**3GPP TSG-RAN WG4 Meeting #96-e R4-2011911**

**Electronic Meeting, 17 August – 28 August, 2020**

**Title: LS on NB-IoT testing issues**

**Reply To:**

**Release:** Rel-14

**Work Item:** TEI-14

**Source:** RAN WG4

**To:** The US Federal Communications Commission

**Cc:**

**Contact Person:**

**Name: Bill Shvodian**

**E-mail Address: bill.shvodian@t-mobile.com**

**Attachments:**

**1. Background information:**

RAN4 has been working on resolving an issue where NB-IoT devices have been failing FCC certification testing [[R4-2003987](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_eBis/Docs/R4-2003987.zip), [R4-2005219](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_94_eBis/Docs/R4-2005219.zip), [R4-2007564](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2007564.zip), [R4-2006445](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_95_e/Docs/R4-2006445.zip), [R4-1815344](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_89/Docs/R4-1815344.zip), [R4-2010582](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2010582.zip), [R4-2011336](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2011336.zip), [R4-2011400](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2011400.zip)]. Some potential solutions have been proposed, but questions have been raised about if they are necessary and sufficient for resolving the testing issue.

In order to resolve this issue, RAN4 has decided that it would be helpful to seek guidance from the FCC on some specific questions that have been raised in RAN4:

1. **Band 12**: If an operator has a license for the lower 700 MHz A block (698-704 MHz uplink) and operates an NB-IoT network in 3GPP Band 12 (699-716 MHz uplink), in the requirement from 27.53 part (g) for 43 + 10 log (P) dB attenuation “in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed”, does “100kHz” apply at A block (698-704 MHz uplink), 3GPP Band 12 (699-716 MHz uplink), or FCC band 12 (698-716MHz uplink)? That is does the “100 kHz” refer to 697.9-698 MHz and 704.704.1MHz or 698.9-699MHz and 716-716.1MHz or 697.9-698 MHz and 716-716.1MHz?
2. **Band 17:** If an operator has a license for the higher 700MHz B block (704MHz-710MHz uplink) and C block (710-716MHz uplink), and operates an NB-IoT network in 3GPP Band 17 (704-716 MHz uplink), in the requirement from 27.53 part (g), does the “100 kHz” refer to 703.9-704 MHz and 710-710.1MHz and 709.9-710MHz and 716-716.1MHz, or 703.9-704 MHz and 716-716.1MHz?
3. **Band 13:** If an operator has a license for the upper 700 MHz C block (776-788 MHz uplink) and operates an NB-IoT network in 3GPP Band 13 (777-787 MHz uplink), in the requirement from 27.53 part (c) says

*“(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;”*

and

*“(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;”*

Does the “100 kHz immediately outside and adjacent to the frequency block” refer to 785.9-786 MHz and 788-788.1 MHz or 776.9-777 and 787-787.1 MHz?

1. **First measurement interval:** The FCC wording in 27.53 says “However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.” When emissions are tested for the lower edge of Band 85 (698-716 MHz uplink), is the first 30 kHz measurement made in 697.97 to 698 MHz, or from 697.985 to 698.15 MHz?
2. **Network deployment restriction:** If the FCC emissions requirements could be met with a 100 kHz offset from the protected region, would it be sufficient for 3GPP to require a mandatory 100 kHz offset from the NB-IoT channel edge to the edge of the protected region for both guard band and standalone NB-IoT operation for US bands and for the FCC to require 100 kHz offset for NB-IoT network deployments in order to ensure that emissions requirements are met?
3. **NS signalling approach:** If the answer of 5) is no, would it be sufficient for 3GPP to use NS signalling to prevent withing 100 kHz of the protected region? Would the FCC labs turn on NS signalling when the UE is certified?
4. **Summary**

RAN4 would appreciate it greatly if the FCC could give us guidance on these issues to ensure that the solutions that RAN4 adopts are both necessary and sufficient to meet the FCC regulations.

1. **Actions:**

**To the US Federal Communications Commission**

**ACTION:** RAN4 kindly asks the FCC to provide answers to the questions listed above.

1. **Date of Next TSG-RAN WG4 Meetings:**

TSG-RAN4 #97-e-bis 26 October- 13 November 2020 Online

TSG-RAN4 #98 1-5 March2020 Athens, Greece?