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3GPP TSG RAN #103 RP-240130

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Views on RAN4 Rel-19 UE RF

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Agenda Item: 9.1.4.1

UE RF enh-High power UE (HPUE) for CA in TN

UE RF WI

- **Potential scope in guidance RP-240019**
  - Potential objectives:
    - High power UE (HPUE) for CA (non-spectrum item for the combinations which need generic requirements)
      - PC1.5 UE for intra-band contiguous CA with or without UL MIMO with 2Tx
      - PC1.5 UE for two band inter-band CA with 2Tx and/or 3Tx for handheld and FWA
        - 3Tx specifics: Also PC2?; EN-DC?
      - Generic framework of support increasing UE power high limit for inter-band CA HPUE (only for TN) for different power classes
        - Do we need a study phase, e.g.. in 2Q'24 (1 quarter)?
    - Further discussion on other type of HPUE CA band combinations.
    - Further discussion on whether to introduction of HPUE for EN-DC
    - Further discussion on whether to introduce PC1.5 for intra-band non-contiguous

- **Our proposals/views on FFS part**
  - For HPUE CA scope
    - 3Tx inter-band CA for PC2/PC1.5 handheld UE should be included
      - EN-DC can be considered as 2nd priority if there is clear interests
    - Generic requirements of increase power high limit for PC2/PC1.5 and different CA combinations, some example bands are needed:
      - PC2 2Tx related: FDD PC2+TDD PC3
      - PC2 3Tx related: e.g. PC3 1Tx + PC2 2Tx
      - PC 1.5 3Tx related: PC3 1Tx + PC1.5 2Tx
    - a study phase of increase power limit at least for PC1.5 3Tx is needed
  - PC1.5 for intra-band non-contiguous can be considered based on clear commercial demand

UE RF enh-Power boosting and/or MPR reduction

UE RF WI

- **Potential scope in guidance RP-240019**
  - Potential objectives:
    - **(Ensure reasonable load)** Power boosting or MPR reduction for PC2/PC3 with ACLR relaxation with BS indication (Study on whether and how much the requirement can be relaxed first and how often the power boosting can be done, and at least lower modulation order need be studied and FFS on higher modulation order) for FR1 and FR2
      - A study phase is necessary
      - Is there a need to consider RedCap?
    - MPR reduction for UL contiguous CA in FR1/FR2
      - How about a single active UL carrier case when CA is configured?

- **Our proposals/views on FFS part**
  - For Power booting/PMR reduction with ACLR relaxation
    - A study phase is needed before specifying requirements
      - PC2/PC3 with ACLR relaxation may only be adopted for FR1
      - For FR2, if considered, the study should be separated, e.g., focus on EVM relaxation
    - RedCap MPR reduction can be a specific case of the above study outcome, which should be considered
  - MPR reduction for UL contiguous CA in FR1/FR2
    - The case of “single active UL carrier when CA is configured” can also be considered

UE RF enh-6 Rx

UE RF WI

- **Potential scope in guidance RP-240019**
  - Potential objectives:
    - Do we need a feasibility study?
    - Investigate and enable 6Rx on higher frequency bands (>2.5GHz) targeting at support of smartphone and FWA
    - Specify the requirements to support SRS antenna switching
    - FFS on the MIMO layer to be supported.
    - Further discussions on the following potential objective:
      - Improved SRS reporting for antenna switching usage

- **Our proposals/views on FFS part**
  - For 6Rx
    - A feasibility study for 6Rx antenna smartphone type is needed
    - Focus on 4 MIMO layer
    - Focus on few example bands at high frequency range (n41 and n78)
  - **Do not** consider "Improved SRS reporting for antenna switching usage"
    - In RAN#102 meeting, many companies share concerns on this scope
    - This may have RAN1 impact

NTN UE RF enh-High power UE (HPUE) for NTN

NTN WI

- **Potential scope in guidance RP-240019**
  - Potential objectives:
    - Important to ensure reasonable load
    - Introduce PC2 for NR/IoT NTN UE in NTN FR1 bands for both handheld and non-handheld (need confirmation on the co-existence)
    - Introduce PC1 for NR NTN UE in NTN FR1 bands for non-handheld (the study on co-existence is needed)
    - Introduce PC1.5 for NR NTN UE in NTN FR1 bands (the study on co-existence is needed)
    - Need further discussion on whether the PC1.5 and PC1 are supported for non-handheld UE only or both handheld UE and non-handheld UE.
    - Need further discussion on whether IoT NTN UE can support PC1 and PC1.5.
    - Need further discussion on the prioritization of NTN work in terms of co-existence study.
    - Need further discussion on high power UE in NTN FR2 bands for non-handheld UE

- **Our proposals/views on FFS part**
  - For NTN HPUE RF (NR-NTN and IoT-NTN)
    - FR1 HPUE for satellite access to improve UL coverage is urgent commercial demand
    - IoT-NTN link budgets is also power starved, especially in the UL
    - For PC1.5 and PC1 NTN, we see clear commercial demand that the UE type should consider **both handheld UE and non-handheld UE**
      - **IoT NTN** should also **support PC1 and PC1.5**
      - a study phase may be needed
      - Focus on same example bands
    - Co-existence study for each new power class is required
    - Prioritize FR1 NTN bands in Rel-19, FR2 can be considered at a later release

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THANK YOU.
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