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

**Electronic Meeting, 15th – 26th Aug, 2022**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.104** | **CR** | **DRAFT** | **rev** | **-** | **Current version:** | **17.6.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

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|  | | | | | | | | | | |
| ***Title:*** | Draft CR on PRACH minimum requirements for high speed train (38.104, Rel-17) | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Huawei, HiSilicon, Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_HST\_FR2-Perf | | | | |  | ***Date:*** | | | 2022-08-22 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 1. Add note that HST FR2 requirements are only applicable for FR2-1.  Remove square brackets for NR HST FR2 PRACH minimum requirements for high speed train. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Add note that HST FR2 requirements are only applicable for FR2-1.  2. For HST FR2 PRACH minimum requirements for high speed train, update clause 11.4.2.2.3. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | There will be inconsisint between RAN4 agreements and the specification. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 11.4.2.2.1, 11.4.2.2.3 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS 38.141-2 | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

*<START OF THE CHANGE 1>*

11.4.2.2.1 General

The probability of detection is the conditional probability of correct detection of the preamble when the signal is present. There are several error cases – detecting different preamble than the one that was sent, not detecting a preamble at all or correct preamble detection but with the wrong timing estimation. For AWGN and TDLA30-300, a timing estimation error occurs if the estimation error of the timing of the strongest path is larger than the time error tolerance given in Table 11.4.2.2-1.

The performance requirements for high speed train (table 11.4.2.2.3-1) are optional and only applicable for FR2-1.

**Table 11.4.2.2-1: Time error tolerance for AWGN and TDLA30-300**

|  |  |  |  |
| --- | --- | --- | --- |
| **PRACH** | **PRACH SCS** | **Time error tolerance** | |
| **preamble** | **(kHz)** | **AWGN** | **TDLA30-300** |
| A1, A2, A3, B4, | 60 | 0.13 us | 0.28 us |
| C0, C2 | 120 | 0.07 us | 0.22 us |

The test preambles for normal mode are listed in table A.6-2 and the test parameter *msg1-FrequencyStart* is set to 0. The test preambles for high speed train short formats are listed in table A.6-7 and the test parameter *msg1-FrequencyStart* for high speed train is set to 0.

*<END OF THE CHANGE 1>*

*<START OF THE CHANGE 2>*

11.4.2.2.3 Minimum requirements for high speed train

The probability of detection shall be equal to or exceed 99% for the SNR levels listed in Table 11.4.2.2.3-1.

**Table 11.4.2.2.3-1: PRACH missed detection requirements for high speed train, 120 kHz SCS**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Number of**  **TX antennas** | **Number of**  **RX antennas** | **Propagation**  **conditions (Annex G)** | **Frequency**  **offset** | **SNR (dB)** |
| **Burst format C2** |
| 1 | 2 | AWGN | 19444 Hz | -10.4 |

*<END OF THE CHANGE 2>*