**3GPP TSG RAN Meeting #88-e RP-20XXXX**

**e-meeting, 29 June - 3rd July 2020**

Source: Thales (Email discussion moderator)

Title: Way forward on satellite-NTN spectrum

TDOC Type: discussion

Agenda Item: 9.10.6 Solutions for NR to support non-terrestrial networks (NTN) [RAN2 WI: NR\_NTN\_solutions]

Document for: discussion

Release: Rel-17

# Introduction

The following TDOC is submitted to the email discussion decided during RAN#88-E and referenced as follow :

* [Satellite\_bands] (Thales)

Goal: Determine a way forward for addressing spectrum bands for NTN/Satellite.

Input contributions covered: 638, 838, 843, 789

Moderator: Nicolas Chuberre

# Discussion

The referred documents:

* RP-200838: “Possible bands for NR based satellite networks” , Thales, document for information
  + It entails a list of all frequency bands that are allocated to Satellite networks in the different ITU regions that may be proposed in the future to be specified as NR bands for the operation of NR based satellite network

As example, the following documents entail example of two work item descriptions proposing to specify the “Ka band” and “Ku band” allocated to satellite service as a new NR frequency band in FR2 for Satellite Networks.

* RP-200638: “FR2 for NR based Satellite networks”, Hughes Network Systems Ltd, document for information
  + This contains a proposal to specify the “Ka band” allocated to satellite service as a new NR frequency band in FR2 for Satellite Networks
* RP-200843 “FR2 for NR based Satellite networks”, Intelsat, document for information
  + This contains a proposal to specify the “Ku band” allocated to satellite service as a new NR frequency band in FR2 for Satellite Networks

Last the following document provides additional considerations

* RP-200789: “Regarding possible bands for NR based satellite networks”, Eutelsat, document for information
  + It suggests to use the ITU-R documentation at its latest issue as the definitive source of information concerning spectrum allocated for satellite use and to prioritize work on a sub-set of the allocated mobile-satellite services bands

Based on the above, the following questions are proposed:

**Question 1: What should be the primary source of information concerning spectrum allocated for satellite services ?**

| **Organization** | **Views** | **Comments** |
| --- | --- | --- |
| Thales | ITU-R documents on spectrum allocation to satellite services should be at least considered |  |
| Hughes Network Systems Ltd | The primary source of information concerning spectrum allocated for satellite services should be the ITU-R Radio Regulations - on the assignment and use of frequencies for satellite services in all bands. |  |

**Question 2: Should other source of information be considered for the RAN4 satellite band specific work items ?**

| **Organization** | **Views** | **Comments** |
| --- | --- | --- |
| Thales | Harmonized standard developed by ETSI for satellite services should also be considered | However they don’t necessarily address all the parameters required in 3GPP |
| Hughes Network Systems Ltd | * Pre-existing Harmonized Standards developed in ETSI for satellite services in specific bands * The United States Table of Frequency allocations and its rules * CEPT or ECC frequency allocations/decisions |  |

**Question 3: Are there any specific recommendation for the “satellite” band specific WI during Rel-17?**

| **Organization** | **Views** | **Comments** |
| --- | --- | --- |
| Thales | No specific recommendations |  |
| Hughes Network Systems Ltd | Satellite stakeholders may consider for Rel-17 any specific satellite band(s) of interest accessible to them for deploying NR-based satellite services. Please also refer to Note 1 of the NTN approved WID-RP-201256, a revision from RP-200600 & 193234:  **Note 1**: It is assumed that this work item will be frequency agnostic and therefore we can consider that NTN can operate in FR1 or FR2 ranges. Defining NR bands for NTN should be included as part of dedicated Rel-17 RAN4 led work items including an analysis of regulations in spectrum considered, which bands 3GPP should specify, as well as potential co-existence between NR terrestrial and satellite. |  |

**Question 4: When NTN/Satellite band specific WI should start during Rel-17 ?**

| **Organization** | **Views** | **Comments** |
| --- | --- | --- |
| Thales | Such work item proposal may be submitted for approval once RAN4 activities on the WID “NR-NTN-solutions” (see RP-200600) have progressed on the generic requirements and once the regulatory context and targeted architecture associated to each of the proposed spectrum are clarified. |  |
| Hughes Network Systems Ltd | Due to time needed in adding new frequency bands to NR-band, and satellite characteristics being quite challenging, it is imperative that such work items be introduced early. The work item proposals should be submitted for approval once RAN4 activities on the WID “NR-NTN-solutions” have progressed onto the generic requirements. |  |

**Question 5: Any other aspects to be considered for Rel-17 satellite band specific WI ?**

| **Organization** | **Views** | **Comments** |
| --- | --- | --- |
| Hughes Network Systems Ltd | Satellite stakeholders may consider for Rel-17 any specific band(s) of interest accessible to them for deploying NR-based or LTE-based satellite services, irrespective of type of services – e.g broadband, NB-IoT or any FSS services. Note that ITU-R Radio Regulations do not mandate the technology of choice. Matters concerning sharing or co-primary decisions on certain satellite bands should follow Radio Regulations (International and Regional) Regulatory Framework. |  |

# Summary

# Proposed way forward

***END***