**3GPP TSG-RAN WG4 Meeting # 104-bis-e R4-22XXXXX**

**Electronic Meeting, 10– 19 October 2022**

**Agenda item:** 7.5.1; 7.5.2; 7.5.5

**Source:** Moderator (MediaTek Inc.)

**Title:** Email discussion summary for [104-bis-e][143]LTE\_NBeMTC\_NTN\_UERF

**Document for:** Information

# Introduction

This email discussion covers the following sub-agenda items for WI LTE\_NBIOT\_eMTC\_NTN\_req (agenda item 7.5):

* 7.5.1: General and Work Plan
* 7.5.2: System parameters
* 7.5.5: UE RF requirements

The aim for the 1st round is to maximise agreement and common understanding on the above aspects.

It is appreciated that the delegates for this topic put their contact information in the table below.

Contact information

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **Email address** |
|  |  |  |

Note:

1. Please add your contact information in above table once you make comments on this email thread.
2. If multiple delegates from the same company make comments on single email thread, please add you name as suffix after company name when make comments i.e. Company A (XX, XX)

# Topic #1: General issues (7.5.1)

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2216857 | Ericsson | <Moderator comment: These documents will be handled in the RRM email thread [226]> |
| R4-2216858 | Ericsson |
| R4-2216859 | Ericsson |

## Open issues summary

There are no issues to discuss in 1st Round for Topic 1. Therefore, no discussion is proposed.

# Topic #2: System Parameters (7.5.2)

This topic covers the proposals in agenda item 7.5.2 on System Parameters.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2215487 | CMCC | **Observation 1:** for NB in-band deployment at 2G era, if same gNB transmit multiple carriers, 100kHz frequency gap is reserved. Besides, operators usually require all neighbor cells using different carriers. If so no frequency gap is reserved even when two carriers are adjacent to each other.  **Proposal 1:** it’s suggested to study the possibility to reduce frequency gap for NB IoT NTN gNB.  **Observation 2:** updated MDL+0.5 in R4-2213243 applies when we approve to shrink frequency gap and make it to be integral multiple of 15kHz tone.  **Proposal 2:** the EARFCN value for band 255 and band 256 are suggested as in above table. |
| R4-2216546 | ZTE Corporation | **Observation 1:** for the legacy TN NB-IoT spec, 100kHz frequency gap between adjacent NB-IoT carrier within the RF bandwidth, it should be still applicable.  **Proposal 1:** to postpone the discussion of guard band between IoT over NTN carriers until we get more concrete simulation results to validate its necessity.  **Proposal 2:** to follow the same M\_DL value of TN FDD band in Rel-18.  **Proposal 3:** to agree the EARFCN value in the above table for Band 256 and B255. |
| R4-2216637 | Ericsson | **Observation 1:** In the legacy NB-IoT specification, MDL is selected from {-10, -9, -8, -7, -6, -5, -4, -3, -2, -1, -0.5, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9} for FDD, which results in unutilized spectrum resources for orthogonal arrangement between anchor and non-anchor carrier since between anchor and non-anchor carriers there are 8 unused subcarriers as the closest possible selection.  **Observation 2:** In Rel-18 for NB-IoT over NTN, MDL is selected from -9.5, -8.5,-7.5, -6.5, -5.5, -4.5, -3.5, -2.5 -1.5, -0.5, 0.5, 1.5, 2.5, 3.5, 4.5, 5.5, 6.5, 7.5, 8.5, 9.5} for FDD, which opens the possibility of having no unused subcarriers (i.e., no unutilized resources) between anchor and non-anchor carriers with orthogonality design.  **Proposal 1:** Introducing a new set value of MDL -9.5, -8.5,-7.5, -6.5, -5.5, -4.5, -3.5, -2.5 -1.5, -0.5, 0.5, 1.5, 2.5, 3.5, 4.5, 5.5, 6.5, 7.5, 8.5, 9.5}. Alternatively, re-using the existing set introducing a new note for deriving a new MDL value defining MDL = MDL + 0.5. |
| R4-2216778 | Huawei, HiSilicon | **Proposal 1:** Reuse the frequency offset Foffset of 200kHz as specified for NB-IoT TN at least for the current WI.  **Proposal 2:** Follow the same M\_DL values as TN FDD for NTN.  **Proposal 3:** Define the ARFCN for IoT-NTN as shown in Table 1. |
| R4-2216799 | MediaTek (Chengdu) Inc. | **Proposal 1:** Existing principles for guardband on the UE side should be used at least as the baseline starting point. However, we welcome further feedback from stakeholders on the network deployment side regarding how to handle the Foffset.  **Proposal 2:** Reuse the existing M-DL values defined for FDD (Option 1) as part of this work item also for non-anchor carriers.  **Proposal 3:** Adopt the channel numbering approach starting from value 262143 and decrementing, starting from the upper edge for each band. Also adopt a similar framework to 38.101-1 in order to allow either a 100kHz or 200kHz EARFCN channel raster step size for future bands. |

## Open issues summary

### Sub-topic 2-1: F\_offset for NB-IoT BS

The question of whether or not to apply Foffset from T36.104 also for 36.108 for the NB-IoT BS.

Open issues and candidate options before e-meeting are captured below.

**Issue 2-1:**

* Proposals
  + Option 1: Reuse Foffset also for NTN operation
  + Option 2: Continue to study/analyse further as to whether Foffset is needed or can be reduced in size (with conclusion at next RAN4 meeting)
* Recommended WF
  + Views invited

### Sub-topic 2-2: MDL values for NB-IoT

The question as to the applicable MDL values for NB-IoT NTN.

Open issues and candidate options before e-meeting are captured below.

**Issue 2-2:**

* Proposals
  + Option 1: For NTN, follow the same MDL values as TN FDD
  + Option 2: For NTN, define an offset of +0.5 to the existing MDL values for FDD, applicable for non-anchor carrier operation
  + Option 3: For NTN, define new explicit values of of MDL {-9.5, -8.5,-7.5, -6.5, -5.5, -4.5, -3.5, -2.5 -1.5, -0.5, 0.5, 1.5, 2.5, 3.5, 4.5, 5.5, 6.5, 7.5, 8.5, 9.5}
* Recommended WF
  + Views invited

### Sub-topic 2-3: EARFCN/channel numbering

The question as to the EARFCN/channel numbering format and table.

Open issues and candidate options before e-meeting:

* Channel numbering options:
  + **Approach 1 (CMCC):** Channel numbering starting from b255. <Moderator: Is this really proposed?>

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **E-UTRA Operating Band** | **Downlink** | | | **Uplink** | | |
| **FDL\_low** [MHz] | **NOffs-DL** | **Range of NDL** | **FUL\_low** [MHz] | **NOffs-UL** | **Range of NUL** |
| 255 | 1525 | 130432 | 130432-130771 | 1626.5 | 261504 | 261504 -261843 |
| 256 | 2170 | 130772 | 130772-131071 | 1980 | 261844 | 261844-262143 |

* + **Approach 2 (Huawei):**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| NTN Operating  Band | Downlink | | | Uplink | | |
| FDL\_low (MHz) | NOffs-DL | Range of NDL | FUL\_low (MHz) | NOffs-UL | Range of NUL |
| 256 | 2170 | 229076 | 229076 – 229375 | 1980 | 261844 | 261844 – 262143 |
| 255 | 1525 | 228736 | 228736 – 229075 | 1626.5 | 261504 | 261504 – 261843 |
| NOTE : The channel numbers that designate carrier frequencies so close to the operating band edges that the carrier extends beyond the operating band edge shall not be used. | | | | | | |

* + **Approach 3 (ZTE):** Different NOffs-DL compared to Huawei, and additional text added to note for cat-M1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| E-UTRA Operating  Band | Downlink | | | Uplink | | |
| FDL\_low(MHz) | NOffs-DL | Range of NDL | FUL\_low(MHz) | NOffs-UL | Range of NUL |
| 256 | 2170 | 243544 | 243544 –<1>-– 243843 | 1980 | 261844 | 261844 –<1>- 262143 |
| 255 | 1525 | 243204 | 243204 –<1>-– 243543 | 1626.5 | 261504 | 261504 –<1>- 261843 |
| NOTE 1: The channel numbers that designate carrier frequencies so close to the operating band edges that the carrier extends beyond the operating band edge shall not be used. This implies that the first 7~~, 15, 25, 50, 75 and 100~~ channel numbers at the lower operating band edge and the last 6~~, 14, 24, 49, 74 and 99~~ channel numbers at the upper operating band edge shall not be used for channel bandwidths of 1.4~~, 3, 5, 10, 15 and 20 MHz respectively~~. | | | | | | |

* Whether to add flexibility to framework (similar to 38.101-1) in order to allow either a 100kHz or 200kHz EARFCN channel raster step size to be selected for “future” bands. (MediaTek) – also see related TP in RP-2216834

**Issue 2-3-1: Channel numbering**

* Proposals
  + Option 1: Channel numbering approach 1 <Moderator, please can CMCC confirm that they really intended to start from b255 as highest range?>
  + Option 2: Channel numbering approach 2
  + Option 3: Channel numbering approach 3
* Recommended WF
  + Agree extended note of Option 3 approach (applicable for cat-M1, not for NB1/2)
  + Feedback invited on down-selection between Option 2 and 3 for the NOffs-DL value to apply

**Issue 2-3-2: Flexibility in channel numbering framework for 100kHz or 200kHz raster later**

* Proposals
  + Option 1: Adopt a similar framework to 38.101-1 in order to allow either a 100kHz or 200kHz EARFCN channel raster step size to be selected for “future” bands
  + Option 2: Other
* Recommended WF
  + Views invited

## Companies views’ collection for 1st round

### Open issues

Sub topic 2-1

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 2-1: |

Sub topic 2-2

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 2-2: |

Sub topic 2-3

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 2-3-1:  Issue 2-3-2: |

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2216682 (Ericsson) | Company A |
| Company B |
|  |
| R4-2216834 (MediaTek) | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Topic #3: UE RF requirements (7.5.5)

This covers the proposals in agenda item 7.5.5 on UE RF requirements.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2215570 | Qualcomm Incorporated | **Observation 1:** UE is required to keep the same pre-compensation for the duration of the segment.  **Observation 2:** Segment duration is configured by the network  **Proposal:** NTN IoT UE frequency error requirement is defined such that UE is required to maintain estimated Doppler compensation constant for the duration of the segment. |
| R4-2215697 | Ligado Networks | **Observation 1:** Additional emissions requirements for NTN Band 255 are relaxed by 35 dB compared to that for TN Band 24.  **Observation 2:** There are no additional emissions requirements for NTN Band 255 in the out of band emissions region of an eMTC channel.  **Observation 3:** For frequency range of 1607 - 1626.5 MHz, NTN Band 255 requirement are much more relaxed than even the 3GPP general emissions requirements.  **Observation 4:** Within the spurious emission region of 1541 – 1607 MHz, the NTN Band 255 requirements exceed those specified in 3GPP by up to 10 dB.  **Observation 5:** 3GPP specifications within 1610 – 1626.5 MHz are adequate for CAT-M1 UEs without requiring A-MPR.  **Observation 6:** IM products resulting from sub-carrier allocation are above the emissions requirements for TN band 24 but below that for NTN Band 255.  **Observation 7:** PA emissions in the spurious region at maximum power are below the emissions requirements for both MBWs (700 Hz, 1 MHz).  **Proposal 1:** It is proposed that A-MPR is not required for IoT NTN operation for NTN Band 255 to meet the additional spurious emissions requirements. |
| R4-2215779 | MediaTek India Technology Pvt. | **Proposal 1:** Reuse existing NB-IoT NTN requirements for MPR, SEM and ACLR.  **Proposal 2:** (For spurious emission coexistence) use the NR bands as a starting point, and contribution invited on any additional E-UTRA bands to consider.  **Proposal 3:** Agree the Frequency Error definition proposed in this document. Also agree to verify the Frequency Error with zero doppler.  **Proposal 4:** Agree to reuse the NR NTN outcome for b256 OOB blocking. Agree the requirements defined in this document for NB-IoT NTN.  **Proposal 5:** Reuse existing NB-IoT TN requirements for IoT NTN UE ACS and adapt the test parameters according to the -40dBm Maximum Input Level.  **Proposal 6:** For Cat-M1 b256 REFSENS, reuse b255 value of –102.7 dBm (FDD) and -103.5 dBm (HD-FDD)  **Proposal 7:** For 36.102 clause 4.1, follow the 38.101-5 approach.  **Proposal 8:** For 36.102 clause 4.2:   * Adapt bullets a) and b) to directly indicate the applicability of main clause and suffix for each UE category. * Apply bullets a), c) and g) from 36.101 * Remove bullet f), as well as bullet d) if not clarified.   **Proposal 9:** Do not reserve a (clause 4 sub)-clause at this stage for “additional/suffix requirements”. Clause 4.2 can be split into different sub-clauses if necessary at a later stage.  **Proposal 10:** Add a bullet to clause 4.2 to indicate to point to TS36.307 for applicability of requirements to earlier Releases. |
| R4-2216147 | Xiaomi | **Proposal 1:** For band 256, the REFSENS is -102.2 dBm for M1 FDD and -103 dBm for M1 HD-FDD.  **Proposal 2:** the out of band requirement for for n256 could be reused for band 256 for cat M1 and NB1/2. |
| R4-2216254 | Sony | **Observation 1:** The REFSENS of NTN Cat-M1 can be scaled from NR NTN by considering the RB numbers, single Rx relaxation, and transmitter noise.  **Observation 2:** Deriving the REFSENS of NTN Cat-M1 from similar TN bands would result in similar values to those obtained by scaling from NR NTN devices.  **Proposal 1:** For band 256, the REFSENS of NTN Cat-M1 is -102.2 dBm for FD-FDD and -103 dBm for HD-FDD per 1.4 MHz. |
| R4-2216549 | ZTE Corporation | **Proposal 1:** to define NS\_xxN for NTN NS naming for all the NTN bands, but only for new NSs specified in TS 36.102.  **Proposal 2:** to define NS\_01 with requirement defined in 6.6.2F.1 of TS 36.101 and NS\_57N with requirement defined in 6.5.3.3.2 of TS 38.101-5 ( channel bandwidth to be updated as 200kHz for NB1 and NB2)for NB1/NB2 operating in Band n255.  **Proposal 3:** to define NS\_01 with requirement defined in 6.6.2F.1 of TS 36.101 and NS\_24 and NS\_100 for NB1/NB2 operating in Band n256.  **Proposal 4:** define NS\_01 with requirement defined in 6.6.2F.1 of TS 36.101 and NS\_57N with requirement defined in 6.5.3.3.2 of TS 38.101-5 ( channel bandwidth to be updated as 1.4MHz for Cat M1)for Cat M1 operating in Band n255.  **Proposal 5:** to define NS\_01 with requirement defined in 6.6.2F.1 of TS 36.101 and NS\_24 and NS\_100 for Cat M1 operating in Band n256.  **Proposal 6:** for Cat M1 REFSENS in band B255 and B256, to reuse the same requirement 1.4MHz of band 24 for B255 and B256.  **Proposal 7:** to define -40dBm as maximum input power for IoT over NTN UE.  **Proposal 8:** to follow the same requirement of OOBB requirement of band n256 for band B256. |
| R4-2216635 | Ericsson | **Observation 1:** The FCC 25.202(f) requirement is more stringent than the 3GPP SEM mask for Cat-M1 and NB-IoT.  **Proposal-2:** The same NS value can be applied to the additional SEM and additional spurious requirement in TS 38.101-5  **Proposal-3:** Further investigate the A-MPR with the new additional SEM requirement for b255 and b256.  **Observation 3:** It will be easier for TE to measure and compensate the pre-compensated doppler shift by UE relative to the nominal UL frequency  **Observation 4:** Discuss further whether the current test methodology is good enough to measure the additional frequency error caused by frequency pre-compensation in UE.  **Proposal-4:** Whether to have GNSS access at TE could leave to RAN5 to decide.  **Proposal-5:** The doppler frequency should be specified in annex so that frequency error caused by the deviation from the UE estimated amount and TE pre-set would be minimized.  **Proposal-6:** RAN4 discuss the above changes for the frequency error requirement considering the test discussion above.  **Proposal-7:** Discuss the above annex for the doppler frequency measurement.  **Proposal-8:** Legacy ACLR requirement should be reused if to reuse the legacy device directly to the NTN.  **Proposal-9:** Reuse the NTN spurious requirement for coexisting with modification of operating band number.  **Proposal-10:** Consider the NTN Cat-M1 REFSENS based on B65 REFSENS with half dB tightening in TS 36.101.  **Proposal-11:** Considering the above OOB for NTN cat-M1 and NTN NB-IoT. |
| R4-2216884 | Qualcomm | **Proposal:** Use suffixes on 2nd level in the specification 36.102 and approve the TP in appendix. |

## Open issues summary

### Sub-topic 3-1: Frequency error

UE frequency error requirement conditions and definition are discussed here (note that at RAN4#104-e there was an agreement on the frequency error values already.

Open issues and candidate options before e-meeting are captured in the options below:

**Issue 3-1:**

The following proposals are made:

* **Proposal 1:** Agree on baseline text for frequency error requirement proposed in R4-2215779, and same approach for cat-M1.
* **Proposal 2:** Make the following modification to proposal 1 final sentence “…*after compensation with ideally pre-compensated doppler frequency compared with nominal reference uplink carrier frequency*”
* **Proposal 3:** Mandate the UE to maintain Doppler pre-compensation constant for the duration of an UL segment
* **Proposal 4:** Agree to verify the Frequency Error with zero Doppler.
* Recommended WF
  + Please provide views on Proposals 1 to 4, indicating for each:
    - Option 1: Agree
    - Option 2: Other

### Sub-topic 3-2: Emissions requirements

Different requirements are proposed in terms of SEM, Additional SEM/Additional Spurious emissions and associated A-MPR, and also ACLR. Proposals are captured below.

**Issue 3-2:**

The following proposals are made:

* **Proposal 1:** Define NS\_xxN for NTN NS naming for all the NTN bands, but only for new NSs specified in TS 36.102.
* **Proposal 2:** The same NS value can be applied to the additional SEM and additional spurious requirement as for 36.101 if the same requirement is applicable for the NTN band as for TN. <Moderator: Ericsson please confirm that this is what you meant to say>
* **Proposal 3:** Reuse the NR NTN spurious requirement for coexisting with modification of operating band number
* **Proposal 4:** Define NS\_01 with requirement defined in 6.6.2F.1 of TS 36.101 and NS\_57N with requirement defined in 6.5.3.3.2 of TS 38.101-5 (channel bandwidth to be updated as 200kHz for NB1 and NB2) for NB1/NB2 operating in Band n255
* **Proposal 5:** Define NS\_01 with requirement defined in 6.6.2F.1 of TS 36.101 and NS\_24 and NS\_100 for NB1/NB2 operating in Band n256
* **Proposal 6:** Define NS\_01 with requirement defined in 6.6.2F.1 of TS 36.101 and NS\_57N with requirement defined in 6.5.3.3.2 of TS 38.101-5 (channel bandwidth to be updated as 1.4MHz for Cat M1) for Cat M1 operating in Band n255
* **Proposal 7:** Define NS\_01 with requirement defined in 6.6.2F.1 of TS 36.101 and NS\_24 and NS\_100 for Cat M1 operating in Band n256Recommended WF
* **Proposal 8:** A-MPR is not required for IoT NTN operation for NTN Band 255 to meet the additional spurious emissions requirements.
* **Proposal 9:** Further investigate the A-MPR with the new additional SEM requirement for b255 and b256.
* **Proposal 10** Reuse TS36.101 NB-IoT UE requirements for MPR, SEM and ACLR for NTN operation.
* Recommended way forward:
  + Please provide views on Proposals 1 to 10, indicating for each:
    - Option 1: Agree
    - Option 2: Other

### Sub-topic 3-3: Rx requirement proposals

Different proposals are made for:

* Rx sensitivity for cat-M1 in b256
* Out of band blocking for b256
* Maximum input level <Moderator: @ZTE: It seems we already agreed on -40dBm in the last meeting. Propose to consider this agreed>
* UE ACS

**Issue 3-3-1: Rx sensitivity for cat-M1 b256**

* Proposals
  + Option 1: For Cat-M1 b256 REFSENS, reuse b255 value of –102.7 dBm (FDD) and -103.5 dBm (HD-FDD)
  + Option 2: For band 256, the REFSENS of NTN Cat-M1 is -102.2 dBm for FD-FDD and -103 dBm for HD-FDD per 1.4 MHz.
  + Option 3: Consider the NTN Cat-M1 REFSENS based on B65 REFSENS with half dB tightening in TS 36.101. <Moderator: @Ericsson, please can you provide some concrete values? From your document it is unclear what exact values you propose>
* Recommended WF
  + Views invited.

**Issue 3-3-2: Maximum input level for all categories**

* Recommended WF
  + -40dBm was already agreed last meeting, so no need to discuss further this meeting.

**Issue 3-3-3: Out of band blocking**

* Proposals
  + Option 1: to follow the same requirement of OOBB requirement of band n256 for band B256 for category NB1/2 and category M1 (as in tables below)
  + Option 2: Other
* Recommended WF
  + Agree Option 1, along with notes as in tables below.

**NB-IoT:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Operating Band | Parameter | Unit | Range 1 | Range 2 | Range 3 |
|  | Pinterferer | dBm | -44 | -30 | -152 |
| 2561 | Finterferer (CW) | MHz | -100 < f – FDL\_low < -15  or  15 < f – FDL\_high < 60 | -145 < f – FDL\_low ≤ -100  or  60 ≤ f – FDL\_high < 85 | 1 ≤ f ≤ FDL\_low – 145  or  FDL\_high + 85 ≤ f ≤ 12750 |
| NOTE 1: Band n256 lower frequency ranges are modified to enable specific implementations  NOTE 2: For operating bands which downlink band frequency range is between 1475.9 MHz < f < 2690 MHz the power level of the interferer (PInterferer) for Range 3 shall be modified to: -20 dBm for the frequency range which is bounded by FDL\_low- 200 MHz of the lowest band that UE supports in frequency range 1475.9 MHz < f < 2690 MHz and FDL\_high + 200 MHz of the highest band that UE supports supports in frequency range 1475.9 MHz < f < 2690 MHz.” | | | | | |

**Cat-M1:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Operating Band | Parameter | Unit | Range 1 | Range 2 | Range 3 |
|  | Pinterferer | dBm | -44 | -30 | -15 |
| 2561 | Finterferer (CW) | MHz | -100 < f – FDL\_low < -15  or  15 < f – FDL\_high < 60 | -145 < f – FDL\_low ≤ -100  or  60 ≤ f – FDL\_high < 85 | 1 ≤ f ≤ FDL\_low – 145  or  FDL\_high + 85 ≤ f ≤ 12750 |
| NOTE 1: Band n256 lower frequency ranges are modified to enable specific implementations | | | | | |

**Issue 3-3-4: UE ACS**

* Proposals
  + Option 1: Reuse existing NB-IoT TN requirements for IoT NTN UE ACS and adapt the test parameters according to the -40dBm Maximum Input Level.
  + Option 2: Other
* Recommended WF
  + Views invited

### Sub-topic 3-4: Clause 4 – Requirements applicability

A set of proposals are made for clause 4, as reflected below.

**Issue 3-4-1:**

* Proposals
  + **Proposal 1:** For 36.102 clause 4.1, follow the 38.101-5 approach (rather than the 36.101 approach)
  + **Proposal 2:** For 36.102 clause 4.2:
    - Adapt bullets a) and b) from 36.101 to directly indicate the applicability of main clause and suffix for each UE category.
    - Apply bullets a), c) and g) from 36.101
    - Apply neither bullet f) nor bullet d) from 36.101 if not clarified.
  + **Proposal 3:** Do not reserve a (clause 4 sub)-clause at this stage for “additional/suffix requirements”. Clause 4.2 can be split into different sub-clauses, if necessary, at a later stage.
  + **Proposal 4:** Add a bullet to clause 4.2 to indicate to point to TS36.307 for applicability of requirements to earlier Releases.
  + **Proposal 5:** Use suffixes on 2nd level in the specification 36.102.
* Recommended WF
  + Views invited on Proposals 1 to 5, indicating for each:
    - Option 1: Agree
    - Option 2: Other

## Companies views’ collection for 1st round

### Open issues

Sub topic 3-1

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 3-1 |

Sub topic 3-2

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 3-2 |

Sub topic 3-3

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 3-3-1:  Issue 3-3-2:  Issue 3-3-3:  Issue 3-3-4: |

Sub topic 3-4

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 3-4: |

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2216636 (Ericsson) | Company A |
| Company B |
|  |
| R4-2216680 (MediaTek) | Company A |
| Company B |
|  |
| R4-2216681 (MediaTek) | Company A |
| Company B |
|  |
| R4-2216884 (Qualcomm) | <Moderator comment: Only provide comments on the text in the Annex here please> |
| Company A |
|  |
| R4-2215779 (MediaTek) – *not a formal TP, but text in Annex should be discussed* | <Moderator comment: Only provide comments on the text in the Annex here please> |
| Company A |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |  |
| --- | --- | --- | --- |
| **New Tdoc number** | **Title** | **Source** | **Comments** |
|  | WF on … | YYY |  |
|  | LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
|  |  |  |  |

**Existing tdocs**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-22xxxxx |  | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tdoc number** | **Revised to** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-22xxxxx |  | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-22xxxxx |  | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-22xxxxx |  | LS on … | ZZZ | Agreeable, Revised, Noted |  |
|  |  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents