101-5 v17.6.0 CR-0062 rev Cat: F (Rel-17)  
  
 Source: Qualcomm Inc*

**Decision: Revised to R4-2403057 (from R4-2401217)**

**R4-2403057 [NR\_NTN\_solutions-Perf] CR to 38.101-5 Remove square brackets from Doppler values for NR NTN**

*Type: CR For: Agreement  
 38.101-5 v17.6.0 CR-0062 rev Cat: F (Rel-17)  
  
 Source: Qualcomm Inc*

**Decision: Agreed**

**R4-2401396 (NR\_cov\_enh-Perf) CR for configuration of FR1 PUSCH TBoMS demodulation requirement**

*Type: CR For: Agreement  
 38.141-2 v17.12.0 CR-0568 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

corrections to the repetition number for TBoMS

**Decision: Agreed**

**R4-2401397 (NR\_cov\_enh-Perf) CR for TS38.141-2 TBoMS configuration Rel-18**

*Type: CR For: Agreement  
 38.141-2 v18.4.0 CR-0569 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

corrections to the repetition number for TBoMS

**Decision: Agreed**

**R4-2401663 (NR\_redcap-Perf) CR on 38.101-4 Correction on applicability rules for RedCap requirements**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0487 rev Cat: F (Rel-17)  
  
 Source: Huawei,HiSilicon*

**Decision: Agreed**

**R4-2401664 (NR\_redcap-Perf) Addition of applicability rules for RedCap 256QAM requirements (TS 38.101-4,Rel-18)**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0488 rev Cat: A (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Agreed**

**R4-2401665 (NR\_ext\_to\_71GHz-Perf) Correction on some parameters for FR2-2 UE test (TS 38.101-4,Rel-17)**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0489 rev Cat: F (Rel-17)  
  
 Source: Huawei,HiSilicon*

**Abstract:**

The specification version is incorrect on CR coversheet. Parsing Failure: Specification version number wrong on CR cover for TDoc R4-2401665. Database value : 17.11.0. CR cover value : 17.10.0. A revision will be required.

**Decision: Withdrawn**

**R4-2401666 (NR\_ext\_to\_71GHz-Perf) Correction on some parameters for FR2-2 UE test (TS 38.101-4,Rel-18)**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0490 rev Cat: A (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Agreed**

**R4-2401745 (NR\_RedCap-Perf) Correction of FRC for RedCap UE demodulation requirements (R17)**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0495 rev Cat: F (Rel-17)  
  
 Source: Ericsson, Anritsu*

**Abstract:**

This CR corrects FRC for RedCap UE demodulation requirements

**Decision: Merged**

**R4-2401746 (NR\_RedCap-Perf) Correction of FRC for RedCap UE demodulation requirements (R18)**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0496 rev Cat: A (Rel-18)  
  
 Source: Ericsson, Anritsu*

**Abstract:**

This CR corrects FRC for RedCap UE demodulation requirements

**Decision: Merged**

**R4-2402395 (NR\_ext\_to\_71GHz-Perf) CR on 38.101-4 Correction on test paramters for FR2-2 PDSCH test with 480kHz**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0498 rev Cat: F (Rel-17)  
  
 Source: Huawei,HiSilicon*

**Decision: Revised to R4-2403076 (from R4-2402395)**

**R4-2403076 (NR\_ext\_to\_71GHz-Perf) CR on 38.101-4 Correction on test paramters for FR2-2 PDSCH test with 480kHz**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0498 rev Cat: F (Rel-17)  
  
 Source: Huawei,HiSilicon*

**Decision: Agreed**

**R4-2402547 (NR\_redcap-Perf) CR to TS38.101-4: Corrections on RedCap SDR test cases (Rel-17)**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0499 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2403058 (from R4-2402547)**

**R4-2403058 (NR\_redcap-Perf) CR to TS38.101-4: Corrections on RedCap SDR test cases (Rel-17)**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0499 rev Cat: F (Rel-17)  
  
 Source: MediaTek inc.*

**Decision: Agreed**

**R4-2402548 (NR\_redcap-Perf) CR to TS38.101-4: Corrections on RedCap SDR test cases (Rel-18)**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0500 rev Cat: A (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Withdrawn**

**R4-2402640 (NR\_DL1024QAM\_FR1-Perf) Include 1024QAM Table in ENDC Demod Requirements (R17)(Cat.F)**

*Type: CR For: Agreement  
 38.101-4 v17.11.0 CR-0505 rev Cat: F (Rel-17)  
  
 Source: QUALCOMM Incorporated*

**Decision: Agreed**

**R4-2402696 (NR\_redcap-Perf) CR to TS38.101-4: Corrections on RedCap SDR test cases (Rel-18)**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0506 rev Cat: A (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Agreed**

**R4-2402758 (NR\_DL1024QAM\_FR1-Perf) Add New Es value for EVM=2.5% (R18)(Cat.A)**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0507 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed**

**R4-2402759 (NR\_perf\_enh-Perf) Correct FRC for R.PDSCH.1-18.1 FDD (R18)(Cat.A)**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0508 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed**

**R4-2402760 (NR\_DL1024QAM\_FR1-Perf) Include 1024QAM Table in ENDC Demod Requirements (R18)(Cat.A)**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0509 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed**

**R4-2402761 (NR\_HST\_FR2-Perf) FR2 HST DPS Model Clarification (R18)(Cat.A)**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0510 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed**

#### 5.2.5 OTA and TRP/TRS test aspects

**R4-2400028 CR to TS 38.151 on FR1 MIMO OTA spatial correlation validation pass/fail limits**

*Type: CR For: Agreement  
 38.151 v17.6.0 CR-0024 rev Cat: F (Rel-17)  
  
 Source: CAICT*

**Decision: Revised to R4-2403077 (from R4-2400028)**

**R4-2403077 CR to TS 38.151 on FR1 MIMO OTA spatial correlation validation pass/fail limits**

*Type: CR For: Agreement  
 38.151 v17.6.0 CR-0024 rev Cat: F (Rel-17)  
  
 Source: CAICT*

**Decision: Agreed**

**R4-2400196 CR to 38.151 on FR1 MIMO OTA MU**

*Type: CR For: Agreement  
 38.151 v17.6.0 CR-0025 rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision: Revised to R4-2403078 (from R4-2400196)**

**R4-2403078 CR to 38.151 on FR1 MIMO OTA MU**

*Type: CR For: Agreement  
 38.151 v17.6.0 CR-0025 rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision: Agreed**

Moderator: Revision is needed for cover page. A possible circular reference with RAN5 TS. But this is referencing a soon-to-be informative annex so may be ok.

Apple: MU was defined previously and is updating RAN4 TS with latest value.

R&S: Typically RAN5 spec takes RAN4 core spec to bring into RAN5 test spec. This may be a source of misalignment in the future.

**R4-2400727 Discussion on NFTF System for UE Transmitter Characteristics Measurement**

*Type: discussion For: Discussion  
 Source: Chosun University, Gwangju Institute of Science and Technology, National Radio Research Agency*

**Decision: Noted**

Qualcomm: Is it only for TRP, or can it also be used for EIRP?

Chosun: By transformation can also be used

**R4-2402256 (NR\_MIMO\_OTA-Core) Correction on the example inter-band band combination tables**

*Type: CR For: Agreement  
 38.151 v17.6.0 CR-0029 rev Cat: F (Rel-17)  
  
 Source: Samsung*

**Decision: Agreed**

### 5.3 Rel-17 TEI

**R4-2402334 (TEI17) CR to TS 36.104 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 36.104 v17.11.0 CR-4994 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Revised to R4-2403037 (from R4-2402334)**

**R4-2403037 (TEI17) CR to TS 36.104 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 36.104 v17.11.0 CR-4994 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402335 (TEI17) CR to TS 36.104 - BS spurious receiver protection note generalization R18**

*Type: CR For: Agreement  
 36.104 v18.4.0 CR-4995 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402336 (TEI17) CR to TS 36.141 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 36.141 v17.11.0 CR-1387 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Revised to R4-2403038 (from R4-2402336)**

**R4-2403038 (TEI17) CR to TS 36.141 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 36.141 v17.11.0 CR-1387 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402337 (TEI17) CR to TS 36.141 - BS spurious receiver protection note generalization R18**

*Type: CR For: Agreement  
 36.141 v18.3.0 CR-1388 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402338 (TEI17) CR to TS 37.104 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 37.104 v17.11.0 CR-1012 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Revised to R4-2403039 (from R4-2402338)**

**R4-2403039 (TEI17) CR to TS 37.104 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 37.104 v17.11.0 CR-1012 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402339 (TEI17) CR to TS 37.104 - BS spurious receiver protection note generalization R18**

*Type: CR For: Agreement  
 37.104 v18.4.0 CR-1013 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402340 (TEI17) CR to TS 37.141 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 37.141 v17.12.0 CR-1083 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Revised to R4-2403040 (from R4-2402340)**

**R4-2403040 (TEI17) CR to TS 37.141 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 37.141 v17.12.0 CR-1083 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402341 (TEI17) CR to TS 37.141 - BS spurious receiver protection note generalization R18**

*Type: CR For: Agreement  
 37.141 v18.4.0 CR-1084 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402342 (TEI17) CR to TS 37.105 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 37.105 v17.8.0 CR-0281 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Revised to R4-2403041 (from R4-2402342)**

**R4-2403041 (TEI17) CR to TS 37.105 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 37.105 v17.8.0 CR-0281 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402343 (TEI17) CR to TS 37.105 - BS spurious receiver protection note generalization R18**

*Type: CR For: Agreement  
 37.105 v18.3.0 CR-0282 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402344 (TEI17) CR to TS 37.145-1 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 37.145-1 v17.10.0 CR-0338 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Revised to R4-2403042 (from R4-2402344)**

**R4-2403042 (TEI17) CR to TS 37.145-1 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 37.145-1 v17.10.0 CR-0338 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402345 (TEI17) CR to TS 37.145-1 - BS spurious receiver protection note generalization R18**

*Type: CR For: Agreement  
 37.145-1 v18.4.0 CR-0339 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402346 (TEI17) CR to TS 37.145-2 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 37.145-2 v17.10.0 CR-0377 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Revised to R4-2403043 (from R4-2402346)**

**R4-2403043 (TEI17) CR to TS 37.145-2 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 37.145-2 v17.10.0 CR-0377 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402347 (TEI17) CR to TS 38.145-2 - BS spurious receiver protection note generalization R18**

*Type: CR For: Agreement  
 37.145-2 v18.4.0 CR-0378 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402348 (TEI17) CR to TS 38.104 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 38.104 v17.12.0 CR-0587 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Revised to R4-2403044 (from R4-2402348)**

**R4-2403044 (TEI17) CR to TS 38.104 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 38.104 v17.12.0 CR-0587 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402349 (TEI17) CR to TS 38.104 - BS spurious receiver protection note generalization R18**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0588 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402350 (TEI17) CR to TS 38.141-1 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 38.141-1 v17.12.0 CR-0425 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Revised to R4-2403045 (from R4-2402350)**

**R4-2403045 (TEI17) CR to TS 38.141-1 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 38.141-1 v17.12.0 CR-0425 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402351 (TEI17) CR to TS 38.141-1 - BS spurious receiver protection note generalization R18**

*Type: CR For: Agreement  
 38.141-1 v18.4.0 CR-0426 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402352 (TEI17) CR to TS 38.141-2 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 38.141-2 v17.12.0 CR-0573 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Revised to R4-2403046 (from R4-2402352)**

**R4-2403046 (TEI17) CR to TS 38.141-2 - BS spurious receiver protection note generalization R17**

*Type: CR For: Agreement  
 38.141-2 v17.12.0 CR-0573 rev Cat: F (Rel-17)  
  
 Source: Ericsson*

Abstract:

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

**R4-2402353 (TEI17) CR to TS 38.141-2 - BS spurious receiver protection note generalization R18**

*Type: CR For: Agreement  
 38.141-2 v18.4.0 CR-0574 rev Cat: A (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR update the note in the spurious table for BS receiver protection and remove unnecessary requirement when the 3GPP band is only partially allocated. Chair: Treat this under email thread [301].

**Decision: Agreed**

### 5.4 Moderator summary and conclusions (for Agenda 5)

## 6 Rel-18 maintenance for LTE and NR

**Guidance for maintenance agendas (AI 4, AI 5 and AI 6)**

The following guidance are provided for AI 4, AI5 and AI6:

- For maintenance agenda AI 4 (up to Rel-16), AI 5 (Rel-17) and AI 6 (Rel-18), formal CRs are expected and multiple formal CRs per company in the lowest agenda are allowed. For tracking the changes easily, it expected that one batch of CRs (Cat-F/A/…) will just cover a single topic/WI rather than multiple topics/WIs and Cat-F CR with corresponding Cat-A CRs needs be submitted under the same agenda.

- When submitting contributions to AI 4, AI 5 and AI 6.1.15/AI 6.2.8, please add (WI\_code) in the beginning of titles for both discussion files and CRs to facilitate moderators and session chairs handling.

- When reserving the tdoc number, please use the correct WI code rather than simply using TEI and fill the column of “Related WIs” in your reservation spreadsheet. If you submit a CR with TEI as WI code, please inform session chair.

- The contributions corresponding to incoming LS for Rel-17 and Rel-18 are expected to be submitted in AI 12, if there is a dedicated agenda in AI 12.

### 6.1 Rel-18 spectrum related WI maintenance

#### 6.1.1 Rel-18 band combinations for concurrent operation of NR/LTE Uu bands/band combinations and one NR/LTE V2X PC5 band

#### 6.1.2 High power UE (power class 1.5) for NR TDD bands

#### 6.1.3 Rel-18 downlink interruption for NR and EN-DC band combinations at dynamic Tx switching

#### 6.1.4 Adding new NR FDD bands for RedCap in Rel-18

#### 6.1.5 Enhancement for 700/800/900MHz band combinations

#### 6.1.6 Additional LTE bands for UE categories M1/M2/NB1/NB2 in Rel-18

##### 6.1.6.1 UE RF requirements

##### 6.1.6.2 BS RF and MSR requirements

#### 6.1.7 Introduction of evolved shared spectrum bands

#### 6.1.8 New bands and BW allocation for 5G terrestrial broadcast - part 2

#### 6.1.9 New FDD Bands using the uplink from n28 and the downlink of n75 and n76

##### 6.1.9.1 UE RF requirements

##### 6.1.9.2 BS RF requirements

##### 6.1.9.3 RRM requirements

#### 6.1.10 Introduction of 900 MHz NR Band in the US

##### 6.1.10.1 UE RF requirements

##### 6.1.10.2 BS RF requirements (resubmitted CR)

##### 6.1.10.3 RRM requirements

#### 6.1.11 Introduction of 900 MHz LTE Band in the US

#### 6.1.12 Introduction of the satellite L-/S-band

##### 6.1.12.1 UE RF requirements

##### 6.1.12.2 SAN RF requirements

##### 6.1.12.3 RRM requirements

#### 6.1.13 Introduction of a new FDD band (L+S band) for IoT NTN operation

##### 6.1.13.1 UE RF requirements (resubmitted CR)

##### 6.1.13.2 SAN RF requirements (resubmitted CR)

##### 6.1.13.3 RRM core requirements (resubmitted CR)

#### 6.1.14 Introduction of NR bands n31 and n72

##### 6.1.14.1 UE RF requirements (resubmitted CR)

##### 6.1.14.2 BS RF requirements and conformance testing (resubmitted CR)

##### 6.1.14.3 RRM core and performance requirements

#### 6.1.15 Other WIs related to bands introduced in Rel-18

### 6.2 Rel-18 non-spectrum related WI maintenance

#### 6.2.1 NR Channel raster enhancement

##### 6.2.1.1 UE and BS channel raster

###### 6.2.1.1.1 Channel raster for TN

###### 6.2.1.1.2 Channel raster for NTN

##### 6.2.1.2 UE capability

#### 6.2.2 NB-IoT/eMTC core & perf. requirements for NTN

##### 6.2.2.1 SAN RF requirement and conformance testing

**R4-2402581 (LTE\_NBIOT\_eMTC\_NTN\_req-Core) CR to TS 36.108: band-agnostic OBUE requirement, Rel-18**

*Type: CR For: Agreement  
 36.108 v18.4.0 CR-0021 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In this CR we implement the band-agnostic approach the conducted OBUE core requirement.

**Decision: Revised to R4-2403051 (from R4-2402581)**

**R4-2403051 (LTE\_NBIOT\_eMTC\_NTN\_req-Core) CR to TS 36.108: band-agnostic OBUE requirement, Rel-18**

*Type: CR For: Agreement  
 36.108 v18.4.0 CR-0021 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

Abstract:

In this CR we implement the band-agnostic approach the conducted OBUE core requirement.

**Decision: Endorsed**

ZTE: Would like to come back next meeting

Chair: Endorsed the CR to allow companies to check. If no technical concern, then the CR can be agreed at next meeting.

**R4-2402582 (LTE\_NBIOT\_eMTC\_NTN\_req-Perf) CR to TS 36.181: band-agnostic OBUE requirement, Rel-18**

*Type: CR For: Agreement  
 36.181 v18.2.0 CR-0014 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

In this CR we implement the band-agnostic approach the conducted OBUE test requirement.

**Decision: Revised to R4-2403052 (from R4-2402582)**

**R4-2403052 (LTE\_NBIOT\_eMTC\_NTN\_req-Perf) CR to TS 36.181: band-agnostic OBUE requirement, Rel-18**

*Type: CR For: Agreement  
 36.181 v18.2.0 CR-0014 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

Abstract:

In this CR we implement the band-agnostic approach the conducted OBUE test requirement.

**Decision: Endorsed**

ZTE: We cannot agree to this CR. The OBUE should be band specific, not band agnostic

Huawei: For some specs, we rely on ITU regulations. This is SAN, not BS. We rely on satellite regulation from ITU, which are not band specific.

ZTE: Future bands might be able to follow the same approach.

Huawei: We cannot foresee the future. We are drafting specs based on current regulation.

ZTE: Listing the specific band number is a safer way

##### 6.2.2.2 UE RF requirement

##### 6.2.2.3 RRM requirement

##### 6.2.2.4 Demodulation requirements

**R4-2400256 CR on TS 36.181 for SAN Demodulation**

*Type: draftCR For: Endorsement  
 36.181 v18.2.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

This is a draftCR for SAN Demodulation.

**Decision: Endorsed**

**R4-2401170 [LTE\_NBIoT\_eMTC\_NTN\_req] CR to 36.102 Remove square brackets from Doppler values for IoT NTN**

*Type: CR For: Agreement  
 36.102 v18.4.0 CR-0028 rev Cat: F (Rel-18)  
  
 Source: Qualcomm Inc*

**Decision: Agreed**

**R4-2401580 (LTE\_NBIOT\_eMTC\_NTN\_req-Perf) CR on SAN demodulation requirements for NB-IoT over NTN**

*Type: CR For: Agreement  
 36.108 v18.4.0 CR-0019 rev Cat: F (Rel-18)  
  
 Source: Samsung*

**Decision: Agreed**

**R4-2401701 (LTE\_NBIOT\_eMTC\_NTN\_req-Perf) CR on IOT NTN demodulation performance requirements (TS36.181, Rel-18)**

*Type: CR For: Agreement  
 36.181 v18.2.0 CR-0011 rev Cat: F (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2401702 Simulation results on SAN demodulation requirements for LTE NTN IOT**

*Type: other For: Information  
 Source: Huawei,HiSilicon*

**Decision: Noted**

**R4-2401747 (LTE\_NBIOT\_eMTC\_NTN\_req-Perf) CR: Completion of eMTC SAN demodulation requirements**

*Type: CR For: Agreement  
 36.108 v18.4.0 CR-0020 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This CR cleanup the values to finalized the SAN demodulatation requirements for IoT-NTN.

**Decision: Agreed**

**R4-2402907 UL RMCs updates for IoT NTN**

*Type: CR For: Agreement  
 36.102 v18.4.0 CR-0035 rev Cat: F (Rel-18)  
  
 Source: Keysight Technologies UK Ltd*

**Decision: Revised to R4-2403065 (from R4-2402907)**

**R4-2403065 UL RMCs updates for IoT NTN**

*Type: CR For: Agreement  
 36.102 v18.4.0 CR-0035 rev Cat: F (Rel-18)  
  
 Source: Keysight Technologies UK Ltd, MediaTek*

**Decision: Agreed**

#### 6.2.3 In-Device Co-existence (IDC) enhancements for NR and MR-DC

#### 6.2.4 Low NR band 4Rx for handheld UE and 3Tx for inter-band UL CA and EN-DC

##### 6.2.4.1 Enhancements for 4Rx at low frequency band (<1GHz)

##### 6.2.4.2 Enhancements of 3Tx for band combinations with two bands

#### 6.2.5 BS and UE EMC enhancements maintenance

##### 6.2.5.1 BS EMC enhancements

**R4-2402763 (NR\_LTE\_EMC\_enh-Perf) CR to TS 37.114 on correction of example used in Annex A**

*Type: CR For: Agreement  
 37.114 v18.0.0 CR-0110 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

The examples used in Annex A are for MSR and need to be corrected for AAS.

**Decision: Withdrawn**

**R4-2402793 (NR\_LTE\_EMC\_enh-Perf) CR to TS 37.114 on correction of example used in Annex A**

*Type: CR For: Agreement  
 37.114 v18.0.0 CR-0111 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

The examples used in Annex A are for MSR and need to be corrected for AAS.

**Decision: Withdrawn**

**R4-2402814 (NR\_LTE\_EMC\_enh-Perf) CR to TS 37.114 on correction of example used in Annex A**

*Type: CR For: Agreement  
 37.114 v18.0.0 CR-0112 rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

The examples used in Annex A are for MSR and need to be corrected for AAS.

**Decision: Agreed**

##### 6.2.5.2 UE EMC enhancements

#### 6.2.6 NR Support for UAV

#### 6.2.7 Enhanced LTE Support for UAV

#### 6.2.8 Other dedicated Rel-18 WIs

**R4-2400224 (FS\_NR\_FR2\_OTA\_enh) Discussion on minimum isolation requirements in multi-Rx demodulation testing**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Withdrawn**

**R4-2400225 (FS\_NR\_FR2\_OTA\_enh) CR to TR 38.871 for demodulation testing enhancement**

*Type: CR For: Agreement  
 38.871 v18.0.0 CR-0001 rev Cat: F (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Withdrawn**

**R4-2400226 (FS\_NR\_FR2\_OTA\_enh) CR to TR 38.871 for editorial corrections**

*Type: CR For: Agreement  
 38.871 v18.0.0 CR-0002 rev Cat: F (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Withdrawn**

##### 6.2.8.1 UE RF requirements

##### 6.2.8.2 BS RF requirements

**R4-2400637 Draft CR for 38.858 editorial update to Technical Report**

*Type: draftCR For: Endorsement  
 38.858 v18.0.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell, Charter Communications, CableLabs, Ericsson, Spark NZ Ltd.*

**Decision: Endorsed**

**R4-2400638 Draft CR for 38.858 technical update to Technical Report**

*Type: draftCR For: Endorsement  
 38.858 v18.0.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell, Charter Communications, CableLabs, Ericsson, Spark NZ Ltd.*

**Decision: Revised to R4-2403013**

**R4-2403013 Draft CR for 38.858 technical update to Technical Report**

*Type: draftCR For: Endorsement  
 38.858 v18.0.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell, Charter Communications, CableLabs, Ericsson, Spark NZ Ltd.*

**Decision: Endorsed**

##### 6.2.8.3 RRM requirements

##### 6.2.8.4 OTA aspects

**R4-2402301 (FS\_NR\_FR2\_OTA\_enh) Discussion on minimum isolation requirements in multi-Rx demodulation testing**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted**

**R4-2402302 (FS\_NR\_FR2\_OTA\_enh) CR to TR 38.871 for demodulation testing enhancement**

*Type: CR For: Agreement  
 38.871 v18.0.0 CR-0003 rev Cat: F (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2403059 (from R4-2402302)**

**R4-2403059 (FS\_NR\_FR2\_OTA\_enh) CR to TR 38.871 for demodulation testing enhancement**

*Type: CR For: Agreement  
 38.871 v18.0.0 CR-0003 rev Cat: F (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2403089 (from R4-2403059)**

**R4-2403089 (FS\_NR\_FR2\_OTA\_enh) CR to TR 38.871 for demodulation testing enhancement**

*Type: CR For: Agreement  
 38.871 v18.0.0 CR-0003 rev Cat: F (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed**

**R4-2402303 (FS\_NR\_FR2\_OTA\_enh) CR to TR 38.871 for editorial corrections**

*Type: CR For: Agreement  
 38.871 v18.0.0 CR-0004 rev Cat: F (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Agreed**

**R4-2402573 (FS\_NR\_FR2\_OTA\_enh) CR to TR 38.871 on DUT alignment figures**

*Type: CR For: Agreement  
 38.871 v18.0.0 CR-0005 rev Cat: F (Rel-18)  
  
 Source: ROHDE & SCHWARZ*

**Decision: Agreed**

### 6.3 Rel-18 TEI

#### 6.3.1 2Rx non-REDCAP XR devices

#### 6.3.2 Others

### 6.4 Moderator summary and conclusions (for Agenda 6)

**R4-2402641 Topic summary for [110][301] BSRF\_Maintenance**

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

**Abstract:**

[110][300] BDaT Session AI 4.2, 5.2.2, 6.2.8.2, 6.2.2.1, 9.4.2

**Decision: Noted**

**R4-2402644 Topic summary for [110][304] NR\_LTE\_EMC\_enh**

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

**Abstract:**

[110][300] BDaT Session AI 4.3, 6.2.5.1, 6.2.5.2

**Decision: Noted**

2598

ZTE: Have comments, would like to discuss further

2794

Huawei: WI code is incorrect. Technical contentes are ok

**R4-2402651 Topic summary for [110][311] Demod\_Maintenance**

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

**Abstract:**

[110][300] BDaT Session AI 4.5, 5.2.4

**Decision: Noted**

**R4-2402670 Topic summary for [110][330] OTA\_Maintenance**

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

**Abstract:**

[110][300] BDaT Session AI 4.6, 5.2.5, 6.2.8.4

**Decision: Noted**

## 7 Rel-18 on-going spectrum related WIs for NR

All the rapporteurs of basket WIs are expected to reserve tdoc numbers for revised WID/draftTR/Big CR before the meeting. Please upload the big CR based on the endorsed draft big CRs in the bis meeting.

### 7.1 Issues arising from basket WIs but not subject to block approval

#### 7.1.1 UE RF requirements

##### 7.1.1.1 Band combinations with UL configurations including intra-band ULCA with IMD or triple beat issues

##### 7.1.1.2 Others

#### 7.1.2 Moderator summary and conclusions

### 7.2 Moderator summary and conclusions (for basket WI AI 7.3 to AI 7.25 )

### 7.3 Rel-18 Dual Connectivity (DC) of 1 band LTE (1DL/1UL) and 1 NR band (1DL/1UL)

#### 7.3.1 Rapporteur input (WID/TR/big CR)

#### 7.3.2 UE RF requirements without FR2 band

#### 7.3.3 UE RF requirements with FR2 band

### 7.4 Rel-18 Dual Connectivity (DC) of 2 bands LTE inter-band CA (2DL/1UL) and 1 NR band (1DL/1UL)

#### 7.4.1 Rapporteur input (WID/TR/big CR)

#### 7.4.2 UE RF requirements without FR2 band

#### 7.4.3 UE RF requirements with FR2 band

### 7.5 Rel-18 WID on DC of x bands LTE inter-band CA (x=3,4,5) and 1 NR band

#### 7.5.1 Rapporteur input (WID/TR/big CR)

#### 7.5.2 UE RF requirements without FR2 band

#### 7.5.3 UE RF requirements with FR2 band

### 7.6 Rel-18 WID: DC of x bands (x=1,2,3,4) LTE inter-band CA (xDL/1UL) and 2 bands NR inter-band CA (2DL/1UL)

#### 7.6.1 Rapporteur input (WID/TR/big CR)

#### 7.6.2 UE RF requirements without FR2 band

#### 7.6.3 UE RF requirements with FR2 band

### 7.7 Rel-18 Dual Connectivity (DC) of x bands (x=1,2,3) LTE inter-band CA (xDL/1UL) and y bands NR inter-band CA (yDL/1UL)

#### 7.7.1 Rapporteur input (WID/TR/big CR)

#### 7.7.2 UE RF requirements without FR2 band

#### 7.7.3 UE RF requirements with FR2 band

### 7.8 Rel-18 WID: DC of x LTE bands and y NR bands with z bands DL and 3 bands UL (x=1, 2, 3, 4, y=1, 2; 3<=z<=6)

#### 7.8.1 Rapporteur input (WID/TR/big CR)

#### 7.8.2 UE RF requirements without FR2 band

#### 7.8.3 UE RF requirements with FR2 band

### 7.9 Rel-18 NR intra band Carrier Aggregation for xCC DL/yCC UL including contiguous and non-contiguous spectrum (x>=y)

#### 7.9.1 Rapporteur input (WID/TR/big CR)

#### 7.9.2 UE RF requirements for FR1 (resubmitted CR)

#### 7.9.3 UE RF requirements for FR2

### 7.10 Rel-18 NR Inter-band Carrier Aggregation/Dual Connectivity for 2 bands DL with x bands UL (x=1,2)

#### 7.10.1 Rapporteur input (WID/TR/big CR)

#### 7.10.2 UE RF requirements without FR2 band

#### 7.10.3 UE RF requirements with FR2 band

### 7.11 Rel-18 NR Inter-band Carrier Aggregation/Dual Connectivity for 3 bands DL with x bands UL (x=1,2)

#### 7.11.1 Rapporteur input (WID/TR/big CR)

#### 7.11.2 UE RF requirements without FR2 band

#### 7.11.3 UE RF requirements with FR2 band

### 7.12 Rel-18 NR Inter-band Carrier Aggregation/Dual Connectivity for y bands DL with x bands UL (y=4,5,6, x=1,2)

#### 7.12.1 Rapporteur input (WID/TR/big CR)

#### 7.12.2 UE RF requirements without FR2 band

#### 7.12.3 UE RF requirements with FR2 band

### 7.13 Rel-18 Band combinations for SA NR supplementary uplink (SUL), NSA NR SUL, NSA NR SUL with UL sharing from the UE perspective (ULSUP)

#### 7.13.1 Rapporteur input (WID/TR/big CR)

#### 7.13.2 UE RF requirements

### 7.14 NR CA band combinations with two SUL cells in Rel-18

#### 7.14.1 Rapporteur input (WID/TR/big CR)

#### 7.14.2 UE RF requirements

### 7.15 High-power UE operation for fixed-wireless/vehicle-mounted use cases in LTE bands and NR bands

#### 7.15.1 Rapporteur input (WID/TR/big CR)

#### 7.15.2 UE RF requirements

### 7.16 High power for FR1 for DC\_R18\_xBLTE\_yBNR\_zDLnUL with power class PC2 and PC1.5

#### 7.16.1 Rapporteur input (WID/TR/big CR)

#### 7.16.2 UE RF requirements

### 7.17 High power UE for FR1 for NR\_CA\_R18\_intra with power class 2 and 1.5 on TDD band(s)

#### 7.17.1 Rapporteur input (WID/TR/big CR)

#### 7.17.2 UE RF requirements with PC2 and PC1.5

### 7.18 High power UE for FR1 NR inter-band CA/DC or SUL band combination with y DL-x UL and PCm (m<3) and high power on TDD

#### 7.18.1 Rapporteur input (WID/TR/big CR)

#### 7.18.2 UE RF requirements with PC2 and PC1.5

### 7.19 High power UE for FR1 for inter-band NR\_CADC\_R18\_yBDL\_xBUL with power class 2 on single carrier uplink on FDD band

#### 7.19.1 Rapporteur input (WID/TR/big CR)

#### 7.19.2 UE RF requirements

### 7.20 High power UE for FR1 for FDD single band(s) with PC2

#### 7.20.1 Rapporteur input (WID/TR/big CR)

#### 7.20.2 UE RF requirements (resubmitted CR)

### 7.21 Additional NR bands for UL-MIMO in Rel-18

#### 7.21.1 Rapporteur input (WID/TR/big CR)

#### 7.21.2 UE RF requirements

### 7.22 Adding new channel bandwidth(s) support to existing NR bands

#### 7.22.1 Rapporteur input (WID/TR/big CR)

#### 7.22.2 UE RF requirements

#### 7.22.3 BS RF requirements

### 7.23 Simultaneous Rx/Tx inter-band combinations for NR CA/DC, NR SUL and LTE/NR DC in Rel-18

#### 7.23.1 Rapporteur input (WID/TR/big CR)

#### 7.23.2 Identification of simultaneous Rx/Tx capability for band combinations and UE RF requirements

### 7.24 4Rx support for NR FR1 bands (<2.6GHz) in Rel-18

#### 7.24.1 Rapporteur input (WID/TR/big CR)

#### 7.24.2 UE RF requirements

### 7.25 3Tx NR inter-band UL Carrier Aggregation (CA) and EN-DC

#### 7.25.1 Rapporteur input (WID/TR/big CR)

#### 7.25.2 UE RF requirements with PC2 and PC1.5

## 8 Rel-18 on-going non-spectrum related work items for NR

### 8.1 Further RF requirements enhancement for NR and EN-DC in FR1

#### 8.1.1 UE RF requirements maintenance

##### 8.1.1.1 4Tx UE RF requirements

##### 8.1.1.2 8Rx UE RF requirements (resubmitted CR)

##### 8.1.1.3 Lower MSD for inter-band CA/EN-DC/DC combinations

#### 8.1.2 RRM performance requirements

##### 8.1.2.1 RLM test cases to support 8Rx

#### 8.1.3 Demodulation and CSI requirements

**R4-2400729 Views on 8Rx demodulation performance requirements**

*Type: discussion For: Discussion  
 Source: QUALCOMM Europe Inc. - Spain*

**Abstract:**

8Rx alignment proposals

**Decision: Noted**

**R4-2402878 Views on 8Rx demodulation performance requirements**

*Type: discussion For: Discussion  
 Source: QUALCOMM Europe Inc. - Spain*

**Abstract:**

Latest proposal on 8Rx demodulation requirements .

**Decision: Noted**

##### 8.1.3.1 8Rx UE demodulation and CSI

###### 8.1.3.1.1 General aspects

**R4-2400241 8Rx General Demodualation Discussion**

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

**Decision: Withdrawn**

**R4-2400806 Discussion on test scope aspects for performance requirements for UE with 8Rx**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted**

**R4-2401058 On extending scope of 8RX demod**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted**

**R4-2401667 Draft BigCR Introduction of UE 8Rx performance requirements (TS 38.101-4,Rel-18)**

*Type: CR For: Endorsement  
 38.101-4 v18.2.0 CR-0491 rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Abstract:**

This is a formal CR with CR number for endorsement.

**Decision: Withdrawn**

**R4-2402277 Discussion on 8Rx general demodulation aspects and spatial channel models**

*Type: discussion For: Information  
 Source: Nokia, Nokia Shanghai Bell, BT*

**Decision: Noted**

**R4-2402508 Draft BigCR Introduction of UE 8Rx performance requirements (TS 38.101-4,Rel-18)**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Abstract:**

MCC: Draft BIG CR for post-meeting agreement.

**Decision: Email approval**

**R4-2402774 Channel Models with Spatial Features**

*Type: discussion For: Information  
 Source: BT, Nokia, Nokia Shanghai Bell, Bell Mobility, CMCC, Deutsche Telekom, Ericsson, Intel, Orange, Telecom Italia, Telenor, Verizon, Vodafone, T-Mobile USA*

**Decision: Noted**

###### 8.1.3.1.2 PDSCH requirements

**R4-2400242 8Rx PDSCH Discussion**

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

**Decision: Noted**

**R4-2400243 8Rx PDSCH Simulation**

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

**Decision: Noted**

**R4-2400244 Introduction of 8Rx CA Performance Requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2402967 (from R4-2400244)**

**R4-2402967 Introduction of 8Rx CA Performance Requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2403083 (from R4-2402967)**

**R4-2403083 Introduction of 8Rx CA Performance Requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed**

**R4-2400422 On the PDSCH Demodulation Requirements for 8Rx UEs in FR1**

*Type: discussion For: Discussion  
 38.101-4 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted**

**R4-2400423 Summary of Simulation Results for 8Rx Demodulation Requirements**

*Type: discussion For: Discussion  
 38.101-4 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted**

**R4-2400424 draftCR on FRC for 8Rx UEs TDD 2 layers in CBW 5MHz to 30MHz**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Revised to R4-2402968 (from R4-2400424)**

**R4-2402968 draftCR on FRC for 8Rx UEs TDD 2 layers in CBW 5MHz to 30MHz**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Endorsed**

**R4-2400425 draftCR on FRC for 8Rx UEs TDD 2 layers in CBW 40MHz to100MHz**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Revised to R4-2402969 (from R4-2400425)**

**R4-2402969 draftCR on FRC for 8Rx UEs TDD 2 layers in CBW 40MHz to100MHz**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Endorsed**

**R4-2400526 Discussion on PDSCH requirements for 8Rx UE**

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

**Decision: Noted**

**R4-2400527 Simulation results on PDSCH requirements for 8Rx UE**

*Type: other For: Information  
 Source: MediaTek inc.*

**Decision: Noted**

**R4-2400528 Draft CR to 38.101-4: FRC for 8Rx PDSCH requirements (FDD, 8 layers)**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Withdrawn**

**R4-2400793 Discussion on PDSCH requirements for UE with 8Rx**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted**

**R4-2400794 Discussion on PDSCH requirements for UE with 8Rx: Simulation results**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted**

**R4-2401108 Draft CR on 8Rx PDSCH demodulation requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Samsung*

**Decision: Revised to R4-2402970 (from R4-2401108)**

**R4-2402970 Draft CR on 8Rx PDSCH demodulation requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Samsung*

**Decision: Endorsed**

**R4-2401109 discussion on 8Rx PDSCH requirements**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2401553 On left open issues for 8Rx UE performance**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On remaining issues for 8Rx UE demodulation requirement

**Decision: Noted**

**R4-2401554 Simulation results for 8Rx PDSCH CA requirement**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Submit our simulation results

**Decision: Noted**

**R4-2401555 Simulation result collection for 8Rx UE demodulation requirement**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Simulation results collection

**Decision: Noted**

**R4-2401668 Discussion on remaining issues on 8Rx PDSCH requirements**

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

**Decision: Noted**

**R4-2401669 Simulation results on 8Rx PDSCH requirements**

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

**Decision: Noted**

**R4-2402034 Discussion on 8Rx UE demodulation requirements**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted**

**R4-2402035 Simulation results for PDSCH demodulation requirements for 8Rx CA**

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

**Decision: Noted**

**R4-2402546 Draft CR to 38.101-4: FRC for 8Rx PDSCH requirements**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Endorsed**

###### 8.1.3.1.3 SDR requirements

###### 8.1.3.1.4 CQI reporting requirements

##### 8.1.3.2 4Tx BS demodulation

#### 8.1.4 Moderator summary and conclusions

**R4-2402652 Topic summary for [110][312] RF\_FR1\_enh2\_Demod**

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

**Abstract:**

[110][300] BDaT Session AI 8.1.3.1.1, 8.1.3.1.2, 8.1.3.1.3, 8.1.3.1.4, 8.1.3.2

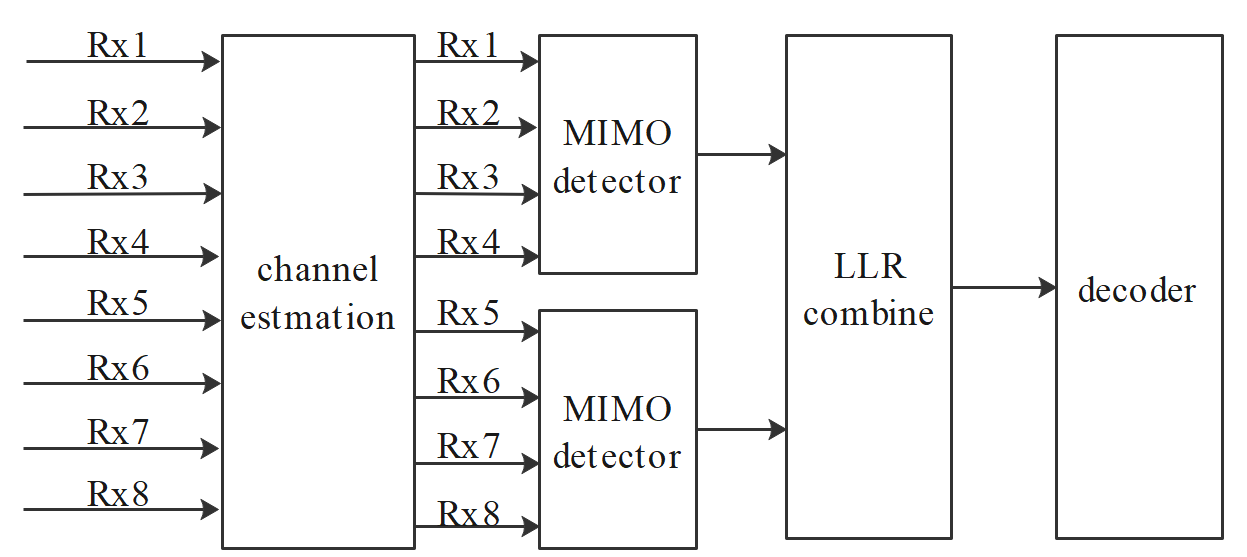
**Decision: Noted**

**Issue 1-1-1: How to define the requirements for Rank4**

* *Background:*
  + *Following options were discussed in RAN4#109 meeting:*

|  |
| --- |
| * *Rank4* * *Option 1: Add 0.8dB margin for 64QAM (the methodology used from NR UE Rel-15)* * *Option 2: Add 1.5dB margin for 64QAM* * *Option 3: Define two sets of requirements applicable to UE support of maxNumberMIMO-LayersPDSCH = 8 and maxNumberMIMO-LayersPDSCH = 4 respectively*   + *Set A (maxNumberMIMO-LayersPDSCH=8): Add 0.8dB margin (the methodology used from NR UE Rel-15)*   + *Set B (maxNumberMIMO-LayersPDSCH=4): Add an additional margin on top of Set A results (e.g., 1.2dB); i.e., When UE supports maxNumberMIMO-LayersPDSCH=4, an additional x dB margin is added to the SNR requirement* |

* Proposals
  + Option 1: Define two set of requirements applicable to UE support of different max MIMO layers, i.e. maxNumberMIMO-LayersPDSCH = 4 or 8. (Qualcomm, MTK, Nokia, Samsung)
    - Set A (maxNumberMIMO-LayersPDSCH=8): Add 0.8dB margin (the methodology used from NR UE Rel-15)
    - Set B (maxNumberMIMO-LayersPDSCH=4): Add an additional X dB margin on top of Set A results, i.e. (0.8 + X) dB
  + Option 2: Define two set of requirements applicable to UE support of different 8Rx receiver for MIMO detector and add 0.8dB margin (the methodology used from NR UE Rel-15) (Ericsson, Huawei, ZTE, CTC)
    - Option 2a: Define optional without capability signalling UE feature for the following two different receiver implementations. (Huawei)
      * Type1: Baseline 8Rx receiver: MIMO detector with 8Rx
      * Type2: Simplified 8Rx receiver: UE performs two separate 4Rx MIMO detector and combines the LLR (Note that this receiver assumption can’t work for 8 layers)



* + Option 3: One set of requirements with 1.5dB margin for 64QAM on top of the averaged impairment results for PDSCH requirements derivation. (Apple)

Moderator: Based on offline discussion, companies have agreed to define 2 sets of requirements. For first set of requirements, use the legacy approach. We need to discuss how to define the second set of requirements.

Qualcomm: We prefer additional margin to account for the simplified design. The expected range of simplificatioin is not large and we are close to end of the work item. We suggest to see if we can agree with a margin w/o simulation first. If this fails, then we can fallback to simulation. We propose 1.2 dB margin. But with the recent agreement to have two sets of requirements, companies may want to revisit the previous proposals. We expect 1.2 to 1.5 dB.

Huawei: The simulation span is very large with the current assumption. We need to agree how to align the result. The final result will be based on alignment and averaging.

MediaTek: Companies have different assumptions, so difficult to align. The baseline result is not agreed yet.

Ericsson: Will QC bring updated simulation results in this meeting? If they can be provided this meeting, then we don’t need the simulation but if they won’t be available until next meeting, then we have time to do the sim.

Chair: Try to agree to a baseline + margin this week. If we cannot agree to a value this week for baesline+margin, then simulations can be considered for next meeting.

Qualcomm: We have our value for baseline already.

Nokia: All companies have simulation results, but the span is very wide.

Huawei: For set 1, we can throw out QC and MTK values if they did not use same receiver and are not able to provide this week. For set 2, we only have two values from QC and MTK.

Apple: We think 2 values is not enough and would prefer a simulation approach.

Qualcomm: The baseline is the set 1 requirement (with 7 sets of data) and we add the margin for set 2 on top of that. Simulation could be very time consuming with agreeing assumptions, etc.

Nokia: Baseline value is 9.5 dB for FDD with span of 2.4 dB. For simple receiver, we have 3 data sets (includes QC original value, resubmitted MTK, and Huawei simplified). The margin is 2.7 dB with span of 1 dB. The final result would be 9.5 dB + 2.7 dB margin.

Qualcomm: We would like to resubmit the value. With the resubmitted value, the average is 9.6 dB

**Issue 2-1-1: Antenna correlation configuration for Rank2 CA test**

* *Background*
  + *Following options were made in RAN4#109 meeting:*

|  |
| --- |
| * + *Option 1: Revisit Rank 2 to TDLA30-10 Low*   + *Option 2: Keep TDLC300-100 ULA Medium B (α = 0.3, β = 0.005154) that is same as Rank 2 single carrier test* |

* Proposals
  + Option 1: Change the configuration to TDLA30-10 Low. (Apple, Nokia(slightly prefer), MTK(slightly prefer))
  + Option 2: Keep TDLC300-100 ULA Medium B (α = 0.3, β = 0.005154) that is same as Rank 2 single carrier test. (Huawei, Samsung, Ericsson, ZTE)

Apple: For CA we have used TDLA.

Nokia: We have enough simulation for either option. We have a slight preference for TDLA30-10.

Huawei: We don’t need to keep legacy CA for 8Rx. The single carrier configuration is TDLC so keeping the same would reduce simulation effort. The correlation should be larger for 8Rx.

Huawei: We should base the decision on technical justification rather than consistency of specification.

Ericsson: TDLC is more reasonable for 8Rx Rank 2 CA from a technical perspective. We discussed this during single carrier requirement.

ZTE: 8Rx receiver has high processing capability.

Apple: CA is mostly functional testing. TDLC was chosen for single carrier, but would not have been chosen for CA if it had been discussed from the start.

Qualcomm: If we start from scratch, we would have selected TDLA. We almost picked TDLA for single carrier.

CTC: We do not agree CA test is purely a functional test. We prefer TDLC.

**Issue 2-1-2: MCS for Rank2 CA test**

* *Background:* 
  + *MCS 19 is agreed for Rank 2 single carrier test*
  + *This is a new issue brought for this meeting, i.e. change MCS from MCS 19 to MCS 17 for Rank 2 test*
* Proposals
  + Option 1: MCS17. (Apple, Nokia (slightly prefer))
  + Option 2: Keep MCS19 that is same as Rank 2 single carrier test. (Huawei, Samsung, Ericsson, ZTE, CTC, MTK)

Nokia: This is dependent on channel.

Qualcomm: Agree with Nokia.

**Issue 3-1-1: Whether to extent the WI scope to include 8Rx PDSCH requirements with inter-cell and intra-cell inter user interference**

* *Background:*
  + *In RAN#102, the was a discussion that further check if 8Rx PDSCH requirements with inter-cell and intra-cell inter user interference can be done in Rel-18 WI.*

|  |
| --- |
| *Summary/conclusions for Demodulation topics:*   * *UE performance requirements with inter cell and with intra-cell inter-use interference for 8Rx CPE/FWA/vehicle/industrial devices*   + *Further check if such objectives can be done in R18 performance* |

* Proposals
  + Option 1: Extending the scope of Rel-18 8RX demod requirements to include requirements for inter-cell interference and intra-cell interference. (Apple, CTC)
  + Other options.

Moderator: This is a Rel-19 proposal.

Nokia: We should not make any RAN4 recommendation to RAN plenary.

**R4-2402857 Way forward on [110][312] RF\_FR1\_enh2\_Demod**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Decision: Approved**

Qualcomm: We are ok

Apple: Under demod enhancements discussion in RAN for Rel-19, there was a proposal to extend intra-cell and inter-cell interference mitigation to 8Rx. Moreover, there was a request to see if this can be done in Rel-18. We think it is feasible to complete in Rel-18, pending the willingness of companies to extend this work.

Nokia: We should not make recommendation for Rel-19. We think it’s too late to introduce in Rel-18. This should be discussed at RAN plenary.

Ericsson: Willing to try. If we reuse Rel-17 inteference model and parameter assumptions, we can bring simulations in next meeting. We respect the view of the rapporteur company on whether to extend or not.

Qualcomm: It’s too late for this release.

### 8.2 NR RF requirements enhancement for FR2, Phase 3

#### 8.2.1 UL 256QAM core requirements maintenance

#### 8.2.2 Beam correspondence requirements maintenance for RRC\_INACTIVE and initial access

##### 8.2.2.1 Beam correspondence requirement applicability

##### 8.2.2.2 UE beam type and DRX implications

##### 8.2.2.3 Beam correspondence test issues

#### 8.2.3 BS demodulation requirements

##### 8.2.3.1 UL 256QAM performance requirements

**R4-2400245 UL 256QAM BS Demodulation**

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

**Decision: Noted**

**R4-2400246 UL 256QAM BS Demodulation Simulation**

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

**Decision: Noted**

**R4-2400247 draftCR for 38.104 : Inclusion of 256QAM PUSCH performance requirements**

*Type: draftCR For: Endorsement  
 38.104 v18.4.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2402972 (from R4-2400247)**

**R4-2402972 draftCR for 38.104 : Inclusion of 256QAM PUSCH performance requirements**

*Type: draftCR For: Endorsement  
 38.104 v18.4.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed**

Samsung: Square brackets need to implemented in the big CR

**R4-2400705 big CR for TS38.104 (256QAM)**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0579 rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Agreed**

**R4-2401203 Discussion on BS PUSCH demodulation performance for 256 QAM**

*Type: discussion For: Discussion  
 Source: xiaomi*

**Decision: Noted**

**R4-2401399 Discussion on FR2 UL 256QAM demodulation requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on remaining issues of FR2 UL 256QAM demodulation requirements

**Decision: Noted**

**R4-2401400 Simulation results for FR2 UL 256QAM demodulation requirements**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Simulation results of FR2 UL 256QAM

**Decision: Noted**

**R4-2401401 Draft CR for TS38.141-2 FR2 UL 256QAM demodulation requirements**

*Type: draftCR For: Endorsement  
 38.141-2 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Introduce FR2 PUSCH 256QAM requirements. MCC: This file is corrupted as it has no document file within the zip.

**Decision: Withdrawn**

**R4-2401411 Big CR for TS38.141-1 FR2 UL 256QAM demodulation requirements**

*Type: CR For: Agreement  
 38.141-1 v18.4.0 CR-0433 rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Big CR for introduce new requirement for UL 256QAM demodulation

**Decision: Agreed**

**R4-2401574 Discussion and simulation results for FR2 256QAM**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2401575 Draft CR on manufacturer and applicability rule of BS demodulation requirements for Rel-18 FR2 256QAM**

*Type: draftCR For: Endorsement  
 38.141-2 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Samsung*

**Decision: Endorsed**

**R4-2401688 Discussion on FR2 UL 256QAM performance requirements**

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

**Decision: Noted**

**R4-2401689 Simulation results on FR2 UL 256QAM performance requirements**

*Type: other For: Information  
 Source: Huawei,HiSilicon*

**Decision: Noted**

**R4-2401690 Simulation summary for FR2 UL 256QAM BS Demodulation requirements**

*Type: other For: Information  
 Source: Huawei,HiSilicon*

**Decision: Noted**

**R4-2402028 Draft CR on 38.104 FRC for FR2-1 UL 256QAM demodulation requirements**

*Type: draftCR For: Endorsement  
 38.104 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2402974 (from R4-2402028)**

**R4-2402974 Draft CR on 38.104 FRC for FR2-1 UL 256QAM demodulation requirements**

*Type: draftCR For: Endorsement  
 38.104 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Endorsed**

**R4-2402029 Draft CR on 38.141-2 FRC for FR2-1 UL 256QAM demodulation requirements**

*Type: draftCR For: Endorsement  
 38.141-2 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2402975 (from R4-2402029)**

**R4-2402975 Draft CR on 38.141-2 FRC for FR2-1 UL 256QAM demodulation requirements**

*Type: draftCR For: Endorsement  
 38.141-2 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Endorsed**

**R4-2402030 Big CR on 38.141-2 for FR2-1 UL 256QAM demodulation requirements**

*Type: CR For: Agreement  
 38.141-2 v18.4.0 CR-0570 rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Agreed**

**R4-2402912 Draft CR for TS38.141-2 FR2 UL 256QAM demodulation requirements**

*Type: draftCR For: Endorsement  
 38.141-2 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Introduce FR2 PUSCH 256QAM requirements

**Decision: Revised to R4-2402973 (from R4-2402912)**

**R4-2402973 Draft CR for TS38.141-2 FR2 UL 256QAM demodulation requirements**

*Type: draftCR For: Endorsement  
 38.141-2 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

Abstract:

Introduce FR2 PUSCH 256QAM requirements

**Decision: Endorsed**

**R4-2403079 Draft CR on 38.141-1 FRC for FR2-1 UL 256QAM demodulation requirements**

*Type: For: Endorsement  
   
 Source: Ericsson*

**Decision: Endorsed**

#### 8.2.4 Moderator summary and conclusions

**R4-2402653 Topic summary for [110][313] NR\_RF\_FR2\_req\_Ph3\_Demod**

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

**Abstract:**

[110][300] BDaT Session AI 8.2.3.1

**Decision: Noted**

**R4-2402858 Way forward on [110][313] NR\_RF\_FR2\_req\_Ph3\_Demod**

*Type: other For: Approval  
 Source: Nokia*

**Decision: Approved**

**R4-2402971 Offline meeting minutes for [110][313] NR\_RF\_FR2\_req\_Ph3\_Demod**

*Type: For: Information  
   
 Source: Nokia*

**Decision: Noted**

**Issue 1-1: 60 kHz SCS and corresponding carrier BW**

* Proposals:
* Option 1: 60 kHz SCS, 50 MHz (Xiaomi, Ericsson, Nokia, Samsung)
* Option 2: Do not define 60kHz requirements (Huawei)

Huawei: It’s very late in the work item and existing deployment is only 120 kHz. If all other companies want to introduce, we can compromise but we don’t see the need.

Option 1 is agreed.

**Issue 1-3: Note**

* Option 3: This note will appear in the dedicated requirement table for 256 QAM

NOTE X: The AWGN level is reduced from the default by any value in the range max (0, SNR-20dB) to 15dB. Changing the AWGN level does not impact the validity of the test, as it reduces the effective base band SNR level. (Samsung, Nokia, Ericsson, Xiaomi, Huawei)

* Option 4:Do Not Define, introduce requirements up to 22dB without note (Nokia)

R&S:

Nokia: We have already had this condition up to 22 dB since Rel-15, so we don’t see the need for a note. But we can accept a note if all other companies want it.

The question is whether to have a note or not. The contents of the note are not in question. Since Nokia is the only company not wanting a note, and they are also listed as supporting a note, then the agreement is option 3.

Option 3 is agreed.

### 8.3 Requirement for NR FR2 multi-Rx chain DL reception

#### 8.3.1 UE RF requirements maintenance for simultaneous DL reception with up to 4 layer MIMO

#### 8.3.2 RRM core requirements maintenance for simultaneous DL reception from different directions

##### 8.3.2.1 General aspects

##### 8.3.2.2 L1-RSRP measurement delay

##### 8.3.2.3 RLM and BFD/CBD requirements

##### 8.3.2.4 Scheduling/measurement restrictions

##### 8.3.2.5 TCI state switching delay with dual TCI

##### 8.3.2.6 Receive timing difference between different directions

#### 8.3.3 RRM performance requirements

#### 8.3.4 Demodulation performance and CSI requirements

**R4-2401139 [NR\_FR2\_multiRX\_DL-Perf] Simulation results summary for FR2 multi-Rx performance requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm India Pvt Ltd*

**Decision: Noted**

**R4-2401140 [NR\_FR2\_multiRX\_DL-Perf] Big CR on UE demodulation and CSI performance requirements for FR2 multi-Rx**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0485 rev Cat: B (Rel-18)  
  
 Source: Qualcomm India Pvt Ltd*

**Decision: Email approval**

**R4-2401152 [NR\_FR2\_multiRX\_DL-Perf] CR to TR38.751 Receiver assumptions and conclusions for FR2 multi-Rx demodulation evolutions**

*Type: CR For: Agreement  
 38.751 v18.0.0 CR-0003 rev Cat: B (Rel-18)  
  
 Source: Qualcomm India Pvt Ltd*

**Decision: Revised to R4-2402992 (from R4-2401152)**

**R4-2402992 [NR\_FR2\_multiRX\_DL-Perf] CR to TR38.751 Receiver assumptions and conclusions for FR2 multi-Rx demodulation evolutions**

*Type: CR For: Agreement  
 38.751 v18.0.0 CR-0003 rev Cat: B (Rel-18)  
  
 Source: Qualcomm Inc, Nokia, Nokia Shanghai Bell*

**Decision: Agreed**

Nokia: There are not results for sDCI. There is no mention of not selecting joint processing. We want to capture the reasoning behind no joint processing for Rel-18.

##### 8.3.4.1 General aspects

**R4-2400453 On General aspects for Multi-RX in FR2 requirements**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted**

**R4-2400456 TP to TR 38.751 for channel correlation model**

*Type: CR For: Agreement  
 38.751 v18.0.0 CR-0002 rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Revised to R4-2402989 (from R4-2400456)**

**R4-2402989 TP to TR 38.751 for channel correlation model**

*Type: CR For: Agreement  
 38.751 v18.0.0 CR-0002 rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Agreed**

**R4-2400884 On MultiRx Demodulation performance and CSI requirements - General aspects**

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

**Abstract:**

This paper presents Nokia's view on the remaining open issues with relation to the general aspects for MultiRx Demodulation performance.

**Decision: Noted**

**R4-2400885 On MultiRx Demodulation performance and CSI requirements - General Simulation Results**

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

**Abstract:**

This paper presents Nokia's simulation results for MultiRx General aspects

**Decision: Noted**

**R4-2401120 [NR\_FR2\_multiRX\_DL-Perf]Discussion on the General Aspects for FR2 Multi-Rx Performance Requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm India Pvt Ltd*

**Decision: Noted**

**R4-2401142 [NR\_FR2\_multiRX\_DL-Perf] CR to 38.101-4 include the FR2 multi-rx correlation model in the specification**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0486 rev Cat: B (Rel-18)  
  
 Source: Qualcomm India Pvt Ltd*

**Decision: Withdrawn**

**R4-2401149 [NR\_FR2\_multiRX\_DL-Perf] Draft CR to 38.101-4 the FR2 multi-Rx correlation model**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: (Rel-18)  
  
 Source: Qualcomm India Pvt Ltd*

**Decision: Revised to R4-2402991 (from R4-2401149)**

**R4-2402991 [NR\_FR2\_multiRX\_DL-Perf] Draft CR to 38.101-4 the FR2 multi-Rx correlation model**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: (Rel-18)  
  
 Source: Qualcomm India Pvt Ltd*

**Decision: Endorsed**

**R4-2401158 Discussion on general aspects of FR2 multiRX DL**

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

**Decision: Noted**

**R4-2401709 Simulation results for NR FR2 multi-Rx chain DL reception**

*Type: other For: Information  
 Source: Huawei,HiSilicon*

**Decision: Noted**

**R4-2401711 Addition of Introduction section for demodulation requirements of NR FR2 multi-Rx chain DL reception in TR 38.751**

*Type: CR For: Agreement  
 38.751 v18.0.0 CR-0004 rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

##### 8.3.4.2 PDSCH requirements

**R4-2400454 Simulation results for PDSCH with multi-RX in FR2**

*Type: discussion For: Information  
 Source: Apple*

**Decision: Noted**

**R4-2400455 DraftCR on PDSCH demod requirements for mDCI fully-overlapping with multi-RX in FR2**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Revised to R4-2402988 (from R4-2400455)**

**R4-2402988 DraftCR on PDSCH demod requirements for mDCI fully-overlapping with multi-RX in FR2**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Apple*

**Decision: Endorsed**

**R4-2400886 On MultiRx Demodulation performance and CSI requirements - PDSCH**

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

**Abstract:**

This paper present Nokia's view on the remaining open issues related to PDSCH requirements for MultiRx Demodulation performance.

**Decision: Noted**

**R4-2400887 On MultiRx Demodulation performance and CSI requirements - PDSCH Simulation Results**

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

**Abstract:**

This paper presents Nokia's simulation results for MultiRx PDSCH

**Decision: Noted**

**R4-2400889 DraftCR on Minimum requirements and RMC for mDCI non-overlapping**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Abstract:**

DraftCR for introduction of minimum requiremenst and RMC for mDCI non-overlappping.

**Decision: Revised to R4-2402990 (from R4-2400889)**

**R4-2402990 DraftCR on Minimum requirements and RMC for mDCI non-overlapping**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

Abstract:

DraftCR for introduction of minimum requiremenst and RMC for mDCI non-overlappping.

**Decision: Endorsed**

**R4-2401110 Draft CR on applicability of requirements for FR2 multi-Rx**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Samsung*

**Decision: Revised to R4-2403063 (from R4-2401110)**

**R4-2403063 Draft CR on applicability of requirements for FR2 multi-Rx**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Samsung*

**Decision: Endorsed**

**R4-2401166 [NR\_FR2\_multiRX\_DL-Perf] Simulation results for FR2 multi-Rx performance requirements**

*Type: discussion For: Discussion  
 Source: Qualcomm India Pvt Ltd*

**Decision: Noted**

**R4-2401707 Discussion on UE demodulation requirements for NR FR2 multi-Rx chain DL reception**

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

**Decision: Noted**

**R4-2401710 Draft CR on Minimum requirements and FRC definition for sDCI SDM (TS38.101-4, Rel-18)**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Revised to R4-2403084 (from R4-2401710)**

**R4-2403084 Draft CR on Minimum requirements and FRC definition for sDCI SDM (TS38.101-4, Rel-18)**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Endorsed**

**R4-2401749 PDSCH demodulation requirements for FR2 UE multi-Rx reception**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the open issue on UE demodulation requirements for FR2 Multi-Rx reception.

**Decision: Noted**

##### 8.3.4.3 PMI reporting requirements

**R4-2400307 [NR\_FR2\_multiRX\_DL-Perf] Tx EVM assumption for PMI reporting**

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

**Abstract:**

Discussion on the FR2 Tx EVM assumption for test equipment.

**Decision: Noted**

**R4-2400888 On MultiRx Demodulation performance and CSI requirements - PMI**

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

**Abstract:**

This paper present Nokia's view on the remaning open issues related to PMI requirements for MultiRx Demodulation performance.

**Decision: Noted**

**R4-2401159 Discussion on PMI requirements of FR2 multiRX DL**

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

**Decision: Noted**

**R4-2401160 Simulation results of PMI requirements of FR2 multiRX DL**

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

**Decision: Noted**

**R4-2401161 Draft CR to 38.101-4 PMI requirements of FR2 multiRX DL**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Revised to R4-2402993 (from R4-2401161)**

**R4-2402993 Draft CR to 38.101-4 PMI requirements of FR2 multiRX DL**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: (Rel-18)  
  
 Source: MediaTek inc.*

**Decision: Endorsed**

**R4-2401708 Discussion on UE CSI reporting requirements for NR FR2 multi-Rx chain DL reception**

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

**Decision: Noted**

**R4-2401750 PMI reporting requirements for FR2 UE multi-Rx reception**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the open issue on PMI reporting requirements for FR2 Multi-Rx reception.

**Decision: Noted**

#### 8.3.5 Moderator summary and conclusions

**R4-2402654 Topic summary for [110][314] NR\_FR2\_multiRX\_DL\_Demod**

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

**Abstract:**

[110][300] BDaT Session AI 8.3.4.1, 8.3.4.2, 8.3.4.3

**Decision: Noted**

**R4-2402859 Way forward on [110][314] NR\_FR2\_multiRX\_DL\_Demod**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Approved**

**R4-2402987 Adhoc Minutes for [109][314]NR\_FR2\_multiRX\_DL\_Demod**

*Type: other For: Information  
 Source: Qualcomm Incorporated*

**Decision: Noted**

**Issue 1-1-4: Antenna Configuration.**

Moderator: Proposal: 4x4 across 2 TRP to UE. Add a note to the test table to identify the TRP in the 4x4 matrix.

Apple: How does 4Tx across 2 TRP looks in the spec? We don’t define across 2 TRP’s together. We define individually.

R&S: Overall, we have 4 transmitters and 4 receivers. Practically we have 2x2 on TRP1 and 2x2 on TRP2. Is there any correlation?

Qualcomm: There is no change to agreement on cross talk. The matrix will look the same. The only issue is how to formulate the antenna configuration in the spec.

Apple: 4x4 antenna configuration does not make sense across 2 TRP’s.

R&S: If both options are equivalent, but 4x4 is more future proof, then we are ok with that.

### 8.4 Even Further RRM enhancement for NR and MR-DC

#### 8.4.1 RRM core requirements maintenance for FR2 SCell activation delay reduction

#### 8.4.2 RRM core requirements maintenance for FR1-FR1 NR-DC

#### 8.4.3 RRM performance requirements for FR2 SCell activation delay reduction

#### 8.4.4 RRM performance requirements for FR1-FR1 NR DC

#### 8.4.5 Moderator summary and conclusions

### 8.5 Further enhancements on NR and MR-DC measurement gaps and measurements without gaps

#### 8.5.1 RRM core requirements maintenance for pre-configured MGs, multiple concurrent MGs and NCSG

##### 8.5.1.1 Case 1 requirements (Pre-configured MG and concurrent MG)

##### 8.5.1.2 Case 2 requirements (NCSG and concurrent MG)

#### 8.5.2 RRM core requirements maintenance for measurements without gaps

##### 8.5.2.1 Measurement without gaps for UEs reporting NeedForGapsInfoNR

##### 8.5.2.2 Inter-RAT measurement without gap

#### 8.5.3 RRM performance requirements for pre-configured MGs, multiple concurrent MGs and NCSG

#### 8.5.4 RRM performance requirements for measurements without gaps

#### 8.5.5 Moderator summary and conclusions

### 8.6 Completion of specification support for bandwidth part operation without restriction in NR

#### 8.6.1 RRM core requirements maintenance

#### 8.6.2 RRM performance requirements

#### 8.6.3 Moderator summary and conclusions

### 8.7 Support of intra-band non-collocated EN-DC/NR-CA deployment

#### 8.7.1 UE RF requirements maintenance

#### 8.7.2 RRM Core requirements maintenance

#### 8.7.3 RRM performance requirements

#### 8.7.4 Demodulation performance requirements

**R4-2401682 Discussion on demodulation requirements for intra-band EN-DC/NR-CA**

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

**Decision: Noted**

**R4-2401683 Simulation results on demodulation requirements for intra-band EN-DC/NR-CA**

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

**Decision: Noted**

**R4-2401751 UE demodulation requirements for non-colocated NR-CA deployment scenario**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution provides the simulation results to finalize PDSCH demodulation requirements for NonCol.

**Decision: Noted**

**R4-2401752 Summary of simulation results for UE demodulation requirements for non-colocated NR-CA deployment scenario**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

This spreadsheet summarizes the simulation results for UE demodulation requirements for non-colocated NR-CA deployment scenario.

**Decision: Noted**

**R4-2402275 Discussion and simulation results on UE Demodulation for non-colocated FR1 intra-band EN-DC/NR-CA**

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

**Decision: Noted**

**R4-2402276 BigCR for 38.101-4: Type 2 UE NonCol NR-CA PDSCH demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0497 rev Cat: F (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell, Ericsson, Apple, Huawei, HiSilicon, ZTE Corporation, MediaTek inc., Qualcomm*

**Decision: Revised**

**R4-2403010 BigCR for 38.101-4: Type 2 UE NonCol NR-CA PDSCH demodulation requirements**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0497 rev Cat: F (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell, Ericsson, Apple, Huawei, HiSilicon, ZTE Corporation, MediaTek inc., Qualcomm*

**Decision: Agreed**

**R4-2402756 Simulation Results for PDSCH Requirements for Non-Colocated Intra-band NR-CA**

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

**Decision: Noted**

#### 8.7.5 Moderator summary and conclusions

**R4-2402655 Topic summary for [110][315] NonCol\_intraB\_ENDC\_NR\_CA\_Demod**

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

**Abstract:**

[110][300] BDaT Session AI 8.7.4

**Decision: Noted**

**R4-2402860 Way forward on [110][315] NonCol\_intraB\_ENDC\_NR\_CA\_Demod**

*Type: other For: Approval  
 Source: Ericsson*

**Decision: Withdrawn**

### 8.8 Enhanced NR support for high speed train scenario in frequency range 2

#### 8.8.1 RRM core requirement maintenance

#### 8.8.2 RRM performance requirements

#### 8.8.3 Demodulation performance requirements

##### 8.8.3.1 General and channel modelling

**R4-2401571 Draft CR for channel model on Rel-18 FR2 HST demodulation requirement**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Samsung*

**Decision: Endorsed**

**R4-2401572 Draft big CR for TS 38.101-4 on Rel-18 FR2 HST demodulation requirement**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Samsung*

**Abstract:**

MCC: Draft BIG CR for post-meeting agreement.

**Decision: Email approval**

**R4-2401573 Simulation results summary for Rel-18 FR2 HST demodulation requirement**

*Type: other For: Information  
 Source: Samsung*

**Decision: Noted**

##### 8.8.3.2 PDSCH requirements with CA

**R4-2402716 HST FR2 Enhanced: UE Demodulation PDSCH Requirements with Carrier Aggregation**

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

**Decision: Noted**

##### 8.8.3.3 PDSCH requirements with multi-Rx Chain DL reception

**R4-2401570 Discussion and simulation results for PDSCH requirements with multi-Rx reception**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2401699 Discussion on UE multi-Rx demodulation requirements for HST FR2**

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

**Decision: Noted**

**R4-2401700 Draft CR on PDSCH requirement with multi-Rx reception for FR2 HST (TS38.101-4, Rel-18)**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Revised to R4-2402984 (from R4-2401700)**

**R4-2402984 Draft CR on PDSCH requirement with multi-Rx reception for FR2 HST (TS38.101-4, Rel-18)**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Revised**

**R4-2401756 draft CR to 38.101-4: FRC of PDSCH demodulation requirements for FR2 HST**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This draft CR provides the FRCs used for UE demodulation requirements in FR2 HST.

**Decision: Revised to R4-2403087 (from R4-2401756)**

**R4-2403087 draft CR to 38.101-4: FRC of PDSCH demodulation requirements for FR2 HST**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

Abstract:

This draft CR provides the FRCs used for UE demodulation requirements in FR2 HST.

**Decision: Revised**

**R4-2401757 UE demodulation requirements for FR2 HST multi-Rx reception**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the open issues on UE demodulation requirements for simultaneous multi-Rx reception scenario in FR2 HST.

**Decision: Noted**

**R4-2402717 HST FR2 Enhanced: UE Demodulation PDSCH Requirements with Multi-Rx Chain DL Reception**

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

**Decision: Noted**

**R4-2402718 Simulation Results on HST FR2 Enhanced with Multi-Rx Chain DL Reception**

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

**Decision: Noted**

**R4-2402749 Discussion on PDSCH requirements with multi-Rx Chain DL reception.**

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

**Decision: Noted**

**R4-2402750 DraftCR for FR2 HST Enhancements – Applicability Rules**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Endorsed**

**R4-2402754 Simulation Results for FR2 HST with multi-Rx Chain DL reception**

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

**Decision: Noted**

**R4-2403088 Draft CR on PDSCH requirement with multi-Rx reception for FR2 HST (TS38.101-4, Rel-18)**

*Type: For: Endorsement  
   
 Source: Huawei,HiSilicon*

**Decision: Revised to R4-2403090 (from R4-2403088)**

**R4-2403090 Draft CR on PDSCH requirement with multi-Rx reception for FR2 HST (TS38.101-4, Rel-18)**

*Type: For: Endorsement  
   
 Source: Huawei,HiSilicon*

**Decision: Endorsed**

#### 8.8.4 Moderator summary and conclusions

**R4-2402656 Topic summary for [110][316] NR\_HST\_FR2\_enh\_Demod**

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

**Abstract:**

[110][300] BDaT Session AI 8.8.3.1, 8.8.3.2, 8.8.3.3

**Decision: Noted**

**Issue 1-1-1: MCS pair for PDSCH requirement for multi-Rx chain reception**

Nokia: we would like to keep MCS 19 + MCS 13. RTD 1.5 vs. 2.5 CP.

Huawei: We never agreed the MCS would be independent of RTD. Power balance follows RTD which implies a different MCS.

Qualcomm: We also never agreed that MCS would be tied to RTD either. So there is no constraint on MCS.

Nokia: This is a CPE UE which is more capable. Can have 2 FFT so can tolerate the 2.5 CP. Therefore we would like to keep (19,13)

Huawei: After long discussion, we compromised to RTD 1.5 CP. Along this this, we also need to reconsider the MCS pair.

Qualcomm: We never agreed to adjust power balance following RTD compromise. We agreed power balance should not exceed a certain value based on RTD (6.5 dB). However a larger power difference leads to a lesser requirement for which we are not willing to compromise.

Huawei: Power imbalance is directly related to RTD.

Moderator: One possibility is to remove outliers in simulation results

Chair: Can we define two sets of requirements? How to distinguish them, how to signal or declare them is for further discussion.

**Issue 2-1-1: UE feature lists for FR2 PDSCH requirements with CA**

Huawei: The existing feature for CA and FR2 HST PC6 is sufficient. If we do have to introduce new feature, it should be optional with capability.

Samsung: For CA demod, agree with Huawei. But there is new capability introduced for RRM that could be used for both RRM and demod.

**Issue 2-1-2: UE feature lists for FR2 PDSCH requirements with multi-Rx chain reception**

Huawei: RF defined feature, and RRM defined feature for >CP, but for demod requirements are intended to verify but does not justify a new feature. Demod can reuse the existing RF/RRM features.

Qualcomm: This is not a new feature, but just a description of the feature.

Samsung:

**R4-2402861 Way forward on [110][316] NR\_HST\_FR2\_enh\_Demod**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Approved**

**R4-2402981 Ad-hoc meeting minutes for [110][316] NR\_HST\_FR2\_enh\_Demod**

*Type: For: Information  
   
 Source: Samsung*

**Decision: Noted**

### 8.9 Air-to-ground network for NR

#### 8.9.1 FR1 co-existence requirements maintenance for ATG network

#### 8.9.2 UE RF requirements maintenance

##### 8.9.2.1 Tx requirements

##### 8.9.2.2 Rx requirements

#### 8.9.3 BS RF requirements maintenance

**R4-2400051 Resubmission of ATG CR for 38.104**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0551 rev Cat: B (Rel-18)  
  
 Source: CATT*

**Decision: Withdrawn**

**R4-2400771 (NR\_ATG-Core)CR to TR 38.876 to include 1024 QAM for ATG BS**

*Type: CR For: Agreement  
 38.876 v18.0.0 CR-0001 rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Decision: Agreed**

**R4-2401250 (NR\_ATG-Core) CR for TS 38.104 on adding RF requirements for ATG BS**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0566 rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation, CMCC, CATT, Huawei, HiSilicon*

**Abstract:**

This CR is re-submission of the last agreed CR CR(R4-2321028)

**Decision: Agreed**

**R4-2401877 (NR\_ATG-Core) CR for TS 38.104 on adding RF requirements for ATG BS**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0568 rev Cat: B (Rel-18)  
  
 Source: CMCC*

**Decision: Merged**

#### 8.9.4 BS RF conformance testing requirements

**R4-2400052 CR for ATG conformance test for TS 38.141-1**

*Type: CR For: Agreement  
 38.141-1 v18.4.0 CR-0407 rev Cat: B (Rel-18)  
  
 Source: CATT, Huawei, ZTE, CMCC*

**Decision: Agreed**

**R4-2400772 (NR\_ATG-Perf)CR for TS 38.104 on RF requirements for ATG BS**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0564 rev Cat: B (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

Parsing failure: Change request Work Item wrong on CR cover for TDoc R4-2400772. Database value : NR\_ATG-Perf. CR cover value : NR\_ATG-Core. A revision will be required.

**Decision: Withdrawn**

**R4-2401251 CR for TS 38.141-2 on adding RF requirements for ATG BS**

*Type: CR For: Agreement  
 38.141-2 v18.4.0 CR-0566 rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation, CATT*

**Abstract:**

This CR is based on the draft CR R4-2321196 which was endorsed in last meeting.

**Decision: Agreed**

#### 8.9.5 RRM core requirements maintenance

#### 8.9.6 RRM performance requirements

#### 8.9.7 Demodulation performance requirements

##### 8.9.7.1 General aspects

**R4-2400840 (NR\_ATG-Perf) Simulation results collection for NR ATG**

*Type: other For: Information  
 Source: CMCC*

**Decision: Noted**

##### 8.9.7.2 UE demodulation performance and CSI requirements

**R4-2400841 (NR\_ATG-Perf) Discussion and Simulation results for ATG PDSCH demodulation**

**Decision: Noted**

**Decision:** The document was **not treated**.

**R4-2400842 (NR\_ATG-Perf) BigCR to TS 38.101-4 Introduction of demodulation performance requirements for NR ATG UE**

*Type: CR For: Agreement  
 38.101-4 v18.2.0 CR-0480 rev Cat: B (Rel-18)  
  
 Source: CMCC*

**Decision: Email approval**

**R4-2401547 On PDSCH demodulation requirement for ATG network**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On remaining issues for ATG UE demodulation requirement

**Decision: Noted**

**R4-2401548 Simulation resutls for ATG PDSCH demodulation requirement**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Submit our simulation results

**Decision: Noted**

**R4-2401549 Draft CR to TS38.101-4: Reference measurement channel for ATG demodulation requirement**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Resubmission for the endorsed draft CR

**Decision: Endorsed**

**R4-2401691 Draft CR on ATG PDSCH demodulation performance requirements (TS38.101-4, Rel-18)**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Revised to R4-2402977 (from R4-2401691)**

**R4-2402977 Draft CR on ATG PDSCH demodulation performance requirements (TS38.101-4, Rel-18)**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Endorsed**

**R4-2401694 Simulation results on NR UE ATG demodulation requirements**

*Type: other For: Information  
 Source: Huawei,HiSilicon*

**Decision: Noted**

**R4-2402031 Simulation results for ATG UE demodulation**

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

**Decision: Noted**

**R4-2402751 draftCR for ATG UE Demodulation Requirements – Applicability Rules**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Revised to R4-2402978 (from R4-2402751)**

**R4-2402978 draftCR for ATG UE Demodulation Requirements – Applicability Rules**

*Type: draftCR For: Endorsement  
 38.101-4 v18.2.0 CR- rev Cat: (Rel-18)  
  
 Source: Qualcomm Incorporated*

**Decision: Endorsed**

**R4-2402755 Updated simulation Results for UE PDSCH Demodulation for ATG**

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

**Decision: Noted**

##### 8.9.7.3 BS demodulation performance requirements

**R4-2400843 (NR\_ATG-Perf) BigCR to TS 38.104 Introduction of demodulation performance requirements for NR ATG BS**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0565 rev Cat: B (Rel-18)  
  
 Source: CMCC*

**Decision: Email approval**

**R4-2400844 (NR\_ATG-Perf) BigCR to TS 38.141-1 Introduction of demodulation performance requirements for NR ATG BS**

*Type: CR For: Agreement  
 38.141-1 v18.4.0 CR-0414 rev Cat: B (Rel-18)  
  
 Source: CMCC*

**Decision: Email approval**

**R4-2400845 (NR\_ATG-Perf) BigCR to TS 38.141-2 Introduction of demodulation performance requirements for NR ATG BS**

*Type: CR For: Agreement  
 38.141-2 v18.4.0 CR-0565 rev Cat: B (Rel-18)  
  
 Source: CMCC*

**Decision: Email approval**

**R4-2401398 Draft CR for TS38.141-1 PUSCH requirements and FRC table for ATG**

*Type: draftCR For: Endorsement  
 38.141-1 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Introduce ATG PUSCH requirements

**Decision: Revised to R4-2402976 (from R4-2401398)**

**R4-2402976 Draft CR for TS38.141-1 PUSCH requirements and FRC table for ATG**

*Type: draftCR For: Endorsement  
 38.141-1 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

Abstract:

Introduce ATG PUSCH requirements

**Decision: Endorsed**

**R4-2401568 Updated simulation results for BS demodulation requirements for Rel-18 ATG**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2401569 Draft CR on manufacturer and applicability rule of BS demodulation requirements for Rel-18 ATG**

*Type: draftCR For: Endorsement  
 38.141-1 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Samsung*

**Decision: Endorsed**

**R4-2401692 Draft CR on ATG PUSCH demodulation performance requirements and FRC definition (TS38.104, Rel-18)**

*Type: draftCR For: Endorsement  
 38.104 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Revised to R4-2402979 (from R4-2401692)**

**R4-2402979 Draft CR on ATG PUSCH demodulation performance requirements and FRC definition (TS38.104, Rel-18)**

*Type: draftCR For: Endorsement  
 38.104 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Endorsed**

**R4-2401693 Simulation results on NR BS ATG demodulation requirements**

*Type: other For: Information  
 Source: Huawei,HiSilicon*

**Decision: Noted**

**R4-2402043 Simulation results for ATG BS demodulation requirements**

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

**Decision: Noted**

**R4-2402044 Draft CR to 38.141-2 Introduction applicability of PUSCH,PUCCH and PRACH for ATG performance requirements**

*Type: draftCR For: Endorsement  
 38.141-2 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Endorsed**

**R4-2402045 Draft CR to 38.141-2 Introduction of PUSCH requirements and FRCs for ATG performance requirements**

*Type: draftCR For: Endorsement  
 38.141-2 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2402980 (from R4-2402045)**

**R4-2402980 Draft CR to 38.141-2 Introduction of PUSCH requirements and FRCs for ATG performance requirements**

*Type: draftCR For: Endorsement  
 38.141-2 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Endorsed**

#### 8.9.8 Moderator summary and conclusions

**R4-2402642 Topic summary for [110][302] NR\_ATG\_BSRF\_Maintenance**

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

**Abstract:**

[110][300] BDaT Session AI 8.9.3, 8.9.4

**Decision: Noted**

**R4-2402657 Topic summary for [110][317] NR\_ATG\_Demod**

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

**Abstract:**

[110][300] BDaT Session AI 8.9.7.1, 8.9.7.2, 8.9.7.3

**Decision: Noted**

**Issue 1-1: Whether to introduce 1024QAM for new incremental PDSCH requirements**

* Proposals
  + Option 1: Introduce 1024QAM requirements for ATG PDSCH demodulation, following test cases can be considered: (Ericsson, CMCC)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test number | Duplex mode, SCS and CBW | Propagation condition | Antenna configuration | MCS | SNR @70% maxTput |
|
| 1 | FDD 15kHz/10MHz | AWGN+220Hz Doppler | 2T2R | 1024QAM Table  MCS23 |  |
| 2 | 2T4R | 1024QAM Table  MCS23 |  |
| 3 | TDD 30kHz/40MHz 7DS2U | AWGN+500Hz Doppler | 2T2R | 1024QAM Table  MCS23 |  |
| 4 | 2T4R | 1024QAM Table  MCS23 |  |
| 5 | TDD 30kHz/40MHz 30D4S6U | AWGN+500Hz Doppler | 2T2R | 1024QAM Table  MCS23 |  |
| 6 | 2T4R | 1024QAM Table  MCS23 |  |

Huawei: This is also being discussed in RF session. We should align.

CMCC: RF session will discuss on Weds, but the discussion can be decoupled

Ericsson: 1024 has already been introduced in TN, and the channel condition is more favorable for ATG, so should include. Our simulations indicate that there is enough margin for MCS24.

ZTE: The Tx and Rx EVM needs to be studied. In practical deployment, we expect the coverage to be limited for 1024QAM.

CMCC: The difference in coverage between Ericsson and ZTE results may be due to Tx power

Ericsson: We used TN EVM for ATG BS simulations.

Ericsson: It has already been agreed that BS Tx EVM will use the TN value including 1024QAM. The main session is only studying the UE Rx max input level.

CMCC: In our simulation we used 2% EVM, same as TN.

Proposals for further offline discussion this week:

1. Agree to ATG BS 1024QAM requirements in square bracket pending confirmation of EVM assumption in the RF sessions
2. Agree to define ATG BS 1024QAM requirements pending definition of TBD requirement in the RF session.

CMCC: There was no conclusion in the RF session. Max input power is not agreed, may be treated in maintenance.

Ericsson: The issue is which FRC to use, but that’s a matter of verification. The same max input power applies to both 256 and 1024QAM, but currently points to a 256 FRC. The core requirement would not change.

ZTE: We cannot agree. We need TxEVM and RxEVM to run the simulations. We don’t know what RxEVM from RF session. We observe power backoff requirement for 1024QAM which will impact coverage. We don’t think it is easy to introduce 1024QAM for ATG.

Ericsson: The BS requirement is already agreed for 1024QAM, so TxEVM is agreed. There is manufacturer declaration for output power. This was taken into account in link simulations. RxEVM is not an RF requirement so not needed to agree. The only thing needed is to use the ATG channel. There are current 1024QAM demod requirements that previously used an RxEVM assumption. The only difference is the channel.

ZTE: We cannot compromise.

**R4-2402862 Way forward on [110][317] NR\_ATG\_Demod**

*Type: other For: Approval  
 Source: CMCC*

**Decision: Withdrawn**

8.10 NR support for dedicated spectrum less than 5MHz for FR1

#### 8.10.1 System parameter maintenance

#### 8.10.2 UE RF requirement maintenance

#### 8.10.3 BS RF requirement maintenance

**R4-2400577 CR to TS 38.104 for editorial corrections**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0556 rev Cat: D (Rel-18)  
  
 Source: Murata Manufacturing Co Ltd.*

**Decision: Agreed**

**R4-2400689 Big CR to TS 38.141-1 on introduction of 3 MHz channel bandwidth**

*Type: CR For: Agreement  
 38.141-1 v18.4.0 CR-0413 rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell, ZTE Corporation, Ericsson, Huawei*

**Abstract:**

Required changes to support 3 MHz channel bandwidth.

**Decision: Revised to R4-2402983 (from R4-2400689)**

**R4-2402983 Big CR to TS 38.141-1 on introduction of 3 MHz channel bandwidth**

*Type: CR For: Agreement  
 38.141-1 v18.4.0 CR-0413 rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell, ZTE Corporation, Ericsson, Huawei*

Abstract:

Required changes to support 3 MHz channel bandwidth.

**Decision: Agreed**

**R4-2402290 draft CR to 38.141-1: Test tolerance for OBUE requirements for 3 MHz channel bandwidth**

*Type: draftCR For: Endorsement  
 38.141-1 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: NEC, Nokia*

**Decision: Endorsed**

#### 8.10.4 RRM core requirement maintenance

#### 8.10.5 RRM performance requirements

#### 8.10.6 Demodulation performance requirements

##### 8.10.6.1 UE demodulation performance and CSI requirements

**R4-2400421 UE demodulation performance and CSI requirements for NR support for dedicated spectrum less than 5MHz for FR1**

*Type: discussion For: Discussion  
 38.101-4 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted**

**R4-2400531 Discussion on UE demodulation requirements for less than 5MHz**

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

**Decision: Noted**

**R4-2400532 Simulation results on UE demodulation requirements for less than 5MHz**

*Type: other For: Information  
 Source: MediaTek inc.*

**Decision: Noted**

**R4-2400882 On Lessthan5MHz UE demod perf and CSI requirements**

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

**Abstract:**

This paper present Nokia's view on the different aspects of UE demodulation performance and CSI requirements for the topic of<5MHz.

**Decision: Noted**

**R4-2400883 On Lessthan5MHz UE demod perf and CSI requirements - Simulations**

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

**Abstract:**

This paper present Nokia's simuation results for <5MHz

**Decision: Noted**

**R4-2400978 Discussion on UE demodulation requirements for dedicated spectrum less than 5MHz**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2401670 Discussion on UE demodulation and CSI requirements for dedicated spectrum less than 5MHz for FR1**

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

**Decision: Noted**

**R4-2401671 Simulation results for PBCH requirements with 3MHz bandwidth**

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

**Decision: Noted**

**R4-2401753 UE demodulation requirements for NR less than 5MHz**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the UE demodulation and CSI reporting requirements for WI NR less than 5MHz.

**Decision: Noted**

**R4-2402036 Discussion on UE demodulation performance and CSI requirements for less than 5MHz**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted**

**R4-2402037 Simulation results for UE demodulation performance and CSI requirements for less than 5MHz**

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

**Decision: Noted**

**R4-2402753 Discussion on UE Demod for spectrum less than 5MHz**

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

**Decision: Noted**

**R4-2402757 Simulation Results for PBCH Requirements for Less than 5MHz BW**

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

**Decision: Noted**

**R4-2403008 Simulation results alignment for UE Demod [110][318] NR\_FR1\_lessthan\_5MHz\_BW\_demod**

*Type: For: Discussion  
   
 Source: Nokia*

**Decision: Noted**

##### 8.10.6.2 BS demodulation performance requirements

**R4-2400239 Discussion on BS Demodulation on Less than 5 MHz**

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

**Decision: Noted**

**R4-2400240 BS Demod Simulations**

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

**Decision: Noted**

**R4-2401404 Discussion on NR less than 5MHz BS demodulation requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on open issues of 3MHz PUSCH/PUCCH demodulation requirements

**Decision: Noted**

**R4-2401405 Simulation results for NR less than 5MHz BS demodulation requirements**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Simulation results for 3MHz PUSCH demodulation

**Decision: Noted**

**R4-2401577 Discussion and initial results for BS demodulation requirement for less than 5MHz**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2401672 Discussion on BS requirements for dedicated sprectrum less than 5MHz for FR1**

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

**Decision: Noted**

**R4-2402038 Discussion on BS demodulation performance requirements for less than 5MHz**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted**

**R4-2402039 Simulation results for BS demodulation performance for less than 5MHz**

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

**Decision: Noted**

**R4-2403007 Simulation results alignment for BS Demod [110][318] NR\_FR1\_lessthan\_5MHz\_BW\_demod**

*Type: For: Discussion  
   
 Source: Nokia*

**Decision: Noted**

#### 8.10.7 Moderator summary and conclusions

**R4-2402643 Topic summary for [110][303] NR\_FR1\_lessthan\_5MHz\_BW\_BSRF\_Maintenance**

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

**Abstract:**

[110][300] BDaT Session AI 8.10.3

**Decision: Noted**

**R4-2402658 Topic summary for [110][318] NR\_FR1\_lessthan\_5MHz\_BW\_demod**

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

**Abstract:**

[110][300] BDaT Session AI 8.10.6.1, 8.10.6.2

**Decision: Noted**

1.2.2.1 Issue 1-2-1: Introduction of PDSCH requirements in non-HST conditions

* + Option1 [Apple, MTK, Samsung, Huawei, QC]: Do not introduce new PDSCH requirements for 3MHz CBW
  + Option2 [Ericsson, Nokia]: Define PDSCH demodulation requirements with 15PRBs for UE supporting support-3MHz-ChannelBW-r18 with applicability rule:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Test number | Bandwidth (MHz) / Subcarrier spacing (kHz) | Modulation format and code rate | Propagation condition | Rank | Correlation matrix and antenna configuration | Fraction of maximum throughput (%) |
| 1-1 | 3 / 15 | QPSK, 0.30 | TDLB100-400 | Rank 1 | 2x2 low  2x4 low | 70 |
| 1-2 | 3 / 15 | 16QAM, 0.48 | TDLC300-100 | Rank 1 | 2x2 low  2x4 low | 70 |

* + Option 3 [ZTE, Nokia]: If introducing PDSCH requirements for 3MHz, to reuse existing requirements.

Nokia: We also observe there is no difference in performance between 10 MHz and 3 MHz. However, in case 3 MHz-only comes in the future, we would like to have that possibility. We can compromise to option 1.

Ericsson: Also ok with option 1

ZTE: Also did not observe large difference between 10 and 3 MHz, so we are ok with option 1

Option 1 is agreed

Same agreement for HST not to define PDSCH for 3 MHz.

Issue 1-2-4: SDR requirements

Apple: We agreed to use larger bandwidth

Qualcomm: Agree with Apple

Huawei: We do not need to introduce SDR due to previous agreement that no UE would support only 3 MHz. Since we test SDR with max bandwidth, 3 MHz would never be tested.

Ericsson: From spec completion point of view, we would like to add the parameters for 3 MHz channel. This doesn’t mean the UE would need to be tested for this.

Apple: Do we need to future-proof the spec to enable a 3 MHz=only device in the future? Or can we address that in the future when it happens?

Huawei: In the future, we may have 3 MHz as part of a CA configuration. So we would need to add 3 MHz into the spec even for a device that does not support only 3 MHz in single carrier mode of operation.

MediaTek: Unclear what is the purpose of introducing the requirement. Is it for testing the device, or just for the spec? RAN5 may not understand the intention.

Nokia: For SDR, it is different from PDSCH in that we specify all the bandwidths. So it is not necessary to treat SDR and PDSCH the same way. We already have 5 MHz in SDR.

Qualcomm: There is no CA in this release, so this requirement would not be tested. We can discuss this in the next release.

Further discussion is needed.

Issue 1-4-1: PBCH

Apple: We should only have requirements that would be tested. We should not have compromised to agree to PBCH last meeting.

Qualcomm: A mid-way solution to reduce the scope of the requirement.

Ericsson: PBCH has a long history since 3G. Even if not testable, RAN4 has agreed to define PBCH requirements for 3G, 4G, 5G.

Huawei: We should respect the previous agreement.

ZTE: Agree with Huawei

Issue 1-4-3: PBCH for HST

Nokia: We can compromise to option 2, not to define HST scenario for PBCH, assuming that PBCH is specified for non-HST case.

Option 2 is agreed.

Issue 1-3-2: Punctured PDCCH for non-HST

* + Option 1 [Nokia, Ericsson, QC, HW, Samsung]: Define punctured PDCCH demodulation requirements with 15PRBs for UE supporting NR\_FR1\_lessthan\_5MHz\_BW
  + Option 1a [Nokia, Ericsson, QC, HW]: Define requirements with the following parameters:
    - 15PRBs, 3 symbols, non-interleaved, AL4, DCI 1\_0 (35 bits for 15 PRBs) , 2Tx, 2Rx/4Rx;
    - Use CCEs #4, #5, #6, and #7 to transmit PDCCH with DCI 1\_0
  + Option 1b [HW]: Define requirements with the following parameters:
    - 3 symbols, Non-interleaved, AL8, CCE#0,#1,#2,#3,#4,#5,#6,#7 DCI 1\_0, 35bit.
  + Option 2 [MTK]: Introduce requirements if testability issue is resolved.
  + Option 3 [Apple, ZTE]: Do not introduce new requirements for punctured PDCCH with focus on CORESET#0 puncturing.

Qualcomm: Number of Tx and propagation condition are missing and have not been discussed.

Moderator: Baseline is to follow the existing non-punctured PDCCH

2.2.3.1 Issue 2-3-1: Introduction of PUCCH requirements for formats other than 2

* Candidate options / tentative agreements:
  + Option 1 [Ericsson, HW, Nokia]: Only introduce new demodulation requirement for PUCCH format 2 with 3MHz CBW.
  + Option 2 [Samsung]: Introduce new demodulation requirement for PUCCH format 0,1,3,4 with 3MHz CBW with frequency hopping.

Samsung: Depends on implementation. Processing would be different for 3 MHz than with the larger channel bandwidths with frequency hopping

Nokia: We don’t expect any impact to the other formats with frequency hopping

Huawei: Same view as Nokia

Samsung: We do think there is frequency hopping with other formats and we do see a difference in performance

**R4-2402863 Way forward on [110][318] NR\_FR1\_lessthan\_5MHz\_BW\_demod**

*Type: other For: Approval  
 Source: Nokia*

**Decision: Approved**

**R4-2403006 Ad-hoc meeting minutes for [110][318] NR\_FR1\_lessthan\_5MHz\_BW\_demod**

*Type: For: Information  
   
 Source: Nokia*

**Decision: Noted**

### 8.11 Enhancement of TRP and TRS requirements and test methodologies

**R4-2400717 ELEMENT - Measurement results for 3GPP Rel-18 TRP TRS AC lab alignment LAD1 and LAD2**

*Type: other For: Information  
 Source: Element Materials Technology*

**Decision: Noted**

**R4-2400718 ELEMENT - Measurement results for 3GPP Rel-18 TRP TRS AC lab alignment LAD3 and LAD4**

*Type: other For: Information  
 Source: Element Materials Technology*

**Decision: Noted**

**R4-2402418 Adding NR channel bandwidths for OTA TRP/TRS requirements testing**

*Type: discussion For: Approval  
 Source: Orange, Vodafone, T-Mobile USA, Deutsche Telekom*

**Decision: Noted**

#### 8.11.1 Enhancement maintenance of test methodology

**R4-2402368 CR for CA in section 4.3.5 of TR 38.870**

*Type: draftCR For: Endorsement  
 38.870 v18.0.0 CR- rev Cat: (Rel-18)  
  
 Source: Huawei, HiSilicon*

**Abstract:**

text proposal on CA for section 4.3.5 in TR 38.870

**Decision: Postponed**

**R4-2402823 Effect of Random Phase Offset on UL MIMO**

*Type: discussion For: Approval  
 Source: Lenovo*

**Abstract:**

Session Chair: Treat this under email thread [331].

**Decision: Noted**

##### 8.11.1.1 Anechoic chamber test methodology

**R4-2400155 CR to TR38.870 on UL MIMO radiated output power metric**

*Type: CR For: Agreement  
 38.870 v18.0.0 CR-0001 rev Cat: F (Rel-18)  
  
 Source: Apple*

**Decision: Postponed**

Vivo: Not all the options are listed.

**R4-2400156 On multi-Tx radiated output power methodologies**

**Decision: Noted**

**Decision:** The document was **not treated**.

**R4-2400222 Discussion on Single-layer UL-MIMO TRP test method**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted**

**R4-2400270 on UL MIMO phase drift**

*Type: discussion For: Discussion  
 Source: Huawei Tech.(UK) Co.. Ltd*

**Abstract:**

simulation results to retrieve phase drift from a fix point power measurement over a time interval.

**Decision: Noted**

**R4-2400706 On Single-Layer UL MIMO for non-coherent/coherent UEs**

*Type: other For: Approval  
 Source: Keysight Technologies UK Ltd*

**Abstract:**

This contribution is providing further thoughts on SL-UL MIMO testing of coherent and non-coherent UEs including metric options 1 and 2

**Decision: Noted**

**R4-2400871 3GPP Rel-18 TRP TRS AC lab alignment activity from SRTC**

*Type: discussion For: Approval  
 38.161 v CR- rev Cat: (Rel-18)  
  
 Source: SRTC*

**Decision: Noted**

**R4-2400980 Measurement results for 3GPP Rel-18 TRP TRS AC lab alignment activity**

*Type: other For: Approval  
 Source: SGS Wireless*

**Decision: Revised to R4-2403066 (from R4-2400980)**

**R4-2403066 Measurement results for 3GPP Rel-18 TRP TRS AC lab alignment activity**

*Type: other For: Approval  
 Source: SGS Wireless*

**Decision: Noted**

**R4-2401537 draft CR to TR 38.870 on TRP TRS test method**

*Type: draftCR For: Endorsement  
 38.870 v18.0.0 CR- rev Cat: F (Rel-18)  
  
 Source: vivo*

**Decision: Endorsed**

**R4-2401540 Measurement results of 3GPP Rel-18 TRP TRS AC lab alignment activity-full set**

*Type: other For: Approval  
 Source: vivo*

**Decision: Noted**

**R4-2401543 Performance metric for coherent UL-MIMO**

*Type: other For: Approval  
 Source: vivo, CAICT, Huawei, HiSilcon, Xiaomi, OPPO, MediaTek*

**Decision: Noted**

**R4-2401800 TRP simulation of coherent UE with power and phase variation**

*Type: other For: Approval  
 Source: OPPO*

**Decision: Noted**

**R4-2401834 CAICT measurement results for 3GPP Rel-18 TRP TRS AC lab alignment activity-v2**

*Type: other For: Approval  
 Source: CAICT*

**Decision: Noted**

##### 8.11.1.2 Reverberation chamber test methodology

**R4-2400268 On AC and RC alignment criteria**

*Type: discussion For: Discussion  
 Source: Huawei Tech.(UK) Co.. Ltd*

**Abstract:**

a proposal for AC and RC alignment criteria

**Decision: Noted**

**R4-2400870 3GPP Rel-18 TRP TRS RC lab alignment activity from SRTC**

*Type: discussion For: Approval  
 38.870 v CR- rev Cat: (Rel-18)  
  
 Source: SRTC*

**Decision: Noted**

**R4-2401541 Measurement results of 3GPP Rel-18 TRP TRS RC harmonization activity-full set**

*Type: other For: Approval  
 Source: vivo*

**Decision: Noted**

**R4-2401801 3GPP Rel-18 TRP TRS LAD measurement for RC harmonization\_n28**

*Type: other For: Approval  
 Source: OPPO*

**Decision: Noted**

**R4-2401835 CAICT measurement results for 3GPP Rel-18 TRP TRS RC harmonization activity-v2**

*Type: other For: Approval  
 Source: CAICT*

**Decision: Noted**

**R4-2402986 Huawei measurement results for 3GPP Rel-18 TRP TRS RC harmonization**

*Type: For: Discussion  
   
 Source: Huawei*

**Decision: Noted**

##### 8.11.1.3 MU assessment

**R4-2401538 General discussions and MU impacts of TRP TRS topics**

*Type: other For: Approval  
 Source: vivo*

**Decision: Noted**

##### 8.11.1.4 Testing time reduction

#### 8.11.2 Performance requirements

**R4-2400217 3GPP Rel-18 TRP TRS LAD measurements for AC lab alignment - Sporton**

*Type: other For: Approval  
 Source: Sporton International Inc*

**Decision: Noted**

**R4-2400269 on TRP metric for UL MIMO**

*Type: discussion For: Discussion  
 Source: Huawei Tech.(UK) Co.. Ltd*

**Abstract:**

proposal for a new TRP metric, combining both option 1 and option 2

**Decision: Noted**

**R4-2400523 Views on Rel18 TRP TRS lab alignment timelines and performance campaign working procedure**

*Type: discussion For: Agreement  
 Source: Apple*

**Decision: Noted**

**R4-2400551 3GPP Rel-18 TRP TRS LAD measurements for AC lab alignment - Sporton n28**

*Type: other For: Approval  
 Source: Sporton International Inc*

**Decision: Noted**

**R4-2401183 Discussion on 2TX configuration**

*Type: discussion For: Discussion  
 38.161 v CR- rev Cat: ()  
  
 Source: xiaomi*

**Decision: Noted**

**R4-2401539 Analysis of 3GPP TRP TRS AC lab alignment and RC harmonization measurement results-phase 2**

*Type: other For: Approval  
 Source: vivo*

**Decision: Noted**

**R4-2401802 Update on LAD1 measurement data for lab alignment**

*Type: other For: Approval  
 Source: OPPO*

**Decision: Noted**

**R4-2401803 3GPP Rel-18 TRP TRS LAD measurement for AC lab alignment\_n28**

*Type: other For: Approval  
 Source: OPPO*

**Decision: Noted**

**R4-2401833 Discussion on TRP requirements**

*Type: other For: Approval  
 Source: CAICT*

**Decision: Noted**

**R4-2402254 Discussion on FR1 TRP TRS remaining issues**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2402852 Issues related to the measurement campaign for FR1 OTA TRP/TRS minimum performance requirements definition**

**Decision: Noted**

**Decision:** The document was **not treated**.

#### 8.11.3 Moderator summary and conclusions

**R4-2402671 Topic summary for [110][331] NR\_FR1\_TRP\_TRS\_enh**

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

**Abstract:**

[110][300] BDaT Session AI 8.11.1.1, 8.11.1.2, 8.11.1.3, 8.11.1.4, 8.11.2

**Decision: Noted**

**R4-2402875 Way forward on [110][331] NR\_FR1\_TRP\_TRS\_enh**

*Type: other For: Approval  
 Source: Vivo*

**Decision: Approved**

**R4-2402985 Ad-hoc meeting minutes for [110][331] NR\_FR1\_TRP\_TRS\_enh**

*Type: For: Information  
   
 Source: vivo*

**Decision: Noted**

**Issue 1-1-1: Performance metric for Coherent UE support multiple TPMI index 2~5**

Apple: We are working on another option with Huawei that seems to be a middle ground between option 1 and option 2. The major difference between option 1 and option 2 is post processing of data.

Huawei: Call it option 3. The main difference between option 1 and option 2 is that option 2 is going for the best but option 1 is averaging across 4pi. This approach is integrating the main beam over hemisphere centered about the main beam.

R&S: Need further detail. If the 4 beams are concentrated in one region, we would lose the average over the entire sphere.

Apple: We need data to apply to option 3.

Moderator: Averaging of TRP is a well used approach from 3G and 4G. The intention is to provide general information rather than specific information about performance in any given condition. Option 3 combines option 1 and 2. Option 1 measures only 2 TPMI, but options 2 and 3 requires all TPMI. For future 3Tx and 4Tx phones, will need to measure many TPMI’s. We can add an option 3, but we need clear guidance on how to move forward rather than keeping all options open.

Vivo: We have some questions on option 3. Without averaging over the entire sphere, we lose information about performance in different directions from main beam. We would be willing to consider option 3.

Apple: We are not ready to downselect but we would like to evaluate all 3 options with data for the next meeting to make a decision.

Oppo: Difficult to reach consensus on option 3 in just one meeting. Some details are not yet finalized, for example, how to identify main beam or how large range of EIRP to be collected. One meeting may not be sufficient. Option 3 is not a comparable metric to 1Tx TRP.

Sony: Option 1 and option 2 have clear physical meaning. But option 3 is a compromise but loses the physical meaning.

Samsung: Same view as Oppo and Sony. It is premature to consider option 3. It may be difficult to identify the direction of the main beam, so this approach may not be practical.

CAICT: Similar view as Oppo, Sony, and Samsung. It may be difficult to find a timely solution around option 3.

Keysight: A lot of open questions for option 3. From a TE vendor, different systems could identify different hemispheres for the same device. Options 1 and 2 do not require to TE to find a beam direction so do not suffer from this problem.

Apple: Identifying the beam is done in post processing.

TIM: Agree with Apple. There seems to be no solution between option 1 and option 2. We should use the same set of data for all 3 options.

Vivo: Feedback from basestation is implementation dependent.

Apple: Option 2 is the best case in an ideal network. Option 1 averaging decouples the UE from the network.

Orange: Option 1 is not realistic, not based on network feedback. We suggest investigating option 3 as a compromise.

CMCC: We prefer option 1. Option 2 is artificially design and may not be realized in an actual network.

MVG: Support Apple, TIM, Orange. Prefer option 2. We are not testing realistic scenario with either option 1 or option 2.

Keysight: We had previously heard option 2 is realistic, but now we are hearing Option 2 is idealistic. OTA testing in general is not realistic. It is representative and repeatable. Network feedback has generally not be incorporated into OTA testing.

CTC: BS considers many factors before deciding on TPMI index.

Sony: So far, we would prefer option 1 and 2 over option 3 since it is not clear how option 3 represents performance in the field.

**Issue 2-2-4: RC vs AC harmonization criteria**

***AC results are reference for comparison. some initial options for further consideration***

* ***Option 1: compare the averaged value of each method***
* ***Option 2: compare the max deviation of RC and AC from each test lab***
* ***Option 3: compare RC and AC from different test lab with same devices***

***Further discuss whether some of RC configurations should be clearly specified, if harmonization conclusion is reached.***

Bluetest: The three options do not include the proposal from Huawei which may be considered as a 4th option.

* + An RC lab is considered harmonized with AC if the differences between both TRP and TRS values from the RC lab and AC averages across participating AC labs come within the AC MU values for all lab alignment devices. (Huawei)

We propose remove option 2 from consideration.

Oppo: What is the difference between option 1 and option 3?

CAICT: Similar concern with Oppo. Support the proposal to remove option 2.

R&S: Option 1 and option 3 have different meaning. Agree that 4th option should be considered.

Vivo: Prefer to keep all options open

CAICT: Need clarification on option 3.

Qualcomm: Option 1 and option 4 are equivalent

Huawei: Agree with QC. Option 4 includes an MU value so allows convergence within an MU.

Bluetest: Option 3 is regarding the max deviation across the device, not the lab. Can reword option 3 as

* ***Option 3: compare max deviation RC and AC with same devices***

Vivo: Option 3 allows comparison across labs, i.e., RC from lab 1 with AC from lab 2

Agreement: Options 1, 2, 3

**Issue 2-3-3: Measurements plan shared by test labs for performance measurement campaign**

* Proposals
  + **Proposal 1: Check the latest feedback from test labs on their plan for performance measurement campaign in Table 2-1. Also check the latest status of interested operators on devices provisioning. (moderator)**
* Recommended WF
  + TBA.

**Table 2-1: Current plan from test labs on device measurement for RAN4 data pool**



Moderator proposed WF for online session:

* + Based on current feedback of test labs, EU operators could hand carry and transfer devices to test labs during RAN4#110 and RAN#103 meeting.
  + Test labs share the UE model information to MCC based on agreed working procedure as soon as possible. According to actual measurement progress in each test labs, each test lab can further update the UE information with MCC.
  + Statistics of UE information can be shared by RAN4 secretary after post-processing to RAN4 reflector before RAN4#110bis meeting.

TIM: Devices provided should be balanced between operator community and vendor community. We can provide 18 devices.

Apple: Not all of the other devices not provided by operators is provided by OEM’s. Balance is already achieved.

TIM: Concern is we don’t know where the devices come from

### 8.12 Enhancement of Multiple Input Multiple Output Over-the-Air test methodology and requirements for NR UEs

#### 8.12.1 FR2 MIMO OTA test methodology enhancement maintenance

**R4-2400031 Template for 3GPP FR2 MIMO OTA Measurement Campaign**

*Type: other For: Approval  
 Source: CAICT*

**Decision: Revised to R4-2403014 (from R4-2400031)**

**R4-2403014 Template for 3GPP FR2 MIMO OTA Measurement Campaign**

*Type: other For: Approval  
 Source: CAICT*

**Decision: Approved**

**R4-2400194 On FR2 MIMO OTA Lab Alignment PADs measurement results**

*Type: discussion For: Information  
 Source: Apple*

**Decision: Noted**

#### 8.12.2 FR1 MIMO OTA test methodology enhancement maintenance

**R4-2400029 CR to TS 38.761 on FR1 MIMO OTA channel model validation results**

*Type: CR For: Agreement  
 38.761 v18.0.0 CR-0001 rev Cat: F (Rel-18)  
  
 Source: CAICT, CMCC, BUPT*

**Decision: Revised to R4-2403015 (from R4-2400029)**

**R4-2403015 CR to TS 38.761 on FR1 MIMO OTA channel model validation results**

*Type: CR For: Agreement  
 38.761 v18.0.0 CR-0001 rev Cat: F (Rel-18)  
  
 Source: CAICT, CMCC, BUPT*

**Decision: Agreed**

**R4-2400030 Template for 3GPP Rel-18 FR1 MIMO OTA Measurement Campaign**

*Type: other For: Approval  
 Source: CAICT*

**Decision: Revised to R4-2403019 (from R4-2400030)**

**R4-2403019 Template for 3GPP Rel-18 FR1 MIMO OTA Measurement Campaign**

*Type: other For: Approval  
 Source: CAICT*

**Decision: Approved**

**R4-2400032 CDL-C UMa channel model validation results for band n1**

*Type: discussion For: Discussion  
 Source: CAICT*

**Decision: Noted**

**R4-2400193 On FR1 MIMO OTA Lab Alignment PADs measurement results**

*Type: discussion For: Information  
 Source: Apple*

**Decision: Revised to R4-2403017 (from R4-2400193)**

**R4-2403017 On FR1 MIMO OTA Lab Alignment PADs measurement results**

*Type: discussion For: Information  
 Source: Apple*

**Decision: Noted**

**R4-2400195 On FR1 MIMO OTA channel model validation**

*Type: discussion For: Information  
 Source: Apple*

**Decision: Noted**

**R4-2400197 CR to 38.151 on FR1 MIMO OTA channel model power phase validation**

*Type: CR For: Agreement  
 38.151 v17.6.0 CR-0026 rev Cat: F (Rel-17)  
  
 Source: Apple*

**Decision: Withdrawn**

**R4-2400198 Update to the FR1 channel model validation results**

*Type: CR For: Agreement  
 38.761 v18.0.0 CR-0002 rev Cat: F (Rel-18)  
  
 Source: Mediatek India Technology Pvt.*

**Decision: Agreed**

**R4-2400267 on 2Rx vs 4Rx performance in 2x2 MIMO**

*Type: discussion For: Discussion  
 Source: Huawei Tech.(UK) Co.. Ltd*

**Abstract:**

discuss the relationship between 2Rx and 4Rx performance in 2x2 MIMO

**Decision: Noted**

**R4-2400534 Update to FR1 Channel model validation**

*Type: CR For: Agreement  
 38.151 v17.6.0 CR-0027 rev Cat: F (Rel-18)  
  
 Source: MVG Industries, Spirent, Apple, ETS-Lindgren, Telecom Italia, Sony*

**Decision: Agreed**

**R4-2400535 Discussion Paper on 38.151 C3.6**

*Type: discussion For: Discussion  
 38.151 v CR- rev Cat: (Rel-18)  
  
 Source: MVG Industries,Apple, Spirent, ETS-Lindgren, Telecom Italia, Sony*

**Decision: Noted**

**R4-2400536 Update to FR1 Calibration Procedure**

*Type: CR For: Agreement  
 38.151 v17.6.0 CR-0028 rev Cat: F (Rel-18)  
  
 Source: MVG Industries, Keysight, Spirent*

**Decision: Revised to R4-2403016 (from R4-2400536)**

**R4-2403016 Update to FR1 Calibration Procedure**

*Type: CR For: Agreement  
 38.151 v17.6.0 CR-0028 rev Cat: F (Rel-18)  
  
 Source: MVG Industries, Keysight, Spirent*

**Decision: Agreed**

**R4-2401184 Channel model validation results for Band n1,n5 and n8**

*Type: discussion For: Discussion  
 38.761 v CR- rev Cat: ()  
  
 Source: xiaomi*

**Decision: Noted**

**R4-2401185 TP for TR 38.761 update the lab 5 channel model validation for n28**

*Type: other For: Approval  
 38.761 v CR- rev Cat: (Rel-18)  
  
 Source: xiaomi*

**Abstract:**

Session Chair: The Tdoc was submitted to wrong "Type". It should be formal CR, so this is withdrawn.

**Decision: Withdrawn**

**R4-2401186 TP to TR 38.761 on the remaining lab 5 channel model validation for n41 and n78**

*Type: other For: Approval  
 38.761 v CR- rev Cat: (Rel-18)  
  
 Source: xiaomi*

**Abstract:**

Session Chair: The Tdoc was submitted to wrong "Type". It should be formal CR, so this is withdrawn.

**Decision: Withdrawn**

**R4-2401804 UE positioning for FR1 MIMO OTA**

*Type: other For: Approval  
 Source: OPPO*

**Decision: Noted**

**R4-2402310 Discussion on FR1 MIMO OTA testing method**

*Type: discussion For: Approval  
 Source: Google Inc.*

**Decision: Noted**

**R4-2402949 Update the lab 5 channel model validation for n28**

*Type: CR For: Agreement  
 38.761 v18.0.0 CR-0003 rev Cat: F (Rel-18)  
  
 Source: Xiaomi*

**Decision: Agreed**

**R4-2402950 On the remaining lab 5 channel model validation for n41 and n78**

*Type: CR For: Agreement  
 38.761 v18.0.0 CR-0004 rev Cat: F (Rel-18)  
  
 Source: Xiaomi*

**Decision: Agreed**

#### 8.12.3 Performance requirements

**R4-2400033 Analysis of 3GPP Rel-18 FR1 MIMO OTA lab alignment results**

*Type: other For: Approval  
 Source: CAICT*

**Decision: Noted**

**R4-2401805 Consideration on FR1 MIMO OTA measurement campaign**

*Type: other For: Approval  
 Source: OPPO*

**Decision: Noted**

**R4-2402255 Discussion of FR2 MIMO OTA on PC3 campaign and PC1 metric**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

#### 8.12.4 Moderator summary and conclusions

**R4-2402672 Topic summary for [110][332] NR\_MIMO\_OTA\_enh**

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

**Abstract:**

[110][300] BDaT Session AI 8.12.1, 8.12.2, 8.12.3

**Decision: Noted**

A graph with different colored squares

Description automatically generated

Fig. 2 Deviation between each measurement result and the average value **(without systematic offset)**

Moderator: Propose that lab 3 for PAD-2 does not meet updated alignment pass/fail limit. We have 5 aligned results. Lab 3 may resubmit for the next meeting.

Apple: The CR has not been approved yet.

Keysight:

~~Agreement: The moderator proposal is agreed pending agreement of the RAN4 CR.~~

Agreement: Alignment pass/fail limit is derived from latest MU agreed in RAN5.

Agreement: Conclude first round alignment with 5 labs. The remaining lab can resubmit the measurement result at the next meeting.

**Issue 2-2: FR2 MIMO OTA lab alignment measurement results**

* Observations
  + Observation 1: Apple submitted their measurement results of all PADs in R4-2400194.
* Recommended WF
  + Volunteer labs are encouraged to share their status and progress, based on which the further plan and potential adjustments of lab alignment can be discussed.

Moderator: The previous agreement is to complete first round of lab alignment by the next meeting.

Agreements:

1. Complete first round alignment at the next meeting with the results from at least three labs. Allow remaining labs to submit afterwards.
2. Return the PADs to ETS by RAN4 #110bis.
3. All labs can submit data but whether the data is included in the pool depends on alignment.
4. The deadline to submit the data for measurement campaign and lab alignment measurement result is RAN4 #111.

**Issue 2-3-1: Devices provision for FR2 MIMO OTA Measurement Campaign**

Moderator: We need at least 8 devices, but there are few devices and difficult to obtain in China where most of the labs are located. Can volunteers provide devices?

Currently we have 3 devices. Apple is targeting to complete at least 5 devices on best effort basis.

Request volunteer companies to provide devices by the next meeting.

|  |  |  |
| --- | --- | --- |
| Company Name | How many FR2 devices can be provided | To which volunteer lab(s) [pending on the lab alignment outcome] |
|  |  | e.g., x to Lab A, y to Lab B |
|  |  |  |
|  |  |  |

**R4-2402876 Way forward on [110][332] NR\_MIMO\_OTA\_enh**

*Type: other For: Approval  
 Source: CAICT*

**Decision: Approved**

**R4-2403011 Ad-hoc meeting minutes for [110][332] NR\_MIMO\_OTA\_enh**

*Type: For: Information  
   
 Source: CAICT*

**Decision: Noted**

### 8.13 NR demodulation performance evolution

#### 8.13.1 General aspects

**R4-2400799 Updates to TR38.878**

*Type: CR For: Agreement  
 38.878 v18.1.0 CR-0003 rev Cat: F (Rel-18)  
  
 Source: China Telecom*

**Decision: Agreed**

#### 8.13.2 Advanced receiver to cancel inter-user interference for MU-MIMO

##### 8.13.2.1 Receiver assumption and NWA signaling

**R4-2400457 On UE feature for advanced receiver for MU-MIMO**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted**

**R4-2400458 On NWA for advanced receiver for MU-MIMO**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted**

**R4-2400556 MU-MIMO demod enhancement**

*Type: discussion For: Approval  
 Source: Qualcomm, Inc.*

**Decision: Noted**

**R4-2400800 Discussion on the receiver assumption and signaling aspects for the advanced receiver for MU-MIMO**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted**

**R4-2400801 Offline e-mail discussion minutes on RAN2 reply LS for NWA signalling**

*Type: discussion For: Information  
 Source: China Telecom*

**Decision: Noted**

**R4-2400802 Reply LS on RRC network assistant signalling for advanced receiver on MU-MIMO scenario**

*Type: LS out For: Approval  
 to RAN2, cc RAN1  
 Source: China Telecom, CATT*

**Decision: Revised to R4-2403064 (from R4-2400802)**

**R4-2403064 Reply LS on RRC network assistant signalling for advanced receiver on MU-MIMO scenario**

*Type: LS out For: Approval  
 to RAN2, RAN1  
 Source: China Telecom, CATT*

**Decision: Revised to R4-2403085 (from R4-2303064)**

**R4-2400879 On Advanced Receivers - Receiver assumption and NWA signalling**

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

**Abstract:**

This paper presents Nokia's views on various open issues with relation to receiver assumptions and NWA signalling for advanced receivers

**Decision: Noted**

**R4-2401111 discussion on advanced receiver assumption and NWA signaling for MU-MIMO**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2401162 Discussion on MIMO-IC on MU-MIMO**

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

**Decision: Noted**

**R4-2401545 On receiver assumption and UE capabilities**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On remaining issues for the network assistance signaling and UE capabilities

**Decision: Noted**

**R4-2401673 Discussion on receiver assumption and NWA signalling on advanced receiver for MU-MIMO**

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

**Decision: Noted**

**R4-2402040 Discussion on Receiver assumption and NWA signaling for MU-MIMO**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted**

**R4-2403085 Reply LS on RRC network assistant signalling for advanced receiver on MU-MIMO scenario**

*Type: For: Approval  
   
 Source: China Telecom, CATT*

**Decision: Return to**

Comments on the final draft in R4-2403086

Apple: We are ok with the content of the LS, but it doesn’t not send a positive message about RAN4 to other working groups.

China Telecom: We are ok with the content, but we feel that RAN1/RAN2 may not understand or care about the long sentences we have captured.

Ericsson: Similar view as Apple

Samsung: Same view as Apple and Ericsson

##### 8.13.2.2 Test parameters and simulation results

**R4-2400459 On demod for requirements for MU-MIMO with advanced receiver**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted**

**R4-2400460 Simulation results for MU-MIMO with advanced receiver**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted**

**R4-2400803 Discussion on test parameters for the advanced receiver for MU-MIMO**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted**

**R4-2400804 Discussion on test parameters for the advanced receiver for MU-MIMO: Simulation results**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted**

**R4-2400805 Phase II simulation result collection for advanced receiver for MU-MIMO**

*Type: discussion For: Information  
 Source: China Telecom, Apple*

**Decision: Noted**

**R4-2400880 On Advanced Receivers - Test parameters**

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

**Abstract:**

This paper presents Nokia's views on various open issues with relation to test parameters for advanced receivers

**Decision: Noted**

**R4-2400881 On Advanced Receivers - Test parameters - Simulations**

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

**Abstract:**

This paper presents Nokia's simulation results for Advanced receivers.

**Decision: Noted**

**R4-2401112 discussion on advanced receiver test parameters for MU-MIMO**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2401163 Simulation results of MIMO-IC on MU-MIMO**

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

**Decision: Noted**

**R4-2401544 On parameter assumptions for phase II**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On remaining issues for phase II parameters

**Decision: Noted**

**R4-2401546 Simulation resutls for phase II**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Submit our simulation results

**Decision: Noted**

**R4-2401674 Discussion on test parameters for advanced receiver for MU-MIMO**

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

**Decision: Noted**

**R4-2401675 Simulation results on advanced receiver for MU-MIMO**

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

**Decision: Noted**

**R4-2402041 Discussion on advanced receiver test parameters for MU-MIMO**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted**

**R4-2402042 Simulation results for MU-MIMO with R-ML receiver**

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

**Decision: Noted**

#### 8.13.3 Absolute physical layer throughput requirements with link adaptation

#### 8.13.4 Moderator summary and conclusions

**R4-2402659 Topic summary for [110][319] NR\_demod\_enh3\_Part1**

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

**Abstract:**

[110][300] BDaT Session AI 8.13.1, 8.13.2.1, 8.13.2.2, 8.13.3

**Decision: Noted**

**R4-2402864 Way forward on [110][319] NR\_demod\_enh3\_Part1**

*Type: other For: Approval  
 Source: CTC*

**Decision: Approved**

**R4-2403009 Ad-hoc meeting minutes for [110][319] NR\_demod\_enh3\_Part1**

*Type: For: Information  
   
 Source: CTC*

**Decision: Noted**

**Issue 1-2-1: Whether to consider capability signalling for UE modulation order blind detection**

* *Status in the last meeting WF in R4-2321114*

|  |
| --- |
| *UE capability for different UE Types*   * + *Different capability based on if modulation order is signaled and not signaled*   + *For capability when modulation order is not signaled (index 6)*     - *Option 1: UE capability signaling*     - *Option 2: UE declaration* |

* Proposals:
  + Option 1: UE capability signaling (Apple, Samsung, MTK, ZTE, Nokia, CTC)
  + Option 2: UE declaration (Qualcomm, Huawei, Nokia E/// ZTE CTC as compromise)

MediaTek: We still support capability. However, if all other companies are willing to compromise, we can also.

Apple: Our preference is also option 1. To move forward we are ok to compromise to UE declaration.

Nokia: The most optimal for the network is to have capability to optimize network configuration. We see it is potentially possible that a network may favor one solution. Based on this, we are willing to compromise to declaration.

CTC: We agree with the motivation for option 1. We are also ok to compromise.

Option 2 is agreed.

**Issue 1-1-4: On DMRS power boosting configurations**

* + Option 1: The new RRC assistant signaling on DMRS power boosting configurations is no longer needed based on RAN1 agreements. (CTC, Apple, Ericsson, Qualcomm, ZTE, Samsung, UniSoc, MTK, Nokia)
  + Option 2: Keep previous RAN4 conclusion. (Huawei)
* Huawei’s proposal on the RAN4 feedback to RAN1 and RAN2:

|  |
| --- |
| RAN4 feedback:  The introduction of this signalling depends on the understanding of the RAN1 conclusion shown above. However, companies in RAN4 have different understanding. RAN4 kindly asks RAN1 that if scheduling of co-scheduled UEs with non-aligned DMRS power boosting between co-scheduled UEs is prohibited in specification. If RAN1 thinks it is not prohibited, RAN4 thinks the introduction of the signalling on DMRS power boosting is needed, otherwise, RAN4 thinks it is not needed.  **To RAN1**  **ACTION:** RAN4 respectfully requests RAN1 to feedback on the question raised by RAN4 on the understanding of RAN1’s conclusion. |

Qualcomm: *The following specification in TS 38.214 is interpreted as* ***the UE may assume that “CDM groups without data” are not used for data transmission for any co-scheduled user in the same serving cell.***

We think the RAN1 conclusion is clear w/o the need for further interpretation.

MediaTek: Same view as Qualcomm

Nokia: Same view. “May assume” means the UE should do this. We don’t see any reason to change the understanding, don’t see the need to ask RAN1.

Huawei: The words “shall”, “should”, “may” have specific meaning in specification language. “May assume” means the UE can assume, but also cannot.

Nokia: When the spec indicates “may assume”, the UE implementation will likely make that assumption

Huawei: We need to know what is the consequence in the other case besides the “may assume”

Qualcomm: UE is based on hardware implementation and must choose to assume or not. It is not flexible.

Apple: “May” indicates permission to do something. May assume is present in several places in RAN1 specification. If this instance is called to question, then the others “may” need to be also

Chair: Is there any company who would oppose sending an LS to RAN1 for clarification, subject to agreeable wording of the LS?

Nokia, Ericson, Apple, Qualcomm, Samsung: We don’t think it’s necessary

Moderator: Is the original WF acceptable? The original WF indicates to RAN1 the understanding of RAN4. This is cc’d to RAN1 so RAN1 has a chance to respond.

Nokia: Original WF and LS may need rewording now that we’ve checked the drafting rules on “may”

**Issue 1-2-3: Capability granularity for the R-ML capability signaling**

* + Option 1: Per UE. With the assumption that UE may have limited processing resources to support R-ML on all the carriers in CA with large CHBW (China Telecom, Qualcomm, Nokia, MTK, Ericsson, ZTE)
  + Option 2: Introduce per CC per band per band combination (Per-FSPC) UE capability (Apple, Samsung, MTK, Huawei, QC)
* Moderator recommendation
  + Per UE. With the following description captured in the UE feature list:
    - UE can support R-ML in single carrier operation, and on one or more carriers in CA operation,
    - The network does not expect the UE to perform R-ML for every CC under CA scenario.

Nokia: “For every CC” means “at least one”. At least one CC should perform R-ML.

Huawei: Some UE’s may disable R-ML when configured for CA. We have only discussed single carrier, we have not defined any CA requirement. Single carrier should be the baseline.

Qualcomm: Adding CA does not affect MU-MIMO on the current carrier. The additional carrier may not be able to. Is option 2 possible to signal?

Apple: Per FSPC means UE can indicate at a per CC level whether you support a feature or not. For single carrier, the feature would be supported. We are ok with Huawei proposal that per UE indication only applies to single carrier.

Huawei: Proposed wording for feature list

* + Per UE. With the following description captured in the UE feature list:
    - UE supports R-ML on MU-MIMO on single carrier operation
    - UE optionally supports R-ML on MU-MIMO on one or more carriers in CA opearation
    - ~~[UE is not expected to perform R-ML for every CC under CA scenario.]~~

Nokia: Does the number of PRG corresponding to the largest single carrier the UE is capable of supporting infer the UE is capable of the same total number of PRG’s across CC’s when configured for CA?

Apple: No

### 8.14 Expanded and improved NR positioning

#### 8.14.1 RF requirements maintenance

#### 8.14.2 RRM core requirements maintenance

##### 8.14.2.1 General aspects

##### 8.14.2.2 SL Positioning

##### 8.14.2.3 LPHAP use case

##### 8.14.2.4 RedCap Positioning

##### 8.14.2.5 PRS/SRS bandwidth aggregation

##### 8.14.2.6 Carrier Phase Positioning

#### 8.14.3 RRM performance requirements

##### 8.14.3.1 SL Positioning

##### 8.14.3.2 LPHAP use case

##### 8.14.3.3 RedCap Positioning

##### 8.14.3.4 PRS/SRS bandwidth aggregation

##### 8.14.3.5 Carrier Phase Positioning

#### 8.14.4 Moderator summary and conclusions

### 8.15 Multi-carrier enhancements for NR

#### 8.15.1 Maintenance for switching time and other RF aspects up to 3 or 4 bands

##### 8.15.1.1 UL Tx switching with single TAG

##### 8.15.1.2 UL Tx switching with multiple TAGs (CRs corresponding to RAN discussion can be submitted in this agenda)

#### 8.15.2 RRM core requirements maintenance

#### 8.15.3 RRM performance requirements

#### 8.15.4 Moderator summary and conclusions

### 8.16 Further NR mobility enhancements

#### 8.16.1 RRM Core requirements maintenance

##### 8.16.1.1 L1/L2 based inter-cell mobility

###### 8.16.1.1.1 General aspects and scenarios

###### 8.16.1.1.2 L1-RSRP measurement requirements

###### 8.16.1.1.3 L1/L2 inter-cell mobility delay requirements

###### 8.16.1.1.4 Others

##### 8.16.1.2 NR-DC with selective activation of cell groups via L3 enhancements

##### 8.16.1.3 Improvement on SCell/SCG setup delay

##### 8.16.1.4 Enhanced CHO configurations

#### 8.16.2 RRM performance requirements

##### 8.16.2.1 L1/L2 based inter-cell mobility

##### 8.16.2.2 Other RRM performance requirements

#### 8.16.3 Moderator summary and conclusions

### 8.17 Dual Tx/Rx Multi-SIM for NR

#### 8.17.1 RRM requirements maintenance for Rel-17 MUSIM gaps

##### 8.17.1.1 General aspects

##### 8.17.1.2 Collisions handling and others

#### 8.17.2 RRM performance requirements

#### 8.17.3 Moderator summary and conclusions

### 8.18 NR NTN enhancement

#### 8.18.1 General aspects

##### 8.18.1.1 System parameters

**R4-2401565 Draft CR on title header for enhanced NR\_ARFCN**

*Type: draftCR For: Endorsement  
 38.101-5 v18.4.0 CR- rev Cat: F (Rel-18)  
  
 Source: LG Electronics Finland*

**Abstract:**

Term enhanced added to the title of the table. 5.4.2.3-2

**Decision: Revised to R4-2402964 (from R4-2401565)**

**R4-2402964 Draft CR on title header for enhanced NR\_ARFCN**

*Type: draftCR For: Endorsement  
 38.101-5 v18.4.0 CR- rev Cat: F (Rel-18)  
  
 Source: LG Electronics Finland*

Abstract:

Term enhanced added to the title of the table. 5.4.2.3-2

**Decision: Postponed**

CATT: There is inconsistency with SAN specification. SAN already uses “enhanced”

NEC: This should be treated in main session

Thales: This is more related to general requirements

**R4-2402262 Response LS on the systems parameters for NTN above 10 GHz**

*Type: LS out For: Approval  
 to RAN1  
 Source: Ericsson*

**Abstract:**

RAN1 sent a reply LS in R1-2312553 with questions related to a RAN4 LS R4-2305926. In this reply LS we answer the questions from RAN1.

**Decision: Withdrawn**

##### 8.18.1.2 Regulatory information

**R4-2400509 Regulatory Analysis of the Ku Band**

*Type: discussion For: Information  
 Source: Intelsat*

**Decision: Noted**

**R4-2400516 Regulatory status of NTN in bands above 10 GHz post WRC-23**

*Type: discussion For: Information  
 Source: Eutelsat Group*

**Decision: Noted**

##### 8.18.1.3 Others

**R4-2401976 Revised NR NTN enhancement workplan**

*Type: Work Plan For: Approval  
 Source: NTT DOCOMO, INC.*

**Decision: Approved**

**R4-2402927 CR proposal to add Doppler and Delay variation examples as a function of time for NGSO and GSO in a new Annex**

*Type: CR For: Agreement  
 38.863 v18.0.0 CR-0013 rev Cat: B (Rel-18)  
  
 Source: THALES*

**Abstract:**

Annex for TR 38.863 providing examples of Doppler shift and Delay variation versus time.

**Decision: Agreed**

#### 8.18.2 Co-existence study for above 10GHz bands

**R4-2400039 Updated co-existence simulation result for above 10GHz bands**

*Type: other For: Information  
 Source: CATT*

**Decision: Noted**

**R4-2400040 Further discussion on Co-existence simulation result for above 10GHz bands**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted**

**R4-2400223 Further discussion on coexistence study between TN and NTN above 10GHz bands**

*Type: other For: Approval  
 Source: Qualcomm Incorporated*

**Decision: Noted**

**R4-2400510 Ku Band Standardization: Topics on Coexistence Studies**

*Type: discussion For: Information  
 Source: Intelsat*

**Decision: Noted**

**R4-2401118 CR on TR38.863 Addition of simulation assumptions in above 10GHz**

*Type: CR For: Agreement  
 38.863 v18.0.0 CR-0012 rev Cat: B (Rel-18)  
  
 Source: Samsung Electronics, Thales*

**Abstract:**

CR to introduce simulation assumptions of co-existence studies for NTN in above 10GHz

**Decision: Agreed**

**R4-2402060 Discussion on simulation conclusion for Ka band NTN UE ACS**

*Type: other For: Approval  
 Source: Huawei, HiSilicon*

**Decision: Noted**

**R4-2402327 NTN enhancement - further investigation on coexistence**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

Based on last RAN4 meeting conclusions, this contribution is investigating furhter the coexistence aspects of this WI and concludes on ACLR/ACS for SAN and VSAT

**Decision: Noted**

#### 8.18.3 SAN RF requirements

**R4-2400041 Further discussion on SAN RF requirements for above 10GHz bands**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted**

**R4-2402328 NTN enhancement: Running CR to TS 38.108 NTN Ka-band**

*Type: CR For: Agreement  
 38.108 v18.1.0 CR-0055 rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

This contribution is the running CR to TS 38.108 capturing all endorsed draft CRs

**Decision: Revised to R4-2402965 (from R4-2402328)**

**R4-2402965 NTN enhancement: Running CR to TS 38.108 NTN Ka-band**

*Type: CR For: Agreement  
 38.108 v18.1.0 CR-0055 rev Cat: B (Rel-18)  
  
 Source: Ericsson*

Abstract:

This contribution is the running CR to TS 38.108 capturing all endorsed draft CRs

**Decision: Endorsed**

**R4-2402520 Further discussion on SAN RF requirements for NTN in Ka-band**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted**

**R4-2402524 Draft CR to TS 38.108 Clause 10.6 OTA out-of-band blocking**

*Type: draftCR For: Endorsement  
 38.108 v18.1.0 CR- rev Cat: (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Endorsed**

**R4-2402525 Draft CR to TS 38.108 Clause 10.7 OTA in-channel selectivity**

*Type: draftCR For: Endorsement  
 38.108 v18.1.0 CR- rev Cat: (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2402966 (from R4-2402525)**

**R4-2402966 Draft CR to TS 38.108 Clause 10.7 OTA in-channel selectivity**

*Type: draftCR For: Endorsement  
 38.108 v18.1.0 CR- rev Cat: (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Endorsed**

#### 8.18.4 SAN RF conformance testing requirements

**R4-2400042 Discussion on SAN RF conformance testing requirements for above 10GHz bands**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted**

**R4-2402797 NTN Enhancement: Discussion on SAN RF Conformance Testing in FR2-NTN**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on RF conformance testing spects for SAN Type 2-O

**Decision: Noted**

#### 8.18.5 UE RF requirements

##### 8.18.5.1 Tx RF requirements

##### 8.18.5.2 Rx RF requirements

##### 8.18.5.3 PUSCH DMRS bundling requirements and others

#### 8.18.6 RRM core requirements

##### 8.18.6.1 NR-NTN RRM requirements in above 10 GHz bands

##### 8.18.6.2 Network verified UE location

##### 8.18.6.3 NTN-TN and NTN-NTN mobility and service continuity enhancements

#### 8.18.7 RRM performance requirements

#### 8.18.8 Demodulation performance requirements

**R4-2401716 Discussion on general issues for demodulation requirements for NR NTN enhancements**

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

**Decision: Noted**

**R4-2401719 Simulation assumption on demodulation requirements for NR NTN enhancements**

*Type: other For: Approval  
 Source: Huawei,HiSilicon*

**Decision: Approved**

##### 8.18.8.1 SAN demodulation performance requirements

**R4-2400043 Further discussion on SAN demodulation requirements for above 10 GHz bands**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted**

**R4-2400253 NR NTN SAN demodulation disussion**

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

**Decision: Noted**

**R4-2401402 Discussion on NR NTN enhancement SAN demodulation requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on open issues of SAN demodulation requirements for FR2-1 and FR1 bands

**Decision: Noted**

**R4-2401403 Simulation results for NR NTN enhancement SAN demodulation requirements**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Simulation results for FR2-1 PUSCH/PUCCH/PRACH and FR1 PUSCH DM-RS bundling

**Decision: Noted**

**R4-2401579 View on BS demodulation requirements for NTN enhancement**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2401717 Discussion on SAN demodulation requirements for NR NTN enhancements**

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

**Decision: Noted**

##### 8.18.8.2 UE demodulation performance and CSI requirements

**R4-2400254 NR NTN UE demodulation disussion**

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

**Decision: Noted**

**R4-2400461 On UE demod requirements for NR NTN enhancement**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted**

**R4-2400735 [NR\_NTN\_enh-Perf]Discussion on the performance requirements for NR NTN enhancements**

*Type: discussion For: Discussion  
 Source: Qualcomm India Pvt Ltd*

**Decision: Noted**

**R4-2400736 [NR\_NTN\_enh-Perf]Simulation results for NR NTN enhancements**

*Type: discussion For: Discussion  
 Source: Qualcomm India Pvt Ltd*

**Decision: Noted**

**R4-2401556 On UE demodulation requirement for NR NTN enhancement**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On open issues for UE demodulation requirement for NTN enh

**Decision: Noted**

**R4-2401557 Simulation results for NR NTN enhancement UE demodulation requirement**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Supporting simulation results

**Decision: Noted**

**R4-2401718 Discussion on UE demodulation requirements for NR NTN enhancements**

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

**Decision: Noted**

#### 8.18.9 Moderator summary and conclusions

**R4-2402645 Topic summary for [110][305] NR\_NTN\_enh\_Part1**

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

**Abstract:**

[110][300] BDaT Session AI 8.18.1.1, 8.18.1.2, 8.18.1.3

**Decision: Noted**

**Issue 1-1-1:** RAN4 revised workplan for the Rel-18 NR-NTN-enh work item

* Proposals
  + Option 1: Revised workplan for the Rel-18 NR-NTN-enh work item for RAN4 based on the WI exception RP-232859 (see [R4-2401976](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_110/Docs/R4-2401976.zip), NTT DOCOMO, INC.)

Chair: In order to close the WI by March the CR’s need to be agreed this meeting. Unclear what is the purpose of the work plan.

Chair: is there a big CR requested

Samsung: 38.101-5 big CR was requested and will be treated in UE RF in the main session

**Issue 1-1-2:** Mobile VSAT in Ka-band

* Proposals
  + Option 1: Rel-18 standards gap of Mobile VSAT to NGSO should be addressed in the Rel-19 RAN4 non spectrum package, now that the regulatory blocker has been removed.

ZTE: Mobile VSAT with NGSO needs WID revision. This can be discussed at that time if there is interest.

**R4-2402646 Topic summary for [110][306] NR\_NTN\_enh\_Part2**

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

**Abstract:**

[110][300] BDaT Session AI 8.18.3, 8.18.4

**Decision: Noted**

**Issue 1-1-1: SAN type 2-O out-of-band blocking requirement.**

* Proposals: Specify out-of-band blocking requirement with the following consideration:
  + For frequency range between 30MHz and 12.75GHz, to reuse the FR1 OOBB requirement
  + For frequency range between 12.75GHz and 2nd harmonic of upper frequency, the following service should be taken into account:
    - Ku-band UL
    - Frequency and timing reference signal between satellite nodes.
    - Wireless positioning between satellite
  + Requirement:

| Frequency range of interfering signal  (MHz) | Wanted signal mean power  (dBm) | Interferer RMS field-strength  (V/m) | Type of interfering signal |
| --- | --- | --- | --- |
| 30 to 12750 | EISREFSENS + 6 dB | 0.0029 | CW |
| 12750 to FUL,low – [1500] | EISREFSENS + 6 dB | 0.0029 | CW |
| FUL,high + [1500] to 2nd harmonic of the upper frequency edge of the *operating band* | EISREFSENS + 6 dB | 0.0029 | CW |

Thales: We agree with the values and requirements as they are. We were concerned about the inclusion of Ku band. We are ok with the requirement itself, but don’t agree with the justification.

Inmarsat: Same as Thales.

**Issue 1-2-1: SAN type 2-O in-channel selectivity requirement.**

* Proposals: Specify in-channel selectivity requirement considering an ICS value of:
  + 9 dBc as the IoT level is ~0dBc (ZTE)
  + 14 dBc (like for FR2 TN) as the IoT level is up to 5dBc (CATT)

ZTE: Cross polarization leakage results in higher IoT. We think only 10-20 dB isolation is achievable. We are ok with the 14 dBc

**R4-2402647 Topic summary for [110][307] NR\_NTN\_enh\_Part3**

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

**Abstract:**

[110][300] BDaT Session AI 8.18.2

**Decision: Noted**

**Issue 3-5: UE ACS**

* Recommended Way Forward:
  + The UE ACS value is [23]/[26]/[30]/[35], noting that additional solutions to address coexistence issues need to be further studied.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | SAN | | UE | |
| GEO | LEO | Fixed | Mobile |
| ACLR (dBc) | 12 | 12 | 14 | 14 |
| ACS  (dBc) | 18 | 24 | [23]/[25/6]/[30]/[35]1, 2 | [23]/[25/6]/[30]/[35]1, 2 |
| NOTE 1: Currently there’s no TN deployment in 17GHz.  NOTE 2: Additional solutions, for example adjusting guard bands, BS/SAN transmission power, antenna gain, or combinations thereof, etc., need to be further considered to address coexistence issues if TN is deployed in 17GHz. | | | | |

Inmarsat: ACS should be in square bracket because this is based on hypothetical scenario that doesn’t actually exist. Ok with [26], but reluctant to go higher than this. Even terrestrial BS is not higher than this. Ok with the notes except “**may** need to be further considered”

Eutelsat: Also ok with 26 dB which is consistent with FR2 BS. Above 26 dB would impact design and cost. Ok with [] and note.

Ericsson: We would prefer [30] since this would improve coexistence. We are willing to discuss cost impact.

ZTE: We don’t have a BS ACS requirement for this band in the past. Even for FR2-1, the ACS is derived based on synchronized adjacent TDD carriers. The ACS is intended to reject uplink. We prefer 30-35 dB, but could accept 30.

CATT: We also prefer 35 but can compromise to 30. With 30 dB, we would need additional accommodation, i.e., guardband

Qualcomm: 35 dB is needed based on the conclusion of the coexistence study. For implementation, we could consider compromise but don’t see where 26 is coming from. The “FR3” BS ACS argument is not justified. We can compromise to 30.

Huawei: Based on simulation assumptions, ACS should be >35 dB. From implementation we think 30-35. We cannot accept 26 dB.

Thales: We do not prefer []. The coex scenario studied does not exist and it is unfair to define a restrictive requirement. We suggest to start with the note and discuss the values afterwards.

Intelsat: 30 dB ACS is expensive, heavy. 25-26 dB is more acceptable based on size, cost, and performance.

Samsung: The note would be in the TR, not the TS.

Inmarsat: Another option is to not specify anything at all since the coex scenario doesn’t exist. We can reconsider if that scenario comes up. Unless we also specify requirement for future terrestrial bands in this range but we don’t think this is possible.

Samsung: Could modify the note to “Currently there is no band definition for TN in 17 GHz.”

Inmarsat: On note 2, another formulation could be “there are concerns that coexistence may not be guaranteed in case future TN systems are deployed in the 17 GHz frequency range”

ZTE: We do not prefer the note proposed by Inmarsat.

Inmarsat: We should also consider a tighter TN BS ACLR specification to improve the coexistence. The victim should not be unduly burdened.

ViaSat: We would be reluctant to specify receiver blocking requirements now especially since we know regulators are also considering this.

Eutelsat: There are mitigations. The end result of the TR is a guideline for deployment.

Chair: How about [28]? Without consensus, we will not have a CR and will not be able to close the WI.

Ericsson: Can agree with the chair’s suggestion.

ZTE: Can agree. We are not convinced of the implementation infeasibility.

**R4-2402660 Topic summary for [110][320] NR\_NTN\_enh\_SAN\_UE\_demod**

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

**Abstract:**

[110][300] BDaT Session AI 8.18.8.1, 8.18.8.2

**Decision: Noted**

**Issue 1-1: Doppler for DL**

* Proposals
  + Option 1 (Apple, Huawei): 600Hz
  + Option 2 (Qualcomm): 1200Hz
  + Option 3 (Ericsson): 2000Hz

Huawei: Based on our evaluation for minimum performance requirement, we prefer 600 Hz

Qualcomm: Either 600 or 1200 Hz is ok. This is the residual doppler.

Samsung: Based on ppm and carrier frequency, we calculate 0.1 ppm to be closest to option 3

Ericsson: Same view as Samsung. We should use 0.1 ppm for both UL and DL. Our simulations does now show performance difference for any of the options.

Apple: 0.1ppm at 20 GHz is 2000 Hz. 0.1ppm was used in Rel-17 to set Doppler for FR1, but this value may not be appropriate for FR2 since the frequencies are higher and resulting Doppler is too high. 2000 Hz is not reasonable to define the requirements.

Huawei: In demod we should use a smaller value than what RF would assume since there is correction.

Samsung: With TRS, we can track larger Doppler than 2000 Hz.

Apple: Requirements should be defined based on what is expected to be observed, not based on what the reference signals enable.

**Issue 2-1-1: Disabled HARQ process for above 10 GHz bands**

* Proposals
  + Option 1 (Qualcomm): Not define.
  + Option 2 (Ericsson, Huawei): Define

Huawei: We already agreed to have disabled HARQ for FR1 NTN but check only 4 out of 16 HARQ processes. For FR2, we have 32 HARQ processes we could test 8.

Apple: Slightly prefer option 1. We are also ok with reusing the FR1 approach, but would not want a new approach. The FR1 approach is really just a functionality test.

Qualcomm: For consistency with FR1, IoT NTN, we are ok with option 2 to extend the FR1 approach.

**Issue 2-1-2: How to define requirements for GSO and NGSO for above 10 GHz bands**

* Proposals
  + Option 1 (Qualcomm): Consider 32 HARQ processes for GSO scenarios and 16 HARQ processes for NGSO scenarios.
  + Option 2 (Huawei): Consider one set of requirements for both NGSO and GSO.

Qualcomm: GSO has longer RTD so needs more HARQ processes.

Huawei: From BS processing perspective there is no difference. To reduce simulation workload, we prefer one set of requirements applicable for both GSO and NGSO.

Apple: Cannot use the same set of requirements for GSO and NGSO. Need to account for K\_offset value for thelong delays for GSO. TN requirements are not available.

**Issue 2-1-2: Whether to define UE PDCCH demodulation requirements for above 10 GHz bands**

* Proposals
  + Option 1 (Nokia, Apple, Ericsson, Huawei): Yes
  + Option 2 (Qualcomm): Further discuss PDCCH performance requirements for NR NTN enhancements in Rel-18.

Qualcomm: We are ok to define. Option 1 is agreeable.

**Issue 2-1-3: How to define UE PDCCH demodulation requirements for above 10 GHz bands (If agreement of Issue 2-1-2 is Yes)**

* Proposals
  + Option 1 (Nokia): Further evaluate feasibility of reusing TN FR2 PDCCH requirements
  + Option 2 (Apple , Ericsson, Huawei): Define new requirements

Qualcomm: Support option 2.

Nokia: Ok with option 2.

**Issue 2-2-1: Channel bandwidth**

* Proposals
  + Option 1 (Nokia, Apple, Qualcomm, Ericsson): 100MHz
  + Option 2(Huawei): 200MHz

Huawei: RF mandates both 100 and 200 MHz. Coex study was using 200 MHz. So we prefer to use 200 MHz for performance requirements.

Qualcomm: 100 MHz was typically used for other requirements.

Apple: Either 100 MHz or 200 MHz is not going to change UE processing. Typically 100 MHz has been used. We don’t have a strong view of which bandwidth but only a single bandwidth is needed.

**Issue 2-2-2: Antenna configuration**

* Proposals
  + Option 1 (Nokia, Ericsson): 1Tx1Rx
    - Option 1a (Ericsson): Take 1Tx1Rx for parabolic VSAT antenna configuration for initial demodulation discussion and input from satellite companies is needed
  + Option 2 (Apple, Qualcomm): 1Tx2Rx
    - Option 2a (Apple): Need further clarification on impact to demodulation performance with parabolic VSAT antenna configuration
  + Option 3 (Huawei): Both 1Tx1Rx and 1Tx2Rx, with antenna type not limit to parabolic, but also phase antenna array

Huawei: This depends on antenna type – parabolic or phased array. Both types should be considered.

Apple: Is the assumption on antenna on the UE or BS side?

Huawei: On the UE.

Qualcomm: Is the understanding that parabolic is 1Rx while phased array is 2Rx?

Apple: If there are two UE types, we should have requirements for each of them

**Issue 2-3-2: PDCCH aggregation level (If agreed to be introduced)**

* Proposals
  + Option 1 (Apple): 8 as baseline
  + Option 2 (Ericsson): 2 and 4
  + Option 3 (Huawei): 4, 8 and 16

Qualcomm: AL4 is a better candidate for performance. AL8 might have too low SNR. We need to run the simulation to evaluate.

Apple: Because the SNR is very low for NTN, the PDCCH needs to be more reliable so needs higher redundancy.

Qualcomm: We can reconsider AL after 1Rx/2Rx is resolved.

**SAN Issue 3-2-1: MCS**

* Proposals
  + Option 1 (CATT): MCS 2/16/20 in Table 1
  + Option 2 (Nokia): MCS 2/16/20 in Table 1 with downselection based on SNR operating point
  + Option 3 (Ericsson): MCS 4/16/20 in Table 1
  + Option 4 (Huawei): MCS 4 in Table 1

Huawei: Considering the UL link budget, the lower MCS makes more sense

CATT: Suggest to reuse FR2 TN network spec until we find we need to do something different

Nokia: Agree with UL link budget and lower MCS, but then why not MCS 2?

Samsung: The purpose is to verify the functionality of FR2 NTN. Ok with option 2 to downselect.

Ericsson: We can also accept option 2. Higher UL and MCS could be available with higher output power.

**R4-2403012 Offline minutes for topic [110][320] NR\_NTN\_enh\_SAN\_UE\_demod**

*Type: other For: Information  
 Source: Huawei, HiSilicon*

**Abstract:**

**Decision: Noted**

**Issue 1-2: Doppler for UL**

* Proposals
  + Option 1 (Ericsson, Samsung, Huawei): 3000Hz
* Recommended WF
  + Option 1

SAN discussion: Keep the same principle to choose the Doppler margin as DL: 0.1ppm\*20GHz

Ka band DL: 19.7 – 21.2GHz, UL: 29.5 – 30GHz

* + Option 1 (Ericsson, Samsung, Huawei, Nokia, CATT): 3000Hz
  + Option 2: (Samsung) 2000Hz

Tentative agreement: 3000Hz as baseline

Nokia: The 0.1ppm used to derive UL should also be applied for DL.

Samsung: We are ok with 0.1ppm option 1, but if we accept a smaller value taking into account for DL then the same principle can also be applied for UL. That’s why we proposed 2000 Hz, but we can accept 3000 Hz.

Huawei: We would like to agree UL first, and then consider DL later. We don’t want to couple the two.

Agreement: 3000 Hz

**Issue 3-1-2: Phase noise**

* Proposals
  + Option 1 (Ericsson): Do not consider impact of phase noise for PUSCH SAN demodulation requirements in FR2-1.
* Recommended WF
  + Option 1

Ericsson: No phase noise was observed considering even lower frequency for different phase noise modelling

Tentative agreement:

* + Do not consider model the phase noise for PUSCH SAN demodulation requirements in FR2-1 in the ideal simulation assumption. The impact of phase noise can be considered in the impairment results.

Samsung: There terminology for NTN may not be “FR2-1” above 10 GHz

**Issue 3-2-4: PTRS configuration**

* Proposals
  + Option 1 (CATT, Nokia, Ericsson, Huawei): Do not configure
  + Option 2 (Samsung): (K=2,L=1) and disabled
* Recommended WF

Tentative agreement:

Not configure PT-RS for all test cases, FFS for configuration PT-RS for other cases

Nokia: For all test cases do not configure PTRS. For some test cases, FFS to also configure PTRS as an additional requirement.

**Issue 3-6-2: Antenna configuration**

* Proposals
  + Option 1 (Nokia): 1Tx1Rx
  + Option 2 (Huawei): Consider both 1Tx1Rx and 1Tx2Rx for PUSCH with DMRS bundling demodulation requirements. Apply the same test applicability for 1T1Rx and 1Tx2Rx performance test.
* Recommended WF
  + Tentative agreement: Both 1Tx1Rx and 1Tx2Rx

Samsung: Need to add testability rule, i.e, agree option 2.

**R4-2402853 Way forward on [110][305] NR\_NTN\_enh\_Part1**

*Type: other For: Approval  
 Source: Thales*

**Decision: Withdrawn**

**R4-2402854 Way forward on [110][306] NR\_NTN\_enh\_Part2**

*Type: other For: Approval  
 Source: Ericsson*

**Decision: Approved**

**R4-2402855 Way forward on [110][307] NR\_NTN\_enh\_Part3**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Revised to R4-2403092 (from R4-2402855)**

**R4-2403092 Way forward on [110][307] NR\_NTN\_enh\_Part3**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Approved**

Moderator: The proposed WF is that note 1, 2, and 3 would apply irrespective of which option is selected.

Huawei: Where would the notes be reflected? In the TS or just in the WF?

Moderator: Notes to be captured in the TR, not the TS.

Thales: TR. Better to have the TS clean.

Eutelsat: Same view as Thales.

Viasat: Agree with Thales and Eutelsat.

Ericsson: Option 3 should not allow for companies to propose any ACS value

Thales: The option 3 is more related to test configuration but not to further discuss the ACS value

Qualcomm: If ACS is not determined until late, then the UE RF cannot be completed. We need to decide on a single ACS value next meeting.

Qualcomm: We cannot agree with note 1 and note 2.

Thales: The note 2 is intended to inform future TN deployments of the existence of devices only capable of very low ACS requirement

FCC: Is the note intended to restrict 3GPP, or it is intended to restrict the regulatory body?

Inmarsat: It is not intended to be restricted to anyone. It is only intended to be informative.

Viasat: A better wording might be “This is not intended to be a definitive analysis to be used by outside references”

Samsung: “shall” should not be in the note. “the results of the coexistence study are not intended to address coexistence issues from regulatory aspect”

Huawei: “hypothetical coexistence scenario” should be changed to “3GPP agreed coexistence scenario”

Thales: Indeed, these are 3GPP agreed but based on a fictional TN deployment

Eutelsat: at the time of the TR, no TN (or NTN) systems were deployed … the reader can reach his own conclusion about “fictional”

Thales: Add “NR”

Inmarsat: In the beginning, the coexistence scenarios were only to be studied for UL. DL was later included to be able to derive the UE requirements.

**R4-2402865 Way forward on [110][320] NR\_NTN\_enh\_SAN\_UE\_demod**

*Type: other For: Approval  
 Source: Huawei*

**Decision: Approved**

**R4-2402963 Ad-hoc meeting minutes for [110][307] NR\_NTN\_enh\_Part3**

*Type: For: Information  
   
 Source: Samsung*

**Decision: Noted**

**R4-2403091 Collection of simulation results for NTN coexistence above 10 GHz**

*Type: For: Information  
   
 Source: Samsung*

**Decision: Noted**

### 8.19 Further NR coverage enhancements

#### 8.19.1 UE RF requirements maintenance

##### 8.19.1.1 Enhancement of increasing UE power high limit for CA and DC

##### 8.19.1.2 Enhancement to reduce MPR/PAR

#### 8.19.2 BS demodulation performance requirements

**R4-2400250 Cov Enh BS demodulation discussion**

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

**Decision: Noted**

**R4-2400251 Cov Enh BS demodulation simulation**

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

**Decision: Noted**

**R4-2400252 draft CR for 38.141-2 A.6 PRACH Test preambles**

*Type: draftCR For: Endorsement  
 38.141-2 v18.4.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Postponed**

**R4-2400704 Big CR for TS38.104 (CovEnh)**

*Type: CR For: Agreement  
 38.104 v18.4.0 CR-0584 rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Withdrawn**

**R4-2400795 Discussion on the BS performance part for Rel-18 coverage enhancement WI**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted**

**R4-2400796 Summary of simulation results for Rel-18 NR coverage enhancements BS demodulation requirements**

*Type: discussion For: Discussion  
 Source: China Telecom*

**Decision: Noted**

**R4-2400797 Draft CR on multiple PRACH transmission BS performance requirements for FR1**

*Type: draftCR For: Endorsement  
 38.104 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: China Telecom*

**Decision: Postponed**

**R4-2400798 Big CR for further coverage enhancements requirements for TS38.141-2**

*Type: CR For: Agreement  
 38.141-2 v18.4.0 CR-0564 rev Cat: B (Rel-18)  
  
 Source: China Telecom*

**Abstract:**

For post-meeting e-mail approval or endorsement.

**Decision: Withdrawn**

**R4-2401408 Discussion on further NR coverage enhancement demodulation requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on open issues of PRACH repetition demodulation

**Decision: Noted**

**R4-2401409 Simulaton results for further NR coverage enhancement demodulation requirements**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Simulation results for PRACH repetition demodulation

**Decision: Noted**

**R4-2401576 View on BS demodulation requirements for further coverage enhancement**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2401695 Discussion on BS demodulation requirements for further coverage enhancements**

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

**Decision: Noted**

**R4-2401696 Simulation results on BS demodulation requirements for further coverage enhancements**

*Type: other For: Information  
 Source: Huawei,HiSilicon*

**Decision: Noted**

**R4-2401697 Draft CR on manufacturer declarations and applicability of PRACH performance requirements for Multiple PRACH transmission (TS38.141-1, Rel-18)**

*Type: draftCR For: Endorsement  
 38.141-1 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Postponed**

**R4-2401698 Draft CR on manufacturer declarations and applicability of PRACH performance requirements for Multiple PRACH transmission (TS38.141-2, Rel-18)**

*Type: draftCR For: Endorsement  
 38.141-2 v18.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Postponed**

**R4-2402032 Discussion on NR\_cov\_enh2 demodulation requirements**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted**

**R4-2402033 Simulation results for multiple PRACH**

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

**Decision: Noted**

#### 8.19.3 Moderator summary and conclusions

**R4-2402661 Topic summary for [110][321] NR\_cov\_enh2\_demod**

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

**Abstract:**

[110][300] BDaT Session AI 8.19.2

**Decision: Noted**

**Issue 1-1: Coverage of frequency range (FR) for Multiple PRACH transmission**

* Recommended WF
  + Cover FR1 for 1x2 only (Nokia, Ericsson, Samsung, CTC, ZTE)

Huawei: From technical perspective, it is not necessary to define this requirement. This feature has not been studied in RAN1 for FR1.

CTC: Study was conducted in Rel-16 and following releases were to address the bottlenecks identified. Since a bottleneck was identified during the study, it is applicable to apply the solution to it as well.

Huawei: A new work item would be needed. The scope of this WI is for FR2. The concluions could be applicable to FR2, but from deployment perspective, no such bottleneck has been observed for FR1.

ZTE: Similar view as China Telecom. This feature can be introduced for FR1.

Ericsson: If RAN1 has no limitation on FR1, then the requirement could be introduced to FR1 for Rel-18.

Nokia: Although the effort focused on FR2-1 in RAN1, we see benefit for FR1. We do however have concerns about timing and work required.

Samsung: The WID does not limit multiple PRACH to FR2.

CTC: 3 companies have already submitted simulation results. We still need alignment but there are still two meetings remaining. We believe there is sufficient time.

Huawei: We can compromise to define requirements, but a declaration would be needed. So far, there is large span between the results. We are concerned on the workload and ability to complete in the following two meetings.

Nokia: It’s not workload, but rather the ability to align in two meetings.

**Issue 1-2: PRACH repetition number for BS performance requirements for Multiple PRACH transmission**

Way forward for the next meeting:

* + Companies to further check the simulation assumptions including TDD pattern, PRACH repetition interval for both FR1 ~~(if introduced)~~ and FR2.
  + For the repetition number, keep the previous meeting agreement before simulation assumption agreed.

**Issue 1-5: Sub Carrier Spacing for BS performance requirements for PRACH repetitions**

* Proposals:
  + FR1:
    - Option 1: 15kHz and 30kHz (China Telecom, Ericsson)
  + FR2-1
    - Option 1: Cover 60kHz SCS and 120kHz SCS (China Telecom, Nokia, ZTE)
    - Option 2: 120kHz only (Ericsson, Huawei)

ZTE: We would like to support 60 kHz.

Huawei: From real deployment, we have not seen the need of 60 kHz for FR2. If there is real product intention, we could accept it.

Samsung: Option 2. There is no difference in baseband processing between 60 and 120 kHz, so to reduce test cases, we can focus on 120 kHz which is the most common deployment option.

Nokia: Support option1 in case there is more future interest in deployment

Samsung: We’d like to hear the operator feedback

Moderator: Agree with 120 kHz and FFS for 60 kHz. Encourage operators to provide input.

**Issue 1-4: Channel model for BS performance requirements for Multiple PRACH transmission**

Huawei: Not sure whether AWGN is necessary

CTC: AWGN provides an upper bound since PRACH combining is across same channel. There was previous agreement to cover both TDLC and AWGN in FR2. We should cover both for FR1 also.

Samsung: What is the assumption of frequency offset for AWGN? Baseband processing is the same between TDLC and AWGN.

Huawei: If baseband processing can already be verified with fading channel TDLC, there is no need for AWGN. AWGN is typically used for alignment, but not needed for requirement definition.

Samsung: For IoT we considered fading channel and AWGN for single PRACH, but only fading channel for multiple PRACH. We can do the same here.

CTC: We are ok to compromise to define requirements only for fading channel for both FR2 and FR1. For alignment purposes, however, we suggest companies provide both fading channel and AWGN.

**R4-2402866 Way forward on [110][321] NR\_cov\_enh2\_demod**

*Type: other For: Approval  
 Source: CTC*

**Decision: Approved**

**R4-2403060 Offline meeting minutes for [110][321] NR\_cov\_enh2\_demod**

*Type: For: Information  
   
 Source: CTC*

**Decision: Noted**

### 8.20 NR Network-controlled Repeaters

#### 8.20.1 RF core requirements maintenance

**R4-2400073 (NR\_netcon\_repeater-Core) CR for TS 38.106, Correction on terminology of repeater**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0053 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Endorsed**

Huawei: “Rel-17 repeater should be named as RF repeater” We don’t agree to distinguish R17 and R18 with RF repeater.

NEC: We agree to use RF repeater.

CATT: It is a common understanding. RF repeater is referring to Rel-17, NCR is referring to Rel-18, and NR repeater is generic to either release.

Huawei: Can we come up with an abbreviation for Rel-17 repeater instead of “RF repeater”? LTE spec also uses “RF repeater”.

ZTE: We could call is “NR RF repeater” to distinguish from LTE RF repeater. It is clear when we speak of NR RF repeater that we refer to Rel-17.

**R4-2400074 Discussion on Rel-17 repeater terminology**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted**

**R4-2400228 CR to TS 38.106 for editorial corrections**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0056 rev Cat: D (Rel-18)  
  
 Source: Murata Manufacturing Co Ltd.*

**Decision: Endorsed**

Ericsson: Why is a frequency deleted, this is changing he requirement, but this is supposed to be an editorial CR.

ZTE: This is a duplicated requirement, not removing it.

Moderator: We can endorse this CR and combine with other CRs to form a big CR for agreement.

**R4-2402512 (NR\_netcon\_repeater-Core) Maintenance draft CR to TS 38.106: NCR RF part**

*Type: draftCR For: Endorsement  
 38.106 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2402955 (from R4-2402512)**

**R4-2402955 (NR\_netcon\_repeater-Core) Maintenance draft CR to TS 38.106: NCR RF part**

*Type: draftCR For: Endorsement  
 38.106 v18.3.0 CR- rev Cat: (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Endorsed**

Ericsson: The “emission requirement could be relaxed”, but needs more precise wording

CATT: We don’t understand the need for all the changes where there isn’t actually a change.

Huawei: Can remove reference to BS and UE requirements. We also have other minor corrections.

##### 8.20.1.1 RF requirements for NCR-Fwd

**R4-2400072 (NR\_netcon\_repeater-Core) CR for TS 38.106, Correction on antenna connector and TAB connector related symbols for NCR**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0052 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Endorsed**

**R4-2402242 (NR\_netcon\_repeater-Core) CR to TS 38.106 with corrections to NCR part**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0058 rev Cat: F (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2402956 (from R4-2402242)**

**R4-2402956 (NR\_netcon\_repeater-Core) CR to TS 38.106 with corrections to NCR part**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0058 rev Cat: F (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Agreed**

NEC: We need to understand the future implication of this CR. Need further discussion. If we have mixed type NCR in the future, we may be restricted if we agree to this CR now.

ZTE: We previously discssed mixed type. If we include in the future, we can revise.

Nokia: we already agreed that we don’t have mixed type at the present. We can have a note to indicate that mixed type is not considered at the present.

Huawei: We shouldn’t put statements that forecast the future.

Ericsson: Where should the note be written? In the scope section?

ZTE: No strong view of whether the note in definitions or scope.

Nokia: Scope is better as it gives better visibility.

**R4-2402291 CR to 38.106: Repeater output power requirements**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0060 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Endorsed**

**R4-2402293 CR to 38.106: Maximum offset of the operating band unwanted emissions mask from the operating band edge**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0062 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Endorsed**

##### 8.20.1.2 RF requirements for NCR-MT

**R4-2400071 (NR\_netcon\_repeater-Core) CR for TS 38.106, Correction on Repeater output power for NCR**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0051 rev Cat: F (Rel-18)  
  
 Source: CATT*

**Decision: Endorsed**

**R4-2400076 Discussion on 15 KHz SCS issue for NCR-MT**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted**

**R4-2400227 CR to TS 38.106 on correction of requirement set applicability for NCR-MT**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0055 rev Cat: F (Rel-18)  
  
 Source: Murata Manufacturing Co Ltd.*

**Decision: Revised to R4-2402958 (from R4-2400227)**

**R4-2402958 CR to TS 38.106 on correction of requirement set applicability for NCR-MT**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0055 rev Cat: F (Rel-18)  
  
 Source: Murata Manufacturing Co Ltd.*

**Decision: Agreed**

Ericsson: Why do we need 2 void sections?

ZTE: Same comment as Ericsson

NEC: Same

**R4-2400823 (NR\_netcon\_repeater-Core) CR for TS 38.106 updating reference measurement channels**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0057 rev Cat: F (Rel-18)  
  
 Source: CMCC*

**Decision: Revised to R4-2402957 (from R4-2400823)**

**R4-2402957 (NR\_netcon\_repeater-Core) CR for TS 38.106 updating reference measurement channels**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0057 rev Cat: F (Rel-18)  
  
 Source: CMCC*

**Decision: Agreed**

NEC: FRC number G-FR1-A1-21 is already allocated.

**R4-2402243 (NR\_netcon\_repeater-Core) CR to TS 38.106 with editorial corrections to NCR part**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0059 rev Cat: D (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed**

**R4-2402292 CR to 38.106: NCR-MT channel bandwidth**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0061 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Agreed**

**R4-2402959 CR to 38.106: NCR-MT channel bandwidth**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0061 rev Cat: F (Rel-18)  
  
 Source: NEC*

**Decision: Withdrawn**

Ericsson: This is a repeater spec, not a BS spec. We don’t know what the BS channel bandwidths should be configured. This is the expectation, but we don’t know how it should be reflected into the specification.

ZTE: UE channel bandwidth within the BS channel bandwidth allows for UE channel to be smaller than BS channel. Curreent spec has this same wording.

Ericsson: We are current saying needs to be within the passband.

ZTE: We already indicate within the passband because we only have in-band NCR.

Ericsson: maybe we should keep both conditions of passband and BS channel bandwidth.

NEC: We copied from other specs, but we are ok with Ericsson’s proposal also.

ZTE: We already have both conditions in separate sentences. Combining the two is fine for us.

ZTE: Still controversial whether NCR carrier can be placed in the passband or next to the passband. MT should be placed in the passband, hence in-band. We can see some benefit to enabling placement just next to the passband because characteristics should be similar. We would like to consider until next meeting.

CATT: Same view as ZTE.

#### 8.20.2 EMC core requirements maintenance

**R4-2402244 (NR\_netcon\_repeater-Core) CR to TS 38.114 with corrections to EMC NCR core part**

*Type: CR For: Agreement  
 38.114 v18.0.0 CR-0012 rev Cat: F (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed**

#### 8.20.3 RF conformance testing

**R4-2400075 Discussion on RF conformance testing for NCR**

*Type: other For: Approval  
 Source: CATT*

**Decision: Noted**

**R4-2401144 Discussion on NCR EMC Perf implementation guidance**

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

**Decision: Noted**

**R4-2401148 Discussion on NCR EMC Perf detailed analysis**

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

**Decision: Noted**

**R4-2402245 Draft CR to TS 38.114 with NCR introduction to EMC test specification**

*Type: draftCR For: Endorsement  
 38.114 v18.0.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Noted**

**R4-2402246 Discussion of NCR EMC immunity setup and monitoring**

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

**Decision: Noted**

**R4-2402247 NCR conformance testing**

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

**Decision: Noted**

**R4-2402514 Further discussion on conformance testing requirement for NCR**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted**

**R4-2402515 Discussion on NCR conformance testing spec structure and work split**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted**

#### 8.20.4 RRM core requirements maintenance

#### 8.20.5 RRM performance requirements

#### 8.20.6 Demodulation performance requirements

**R4-2401712 Simulation results on demodulation performance requirements for NR network-controlled repeaters**

*Type: other For: Information  
 Source: Huawei,HiSilicon*

**Decision: Noted**

**R4-2401713 Draft CR on FRC for NCR-MT (TS38.106, Rel-18)**

*Type: draftCR For: Endorsement  
 38.106 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Revised to R4-2402994 (from R4-2401713)**

**R4-2402994 Draft CR on FRC for NCR-MT (TS38.106, Rel-18)**

*Type: draftCR For: Endorsement  
 38.106 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Endorsed**

**R4-2401714 Draft CR on conducted performance requirements(CSI) for NCR-MT (TS38.115-1, Rel-18)**

*Type: draftCR For: Endorsement  
 38.115-1 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Revised to R4-2402995 (from R4-2401714)**

**R4-2402995 Draft CR on conducted performance requirements(CSI) for NCR-MT (TS38.115-1, Rel-18)**

*Type: draftCR For: Endorsement  
 38.115-1 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Endorsed**

**R4-2401715 Draft CR on propagation conditions for NCR-MT (TS38.115-2, Rel-18)**

*Type: draftCR For: Endorsement  
 38.115-2 v17.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Revised to R4-2402996 (from R4-2401715)**

**R4-2402996 Draft CR on propagation conditions for NCR-MT (TS38.115-2, Rel-18)**

*Type: draftCR For: Endorsement  
 38.115-2 v17.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Endorsed**

**R4-2402046 Simulation results for NCR-MT**

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

**Decision: Noted**

**R4-2402047 Simulation results collection for NCR-MT demodulation requirements**

*Type: other For: Information  
 Source: ZTE Corporation*

**Decision: Noted**

**R4-2402048 Draft CR for TS38106 on conducted performance requirements for NCR-MT**

*Type: draftCR For: Endorsement  
 38.106 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2402997 (from R4-2402048)**

**R4-2402997 Draft CR for TS38106 on conducted performance requirements for NCR-MT**

*Type: draftCR For: Endorsement  
 38.106 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Endorsed**

**R4-2402049 Draft CR for TS38115-1 on Fixed Reference Channels for NCR-MT**

*Type: draftCR For: Endorsement  
 38.115-1 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2402998 (from R4-2402049)**

**R4-2402998 Draft CR for TS38115-1 on Fixed Reference Channels for NCR-MT**

*Type: draftCR For: Endorsement  
 38.115-1 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Endorsed**

**R4-2402050 Draft CR for TS38115-2 on Radiated performance requirements(PDSCH, PDCCH) for NCR-MT**

*Type: draftCR For: Endorsement  
 38.115-2 v17.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Revised to R4-2402999 (from R4-2402050)**

**R4-2402999 Draft CR for TS38115-2 on Radiated performance requirements(PDSCH, PDCCH) for NCR-MT**

*Type: draftCR For: Endorsement  
 38.115-2 v17.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Endorsed**

**R4-2402381 Big CR on 38.106 for NCR-MT demodulation requirements**

*Type: CR For: Agreement  
 38.106 v18.3.0 CR-0065 rev Cat: B (Rel-18)  
  
 Source: ZTE Corporation*

**Decision: Email approval**

**R4-2402415 Draft CR to 38.106: Addition of radiated performance requirements**

*Type: draftCR For: Endorsement  
 38.106 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR as per work split

**Decision: Revised to R4-2403000 (from R4-2402415)**

**R4-2403000 Draft CR to 38.106: Addition of radiated performance requirements**

*Type: draftCR For: Endorsement  
 38.106 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

Abstract:

Draft CR as per work split

**Decision: Endorsed**

**R4-2402416 Draft CR to 38.115-1: Addition of test procedures for NCR demodulation**

*Type: draftCR For: Endorsement  
 38.115-1 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR as per work split

**Decision: Revised to R4-2403001 (from R4-2402416)**

**R4-2403001 Draft CR to 38.115-1: Addition of test procedures for NCR demodulation**

*Type: draftCR For: Endorsement  
 38.115-1 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

Abstract:

Draft CR as per work split

**Decision: Endorsed**

**R4-2402417 Draft CR to 38.115-2: Addition of test procedures for NCR demodulation**

*Type: draftCR For: Endorsement  
 38.115-2 v17.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

Draft CR as per work split

**Decision: Revised to R4-2403002 (from R4-2402417)**

**R4-2403002 Draft CR to 38.115-2: Addition of test procedures for NCR demodulation**

*Type: draftCR For: Endorsement  
 38.115-2 v17.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

Abstract:

Draft CR as per work split

**Decision: Endorsed**

**R4-2402534 BigCR for introduction of performance requirements for NCR-MT in TS 38.115-1**

*Type: CR For: Agreement  
 38.115-1 v18.3.0 CR-0029 rev Cat: B (Rel-18)  
  
 Source: Huawei,HiSilicon*

**Decision: Email approval**

**R4-2402710 On NCR PDSCH and PDCCH Demodulation Requirements**

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

**Decision: Noted**

**R4-2402711 Simulation Results on NCR PDSCH and PDCCH Demodulation Requirements**

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

**Decision: Noted**

**R4-2402712 Draft CR on Propagation Condition for NCR-MT for 38.106**

*Type: draftCR For: Endorsement  
 38.106 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2403003 (from R4-2402712)**

**R4-2403003 Draft CR on Propagation Condition for NCR-MT for 38.106**

*Type: draftCR For: Endorsement  
 38.106 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed**

**R4-2402713 Draft CR on Propagation Condition for NCR-MT for 38.115-1**

*Type: draftCR For: Endorsement  
 38.115-1 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2403004 (from R4-2402713)**

**R4-2403004 Draft CR on Propagation Condition for NCR-MT for 38.115-1**

*Type: draftCR For: Endorsement  
 38.115-1 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed**

**R4-2402714 Draft CR on FRC for NCR-MT for 38.115-2**

*Type: draftCR For: Endorsement  
 38.115-2 v17.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Revised to R4-2403005 (from R4-2402714)**

**R4-2403005 Draft CR on FRC for NCR-MT for 38.115-2**

*Type: draftCR For: Endorsement  
 38.115-2 v17.4.0 CR- rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed**

**R4-2402715 Big CR on Performance Requirements for NCR-MT in 38.115-2**

*Type: CR For: Agreement  
 38.115-2 v17.4.0 CR-0013 rev Cat: B (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Email approval**

#### 8.20.7 Moderator summary and conclusions

**R4-2402648 Topic summary for [110][308] NR\_netcon\_repeater\_RF**

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

**Abstract:**

[110][300] BDaT Session AI 8.20.1.1, 8.20.1.2, 8.20.2

**Decision: Noted**

ZTE: Propose to agree:Proposal 1: The 15 KHz SCS related contents for REFSENS/ACS/IBB requirement could be supplemented for WA NCR-MT.

CATT: Why do we need 15 kHz?

ZTE: NCR is supported in all FR1 and FR2 bands. We don’t have it for IAB because the bands were only 30 kHz bands, but we need it now.

CATT: We don’t expect FDD NCR. RAN1 does not expect FDD NCR.

ZTE: Repeater and NCR is supposed to be supporter in FR1 and FR2, FDD and TDD.

CMCC: We need FDD NCR. In RAN1 there is no agreement to preclude FDD NCR.

CATT: We think there is a disconnect between RAN1 and RAN4. We suggest sending an LS to RAN1. We can draft the LS.

ZTE: We don’t think it’s needed to send the LS. We believe the common understanding in RAN4 except one company.

Ericsson: If the WID scope is to cover FDD, we should do so.

CMCC: We don’t think LS is necessary. We can informally talk with our RAN1 colleagues.

CATT: We can draft an LS and also discuss whether it is needed by this week.

**R4-2402649 Topic summary for [110][309] NR\_netcon\_repeater\_RFConformance**

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

**Abstract:**

[110][300] BDaT Session AI 8.20.3

**Decision: Noted**

• Proposals

o Option 1: (CATT)

 Declare a set of the I/O pairs. This set should include all TABs; all declared pairs need to be tested.

Ericsson: Agree with general principle, but wording can be generalized. It may not only be pairs, but groups, that need to be tested.

Nokia: We should optimize to save test effort. We may not need to test all pairs.

ZTE: Ok with Ericsson’s wording. If test by groups rather than by individual pairs, that would reduce the test burden.

Ericsson: Not only to reduce testing, but only testing a pair might not provide adequate test coverage.

Issue 2-2: Manufacture declaration table

• Option 1 (ZTE):

* To consider the manufacture declaration for NCR as shown in Table 2.3.1 and Table 2.3.2 as starting point.

ZTE: Single table with two columns of declaration for NCR-MT and NCR-Fwd.

Ericsson: Table format is ok, but some of the declarations may need to be further discussed. Some need additions and one or two that are not necessary.

ZTE: We are open to add more declarations to the table.

Huawei: Does colocation declaration represent a valid scenario? It may not be needed.

**Issue 3-1: testing on edge PRB**

* Background: Some companies believed that for LA NCR-MT, the SEM testing on edge PRBs with max Tx power should be conducted
* Option 1(ZTE):
  + Not to consider the LA NCR-MT SEM requirement to be tested under edge\_1PRB\_left and edge\_1PRB\_right RB allocations with max Tx power.

Ericsson: There may be emissions concerns and this may have regulatory implications. We aren’t ready to dismiss the 1RB edge test case.

ZTE: There is no power class, MPR, or A-MPR for NCR-MT. MT cannot be tested at max power, but we don’t have the power backoff specified.

CATT: Same view as ZTE. Even if the requirements are derived from UE, this is a network device not a UE.

NEC: We should change the requirement if it cannot be met. Just removing the test case is not correct.

Ericsson: Just because it is a network device does not allow to create emissions into adjacent operator. We can write in the spec that power backoff is allowed, without specifying the actual value.

Huawei: Is edge of pass band? Edge of donor band?

ZTE: We could have declaration of max supported power instead of specified for the edge RB. We would not expect to be able to pass spurious emissions at max power.

* Proposals in R4-2402247 (Nokia):
  + For NCR-MT Rx IMD test configuration to modify position of f2 for CW interfering signal.

ZTE: We previously discussed, there would be no requirement for the case where the IM3 falls inside the band.

Ericsson: We agreed separate test for Fwd and MT, but not that we wouldn’t have an RxIM requirement.

Nokia: Same as Ericsson

* Proposals
  + Option 1 (Nokia)
    - Reuse FR1 UL repeater test models for NCR-MT type 1-C/H
    - Reuse FR2 UL repeater test models for NCR-MT type 2-O

ZTE: Can we follow the previous IAB-MT test model? This is the same as the proposal from Nokia.

* Proposals
  + Option 1 (Nokia)
    - It is proposed to add to TM1.1 for both FR1 and FR2 NCR-MT receiver sensitivity requirement

ZTE: We may not need to consider the test model, just the FRC.

Ericsson: Agree with ZTE

Nokia: Agree with ZTE

* Proposals
  + Option 1: (CATT)
    - Reuse BS/IAB MU &TT for NCR-MT
  + Option 2: (ZTE)
    - Reuse BS MU &TT for WA NCR-MT, for LA NCR-MT, reuse TT from TS 38.521 (UE)
* For LA NCR-MT, reuse relevant MU/TT from BS or UE.

NEC: Do we need different MU/TT for different NCR classes?

CATT: Same view as NEC. For all classes can use from BS. The UE is more relaxed.

ZTE: For LA core, we followed UE, so we thought to use the same for MU/TT.

Nokia: We should check the difference in MU/TT between BS and UE.

CATT: We checked and UE is relaxed by ~1dB

**Issue 5-2: Wanted RF input signal nominal frequency**

* Proposals
  + Option 1: (ZTE)
    - The wanted RF input signal nominal frequency of NCR-Fwd and NCR-MT shall follow the BS’s NR-ARFCN and UE’s NR-ARFCN respectively.

Ericsson: Since NCR-MT is communicating with BS, why use UE ARFCN? The values could be the same or could be different.

**R4-2402662 Topic summary for [110][322] NR\_netcon\_repeater\_Demod**

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

**Abstract:**

[110][300] BDaT Session AI 8.20.6

**Decision: Noted**

**R4-2402867 Way forward on [110][322] NR\_netcon\_repeater\_Demod**

*Type: other For: Approval  
 Source: ZTE*

**Decision: Withdrawn**

**R4-2402960 Way Forward for [110][309] NCR RF conformance**

*Type: For: Approval  
   
 Source: CATT*

**Decision: Approved**

**R4-2402961 Way Forward for [110][309] NCR EMC conformance**

*Type: For: Approval  
   
 Source: ZTE*

**Decision: Approved**

### 8.21 NR MIMO evolution for downlink and uplink

#### 8.21.1 UE RF requirements maintenance for simultaneous transmission with multi-panel (STxMP)

##### 8.21.1.1 Configured transmitted power

##### 8.21.1.2 Other UE RF requirements

#### 8.21.2 RRM core requirements maintenance

##### 8.21.2.1 RRM requirements impacts

##### 8.21.2.2 Timing requirements for UL multi-DCI multi-TRP with two TAs

##### 8.21.2.3 Unified TCI framework

#### 8.21.3 RRM performance requirements

#### 8.21.4 Demodulation performance requirements

**R4-2400730 NR MIMO Evolution: Views on UE demodulation and CSI performance requirements**

*Type: discussion For: Discussion  
 Source: QUALCOMM Europe Inc. - Spain*

**Abstract:**

NR MIMO: proposals

**Decision: Noted**

##### 8.21.4.1 UE demodulation performance and CSI requirements

**R4-2400467 On UE demod and CSI requirements for NR MIMO evolution**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted**

**R4-2400890 On MIMO\_evo UE demodulation performance and CSI requirements**

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

**Abstract:**

This paper present Nokia's view on the various issue related to UE demodulation performance and CSI requirements for the topic of MIMO Evolution

**Decision: Noted**

**R4-2400891 On MIMO\_evo UE demodulation performance and CSI requirements - simulations**

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

**Decision: Noted**

**R4-2401113 discussion on UE demodulation performance and CSI requirements of NR MIMO evolution for downlink and uplink**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2401114 Simulation results on Rel-18 MIMO UE demodulation performance and CSI requirements**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2401164 Discussion on NR MIMO evolution for downlink**

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

**Decision: Noted**

**R4-2401165 Simulation results of NR MIMO evolution for downlink**

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

**Decision: Noted**

**R4-2401705 Discussion on UE demodulation requirements for MIMO evolution**

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

**Decision: Noted**

**R4-2401754 UE demodulation and CSI reporting requirements for MIMO evolution**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the UE demodulation and CSI reporting requirements for WI MIMO evolution.

**Decision: Noted**

##### 8.21.4.2 BS demodulation performance requirements

**R4-2400248 MIMO\_evo BS demodulation simulations**

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

**Decision: Noted**

**R4-2400249 MIMO\_evo BS demodulation discussion**

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

**Decision: Noted**

**R4-2401406 Discussion on eMIMO UL demodulation requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

Discussion on open issues of eMIMO PUSCH demodulation requirements

**Decision: Noted**

**R4-2401407 Simulaton results for eMIMO UL demodulation requirements**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Simulation results for eMIMO PUSCH demodulation

**Decision: Noted**

**R4-2401578 Discussion and simulation results on BS demodulation requirements for Rel-18 FeMIMO**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2401704 Discussion on BS demodulation requirements for MIMO evolution**

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

**Decision: Noted**

#### 8.21.5 Moderator summary and conclusions

**R4-2402663 Topic summary for [110][323] NR\_MIMO\_evo\_DL\_UL\_demod**

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

**Abstract:**

[110][300] BDaT Session AI 8.21.4.1, 8.21.4.2

**Decision: Noted**

**Issue 1-1-4: clarify test metric for PMI reporting requirements with ‘typeII-Doppler-r18’ codebook**

* + Option 1: Test metric defined as , where is X % (e.g. X=90) of the maximum throughput obtained at using the typeII-Doppler-r18 precoder configured according to the UE reports, and is the throughput measured at with random precoding based on Type I Single Panel codebook.. (Nokia, Samsung, Huawei)
  + Option 2: For the PMI reporting requirements with typeII-Doppler-r18, define the test metric as as a starting point, where is [90] % of the maximum throughput obtained at using the *typeII-Doppler-r18* precoder configured according to the UE reports, and is the throughput measured at using the typeII-r16 precoder configured according to the UE reports. (Ericsson)

Moderator: We agreed to use option 1 as starting point in RAN4#109, encourage companies to give feedback on option 2.

Ericsson: Agree with option 1. Confirm the previous agreement.

Option 1 is agreed

**Issue 1-1-6: clarify how to approach random PMI precoding in mTRP case for Test metric defined a*s***

* Proposals
  + Option 1: all TRPs use uncorrelated random type I SP precoding (Nokia, MTK)
    - * Option 1A: define that when Throughput is measured using random precoder selection, all TRxPs transmit all PDSCH layers meaning coherent transmission scheme. (MTK)
  + Option 2: TRPs coordinatively choose different random type I SP precoding (Nokia)
  + Option 3: TRPs coordinatively choose parts of a random type I SP codebooks or MP codebook (Nokia)

Moderator: Suggest option 1

Ericsson: What does uncorrelated random PMI mean? Each TE selects random PMI per TRP, but what does uncorrelated mean?

Moderator: For each TRP, use random type 1 SP PMI precoding independently.

**Issue 1-1-7: explicitly define for clarification what “equal probability of each applicable i1, i2 combination”**

* Proposals
  + Option 1: explicitly define random precoding frequency domain granularities as random i1 with wideband granularity and random i2 with subband granularity with ‘typeII-Doppler-r18’ and ‘typeII-CJT-r18’ codebook. (MTK)

Option 1 is agreed

**Issue 1-2-1: clarify the details of applicability rule for Rel-18 DMRS ports**

Option 2: a BS that passes tests with enhanced DM-RS port (enhanced-dmrs-Type\_r18) can consider the tests with same test parameters but configuring legacy DM-RS port as passed (Samsung, Huawei)

Ericsson: We cannot accept option 2 unless it is clear enough to the tester. Is it clear which tests can be skipped? Adding the table number of the legacy test case could make it clearer.

Samsung: We can agree to the principle now, but the details of identifying the table numbers can be discussed during CR drafting.

**Issue 2-1-1:** **Propagation channel**

* Proposals
  + Option 1: TDLA30-50 (Qualcomm, Huawei)
  + Option 2: TDLA30-30 (Samsung, MTK, Ericsson)
    - Option 2A: propose to check TDLA30-30 channel results from all companies with N4=1 and N4=4. (MTK)

Qualcomm: Based on the simulation results from other companies, we are ok to support option 2.

Nokia: We also favor option 2. We encourage companies to consider other doppler around 30 Hz to find the optimal position. 20 and 40 Hz could be considered for example.

Huawei: We would like to understand if option 1 could still be feasible if there is gain, even if not as much as option 2. If the doppler is too low, we may not be able to properly verify the correct operation.

Nokia: RAN1 uses CDL. We use TDL, but the consequence is the optimal Doppler is not the same as RAN1. We can discuss whether the optimal Doppler is testable in the next meeting.

MediaTek: Same view as Nokia. The low Doppler observed here is due to the TDL vs. CDL.

Agreement: TDLA30-30 as baseline. Interested companies can also provide results with 20 and 40 Hz in addition to 30 Hz.

**Issue 2-1-2:** **N4 and K configuration**

* Proposals
  + Option 1: N4=4 and K=4 (Samsung, Huawei)
  + Option 2: N4=1 and K=4 with CSI-RS periodicity as 4 slot for FR1 FDD SCS=15kHz (Ericsson)

Huawei: The overhead is very high for option 2

Ericsson: We are ok with option 1

MediaTek: We prefer to keep both options for the next meeting. N4=4 leads to lower gain so is only a functional test.

Apple: N4=4 is an additional capability, so we prefer N4=1 as the baseline but ok to keep both options open

Moderator: We can keep both options open and decide in the next meeting

**Issue 2-1-4:** **X% of the maximum throughput in Test metric**

* Proposals
  + Option 1: 60% (Samsung)
  + Option 2: 90% (Huawei)

Huawei: What is the technical justification for option 1?

Samsung: We can further check simulation result and decide in the next meeting

**Issue 2-1-7:** **Beam steering modelling for TypeII-Doppler-r18 PMI reporting requirements**

* Proposals
  + Option 1: For the PMI reporting requirements with typeII-Doppler-r18, apply the single cluster beam steering model as specified in TS 38.101-4 B.2.3.2.3. (Ericsson)

MediaTek: Our preference is dual cluster. If all other companies prefer single cluster, we can compromise.

Samsung: We don’t know why we only consider single cluster model. Needs further discussion

Ericsson: This codebook is optimized for Doppler

Moderator: Since no strong views on single cluster beam steering, propose to use dual cluster.

**Issue 2-2-5: RI restriction (typeII-CJT-RI‑Restriction-r18)**

* Proposals
  + Option 1: Set RI restriction as 0001 for Rel-18 TypeII for CJT PMI test. (Nokia, Samsung,)
  + Option 2: Set RI restriction as 0010 for Rel-18 TypeII for CJT PMI test. (MTK)

Ericsson: We support option 2

Huawei: We prefer option 1. Existing configurations use rank 1.

**Issue 3-1-1: SCS & CBW**

* Proposals
  + Option 1: (Nokia)
    - SCS 15kHz, CBW 5 and 50 MHz
    - SCS 30kHz, CBW 10 and 100 MHz
  + Option 2: (Ericsson, Samsung, Huawei)
    - SCS 15kHz, CBW 5MHz
    - SCS 30kHz, CBW 10MHz

Nokia: We thought min and max bandwidth could be beneficial, but we can compromise to option 2

**Issue 3-1-2: MCS**

* Proposals
  + Option 1: MCS16(Nokia, Samsung, Huawei)
    - Observation: The maximum throughput cannot be achieved with MCS 21 under 2T2R antenna condition (Samsung)
  + Option 2: MCS21 (64QAM) (Ericsson)

Ericsson: We can compromise to option 1 as functionality testing

**Issue 2-3-4: Cases need to be defined for FR1 Rel-18 DMRS**

Apple: We don’t think it’s needed to test so many requirements for eDMRS. One test case is sufficient with rank2 with 2Rx and 4Rx. Don’t need rank1, 3, and 4. This is just a functional test.

Qualcomm: 4 DMRS in the same CDM group justifies a test case as this is new. We would like rank4 test case. We propose 2 test cases: rank2 for 2Tx and rank4 for 4Tx.

Huawei: This is a functionality test, we should minimize number of test cases. The max number of layers is dependent on capability. Lower rank would allow the test to be applicable to more UE’s. We propose Rank 1 for FDD and Rank 2 for TDD.

MediaTek: Applicability rule where if the legacy test can be skipped. Therefore, adding new test cases does not increase the test effort.

Apple: This is a functionality test. We don’t need such comprehensive testing. Rank4 with 4Rx and Rank2 with 2Rx should be testable for all UE’s since these are mandatory capabilities.

Nokia: We can agree with Qualcomm proposal

Ericsson: Agree with the Qualcomm proposal for both FDD and TDD, so a total of 4 cases

Samsung: Same view as Qualcomm

Agreement

* For Rank 2 with 2Rx, Test 2-1 in Chapter 5.2.2.1.1, 5.2.2.2.1
* For Rank 4 with 4Rx, Test 4-1 in Chapter 5.2.3.1.1, 5.2.3.2.1

**Issue 2-3-6: Minimum requirements for tests need to be defined for Rel-18 DMRS**

* Proposals
  + Option 1: reuse legacy value because Rel-18 DMRS has almost same simulation results as Rel-15 DMRS cases (Samsung, MTK, Huawei, Ericsson)
    - Observation: For the PDSCH demodulation performance, cases with Rel-18 enhanced DMRS almost have the same performance with Rel-15 DMRS cases. (Samsung)
    - Observation: In our simulations we support see maximum performance losses less than 0.3dB. Therefore, we see that reusing old values with possible additional margin is sufficient. (MTK)
    - Observation: There is negligible performance difference between the cases with legacy DMRS ports and the new DMRS ports. (Huawei)
    - Observation: No performance difference between Rel-15 and Rel-18 DMRS configurations. (Ericsson)
  + Option 2: new value according simulation results (Apple, Qualcomm, Nokia)

Samsung: Ok to reuse legacy value for Rank 2 case, but new value for Rank 4 case

Qualcomm: We would like a chance to check

Apple: We think simulations should be conducted rather than using Rel-15 values

**R4-2402868 Way forward on [110][323] NR\_MIMO\_evo\_DL\_UL\_demod**

*Type: other For: Approval  
 Source: Samsung*

**Decision: Approved**

**R4-2403061 Ad-hoc meeting minutes for [110][323] NR\_MIMO\_evo\_DL\_UL\_demod**

*Type: For: Information  
   
 Source: Samsung*

**Decision: Noted**

### 8.22 NR sidelink evolution

#### 8.22.1 UE RF requirements maintenance

##### 8.22.1.1 Sidelink on a single unlicensed spectrum

###### 8.22.1.1.1 System parameters (channel bandwidth, channel arrangement)

###### 8.22.1.1.2 Tx requirements

###### 8.22.1.1.3 Rx requirements

##### 8.22.1.2 Con-current operation on Uu and sidelink

##### 8.22.1.3 Sidelink CA

##### 8.22.1.4 Co-channel coexistence for LTE sidelink and NR sidelink

#### 8.22.2 RRM core requirements maintenance

##### 8.22.2.1 Sidelink CA

##### 8.22.2.2 SL unlicensed operation and others

#### 8.22.3 RRM performance requirements

#### 8.22.4 UE demodulation performance requirements

**R4-2400558 SL demod performance discussion**

*Type: discussion For: Approval  
 Source: Qualcomm, Inc.*

**Decision: Noted**

**R4-2400575 Discussion on UE demodulation performance for NR SL evolution**

*Type: discussion For: Discussion  
 38.101-4 v CR- rev Cat: (Rel-18)  
  
 Source: LG Electronics Inc.*

**Abstract:**

Our views to UE demodulation performance for NR SL evolution

**Decision: Noted**

**R4-2400576 Simulation results for PSSCH in SL-U**

*Type: other For: Information  
 38.101-4 v CR- rev Cat: (Rel-18)  
  
 Source: LG Electronics Inc.*

**Abstract:**

Simulation results for PSSCH in SL-U for information.

**Decision: Noted**

**R4-2401676 Discussions on sidelink UE demodulation requirements**

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

**Decision: Noted**

**R4-2402719 NR Sidelink Evolution: UE Demodulation Performance Requirements**

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

**Decision: Noted**

#### 8.22.5 Moderator summary and conclusions

**R4-2402664 Topic summary for [110][324] NR\_SL\_enh2\_demod**

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

**Abstract:**

[110][300] BDaT Session AI 8.22.4

**Decision: Noted**

**R4-2402869 Way forward on [110][324] NR\_SL\_enh2\_demod**

*Type: other For: Approval  
 Source: LGE*

**Decision: Approved**

**R4-2402982 Offline meeting minutes for [110][324] NR\_SL\_enh2\_demod**

*Type: For: Information  
   
 Source: LGE*

**Decision: Noted**

**Issue 1-2-4: Test configurations for PSSCH of SL-U**

* Table 11.1.2B.1.1-1: Test parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | | Unit | Value |
| Active cell(s) | |  | None |
| SL transmission model | |  | As specified in **B.X** |
| SL model  parameters | SL transmission duration values | Slots | ~~{2,4,6,7} or~~ {2,4,8} |
| ~~Occupied OFDM symbols in slot other than the first slot of the transmission duration~~ | ~~Symbols~~ | ~~12 (Except AGC, TxRx switching symbols)~~ |
| ~~Occupied OFDM symbols in the first slot of the transmission duration~~ | ~~Symbols~~ | ~~{6,7, …,12}~~ |
| Channel access procedure |  | Type 1 |
| Channel Access Priority Class (CAPC) |  | 1 |
| LBT failure probability (*pLBT*) |  | 0.25 |
| Sidelink UE 1 | Sidelink transmissions |  | PSCCH + PSSCH |
| PSSCH DMRS pattern (Note 1) |  | {2,3} |
| Number of interlace |  | 1 with RB index 0, 5, 10, …, 50 |
| Timing offset (Note 2) | μs | CP/2-12\*64\*Tc |
| Frequency offset (Note 3) | Hz | +650 |
| Synchronization |  | GNSS or GNSS-equivalent |
| Antenna configuration |  | 1x2 Low |
| PSFCH resource period | | Slot | 4 |
| MinTimeGapPSFCH | | Slot | 3 |
| Note 1: {x, y}: x and y means the number of DMRS symbols for slot with PSFCH transmission and without PSFCH transmission, respectively.  Note 2: Time offset of transmitted Sidelink UE signal with respect to GNSS referring timing.  Note 3: Frequency offset of transmitted Sidelink UE signal with respect to GNSS reference frequency. | | | |

Qualcomm: We would like to leave transmission duration and LBT probability in square brackets

LGE: Ok. The LBT is not expected to impact BLER but only the throughput

Qualcomm: The table is not a complete description of the LBT model. Ok to run the simulation, but for spec completion we still need an LBT model.

Huawei: Same view as Qualcomm. Can first focus on simulation, and leave the LBT model to CR work. It only affects the spec wording and CR implementation, not the simulation result.

### 8.23 Enhanced support of reduced capability NR devices

#### 8.23.1 UE RF requirements maintenance

#### 8.23.2 RRM core requirements maintenance

#### 8.23.3 RRM performance requirements

#### 8.23.4 Demodulation performance requirements

**R4-2401758 Work plan for demodulation requirements for Rel-18 eRedCap**

*Type: discussion For: Approval  
 Source: Ericsson*

**Abstract:**

This contribution proposes the work plan of UE and BS demodulation requirements for Rel-18 eRedCap.

**Decision: Noted**

##### 8.23.4.1 UE demodulation performance and CSI requirements

**R4-2400419 On the UE Demodulation Performance and CSI Requirements for RedCap Enhancements in NR**

*Type: discussion For: Discussion  
 38.101-4 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted**

**R4-2401677 Discussion on UE demodulation and CSI requirements for eRedCap**

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

**Decision: Noted**

**R4-2401759 UE demodulation requirements for RedCap enhancements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution shows our view on the UE demodulation and CSI reporting requirements for Rel-18 eRedCap.

**Decision: Noted**

**R4-2401860 UE demodulation performance requirements for eRedCap**

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

**Decision: Noted**

**R4-2402812 Scope of demod requirements for eRedCap**

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

**Decision: Noted**

##### 8.23.4.2 BS demodulation performance requirements

**R4-2401410 Discussion on eRedCap BS demodulation requirements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

General view on the eRedCap BS demodulation requirements

**Decision: Noted**

**R4-2401581 View on BS demodulation requirements for eRedCap**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2401678 Discussion on BS requirements for eRedCap**

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

**Decision: Noted**

**R4-2401861 BS demodulation performance requirements for eRedCap**

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

**Decision: Noted**

#### 8.23.5 Moderator summary and conclusions

**R4-2402665 Topic summary for [110][325] NR\_redcap\_enh\_demod**

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

**Abstract:**

[110][300] BDaT Session AI 8.23.4.1, 8.23.4.2

**Decision: Noted**

**Issue 2-2-4: PDSCH test cases for UE not supporting eRedCapNotReducedBB-BW-r18 (FG 48-1, supportOfERedCap-r18 only)**

Apple: We are doing both FDD and TDD for all modulations. Can we reduce test cases by not testing all modulations for both FDD and TDD and leveraging between FDD and TDD?

Ericsson: Some UE’s only support certain bands, may not support both FDD and TDD. Applicability rules can be discussed later, but the requirements should be defined for both FDD and TDD in case the UE only supports one duplex type.

Ericsson: For 2Rx case for 64QAM rank 2, it exceeds the Rel-18 eRedcap capability. We could reduce rank or PRB’s if we want to keep 64QAM.

Nokia: The PRB sizes are those that have been discussed in the RF.

Moderator: We can agree to QPSK and 16QAM. Other modulations are FFS. For 64QAM 2Rx, we need to reduce rank or bandwidth.

Ericsson: 256QAM will be difficult because of the restrictions on data rate for eRedcap.

Apple: What is the maximum number of PRB’s for 256QAM to keep within the data rate?

**Issue 2-2-5: Test cases for UE supporting eRedCapNotReducedBB-BW-r18 (FG 48-2)**

Moderator: At least we can use QPSK R=1/3

Qualcomm: Can we use the same test cases since the wider bandwidth still allows smaller number of PRBs

Apple: Is this only to reduce the simulation effort, or is there some other reason?

Qualcomm: Simulation is the main motivation. But we are also ok with wider bandwidth.

Huawei: For QPSK, legacy can be resused, but for higher modulation order with existing code rate cannot be used since this exceeds the target data rate.

Huawei: We are ok to define 16QAM and 64QAM, but we need to adjust code rate, PRB to meet the data rate

Ericsson: Also ok to define higher order modulation and would like to reuse Rel-17 MCS, but reduce PRB size and maybe rank.

Qualcomm: If we are reducing the PRB to meet the data rate, we may end up with the same as the bandwidth reduced test cases.

**Issue 2-7-1: CQI reporting test in static condition**

* Proposals (Ericsson, Nokia)
  + Define CQI reporting test in static condition for 1Rx/2Rx with TDD/FDD/HD-FDD.
    - Option 1 (Ericsson): Rank 1, lower SNR test point only

Huawei: We support this proposal

Qualcomm: We only need new RMC. No other changes to test configuration.

**R4-2402870 Way forward on [110][325] NR\_redcap\_enh\_demod**

*Type: other For: Approval  
 Source: Ericsson*

**Decision: Approved**

**R4-2403062 Ad-hoc meeting minutes for [110][325] NR\_redcap\_enh\_demod**

*Type: For: Information  
   
 Source: Ericsson*

**Decision: Noted**

### 8.24 Enhanced NR Sidelink Relay

#### 8.24.1 RRM core requirements maintenance

#### 8.24.2 RRM performance requirements

#### 8.24.3 Moderator summary and conclusions

### 8.25 Mobile IAB (Integrated Access and Backhaul) for NR

#### 8.25.1 Co-existence requirements maintenance

#### 8.25.2 RF core requirements maintenance

**R4-2402250 Draft CR to TS 38.175 with mobile IAB introduction to EMC specification**

*Type: draftCR For: Endorsement  
 38.175 v17.5.0 CR- rev Cat: (Rel-18)  
  
 Source: Nokia, Nokia Shanghai Bell*

**Decision: Endorsed**

**R4-2402502 Draft CR to 38.174 for mIAB RF requirement maintanence**

*Type: draftCR For: Endorsement  
 38.174 v18.3.0 CR- rev Cat: F (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

the CR corred the mIAB output power requriement

**Decision: Endorsed**

#### 8.25.3 RF conformance testing

**R4-2400650 On mobile-IAB RF conformance requirements**

*Type: discussion For: Approval  
 Source: Qualcomm Germany*

**Decision: Noted**

**R4-2400651 DraftCR to TS 38.176-1 on RF conformance requirements for NR Mobile IAB**

*Type: draftCR For: Endorsement  
 38.176-1 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Qualcomm Germany*

**Decision: Noted**

**R4-2400652 DraftCR to TS 38.176-2 on RF conformance requirements for NR Mobile IAB**

*Type: draftCR For: Endorsement  
 38.176-2 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Qualcomm Germany*

**Decision: Noted**

**R4-2400655 (NR\_IAB-Perf) CR for TS 38.176-1, Correction on IAB-MT Output power dynamics test requirements**

*Type: CR For: Agreement  
 38.176-1 v18.3.0 CR-0046 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Germany*

**Decision: Agreed**

**R4-2400658 (NR\_IAB-Perf) CR for TS 38.176-2, Correction on IAB-MT Output power dynamics test requirements**

*Type: CR For: Agreement  
 38.176-2 v18.3.0 CR-0049 rev Cat: A (Rel-18)  
  
 Source: Qualcomm Germany*

**Decision: Agreed**

**R4-2401993 (NR\_IAB-Perf) BigCR for 38.176-1 introduction of mobile IAB RF conformance requirements**

*Type: CR For: Agreement  
 38.176-1 v18.3.0 CR-0047 rev Cat: B (Rel-18)  
  
 Source: Qualcomm Germany, Ericson, Nokia*

**Decision: Endorsed**

Qualcomm: This Big CR to be endorsed because the WID needs to be changed for impacted specification

**R4-2401994 (NR\_IAB-Perf) BigCR for 38.176-2 introduction of mobile IAB RF conformance requirements**

*Type: CR For: Agreement  
 38.176-2 v18.3.0 CR-0050 rev Cat: B (Rel-18)  
  
 Source: Qualcomm Germany, Ericson, Nokia*

**Decision: Endorsed**

Qualcomm: This Big CR to be endorsed because the WID needs to be changed for impacted specification

**R4-2402251 Discussion on mobile IAB conformance testing**

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

**Decision: Noted**

**R4-2402499 On mIAB RF Conformance test**

*Type: other For: Approval  
 Source: Ericsson*

**Abstract:**

In this paper, we present our view on mIAB RF conformance updates.

**Decision: Noted**

**R4-2402500 Draft CR to 38.176-2 for mIAB RF conformance testing**

*Type: draftCR For: Endorsement  
 38.176-2 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

the CR to add test case for mIAB for 38.176-2

**Decision: Noted**

**R4-2402501 Draft CR to 38.176-1 for mIAB RF conformance testing**

*Type: draftCR For: Endorsement  
 38.176-1 v18.3.0 CR- rev Cat: B (Rel-18)  
  
 Source: Ericsson*

**Abstract:**

the CR to add test case for mIAB for 38.176-1

**Decision: Noted**

#### 8.25.4 RRM core requirements maintenance

#### 8.25.5 RRM performance requirements

#### 8.25.6 Demodulation performance requirements

**R4-2400649 Discussion on mobile-IAB demodulation performance requirements**

*Type: discussion For: Approval  
 Source: Qualcomm Germany*

**Decision: Noted**

**R4-2401558 On demodulation requirement for mIAB-MT and mIAB-DU**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On open issues for UE demodulation requirement for mIAB-DU and mIAB-MT

**Decision: Noted**

**R4-2401582 View on BS demodulation requirements for mobile IAB**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2401706 Discussion on demodulation performance requirements for mobile IAB**

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

**Decision: Noted**

**R4-2402564 On mIAB Demodulation Performance Requirements**

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

**Decision: Noted**

#### 8.25.7 Moderator summary and conclusions

**R4-2402650 Topic summary for [110][310] NR\_mobile\_IAB\_RF**

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

**Abstract:**

[110][300] BDaT Session AI 8.25.1, 8.25.2, 8.25.3

**Decision: Noted**

**R4-2402666 Topic summary for [110][326] NR\_mobile\_IAB\_demod**

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

**Abstract:**

[110][300] BDaT Session AI 8.25.6

**Decision: Noted**

**R4-2402871 Way forward on [110][326] NR\_mobile\_IAB\_demod**

*Type: other For: Approval  
 Source: Ericsson*

**Decision: Approved**

**R4-2402962 Way Forward for [110][310] NR\_mobile\_IAB\_RF**

*Type: For: Approval  
   
 Source: Qualcomm*

**Decision: Approved**

**R4-2403018 Ad-hoc meeting minutes for [110][326] NR\_mobile\_IAB\_demod**

*Type: For: Information  
   
 Source: Ericsson*

**Decision: Noted**

**Issue 1-2-1: Modulation order and Channel model selection for FR1 PDSCH demodulation requirements from 38.101-4.**

* Proposals
  + Option 1: QPSK with TDLB100-400 only. (Huawei)
  + Option 2: QPSK with TDLB100-400 and 16QAM with TDLC300-100. (Nokia)
  + Option 3: QPSK with TDLC300-100 only. (Qualcomm? Ericsson?)
  + Option 4: QPSK with TDLC300-100 and 16QAM with TDLC300-100. (Qualcomm? Ericsson?)
* Recommended WF
  + Companies to discuss during the meeting.

Tentative way forward:

Option 1: QPSK with TDLB100-400

Option 2: 16QAM with TDLC300-100.

Nokia: 16QAM with TDLC300-100 is defined for 30% throughput. If only this requirement is introduced, then we don’t have any requirement with higher doppler and 70% throughput. So, we could also consider option 3.

Huawei: The higher doppler is the key difference between mobile IAB and Rel-17 IAB. Option 1 is the best choice with higher doppler. The higher modulation order can be verified by existing test cases.

Nokia: Option 2 replaces one of the existing IAB test cases, so does not increase the number of test cases. This test case is already defined for UE, so we don’t need simulations.

Way forward: Both option 1 and option 2 are introduced, but option 2 replaces a corresponding existing test case.

**Issue 1-2-6: Rank selection for FR2-1 PDSCH demodulation requirements from 38.101-4.**

* Proposals
  + Option 1: Rank 1 only. (Huawei, Ericsson)
  + Option 2: Rank 1 and rank 2. (Nokia)
* Recommended WF:
  + Agree with rank 1 and FFS on rank 2.

Nokia: We proposed Rank 2 for FR2 because 16QAM is defined.

**Issue 1-2-7: Modulation order and Channel model selection for FR2-1 PDSCH demodulation requirements from 38.101-4.**

* Proposals:
  + Option 1: QPSK with TDLC60-300 (rank 1), 64QAM with TDLA30-300 (rank 1) and 16QAM in TDLA30-300 (rank 2). (Nokia)
  + Option 2: QPSK with TDLC60-300 (rank 1), 16QAM with TDLA30-300 (rank 1) and 64QAM in TDLA30-300 (rank 1). (Ericsson, Huawei?)
  + Option 3: 64QAM in TDLA30-300 (rank 1). (Huawei)
  + Option 4: Other options are not precluded.
* Recommended WF
  + Agree with the combinations of QPSK with TDLC60-300, 16QAM with TDLA30-300 ,64QAM with TDLA30-300. FFS on the appliable rank (depends on the agreement of Issue 1-2-6).

Huawei: We should focus on higher doppler. Higher order modulation is already covered by existing test cases.

Nokia: The question is about 16QAM.

Qualcomm: Can we agree at least with 64QAM with higher Doppler? (option 3 + option 4)

Seems agreeable.

Nokia: If we test higher modulation with higher doppler, then the same modulation with lower doppler can be skipped.

**Issue 1-3-2: Antenna selection for FR1 PDCCH demodulation requirements from 38.101-4**

* Proposals
  + Conducted
    - Option 1: Both 1Tx4Rx and 2Tx4Rx. (Nokia, Ericsson)
    - Option 2: Only 1Tx4Rx. (Huawei)
  + Radiated
    - Option 1: Both 1Tx2Rx and 2Tx2Rx. (Ericsson)
    - Option 2: Only 1Tx2Rx. (Nokia, Huawei)
* Recommended WF
  + Agree with 1Tx4Rx for conducted and 1Tx2Rx for PDCCH radiated requirements.
  + Further discussion on 2Tx4Rx for conducted and 2Tx2Rx for radiated requirements.

Huawei: 2Tx would require new test cases and new simulations. No existing 2Tx test case can be reused for 2Tx.

Moderator: 1Tx can be agreed.

**Issue 1-3-4: Aggregation level selection for FR1 PDCCH demodulation requirements from 38.101-4**

* Proposals
  + Option 1: 4 for 1Tx and 8 for 2Tx. (Nokia, Ericsson)
  + Option 2: 2 and 4 for 1Tx. (Huawei)
* Recommended WF
  + Moderator’s observation:
    - AL configuration selection depends on the selection of Tx, CORESET duration and Duplex.
  + Depend on the agreements of Issue 1-1-2, 1-3-2 and 1-3-3.

Nokia: It depends on which test case we introduce.

### 8.26 Network energy saving for NR

#### 8.26.1 BS conformance testing requirements

#### 8.26.2 RRM core requirements maintenance

##### 8.26.2.1 RRM requirements impacts

##### 8.26.2.2 SSB-less SCell operation

#### 8.26.3 RRM performance requirements

#### 8.26.4 UE demodulation performance and CSI requirements

**R4-2400420 Discussion on UE demodulation performance and CSI requirements for Network Energy Savings for NR**

*Type: discussion For: Discussion  
 38.101-4 v CR- rev Cat: (Rel-18)  
  
 Source: Apple*

**Decision: Noted**

**R4-2401115 discussion on demodulation and CSI requirements for NES**

*Type: discussion For: Discussion  
 Source: Samsung*

**Decision: Noted**

**R4-2401679 Discussion on Rel-18 NES demodulation and CSI requirements**

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

**Decision: Noted**

**R4-2401755 Discussion on UE demodulation and CSI reporting requirements for NES**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the UE demodulation and CSI reporting requirements for WI network energy saving.

**Decision: Noted**

**R4-2402278 Discussion on Network energy saving for NR UE demodulation performance and CSI requirements**

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

**Decision: Noted**

**R4-2402279 Simulation results on Network energy saving for NR UE demodulation performance and CSI requirements**

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

**Decision: Noted**

**R4-2402752 Discussion on UE Demod Requirements for NR Network Energy Saving**

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

**Decision: Noted**

#### 8.26.5 Moderator summary and conclusions

**R4-2402667 Topic summary for [110][327] Netw\_Energy\_NR\_demod**

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

**Abstract:**

[110][300] BDaT Session AI 8.26.4

**Decision: Noted**

**Issue 1-1-1: Whether to introduce new requirements for CA in SSB-less scenario**

* Proposals
  + Option 1: RAN4 discuss whether UE demodulation requirements are needed to verify SSB-less SCell operation in inter-band CA, considering that the RRM has introduced SCell activation delay requirements for SSB-less SCell in inter-band CA. (Ericsson)
  + Option 2: RAN4 shall define SSBless SCell PDSCH performance requirements for the case of TO=0.4CP, with fading channel, with TRS configured/sent, but without SSB transmission in the RMC. (Nokia)
  + Option 3: RAN4 shall evaluate the performance of SSB-less SCells CA performance with Rel-15 compliant demodulator implementations and decide, if the observed performance constitutes a practical operating point of the feature, or if new requirements that capture improved demodulator implementations are needed, or if SSB-less SCell compliant UE shall be tested with normal CA requirements.(Nokia)
  + Option 4: No (Apple, Huawei, Samsung, Qualcomm)

Nokia: We have many simulations that are not feasible for demod. All sims show reliability up to 0.4CP. We would set a limit for cell planning on how this feature can be used.

Huawei: Even though there may be a performance difference, we don’t expect any baseband algorithmic difference. We don’t expect new algorithms and we need to specify the minimum requirement.

Nokia: 1CP offset does not work with any implementation. Not all implementations perform the same. Some can tolerate larger offset, but the minimum achievable by all implementations is 0.4CP.

Qualcomm: We need to further evaluate the 0.4CP value. We need to align on the assumption on how the offset is simulated.

Nokia: We welcome other companies to provide simulation results. We should agree to parameters, channel model.

Ericsson: We are interested to see the performance, but we need to consider the WI objectives. The 0.4CP assumption might be misunderstood by some readers of the spec since collocated wouldn’t have such large offset.

Nokia: RRM spec seems to imply 1CP for co-location, so we want to clarify that operation can only be achieved with much lower offset than that.

Apple: We aren’t sure a requirement is needed yet. Share the same concern with Ericsson that collocated does not need such a large time offset.

Huawei: Existing tests already cover PDSCH with timing offset. It would be redundant to introduce another test as being discussed here.

Samsung: Same view as Huawei. 1CP is time difference after SCell activation stage, so there is very little remaining offset. No UE side algorithm enhancement is expected. Cell planning restrictions should come from RRM, not from performance.

Nokia: Disagree that there are many PDSCH with timing offset. This is different because we don’t have SSB SCell here. We have to use TRS. There is no such rule that cell planning should only be based on RRM.

Apple: Same concern as Samsung. We aren’t enhancing algorithms. Nokia results are only TDLC300-100. We could consider compromise to run simulations but would like to hear the view of other companies.

Nokia: We simulated TDLC300-100, TDLA, and AWGN. We aren’t looking at enhancing algorithms, but would like to understand how existing algorithms work with this feature so operators know when this feature can be enabled.

Huawei: We can compromise to run simulations if other companies are willing to do so.

Samsung: We prefer not to run simulations because we don’t know what the outcome would be.

Nokia: If sims show no degradation, then no new requirements are needed. Old requirements can apply. If there are limitations on timing offset, then this could be captured in specifications.

Samsung: Before inter-band SSB-less, there was already intra-band SSB-less CA. Would we need to go back and revisit that case as well?

Nokia: No. For intra-band, RRM does not expect large TO due to similar propagation path between the two carriers.

Samsung: We can also compromise to provide simulation results. We need to align the simulation assumptions first.

Chair: Companies are willing to provide simulation results for next meeting, but suggest to meet offline/ad-hoc first this week to align assumptions and parameters.

**Issue 2-2-1: Whether to introduce type1 spatial domain adaption requirements**

* Proposals
  + Option 1: Yes (Huawei)
  + Option 2: No (Apple, Samsung, Ericsson, Nokia, QC)

Huawei: This feature is very important. There is no RRM or RF test, so demod is needed. We expect the UE should develop improved algorithms and therefore we need requirements to verify.

Nokia: This is only a functional test. We should follow the same approach as RRM and RF to not have a test. There is already a capability in UE to show number of reports it can process. There is no performance aspect.

Apple: Same view as Nokia. This is a repackaging of existing functionality. There is no algorithm redesign.

Nokia: The performance increase from this feature is not coming from the UE, but rather the network. So testing to UE doesn’t make sense.

Huawei: The UE is required to report multiple channel estimation results, and other functions, so the UE performance is needed. We would like to keep this open still for further offline discussion to convince the other companies.

**R4-2402872 Way forward on [110][327] Netw\_Energy\_NR\_demod**

*Type: other For: Approval  
 Source: Huawei*

**Decision: Approved**

### 8.27 Enhancement of NR dynamic spectrum sharing

#### 8.27.1 General aspects

#### 8.27.2 UE demodulation performance requirements

**R4-2400468 UE demodulation performance requirements for NR dynamic spectrum sharing**

*Type: discussion For: Discussion  
 Source: Apple*

**Decision: Noted**

**R4-2400529 Discussion on PDCCH requirements for DSS enhancement**

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

**Decision: Noted**

**R4-2400530 Simulation results on PDCCH requirements for DSS enhancement**

*Type: other For: Information  
 Source: MediaTek inc.*

**Decision: Noted**

**R4-2400734 [NR\_DSS\_enh-Perf]Discussion on the demodulation performance requirements for DSS enhancements**

*Type: discussion For: Discussion  
 Source: Qualcomm India Pvt Ltd*

**Decision: Noted**

**R4-2401550 On PDCCH demodulation requirements for DSS enhancement**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

On remaining issues for PDCCH demodualtion requirement for DSS enh

**Decision: Noted**

**R4-2401551 Simulation resutls for DSS enhancement**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Submit our simulation results

**Decision: Noted**

**R4-2401552 Simulation result collection for DSS enhancement demodulation requirement**

*Type: other For: Information  
 Source: Ericsson*

**Abstract:**

Simulation results collection

**Decision: Noted**

**R4-2401680 Discussion on performance requirements for Rel-18 eDSS**

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

**Decision: Noted**

**R4-2401681 Simulation results for eDSS performance**

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

**Decision: Noted**

**R4-2402051 Discussion on enhancement of NR dynamic spectrum sharing demodulation requirements**

*Type: other For: Approval  
 Source: ZTE Corporation*

**Decision: Noted**

**R4-2402052 Simulation results for eDSS demodulation requirements**

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

**Decision: Noted**

**R4-2402720 Enhancement of NR dynamic spectrum sharing: UE Demodulation Performance Requirements**

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

**Decision: Noted**

**R4-2402721 On PDCCH of Enhancement of NR Dynamic Spectrum Sharing: Simulation Results**

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

**Decision: Noted**

#### 8.27.3 Moderator summary and conclusions

**R4-2402668 Topic summary for [110][328] NR\_DSS\_enh**

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

**Abstract:**

[110][300] BDaT Session AI 8.27.1, 8.27.2

**Decision: Noted**

**Issue 1-1: Antenna configuration**

* Proposals
  + Option 1: 2x2, 2x4, 4x2, 4x4 (Ericsson, ZTE, Nokia)
  + Option 2: 4x2, 4x4 only (Apple, MTK, QC, Huawei)
* Recommended WF
  + Need discussion

Apple: If LTE is transmitting on X ports, the NR can transmit on >=X ports. LTE can transmit on 4 ports, so 2Tx is not feasible unless LTE also transmits only 2 CRS ports.

MediaTek: Same view as Apple. We have LTE/NR coexistence previously with 4Tx.

Qualcomm: Same view as Apple. Because of PDCCH overlap with CRS, there is different performance.

Ericsson: The BS may still only Tx with 2Tx. For NR we always have 1Tx and 2Tx requirements, so should include those also for DSS.

ZTE: Even with LTE 4 port transmission, this does not limit NR to 4Tx.

Nokia: Same view as ZTE

Apple: If the assumption is 4port CRS but only 2port NR transmission, then why do we need to puncture for 4 port?

Huawei: RAN1 has always used 4Tx for LTE and NR.

**Issue 1-2: Channel bandwidth for TDD**

* Proposals
  + Option 1: 10MHz/15kHz (Apple, QC, Huawei, Nokia)
  + Option 2: 20MHz/15kHz (MTK, Ericsson)
* Recommended WF
  + Need discussion

MediaTek: We are also ok with 10 MHz. PDCCH is not related to channel bandwidth since it occupies the narrower bandwidth. We are ok with either option.

Ericsson: We prefer 20 MHz because the requirement assumes 20 MHz for CRS coexistence. There is no large difference in simulation results between 10 and 20 MHz, so we are also fine with 10 MHz.

Option1 is agreed.

**Issue 1-3: Channel model**

* Proposals
  + Option 1: Consider both TDLA30-10 and TDLC300-100 (Apple, MTK, Ericsson, Huawei, Nokia)
  + Option 2: Consider TDLA30-10 only (QC)
* Recommended WF
  + Need discussion

Qualcomm: We wanted to reduce the number of scenarios, but we are ok with option 1 as well.

Option 1 is agreed

**Issue 1-4: Payload**

* Proposals
  + Option 1: Higher payload for AL8 (Nokia)
  + Option 2: Keep previous agreement: 39bits
* Recommended WF
  + Need discussion

Nokia: If we use the same payload for AL4 and AL8, there is no additional information. If we want to consider both AL4 and AL8, then we need a different payload.

Ericsson: Some results are lower than -6 dB which is too low. So we are ok to discuss option 1.

Apple: Would like to keep previous agreement. The point is not the better performance of AL8, but rather the impact puncturing and channel estimation.

Qualcomm: Other parameters besides payload size to address low SNR.

Huawei: For AL8, our simulations show SNR is below -6 dB so we prefer option 1

Apple: We can also consider channel or other parameters to find a suitable SNR. These are just initial results.

Nokia: Is there any willingness to evaluate different payload size as part of the evaluation?

Apple: We are not suggesting another evaluation but rather to look at the existing simulation results to see if we can find a viable set of parameters. If cannot be found, then we can reconsider the payload size.

Ericsson: A possible WF is to double check the results. If we can find a proper test case with suitable SNR, then we can keep the payload size. We can also consider 53 bit payload size.

Nokia: We understand the WF for SNR, but there is another aspect of a previous agreement to consider both AL4 and AL8. If we keep 39 bits, then it may be better to just use AL4 and disregard AL8.

**Issue 1-6: How to align the simulation results**

* Proposals
  + Option 1: If there is a large variation in results, then discuss receiver assumptions (Huawei)
* Recommended WF
  + Large span has been observed already.
  + The moderator suggests companies to discuss and try to align the receiver assumption offline.

Huawei: We suggest to focus on simulation assumptions first, before discussion of receiver assumptions.

MediaTek: AL4 and AL8 results are available. The AL8 results are aligned, but not the AL4.

Apple: There is only one outlier. The results are not so disparate, so we may be able to avoid a discussion on receiver assumptions. We would not like to impose a restriction on the UE.

Nokia: We observe the same as MTK and Apple. We would like to understand the receiver assumptions, but agree that mandating a restriction to the UE is not appropriate. We are looking at our AL4 results which seem to be quite different from results of other companies.

Ericsson: Same view as other companies. We can bring updated simulation results in the next meeting. We’d like to check the receiver assumptions. Can these be made available?

Huawei: There are two receiver assumptions. The first is baseline receiver no processing for CRS RE’s. Second advanced receiver which punctures the LLR’s for CRS RE’s.

**R4-2402873 Way forward on [110][328] NR\_DSS\_enh**

*Type: other For: Approval  
 Source: Ericsson*

**Decision: Approved**

## 9 Rel-18 on-going work Items for LTE

### 9.1 Rel-18 LTE-Advanced Carrier Aggregation for x bands (2<=x<= 6) DL with y bands (y=1, 2) UL

#### 9.1.1 Rapporteur input (WID/TR/big CR)

#### 9.1.2 UE RF requirements for 1 UL

##### 9.1.2.1 Requirements with specific issues

##### 9.1.2.2 Requirements without specific issues

#### 9.1.3 UE RF requirements for 2UL

##### 9.1.3.1 Requirements with specific issues

##### 9.1.3.2 Requirements without specific issues

#### 9.1.4 Moderator summary and conclusions

### 9.2 Introduction of the Extended L-band (UL 1668-1675, DL 1518-1525) for IoT NTN

#### 9.2.1 General aspects (TR)

#### 9.2.2 Band definition and system parameters

#### 9.2.3 UE RF requirements (resubmitted CR)

#### 9.2.4 SAN RF requirements (resubmitted CR)

#### 9.2.5 RRM core requirements (resubmitted CR)

#### 9.2.6 Moderator summary and conclusions

### 9.3 High Power UE (Power Class 2) for LTE FDD Band 14

#### 9.3.1 General aspects (TR/big CR)

#### 9.3.2 UE RF requirements

##### 9.3.2.1 Tx requirements

##### 9.3.2.2 Rx requirements

#### 9.3.3 Release independency

#### 9.3.4 Moderator summary and conclusions

### 9.4 IoT (Internet of Things) NTN (non-terrestrial network) enhancements

#### 9.4.1 UE RF requirements maintenance

#### 9.4.2 SAN RF requirements maintenance

#### 9.4.3 RRM core requirements maintenance

#### 9.4.4 RRM performance requirements

#### 9.4.5 Demodulation performance requirements

**R4-2400255 Discussion on IoT NTN**

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

**Decision: Noted**

**R4-2400533 Discussion on UE requirements for IoT-NTN enhancement**

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

**Decision: Noted**

**R4-2400732 [IoT\_NTN\_enh-Perf]Discussion on the performance requirements for IoT NTN enhancements**

*Type: discussion For: Discussion  
 Source: Qualcomm India Pvt Ltd*

**Decision: Noted**

**R4-2400733 [IoT\_NTN\_enh-Perf]Simulation results for IoT NTN enhancements**

*Type: discussion For: Discussion  
 Source: Qualcomm India Pvt Ltd*

**Decision: Noted**

**R4-2401703 Discussion on demodulation performance requirements for IoT NTN enhancement**

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

**Decision: Noted**

**R4-2401748 UE demodulation requirements for IoT-NTN enhancements**

*Type: discussion For: Discussion  
 Source: Ericsson*

**Abstract:**

This contribution discusses the UE demodulation requirements for Rel-18 IoT-NTN enhancements.

**Decision: Noted**

#### 9.4.6 Moderator summary and conclusions

**R4-2402669 Topic summary for [110][329] IoT\_NTN\_Demod**

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

**Abstract:**

[110][300] BDaT Session AI 6.2.2.4, 9.4.5

**Decision: Noted**

**Issue 1-1: Whether to** **define** **PDSCH requirements for IoT-NTN with HARQ disabled?**

* Proposals
  + Option 1 (Nokia, MTK, HW, Ericsson): No
  + Option 2: Yes
    - Option 2a (QC): At least for NB-IoT devices. FFS for eMTC devices.

Qualcomm: Since we have disabled HARQ for NR NTN, we can do the same for IoT NTN, at least NB-IoT. For testability, there is dynamic HARQ enable/disable option which can be used for test. The test time is long, but for TDLC channel with small repetition, the test time can be reduced.

MediaTek: For NR NTN and NTN enh, there are many HARQ processes so we can reduce the number of processes and capture performance. But for IoT, there is only 1 HARQ process. If disabled, there is no feedback and difficult to test.

Qualcomm: The dynamic HARQ can be used

Ericsson: RAN4 is discussing the performance requirement. HARQ feedback is a MAC layer procedure. This is more of a functional test.

Qualcomm: There is a small delta in performance with and without HARQ. There may be larger performance delta for TDLC.

Ericsson: Performance gain is seen with combining. In this test, we would not be using HARQ ReTx so performance is decided by single transmission.

MediaTek: If the performance difference is small, it is difficult to identify if the UE is correctly following the requirement.

Ericsson: From performance point of view existing test already verifies the HARQ disabled because of repetition for IoT.

Qualcomm: Agree with Ericsson that with HARQ ReTx = 1, it is the same as HARQ disabled. But we don’t know if there is such a case. RAN1 has studied HARQ disabled, so RAN4 should define a requirement for this feature.

Qualcomm: We would like some time to check whether we can accept Option 1.

Qualcomm: We have rerun simulations with TDLA channels. The difference is nearly 2 dB at 50% throughput point which is much larger than previously assumed. For GSO test cases, the delay is very long for HARQ ReTx.

MediaTek: agree there is performance difference. But this a functional test. We already have this function in legacy test. We don’t need to define a requirement for every RAN1 feature. The UE algorithm is not expected to change.

Ericsson: Similar view as MediaTek. The change in performance is only coming from different configuration, not from any algorithmic change.

Huawei: Not a new feature since we have similar for LTE. Dynamic HARQ enabling and disabling is too complicated for the test setup.

Qualcomm: How do we verify HARQ disabled behavior?

MediaTek: There are many features for which we don’t have test cases. We don’t need to test every one.

Huawei: This is not the same as NR NTN where we defined HARQ disabled since there a large number of HARQ processes.

MediaTek: We need to consider whether feature needs to be tested, whether the testing is feasible, and the complexity of the test setup. Furthermore, we have limited time to complete the WI.

Qualcomm: Is the concern based on testability? It is not based on the need to define a requirement?

MediaTek: Not only the testability, but also the necessity.

Qualcomm: We agreed for a test for NR NTN which established a need. However, here the concern is only about testability.

Nokia: For NR NTN due to the large number of HARQ processes there is clear performance difference. Here, the performance difference is minimal.

Qualcomm: If repetitions are very high, then the difference between HARQ and HARQ disabled is small. But for small number of repetitions, the same is not true. There are two cases that were previously chosen: 32 and 256 repetitions, but there are possibly lower repetitions.

**R4-2402874 Way forward on [110][329] IoT\_NTN\_Demod**

*Type: other For: Approval  
 Source: MediaTek*

**Decision: Approved**

## 10 Rel-18 feature list

## 11 Rel-19 on-going non-spectrum related work items for NR

### 11.1 Artificial Intelligence (AI)/Machine Learning (ML) for NR Air Interface

#### 11.1.1 General aspects

#### 11.1.2 Testability and interoperability issues for beam management

#### 11.1.3 Testability and interoperability issues for positioning accuracy enhancement

#### 11.1.4 Testability and interoperability issues for CSI compression and CSI prediction

#### 11.1.5 Moderator summary and conclusions

## 12 Liaison output to other groups and related issues

### 12.1 R18 related

Submit contributions if there is no dedicated AI for the corresponding WIs

#### 12.1.1 LS on combination of HST and RRM relaxation (R2-2311435)

#### 12.1.2 Others

### 12.2 R17 related

#### 12.2.1 Power class related topics

LS on ue-PowerClassPerBandPerBC-r17(R2-2211023)

Configured transmitted power for inter-band UL CA including intra band contiguous CA with higherPowerLimit, and about handling of NOTE for power class in CA configuration tables

Multiple tdocs per company are allowed

#### 12.2.2 Others

### 12.3 R15, R16 related

#### 12.3.1 Reply LS on update for “interBandMRDC-WithOverlapDL-Bands-r16” in 38.306 (R2-2309218)

#### 12.3.2 Reply LS on power scaling and PHR in 38.213 (R1-2310555)

#### 12.3.3 Others

### 12.4 Moderator summary and conclusions

## 13 RAN task and other topics

### 13.1 Release independency specification (36.307, 38.307)

### 13.2 Co-existence for existing mobile networks caused by band n101

## 14 Revision of the Work Plan

## 15 Any other business

## 16 Close of the meeting

The RAN4 Chair Xizeng Dai (Huawei) formally closed the RAN4#110 meeting on Friday, 01/03/2024 at 17h30.

Report prepared by: MCC