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| **Radiocommunication Study Groups** |  |
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| Received: 27 November 2019 | **Document 5D/4-E** |
| **28 November 2019** |
| **English only****TECHNOLOGY ASPECTS** |
| Alliance for Telecommunications Industry Solutions |
| INITIAL EVALUATION REPORT FOR RIT SUBMISSION FROM TSDSI ([IMT-2020/19](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-IMT.2020-C-0019)) FOR 3GPP PORTIONS ONLY |
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Part I - Administrative aspects of the Independent Evaluation Group

1. Name of the Independent Evaluation Group

 ATIS WTSC IMT-2020 Independent Evaluation Group (IEG).

1. Introduction and background of the Independent Evaluation Group

 The Wireless Technologies and Systems Committee (WTSC) is a technical standards committee chartered under the sponsorship of the Alliance for Telecommunications Industry Solutions (ATIS). ATIS is made up of more than 150 member companies contributing to more than 30 committees and strategic initiatives. ATIS is a Standards Development Organization (SDO) accredited by the American National Standards Institute (ANSI).

 WTSC develops standards for the 3GPP family of technologies (GERAN, UMTS, HSPA, LTE, LTE-Advanced, 5G, etc.). As of November 2019, there were over 40 voting member companies of WTSC.

 The ATIS WTSC IMT-2020 IEG was formed under the auspices of WTSC, and was given the responsibility of conducting the IMT-2020 submission evaluations.

1. Method of Work

 IEGs are kindly requested to share the process and method of working employed in the development and preparation of their evaluation reports. Please indicate to WP 5D aspects such as:

* 1. The manner in which the evaluation group conducted its work: e.g. through meetings, evaluation discussion area, etc.

The ATIS WTSC IMT-2020 IEG conducted its work mostly through face-to-face and virtual meetings, supported by the ATIS Workspace tool.

Whether interaction with proponents and other evaluation groups occurred; ATIS WTSC IMT-2020 IEG conducted its work through:

* Physical meetings where contributions are presented by the members and baseline text is adopted.
* Email reflectors are utilized to communicate with the members.
* A contribution database is maintained by ATIS.
* Participation in the ITU-R Evaluation Group discussion area.
* Participation in the relevant workshops.
	1. The manner in which it performed the evaluation - analysis, inspection, simulations or by combinations of these, or other, means.

The following TPRs were evaluated using Simulation:

* Indoor Hotspot, Dense Urban, and Rural eMBB: Cell/User Spectral Efficiency and Mobility.
* Urban Macro: Connection Density (full buffer), Connection Density (non-full buffer), and Reliability.

The following TPRs were evaluated using Analysis:

* eMBB: Peak spectral efficiency and Peak data rate.
* eMBB and URLLC: Peak spectral efficiency, Peak data rate, Mobility interruption time, Control Plane Latency, User Plane Latency.

The following TPRs were evaluated using Inspection:

* Bandwidth.
* Energy efficiency.
* Support of wide range of services.
* Supported spectrum band(s)/range(s).

Link Budgets (Characteristics Template)

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Part II - Technical aspects of the work of the Independent Evaluation Group

1 What candidate technologies or portions of the candidate technologies this IEG is or might anticipate evaluating?

 RIT Submission from TSDSI ([IMT-2020/19](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-IMT.2020-C-0019))[[1]](#footnote-1) *3GPP portions only.*

2 Confirmation of utilization of the ITU-R evaluation guidelines in Report ITU R M.2412

 Confirmed.

3 Documentation of any additional evaluation methodologies that are or might be developed by the Independent Evaluation Group to complement the evaluation guidelines.

 Please refer to the Interim Report - Initial Evaluation Report from ATIS WTSC IMT‑2020 Evaluation Group for 3GPP proponent submissions of SRIT ([*IMT-2020/13*](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-IMT.2020-C-0013)*)* & RIT ([*IMT-2020/14*](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-IMT.2020-C-0014)*)*.

4 Verification as per Report ITU-R M.2411 of the compliance templates and the self‑evaluation for each candidate technology as indicated in 1.

* + Identify gaps/deficiencies in submitted material and/or self-evaluation.
	+ Identify areas requiring clarifications.
	+ General questions.

 Please refer to the Interim Report - Initial Evaluation Report from ATIS WTSC IMT‑2020 Evaluation Group for 3GPP proponent submissions of SRIT ([*IMT-2020/13*](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-IMT.2020-C-0013)*)* & RIT ([*IMT-2020/14*](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-IMT.2020-C-0014)*)*.

5 Assessment as per Reports ITU-R M.2410, ITU-R M.2411 and ITU-R M.2412 for each candidate technology as indicated in 1.

* + Detailed analysis/assessment and evaluation by the IEGs of the compliance templates submitted by the proponents per the Report ITU-R M.2411 section 5.2.4.
	+ Provide any additional comments in the templates along with supporting documentation for such comments.
	+ Analysis of the proponent’s self-evaluation by the IEG.

 Please refer to the Interim Report - Initial Evaluation Report from ATIS WTSC IMT‑2020 Evaluation Group for 3GPP proponent submissions of SRIT ([*IMT-2020/13*](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-IMT.2020-C-0013)*)* & RIT ([*IMT-2020/14*](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=R15-IMT.2020-C-0014)*)*.

6 Questions and feedback to WP 5D and/or the proponents or other IEGs.

 ATIS WTSC IMT-2020 IEG has posted a number of questions and feedback on the IMT-2020 Evaluation Groups discussion area.

7 In the interim report, kindly provide the proposed next steps towards the final report to be sent to WP 5D for the February 2020 meeting.

 ATIS WTSC IMT-2020 IEG will continue to analyse the submission and update its report accordingly.

Part III - Conclusion

 ATIS WTSC IMT-2020 IEG has reviewed submission in Documents [5D/1231](https://www.itu.int/md/R15-WP5D-C-1231/en) and [5D/1301](https://www.itu.int/md/R15-WP5D-C-1301/en).

 ATIS WTSC IMT-2020 IEG notes that a large portion of the submission is identical to the unmodified 3GPP specific portions of the submission; as such, it should follow the same disposition.

 ATIS WTSC IMT-2020 IEG notes that in accordance with Report ITU-R M.2411 there are certain submission guidelines, some of which are related to the provision of voluntary supplementary material, as indicated in this extract from Report ITU-R M.2411:

## “……

## 5.2 Submission guidelines and templates

### 5.2.1 Submission guidelines

Submission of the ITU-R requested information and voluntary supplementary information addressing the description template and compliance template on the candidate RITs or SRITs by proponents in the form of completed templates shown in § 5.2.2 can be made electronically or by other means to the ITU-R.

### 5.2.2 Templates for submission

Templates required for submission of IMT-2020 candidate RITs or SRITs are divided into two categories: an RIT/SRIT description template and RIT/SRIT compliance templates. Each set of responses:

a) must complete the RIT/SRIT description template and RIT/SRIT compliance templates – this is information developed in a template format in order to provide a common base of information across the submissions and therefore follows a defined format, asks certain questions, and proposes the responses be provided in a suggested format to the questions determined by ITU-R; and

b) may include voluntary supplementary information – this is additional information deemed relevant by the proponent *to provide further understanding of the submission*. This information may be formatted as desired by the proponent.

…..”

 ATIS WTSC IMT-2020 IEG duly notes that TSDSI has provided supplementary material, in particular, in Document 5D/[1301](https://www.itu.int/md/R15-WP5D-C-1301/en) as indicated below:

*Section 20: Coverage Enhancement with Pi/2 BPSK and Spectrum Shaping*

 *…provide additional coverage results using power boost (26 dBm TX power with 50% duty cycle) feature as supplementary information. RIT introduces an LMLC waveform*

* *pi/2 BPSK with spectrum shaping feature using unfiltered DMRS*
* *When pi/2 BPSK is enabled, UE transmits up to 26 dBm max power compared to 23 dBm for QPSK*

Configuration/Assumptions (multi-cell system-level-simulation)

|  |  |
| --- | --- |
| **Parameter** | **Value** |
| **ISD** | **12 Km** |
| **Fc** | **3.5 GHz TDD** |
| Antenna (UE, BTS) | (1,2), (1,4) and 18 dB gain sectoral antenna |
| BS height | 35 m |
| UE height | 1.5 m |
| Bandwidth | 60 MHz |
| UE transmit power | 23 dBm (without pi/2 bpsk), 26 dBm (for pi/2 bpsk) |
| Pathloss Model | LMLC (ITU-R M.2412-0) |
| 10 UEs/sector | Available RBs are equally shared among the UEs |

 ATIS WTSC IMT-2020 IEG has the following observations on this supplementary information.

 It is noted that this supplementary information, while interesting, does not provide material that is relevant and pertinent to the IMT-2020 evaluation and does not “*provide further understanding of the submission*” because this supplementary information in general, in the parametric values or other assumptions and analysis utilized, does not align with that specified in Report ITU-R M.2412 for a specific scenario being assessed.

 Therefore, in conjunction with the supplementary material noted above, and pertaining to Step 3 (for self-evaluation aspects) and/or Step 4 for this submission, it is noted that:

* ATIS WTSC IMT-2020 IEG has not considered the indicated supplementary materials in the IMT-2020 evaluation as it is not directly relevant to the formal IMT-2020 evaluation.
* ATIS WTSC IMT-2020 IEG holds the view that the proposed technology operating under the specific technical provisions stated in the supplementary material provides no indication or validation of the suitability of the proposed technology with regard to meeting the IMT-2020 performance requirements.
* ATIS WTSC IMT-2020 IEG therefore offers no endorsement of this supplementary information in the context of IMT-2020 suitability.

 ATIS WTSC IMT-2020 IEG requests that this view be included in the records of the work of ITU-R Working Party 5D pertaining to Step 3 (for self-evaluation aspects) and also Step 4 for this submission.

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1. Document [5D/1231](https://www.itu.int/md/R15-WP5D-C-1231/en) “Updated submission of the candidate IMT-2020 technology”. Also, Document [5D/1301](https://www.itu.int/md/R15-WP5D-C-1301/en) “Updated submission of the candidate IMT-2020 Technology” was considered. [↑](#footnote-ref-1)