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| **Radiocommunication Study Groups** |  |
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| Received: 28 May 2021 | **Document 5D/630-E** |
| **31 May 2021** |
| **English only**  **TECHNOLOGY ASPECTS** |
| Director, Radio communication Bureau[[1]](#footnote-1) | |
| final Evaluation report of EUHT rit by  Africa Evaluation group | |
|  | |

**1 Introduction**

In the 35th e-meeting of ITU-R Working Party 5D (WP 5D), the two IMT-2020 candidate technology submissions from ETSI (TC DECT) and DECT forum and Nufront were agreed to rewind to Step 4. Before the 37th e-meeting of WP 5D, Africa Evaluation Group (AEG) indicated the intention of re-evaluation of submission from Nufront.

This contribution contains the final evaluation report of EUHT RIT (Doc. [IMT-2020/18(Rev.1)](https://www.itu.int/md/R15-IMT.2020-C-0018/en)) from Nufront proponent by AEG.

**Attachment**: 1

Attachment

Final Evaluation Report on submission IMT-2020/18(Rev.1)

Part I

Administrative aspects of the Independent Evaluation Group

**I.1 Name of the independent evaluation group**

Africa Evaluation Group (AEG).

**I.2 Background of AEG**

AEG is an independent evaluation group open to all African administrations, industry and academia. These will operate under the auspices of Africa Telecommunications Union (ATU) and participation will be allowed for eligible membership of ATU.

**I.3 Contact details**

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Part II

Technical aspects of the work of the Independent Evaluation Group

# II.1 Evaluated candidate IMT-2020 RIT/SRIT

This evaluation report contains the evaluation results on the submissions in Doc. [IMT‑2020/1](https://www.itu.int/md/R15-IMT.2020-C-0018/en)8(Rev.1).

# II.2 Utilization of ITU-R documents

AEG confirms that this evaluation report follows the evaluation guideline described in Report ITU‑R M.2412-0. The minimum technical requirements in this report are from Report ITU‑R M.2410-0.

# II.3 Verification

AEG identifies that the technology submissions in Document [IMT-2020/1](https://www.itu.int/md/R15-IMT.2020-C-0018/en)8(Rev.1) include complete compliance templates for service, spectrum and technical performance as specified in Report ITU-R M.2411.

AEG also identifies that the technology submission includes material for independent evaluation.

# II.4 Provision of Compliance Templates

The evaluation results by AEG are summarized in the tables below.

## II.4.1 Compliance template for service

Provision of compliance template for services (Section 5.2.4.1 of Report ITU-R M.2411)

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| --- | --- | --- |
|  | **Service capability requirements** | **Evaluator’s comments** |
| **5.2.4.1.1** | **Support for wide range of services**  Is the proposal able to support a range of services across different usage scenarios (eMBB, URLLC, and mMTC)?:🗹 YES / NO  Specify which usage scenarios (eMBB, URLLC, and mMTC) the candidate RIT or candidate SRIT can support.(1) | The candidate EUHT RIT can support the usage scenario of eMBB, URLLC and mMTC with the results in this evaluation report. |
| (1) Refer to the process requirements in IMT-2020/2. | | |

## II.4.2 Compliance template for spectrum

Provision of compliance template for spectrum (Section 5.2.4.2 of Report ITU-R M.2411)

|  |  |
| --- | --- |
|  | **Spectrum capability requirements** |
| **5.2.4.2.1** | **Frequency bands identified for IMT**  Is the proposal able to utilize at least one frequency band identified for IMT in the ITU Radio Regulations?: 🗹 YES / NO  Specify in which band(s) the candidate RIT or candidate SRIT can be deployed.  The following frequency bands can be supported, in accordance with spectrum requirements defined by Report ITU-R M.2411-0.   |  |  | | --- | --- | | **Uplink (UL) and Downlink (DL)operating band** | **Duplex Mode** | | 450-470 MHz | TDD | | 470-698 MHz | TDD | | 694/698-960 MHz | TDD | | 1 427-1 518 MHz | TDD | | 1 710-2 025 MHz | TDD | | 2 110-2 200 MHz | TDD | | 2 300-2 400 MHz | TDD | | 2 500-2 690 MHz | TDD | | 3 300-3 400 MHz | TDD | | 3 400-3 600 MHz | TDD | | 3 600-3 700 MHz | TDD | | 4 800-4 990 MHz | TDD | |
| **5.2.4.2.2** | **Higher Frequency range/band(s)**  Is the proposal able to utilize the higher frequency range/band(s) above 24.25 GHz?:  🗹YES / NO  Specify in which band(s) the candidate RIT or candidate SRIT can be deployed.  NOTE 1 – In the case of the candidate SRIT, at least one of the component RITs need to fulfil this requirement.   |  |  | | --- | --- | | **Uplink (UL) and Downlink (DL) operating band** | **Duplex Mode** | | 26 500 MHz-29 500 MHz | TDD | | 24 250 MHz-27 500 MHz | TDD | | 37 000 MHz-40 000 MHz | TDD | | 27 500 MHz-28 350 MHz | TDD | |

## II.4.3 Compliance template for technical performance

Provision of compliance template for technical performance (Section 5.2.4.3 of Report ITU-R M.2411)

| **Minimum technical performance requirements item (5.2.4.3.x), units, and Report ITU-R M.2410-0 section reference(1)** | **Category** | | | **Required value** | **Value(2)** | **Requirement met?** | **Comments (3)** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Usage scenario** | **Test environment** | **Downlink or uplink** |  |  |  |  |
| **5.2.4.3.1** Peak data rate (Gbit/s) *(4.1)* | eMBB | IMT-band | Downlink | 20 | 40.86 | 🗹 Yes  No |  |
| Uplink | 10 | 41.91 | 🗹 Yes  No |
| Higher Frequency band | Downlink | 20 | 127.82 | 🗹 Yes  No |  |
| Uplink | 10 | 85.51 | 🗹 Yes  No |  |
| **5.2.4.3.2** Peak spectral efficiency (bit/s/Hz) *(4.2)* | eMBB | IMT-band | Downlink | 30 | 51.08 | 🗹 Yes  No |  |
| Uplink | 15 | 52.39 | 🗹 Yes  No |
| Higher Frequency band | Downlink | 30 | 39.94 | 🗹 Yes  No |  |
| Uplink | 15 | 26.72 | 🗹 Yes  No |  |
| **5.2.4.3.3** User experienced data rate (Mbit/s) *(4.3)* | eMBB | Dense Urban – eMBB | Downlink | 100 | 130 | 🗹 Yes  No |  |
| Uplink | 50 | 56 | 🗹 Yes  No |
| **5.2.4.3.4** 5th percentile user spectral efficiency (bit/s/Hz) *(4.4)* | eMBB | Indoor Hotspot – eMBB | Downlink | 0.3 | 0.42 | 🗹 Yes  No |  |
| Uplink | 0.21 | 0.30 | 🗹 Yes  No |
| eMBB | Dense Urban – eMBB | Downlink | 0.225 | 0.39 | 🗹 Yes  No |
| Uplink | 0.15 | 0.24 | 🗹 Yes  No |
| eMBB | Rural – eMBB | Downlink | 0.12 | 0.35  (cfg. B) | 🗹 Yes  No |
| 0.14  (cfg. C) |
| Uplink | 0.045 | 0.09  (cfg. B) | 🗹 Yes  No |
| 0.062  (cfg. C) |
| **5.2.4.3.5** Average spectral efficiency (bit/s/Hz/ TRxP) *(4.5)* | eMBB | Indoor Hotspot – eMBB | Downlink | 9 | 10.28 | 🗹 Yes  No |  |
| Uplink | 6.75 | 7.50 | 🗹 Yes  No |
| eMBB | Dense Urban – eMBB | Downlink | 7.8 | 8.8 | 🗹 Yes  No |
| Uplink | 5.4 | 7.25 | 🗹 Yes  No |
| eMBB | Rural – eMBB | Downlink | 3.3 | 7.8  (cfg. B) | 🗹 Yes  No |
| 4.35  (cfg. C) |
| Uplink | 1.6 | 4.85  (cfg. B) | 🗹 Yes  No |
| 4.31  (cfg. C) |
| **5.2.4.3.6** Area traffic capacity (Mbit/s/m2) *(4.6)* | eMBB | Indoor-Hotspot – eMBB | Downlink | 10 | 10.97 | 🗹 Yes  No |  |
| **5.2.4.3.7** User plane latency (ms) *(4.7.1)* | eMBB | Not applicable | Downlink | 4 | 0.65~2.70 | 🗹 Yes  No |  |
| Uplink | 4 | 0.57~2.62 | 🗹 Yes  No |
| URLLC | Not applicable | Downlink | 1 | 0.53~0.62 | 🗹 Yes  No |
| Uplink | 1 | 0.33~0.43 | 🗹 Yes  No |
| **5.2.4.3.8** Control plane latency (ms) *(4.7.2)* | eMBB | Not applicable | Not applicable | 20 | 4~8 | 🗹 Yes  No |
| URLLC | Not applicable | Not applicable | 20 | 4~8 | 🗹 Yes  No |
| **5.2.4.3.9** Connection density (devices/km2) (4.8) | mMTC | Urban Macro – mMTC | Uplink | 1,000,000 | 148,063,086 | 🗹 Yes  No |  |
| **5.2.4.3.11** Reliability *(4.10)* | URLLC | Urban Macro –URLLC | Uplink or Downlink | 1-10−5 success probability of transmitting a layer 2 PDU(protocol data unit) of size 32 bytes within 1 ms in channel quality of coverage edge | >99.999% | 🗹 Yes  No |  |
| **5.2.4.3.14** Mobility interruption time (ms)  *(4.12)* | eMBB and URLLC | Not applicable | Not applicable | 0 | 0 | 🗹 Yes  No |  |
| **5.2.4.3.15** Bandwidth and Scalability *(4.13)* | Not applicable | Not applicable | Not applicable | At least 100 MHz | At least 800MHz | 🗹 Yes  No |  |
| Up to 1 GHz | Up to 6.4GHz | 🗹 Yes  No |
| Support of multiple different bandwidth values(4) | 11 supported bandwidth for IMT-band: 5, 10, 15, 20, 25, 30, 40, 50, 60, 80, 100MHz  4 supported bandwidth for higher frequency band:  50, 100, 200, 400MHz | 🗹 Yes  No |
| (1) As defined in Report ITU-R M.2410-0.  (2) According to the evaluation methodology specified in Report ITU-R M.2412-0.  (3) Proponents should report their selected evaluation methodology of the Connection density, the channel model variant used, and evaluation configuration(s) with their exact values (e.g. antenna element number, bandwidth, etc.) per test environment, and could provide other relevant information as well. For details, refer to Report ITU-R M.2412-0, in particular, § 7.1.3 for the evaluation methodologies, § 8.4 for the evaluation configurations per each test environment, and Annex 1 on the channel model variants.  (4) Refer to § 7.3.1 of Report ITU-R M.2412-0. | | | | | | | |

# II.5 Provision of Compliance Templates

**Additional Evaluation Methodologies and Assumptions**

Have any additional evaluation methodologies or assumptions that had not been included in the Report ITU-R M.2412-0 been used in evaluation?

🞎 Yes 🗹No

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1. Submitted on behalf of AEG. [↑](#footnote-ref-1)