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Radio Spectrum Policy Group - Secretariat
DG CNECT B4: Spectrum – Office: BU33 7/55
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Re: RSPG14-578, Draft RSPG Opinion on Common Policy Objectives for WRC-15

I. Introduction

Solaris Mobile Limited (SML) and Hughes Network Systems, Limited (Hughes) (collectively, the Satellite Providers), hereby provide comments in response to the Radio Spectrum Policy Group's (RPSG) Opinion on Common Policy Objectives for WRC-15 (WRC-15 Policy Objectives). The Satellite Providers appreciate the opportunity to comment on the draft WRC-15 Policy Objectives and urge the RSPG to consider narrowing the proposed future WRC agenda item for 5G services (Proposed 5G Future Agenda Item) and to adopt a World Radiocommunications Conference (WRC) future agenda item aimed at ensuring the availability of sufficient spectrum for advanced satellite services. Such an approach will serve the public interest by ensuring there is sufficient spectrum for advanced terrestrial and satellite services, while protecting the use of spectrum by incumbent services, and enabling their continued growth.

II. Background

SML holds an EU-wide authorization for a mobile satellite service (MSS) with a complementary ground component (CGC) and provides MSS using the EUTELSAT E10A satellite in a significant portion of the European Union. Further, with the launch in 2016 of EchoStar 21, SML will provide advanced and innovative MSS services throughout the European Union.¹ Utilizing spectrum above 6 GHz is critical for SML's satellite system as the feeder links, the links between its gateway earth stations and its satellites, operate in the Ku band and, in the future, will operate in the Ka band.

The Hughes group is the global leader in providing broadband satellite networks and services for enterprises, governments, small businesses, and consumers. Having pioneered the

¹ In the future, SML, using its wholesale model, will also provide CGC services through much of the European Union.

use of the very small aperture terminal (VSAT), the Hughes group is the world's leading provider of enterprise VSAT services and has built on this expertise to bring high speed satellite broadband service to consumers and businesses across the United States and Europe using the Ku and Ka bands. Hughes' affiliate in North America is the leading provider of satellite broadband with over one million active users. Today, Hughes provides high-quality, resilient and cost-effective broadband network solutions to organizations throughout Europe and combines satellite and terrestrial technologies to offer Managed Network Services.²

III. Discussion

A. Satellite Services Require Access to Adequate Spectrum in the Ka, Ku and V Bands

Satellite networks are the one communications platform that provides service to consumers virtually no matter where they are located and can operate even when the terrestrial infrastructure is unavailable. Because satellite networks provide cost-effective, distance-insensitive service over very broad coverage areas, they are ideal for providing communications services in rural and remote areas where terrestrial networks are limited or unavailable, including broadband service at speeds comparable to terrestrial technologies.³ Importantly, the demand for these services, which currently utilize the Ka, Ku and in the future V bands, continue to grow. Accordingly, as discussed below, RPSG must consider revising its proposed 5G Future Agenda Item in order to protect these services and enable their growth.

1. Ku Band

The Ku band is currently heavily used for satellite communications. Satellite services over the Ku band frequencies are used for a variety of important communications needs, including television broadcasting, fixed satellite services and direct to the home video content.⁴ In addition, investment in the Ku band is ongoing with research, development and manufacturing of high-throughput satellites that will use the band.⁵ Hughes, SML and its affiliates today provide a variety of valuable services in the Ku band. For instance, Hughes provides resilient and cost-effective advanced broadband network solutions to organizations throughout Europe

² Hughes Europe, <http://europe.hughes.com/company> (last visited Jan. 10, 2015).

³ See Digital Agenda for Europe, <http://ec.europa.eu/digital-agenda/en/broadband-all-satellite> (last visited Jan. 10, 2015).

⁴ Tech-Faq, Ku Band, <http://www.tech-faq.com/ku-band.html> (last visited Jan. 10, 2015).

⁵ See e.g., *Investing in new assets for a Ku-band HTS future*, http://www.intelsat.com/wp-content/uploads/2014/03/Investing_in_new_assets_for_a_Ku-band_HTS_future.pdf (detailing Intelsat's plans to launch new high-throughput satellites for use in the Ku band).

that utilize the Ku band.⁶ The Ku band is also utilized by SML for feeder links for its EUTELSAT E10A satellite.

In addition, demand for Ku band spectrum by advanced satellite services continues to grow, especially in the European Union. Today, there is very little, if any Ku band spectrum available for additional use in Europe. Further, for certain uses, sharing between satellite services and 5G uses will be impossible. Based on this extensive use by satellite services, any future agenda item that considers the use of the Ku band, including the Proposed Future Agenda Item on 5G, must ensure that these services are protected and are able to expand, as necessary, to meet consumer demand.

2. Ka Band

Today, as the European Union has recognized, the Ka band is used on a widespread basis for high-speed services that are comparable to that of terrestrial services.⁷ Because of this service availability, in 2013 the European Commission stated that every EU home was able to have a basic broadband connection because of the ubiquitous availability of satellite broadband.⁸ This goal only remains a reality if there is sufficient spectrum available to support such services now and in the future.

As noted in the ITU Broadband Commission's report, *The State of Broadband 2014: Broadband for All*, "European manufacturers are carrying out R&D in new generations of high-throughput satellites (HTS) capable of providing 50-100 Mbps by 2020."⁹ As the below table demonstrates, satellite broadband technology will continue to progress, providing EU consumers access to increasingly innovative high-speed broadband service no matter where they are located.¹⁰

⁶ HN System, <http://europe.hughes.com/technologies/satellite/hn-system> (last visited Jan. 10, 2015).

⁷ See S. Agnelli, P. Feltz, P-F. Griffiths, D. Roth, *Satellite's role in the penetration of broadband connectivity within the European Union*, available at <http://www.project-saber.eu/cms/attachments/article/79/Satellite%E2%80%99s%20role%20in%20the%20penetration%20of%20broadband%20connectivity%20-%20June%202014%20-%20EN.pdf>

⁸ *The State of Broadband 2014: Broadband for All*, a Report by the Broadband Commission at 52 (Sept. 2014) ("ITU Report") (citing satellite connections are now available in all 28 countries SPEECH/13/829 by Neelie Kroes, 17/10/2013: "Every European digital on a connected continent").

⁹ ITU Report at 52.

¹⁰ ITU Report at 53. The Broadband Commission for Digital Development was launched by the International Telecommunication Union (ITU) and the United Nations Educational, Scientific and Cultural Organization (UNESCO).

Box Table 1: Advances in Satellite Broadband Technologies

Timeline	2005	2010	2015	2020
Generation	Ku-band satellites	First generation multi beam Ka-band satellites	Second generation multi beam Ka-band satellites	Third generation multi beam Ka-band satellites
Service capability	Internet broadband	High speed Internet broadband	Superfast Internet broadband	Very high speed Internet broadband
Maximum service rate	2-3 Mbps	10-2 Mbps	30-50 Mbps	100 Mbps
Capacity per satellite	5	50-100	150-200	>500
Users per satellite	100.000	Several 100.000s	Up to 1 million	>1 million

Source: ISI European Technology Platform.

Ka band satellite solutions also serve other important functions. For example, today, satellites are playing an important role in providing broadband to EU-based schools.¹¹ Further, Ka band networks play an important role in providing critical safety-of-life services and other important emergency services, especially when terrestrial networks are unavailable.¹² MSS systems also play a critical role in supporting emergency and public safety communications.¹³ While MSS services themselves are not provided in the Ka band, the feeder links of MSS systems, including SML's next generation EchoStar 21, operate their feeder links in the Ka band.

Accordingly, as the RPSG considers its Proposed Future 5G Agenda Item, it must ensure that the proposed agenda item does not negatively impact the important uses of the Ka band frequencies by satellite services and the need for access to more spectrum in the future as consumer demand continues to increase. In many portions of the Ka band, such as where user terminals operate today, it will be impossible for sharing to occur between 5G and satellite

¹¹ ITU Report at 69 ("On 6 February 2014, the French Minister for the Digital Economy, announced a €5 million plan to connect 16,000 schools by the year end, referring in particular to the satellite broadband solution.").

¹² See Satellite Communications for Aid and Emergency, European Satellite Operators Association, *available at* https://www.esoa.net/upload/files/publications/newsletter_satellitesAidEmergency.pdf (detailing the role that satellite providers play in providing communications needs in the event of disasters).

¹³ See Mobile Satellite Services in Europe: Frequently Asked Questions, May 14, 2009, *available at* http://europa.eu/rapid/press-release_MEMO-09-237_en.htm?locale=en, and White Paper, Futron Corporation and GVF, Why Satellite Communications Are an Essential Tool for Emergency Management and Disaster Recovery.

broadband services. And even in those situations where sharing is possible, it will be limited and must be structured in a way that enables the growth of satellite services.

3. V Band

With planned expansion for broadband and other advanced satellite services, it is unlikely that there will be sufficient Ka band spectrum in the near future to support this growing demand. The V band is the natural expansion band for Ka band satellite systems and is the focus of satellite operators as they plan for their future systems.¹⁴ In anticipation of the need for additional capacity to provide broadband services, many satellite operators have made ITU filings for V band satellite spectrum,¹⁵ and vendors have been actively developing the equipment necessary to provide V band broadband satellite services.¹⁶ Accordingly, it is critical that the EU recognize that any proposed changes to this band could severely curtail future satellite broadband use and, accordingly, retard the growth of satellite broadband services. This must be taken into account as the RPSG considers its support for Proposed 5G Future Agenda Item.

¹⁴ Ashish Tyagi et al., *Future of V Band in Satellite Communication*, 1 International Journal of Science, Engineering and Technology 1, 2 (2013), available at ijset.in/wp-content/uploads/2014/02/IJSET_101100152013.pdf (“... the congestion in lower frequency bands like Ku-band will push new systems into moving progressively to Ka band and, in a longer term, to Q/V band.”)

¹⁵ A search of the ITU database shows that there have been thousands of filings for V band frequencies (37.0 GHz to 42.5 GHz).

¹⁶ See European Space Agency, Our Activities, Telecommunications & Integrated Applications, Alphasat, http://www.esa.int/Our_Activities/Telecommunications_Integrated_Applications/Alphasat/Aldo_Paraboni_Q_V_Band_Payload (noting the use of V band spectrum because capacity is scarce in other bands). See also, e.g., *Northrop Grumman Begins Integrating High-Speed Downlink Antennas for Fourth Advanced EHF Communications Payload*, PR Newswire (Mar. 11, 2014), www.prnewswire.com/news-releases/northrop-grumman-begins-integrating-high-speed-downlink-antennas-for-fourth-advanced-ehf-communications-payload-249452801.html (demonstrating that the Advanced Extremely High Frequency satellites used by the United States Air Force Command operates at 40 GHz); Letter from Stephen D. Baruch, Attorney for Northrop Grumman Space & Mission System Corporation, to Marlene H. Dortch, Secretary, Federal Communications Commission, SAT-LOA-19970904-00080, (filed Mar. 26, 2009) (discussing that the satellite industry will “cross the threshold” for the V band spectrum and that V band “systems and technology are now practicable”); see also, *Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands*, IB Docket No. 97-95, Comments of the Satellite Industry Association (filed Jan. 16, 2011) (“commercial satellite use of V-band spectrum is now just over the horizon . . . [t]he satellite industry is perhaps just one spacecraft generation (*i.e.*, fewer than five years) away from seeing V-band spectrum tapped to relieve the demand for feeder link spectrum. . . . V-band FSS spectrum . . . will soon enhance satellite broadband capabilities and capacity.”).

B. The European Union Should Narrow the Scope of Its Proposed 5G Future Agenda Item to Protect and Allow Growth of Satellite Services

Based on the above, the Satellite Providers are concerned with the breadth of a future agenda item on 5G networks that could negatively impact critical satellite operations above 6 GHz. While the Satellite Providers understand the need to identify spectrum for future terrestrial mobile requirements, such an open-ended agenda item could result, in the long run, in unattended consequences that could adversely impact investment in as well as the provision of innovative satellite services.

As discussed above, the Ku and Ka bands are already heavily utilized in the European Union and the growing consumer demand for advanced satellite services makes their continued availability for incumbent and future satellite uses critical. Similarly, the V band is planned for use by the satellite industry as an expansion band for future systems, including for supporting broadband networks. Accordingly, the RPSG should consider narrowing the scope of the 5G Future Agenda Item in a way that it does not jeopardize the current and planned use of the Ku, Ka and V bands for advanced satellite services. This could be done by, at a minimum, recognizing in the resolution that such bands are already heavily utilized by the satellite services and that increased sharing will be difficult and at times, impossible, and that in such cases, satellite services must be protected.

C. The RSPG Should Propose Future Agenda Item to Examine Additional Bands for Advanced Satellite Services

As demonstrated above, there is an increasing need for more spectrum to support advanced satellite services in the bands above 6 GHz. Accordingly, in order to meet the very real demands of the advanced satellite service, it is critical that the RPSG consider supporting a future agenda item that will consider spectrum requirements for the development of advanced satellite services, and possible regulatory actions, including allocations above the 6 GHz band to the fixed, mobile and broadcasting satellite service for both geostationary and non-geostationary orbit use.

IV. Conclusion

For the reasons stated above, there needs to be adequate spectrum in the Ka, Ku and V band to continue current operations and expand capacity and operations in the future. Accordingly, the Satellite Providers urge the EU to narrow proposed 5G Future Agenda to protect and enable the growth of satellite services in these frequency bands. In addition, the Satellite Providers propose a future Agenda item that addresses the spectrum needs for advanced satellite services above 6 GHz.

RSPG Secretariat

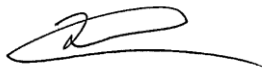
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