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| **Radiocommunication Study Groups** |  |
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| Received: 3 December 2019 | **Document 5D/32-E** |
| **4 December 2019** |
| **English only  TECHNOLOGY ASPECTS** |
| Director, Radiocommunication Bureau[[1]](#footnote-1)\* | |
| INITIAL EVALUATION REPORT FROM EAG FOR ETSI PROPONENT SUBMISSIONS OF SRIT & RIT | |
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# 1 Introduction

In accordance to the ITU-R Submission, Evaluation Process and Consensus Building for IMT-2020 (Doc. [IMT-2020/2](https://www.itu.int/md/R15-IMT.2020-C-0002/en)), the Africa Evaluation Group (AEG) has been established as an independent evaluation group open to all African administrations, industry and academia. This initial/interim report focuses of the “inspection approach” of the 3GPP proponent submission of the SRIT and RIT. The inspection was conducted by reviewing the functionality and parameter provided by 3GPP. The following were inspected; (1) *energy efficiency*, (2) *bandwidth,* (3) *support of wide range of services* and (4) *supported spectrum band(s)/range(s).*

This preliminary submission covers only items labelled “Inspection” in Table 1 *“Summary of evaluation methodologies*” of Report ITU-R M.2412-0. The assessment criteria from Reports ITU‑R M.2410-0 (11/2017), ITU-R M.2411-0 (11/2017) and ITU-R M.2412-0 (10/2017) have been followed.

Work is in progress to expand the evaluation for further submission in time for the 34th Working Party 5D meeting to include items labelled “Analytical” in Table 1 of Report ITU-R M.2412-0.

# 2 Evaluation of Technical Performance Requirements (TPR)

This section evaluates TPR and Other Requirements via “inspection” of the 3GPP submission for IMT-2020.

## 2.1 Energy efficiency

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| 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 |
| **5.2.4.3.10 Energy efficiency *(4.9)*** | eMBB | Not applicable | Not applicable | Capability to support a high sleep ratio and long sleep duration | *N/A* | Yes  No |  |

From the characteristics template, 5.2.3.2.25,

For NR :

For DECT-2020 NR component RIT:

The RIT includes multiple mechanisms for supporting the efficient operation of PPs with high sleep ratio and long sleep duration, such as battery operated IoT devices. Such techniques are inherited from the DECT ULE technology and include:

– Full deep sleep mode with zero radio activity (including reception);

– Extended beacon bearer with specific ULE access information;

– Channel scanning and pre-selection;

– Ultra slow paging mechanism for high sleep ratio devices;

– Optimized packet format for ULE;

– Expedited access procedures.

## 2.2 Bandwidth

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| 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 |
| **5.2.4.3.15** Bandwidth and Scalability *(4.13)* | Not applicable | Not applicable | Not applicable | At least 100 MHz | *108 MHz with subcarrier x4 and FFT =1024* | 🗹 Yes  No |  |
| Up to 1 GHz | *432 MHz per link with subcarrier x16 and FFT =1024*  *3 links = 1.296 GHz* | 🗹 Yes  No |  |
| Support of multiple different bandwidth values(4) | *0.6 – 432 MHz (per layer 1 link)* | 🗹 Yes  No |  |

From the characteristics template, 5.2.3.2.25,

For NR :

For DECT-2020 NR component RIT:

Channel bandwidth is scalable in multiples of WBC (1.728 MHz). Assuming 27 kHz sub-carrier spacing and FFT size = 1024, the largest operating bandwidth for a single link is 27.648 MHz.

Wider bandwidths are possible by either increasing FFT size, stacking multiple layer 1 links or by scaling up the subcarrier spacing.

For operation at higher frequencies the scaling up of the subcarrier spacing is used. Escalation factors of x2 (54 kHz), x4 (108 kHz), x8 (216 kHz) and x16 (432 kHz) have been considered.

– For 216 kHz sub-carrier spacing (x8), the largest operating bandwidth for a single link assuming FFT = 1024 is 221.184 MHz.

– For 432 kHz sub-carrier spacing (x16), the largest operating bandwidth for a single link assuming FFT = 1024 is 442.368 MHz.

Further scalability beyond these figures is possible by using multiple layer 1 links.

## 2.3 Range of Services supported

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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 SRIT proposal can support eMBB, URLLC and mMTC usage scenarios.* |
| (1) Refer to the process requirements in IMT-2020/2. | | |

## 2.4 Supported Bands/Ranges

Compliance template **for** services

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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 SRIT proposal can support eMBB, URLLC and mMTC usage scenarios.* |
| 1. Refer to the process requirements in IMT-2020/2. | | |

Compliance template for spectrum3

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|  | 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.  ***For DECT-2020 NR component RIT:***  *The candidate RIT is designed to operate over:*   1. *The frequency bands currently allocated to DECT service (1880 MHz – 1900 MHz)* 2. *The frequency bands currently allocated to IMT-2000 FT service (1900 MHz – 1980 MHz and 2010 MHz – 2025 MHz)* 3. *Any other frequency band that may be allocated in the future to the service, including bands above 24.25 GHz*   *In particular license exempt frequencies at the 5 GHz band have been considered as possible.*  ***For 3GPP-NR component RIT:***  *Same as in the „3GPP 5G CANDIDATE FOR INCLUSION IN IMT-2020: SUBMISSION 2 FOR IMT-2020 (RIT)“ package.* |
| **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.  ***For DECT-2020 NR component RIT:***  *N/A*  ***For 3GPP-NR component RIT:***  *Same as in the „3GPP 5G CANDIDATE FOR INCLUSION IN IMT-2020: SUBMISSION 2 FOR IMT-2020 (RIT)“ package.* |

(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.

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1. \* Submitted on behalf of the Africa Evaluation Group (AEG). [↑](#footnote-ref-1)