

PCG Meeting #48-e
e-meeting, 26th - 27th April 2022

PCG-48_25

Source: Global Satellite Operators Association, GSOA
Title: >10 GHz Spectrum for non-terrestrial networks
TDOC Type: Other
Agenda Item: 10 - Matters Arising from MRPs
Document for: Discussion for approval
Release: Rel-18

1 Introduction

This paper is intended to inform the decision regarding the approval of a new work item during TSG-RAN#94-e and to request guidance for handling this matter within the relevant working group, i.e., RAN4.

2 Discussion

During RAN#94-e, a new work item "NR-NTN-enh" was approved to be carried out in Rel-18.

The work item includes an objective to study the deployment of NR (with NTN enhancements) in satellite networks operating in bands 10 GHz.

As part of developing this work item it was suggested that RAN4 references the harmonized Ka band allocated to satellite services at ITU-R level (see ITU RR, edition 2020) and the corresponding frequency range [17.7 – 20.2 GHz: downlink] and [27.5 – 30.0 GHz: uplink]. Pursuant to Article 5 of the Radio Regulations, the bands 27.5-30 GHz and 17.7-20.2 GHz are unique in the Ka-band in that they are allocated to the fixed-satellite service in contiguous blocks and on a primary basis in all three ITU regions, respectively in the Earth-to-space and space-to-Earth direction of transmission. This spectrum allocation to satellite services is reflected in the national frequency plans of most countries around the world.

Note that for more than four years, the SatCom industry has been clear about its intention to define satellite allocated bands (See RP-172272 submitted to RAN#78 and then RP-190995 submitted to RAN#84) in 3GPP and especially the ITU-R harmonized Ka band allocated to satellite services corresponding to the frequency range [17.7 – 20.2 GHz: downlink] and [27.5 – 30.0 GHz: uplink].

While almost all national spectrum administrations have allocated the whole range to satellite services, (including the FCC in the USA), some countries have designated certain portion of the band for deployment of terrestrial IMT. In the latter case, coexistence with satellite services and other coexistence constraints are governed by the relevant national regulations.

For example, for the USA, see FCC-16-89A1 on 'Establishing a More Flexible Framework to Facilitate Satellite Operations in the 27.5-28.35 GHz and 37.5-40 GHz Bands' and notably

section IV.A.4., 'Satellite Terrestrial Sharing', which serves as the 'REPORT AND ORDER' establishing detailed terms for NTN-TN co-existence in the 27.5 - 28.35 GHz band.

During the discussion, a decision was taken to remove explicit reference to the frequency range of the harmonized Ka band allocated to satellite services at ITU-R level, with the rationale that since one country has adopted specific regulations with respect to this band, 3GPP may not consider the whole frequency range for its study and then normative work.

Observation 1: Given the differences in deployment, operation and frequency use between mobile and satellite systems, local restrictions are being taken into account when defining bands for satellite access network in 3GPP.

Observation 2: Satellites operating in Ka-band are designed to operate in all of the harmonized Ka band range allocated to satellite services, irrespective of specific national regulations.

Observation 3: Based on 3GPP standing practice, companies are welcome to bring spectrum bands with frequency ranges to 3GPP so long as the allocation is covered under relevant ITU-RR and national regulations. 3GPP does not have rules that prevent consideration of a frequency range on the basis of specific national constraints.

Observation 4: The possibility to roll-out satellite terminals for broadband access in specific countries in all or parts of the harmonized Ka band depends on national or regional regulations. 3GPP need not refrain from considering certain portions of the harmonized Ka band on the basis of constraints in certain countries, as the same portions of spectrum could be available for satellite broadband services in other regions.

Observation 5: As part of the study and normative work on the definition of satellite bands above 10 GHz (see work item NR-NTN-enh), the reference to ITU-RR harmonized Ka band, allocated to satellite services at ITU-R has been agreed.

Proposal: The frequency range associated with the harmonized Ka-band of [17.7 – 20.2 GHz: downlink] and [27.5 – 30.0 GHz: uplink] allocated to satellite services on a worldwide basis shall be explicitly included in the RAN2-led Rel-18 WID NR-NTN-enh to clarify the work item scope.

3 Conclusion

Observation 1: Given the differences in deployment, operation and frequency use between mobile and satellite systems, local restrictions are being taken into account when defining in 3GPP, bands for satellite assess network.

Observation 2: Satellite operating in Ka-band are designed to operate in all of the harmonized Ka band allocated to satellite services irrespective of specific national regulations.

Observation 3: Based on 3GPP standing practice, companies have been welcomed to bring spectrum bands with frequency ranges to 3GPP so long as the allocation is covered under

relevant ITU-RR and national regulations. 3GPP does not have rules that prevents consideration of a frequency range on the basis of specific national constraints.

Observation 4: The possibility to roll-out satellite terminals for broadband access in specific countries in all or parts of the harmonized Ka band depends on national or regional regulations. 3GPP need not refrain from considering certain portions of the harmonized Ka band on the basis of constraints in certain countries, as the same portions of spectrum could be available for satellite broadband services in other regions.

Observation 5: As part of the study and normative work on the definition of satellite bands above 10 GHz (see work item NR-NTN-enh), reference to ITU-RR harmonized Ka band, allocated to satellite services at ITU-R has been agreed.

PCG is hereby requested to provide guidance, on the following:

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