**3GPP TSG-RAN5 Meeting #94-e R5-221383**

**Electronic Meeting, 21 February - 04 March 2022**

**3GPP TSG RAN Meeting #95-e RP-22xxxx**

**Electronic Meeting, 17 March - 23 March 2022**

**Source: China Telecom**

**Title: New WID on UE Conformance - NR coverage enhancements**

**Document for: Endorsement**

**Agenda Item: 7.4.1**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

# Title: UE Conformance - NR coverage enhancements

## Acronym: NR\_cov\_enh-UEConTest

## Unique identifier:

|  |  |
| --- | --- |
| **This WID includes a Testing part** | **X** |
| **and it addresses the following 3GPP work area:** | **Radio Access** | **X** |
| **Core Network** |  |
| **Services** |  |

Potential target Release: Rel-17

## 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  |  |  |  |  |
| **No** | X | X | X | X |  |
| **Don't know** |  |  |  |  |  |

## 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

This work item is a

|  |  |
| --- | --- |
|  | Feature |
| X | Building Block |
|  | *Work Task* |
|  | Study Item |

### 2.2 Parent Work Item

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| NR\_cov\_enh | RAN1 | 900061 | NR coverage enhancements |

### 2.3 Other related Work Items and dependencies

|  |
| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
|  |  |  |

## 3 Justification

Coverage is one of the key factors that an operator considers when commercializing cellular communication networks due to its direct impact on service quality as well as CAPEX and OPEX. Many countries are making available more spectrum in FR1, such as 3.5 GHz, which is typically in higher frequencies than for LTE or 3G. Furthermore, compared to LTE, NR is designed to operate at much higher frequencies such as 28GHz or 39GHz in FR2. Due to the higher frequencies, it is inevitable that the wireless channel will be subject to higher path-loss making it more challenging to maintain an adequate quality of service that is at least equal to that of legacy RATs.

The Rel-17 study item “Study on NR coverage enhancements” studied the enhancements of coverage for PUSCH, PUCCH and other channels/signals. In the follow-up WI on NR coverage enhancements, the enhancements for PUSCH, PUCCH and Msg3 PUSCH have been specified.

The overall completion level for the core part of NR\_cov\_enh WI is already 85% at the RAN #94e in December 2021, and the WI core part is expected to be 100% completed at March 2022. The corresponding UE conformance specifications are now required to be implemented in RAN5.

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

The objective of this work item is to define the UE conformance requirements corresponding to the WID on NR coverage enhancements. This work item will cover RF and Protocol conformance test specifications.

## 5 Expected Output and Time scale

|  |
| --- |
| **New specifications** *{One line per specification. Create/delete lines as needed}* |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Remarks |
|  |  |  |  |  |  |

|  |
| --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* |
| TS/TR No. | Description of change | Target completion plenary# | Remarks |
| TS 38.508-1 | Definition of common test environment for R17 NR coverage enhancements | TSG RAN #100(June-23) |  |
| TS 38.508-2 | Introduction of common implementation conformance statement (ICS) for R17 NR coverage enhancements | TSG RAN #100(June-23) |  |
| TS 38.521-1 | Introduction of NR coverage enhancements RF requirements - FR1 | TSG RAN #100(June-23) |  |
| TS 38.521-2 | Introduction of NR coverage enhancements RF requirements - FR2 | TSG RAN #100(June-23) |  |
| TS 38.522 | Applicability statements of the NR coverage enhancements for the RF test cases | TSG RAN #100(June-23) |  |
| TS 38.523-1 | Introduction of protocol test cases for R17 NR coverage enhancements | TSG RAN #100(June-23) |  |
| TS 38.523-2 | Applicability statements of NR coverage enhancements for the SIG test cases | TSG RAN #100(June-23) |  |
| TS 38.523-3 | Introduction of test model for R17 NR coverage enhancements | TSG RAN #100(June-23) | Progress of TTCN development of the new protocol test cases is tracked in MCC TF160 reports to RAN5/RAN. |
| TR 38.903 | Derivation of test tolerances and measurement uncertainty for R17 NR coverage enhancements conformance test cases | TSG RAN #100(June-23) |  |
| TR 38.905 | Derivation of test points for R17 NR coverage enhancements requirements in radio transmission and reception User Equipment (UE) conformance test cases. | TSG RAN #100(June-23) |  |

## 6 Work item Rapporteur(s)

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## 7 Work item leadership

RAN5

## 8 Aspects that involve other WGs

None

## 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| China Telecom |
| Huawei |
| HiSilicon |
| ZTE |
| Verizon |
| DISH Network |
| Orange |
| Ericsson |
| AT&T |
| CATT |
| Nokia |
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