3GPP TSG-RAN WG4 Meeting #96-e R4-2012639

Electronic Meeting, 17 – 28 August 2020

**Source: Nokia, Nokia Shanghai Bell**

**Title: Definitions and immunity of IAB EMC**

**Agenda item: 7.4.4.3**

**Document for: Approval**

# 1 Background

According to the work split, this document provides a text proposal to Sections 3 and 7.2 based on the TS skeleton [1].

This is a revision of [2] according to comments captured in the email discussion summary for [96e] [304] NR\_EMC [3].

Construction feedback is encouraged.

# References

1. Skeleton of the IAB EMC technical specification, ZTE
2. R4-2011375, Definitions and immunity of IAB EMC, Nokia, Nokia Shanghai Bell
3. R4-2012532, Email discussion summary for [96e] [304] NR\_EMC, ZTE (Moderator)

TEXT PROPOSAL:

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

**channel bandwidth:** the RF bandwidth supporting a single NR RF carrier with the transmission bandwidth configured in the uplink or downlink of a cell. The *channel bandwidth* is measured in MHz and is used as a reference for transmitter and receiver RF requirements.

**continuous phenomena:** electromagnetic disturbance, the effects of which on a particular device or equipment cannot be resolved into a succession of distinct effects (IEC 60050-161 [9]).

**enclosure port:** physical boundary of the equipment through which electromagnetic fields may radiate or impinge.

NOTE: In the case of *integral antenna* equipment, this port is inseparable from the antenna port.

**exclusion band:** frequency range(s) not subject to test or assessment.

**IAB-node**: RAN node that supports wireless access to UEs and wirelessly backhauls the access traffic.

**integral antenna:** antenna designed for permanent connection to the equipment and considered part of the enclosure port.

NOTE: An *integral antenna* may be fitted internally or externally.

**operating band:** frequency range in which NR operates (paired or unpaired), that is defined with a specific set of technical requirements.

**port:** particular interface of EUT used for EMC requirements testing purposes.

NOTE: Any connection point on EUT intended for connection of cables to or from EUT during the EMC testing is considered as a port.

EXAMPLE 1: Examples of ports for *IAB type 1-H* are as presented in figure 3.1‑1:



Figure 3.1-1: Examples of *port*s for *IAB type 1-H*

EXAMPLE 2: Examples of ports for *IAB type 1-O* and *IAB type 2-O* (i.e. with no *antenna ports*) are as presented in figure 3.1-2:



Figure 3.1-2: Examples of *port*s for *IAB type 1-O* and *IAB type 2-O*

**receiver exclusion band:** band of frequencies over which no tests of radiated immunity of a receiver are made, and expressed relative to the IAB receive band.

**signal port:** portintended for the interconnection of components of an EUT, or between an EUT and associated equipment and used in accordance with relevant functional specifications (for example for the maximum length of cable connected to it).

**Throughput:** number of payload bits successfully received per second for a reference measurement channel in a specified reference condition.

**telecommunication port:** ports which are intended to be connected to telecommunication networks (e.g. public switched telecommunication networks, integrated services digital networks), local area networks (e.g. Ethernet, Token Ring) and similar networks.

NOTE: *Telecommunication port* is called "wired network port" in CISPR 32 [11] and ETSI EN 301 489-1 [23].

**transient phenomena:** pertaining to or designating a phenomena or a quantity which varies between two consecutive steady states during a time interval short compared with the time-scale of interest (IEC 60050-161 [9]).

## 3.2 Symbols

For the purposes of the present document, the following symbols apply:

BWChannel Channel bandwidth

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

AC Alternating Current

AMN Artificial Mains Network

BC Band Category

BH Backhaul

CA Carrier Aggregation

CDN Coupling/Decoupling Network

CS Capability Set

DC Direct Current

EIRP Equivalent Isotropic Radiated Power

EMC Electromagnetic Compatibility

e.r.p. Effective Radiated Power

ESD Electrostatic Discharge

EUT Equipment Under Test

FR Frequency Range

FRC Fixed Reference Channel

IAB Integrated Access and Backhaul

NC Non Contiguous

NG Next Generation

NGC Next Generation Core

NR New Radio

NR-ARFCN NR Absolute Radio Frequency Channel Number

NRTC NR Test Configuration

NTC Test Configuration for Non-contiguous operation

RAT Radio Access Technology

RF Radio Frequency

RIB Radiated Interface Boundary

rms root mean square

SC Single Carrier

TC Test Configuration

## 7.2 Immunity

Table 7.2-1: Immunity requirements applicability

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Phenomenon | Application | Equipment test requirement | | Reference  subclause in the present document | Reference  standard |
| IAB equipment | Ancillary equipment |
| RF electro­magnetic field (80 – 6000 MHz) | Enclosure | applicable | applicable | 9.2 | IEC 61000‑4‑3 [18] |
| Electrostatic discharge | Enclosure | applicable | applicable | 9.3 | IEC 61000‑4‑2 [17] |
| Fast transients common mode | Signal, telecommunications and control ports, DC and AC power input ports | applicable | applicable | 9.4 | IEC 61000‑4‑4 [19] |
| RF common mode  0.15 - 80 MHz | Signal, telecommunications and control ports, DC and AC power input ports | applicable | applicable | 9.5 | IEC 61000‑4‑6 [21] |
| Voltage dips and interruptions | AC mains power input *port*s | applicable | applicable | 9.6 | IEC 61000‑4‑11 [22] |
| Surges, common and differential mode | AC power input *port*s and *telecommunications port* | applicable | applicable | 9.7 | IEC 61000‑4‑5 [20] |