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GSOA response to the Agency for Communication Networks and Services of the Republic of Slovenia (AKOS)

Consultation on the Radio Spectrum Management Strategy for the Period 2024-2026

Reference #: 0070-1/2023

GSOA welcomes the opportunity to provide comments to AKOS on the Radio Spectrum Management Strategy for the Period 2024-2026.

GSOA[1] is the CEO-driven association representing global and regional satellite operators, and it provides a platform for collaboration between satellite operators globally and a unified voice for the sector. Our vision is to help policymakers improve the state of the world by continuously bridging digital, education, health, social, gender and economic divides across diverse geographies and across mature and developing economies.

Satellite-enabled services enrich the daily life of millions of people around the globe for decades, by broadcasting news and events worldwide, by cost-effectively providing satellite-powered broadband to consumers in the air, at sea and on land as well as providing cellular services to Mobile Network Operators (MNO) in urban, suburban, and rural locations. Together, we connect millions of people and devices for the benefit of consumers, institutions, businesses, and governments.

GSOA invites AKOS to recognise the satellite role in contributing to fixed and mobile communications in Slovenia and Europe, and how this determines the need to access spectrum for geostationary (GSO) and non-geostationary (NGSO) systems.

Criticality of 28 GHz band for satellite services

The 27.5-29.5 GHz band ("28 GHz band") is absolutely essential to the satellite sector for its contribution to the deployment of satellite broadband services. As a result of the demand for satellite broadband services, both the 28 GHz and 29.5-30.0 GHz uplink bands, as well as the corresponding 17.7-19.7 GHz and 19.7-20.2 GHz downlink bands, are already in extensive use today by satellite broadband systems for fixed and mobile services worldwide. More than 100 geostationary (GSO) satellites now in orbit and thousands of non-geostationary (NGSO) satellites put in operation recently are all using these Ka-band frequencies to provide a wide range of services to individuals, businesses and governments in Europe and elsewhere in the world (cf. list in annex). Many more GSO and NGSO satellites relying on Ka-band are under construction to meet the very high demand for connectivity that requires access to the full 27.5-30 GHz band which is vital for satisfying this demand.

This outstanding growth of the satellite sector has been based on the 28 GHz band allocation by the ITU Radio Regulations to the Fixed Satellite Service (FSS) on a primary basis, as confirmed by the

[1] The members, activities, and other details about GSOA can be found at www.gsoasatellite.com.

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European Allocation Table (ECA). Satellite operators are currently deploying uncoordinated satellite Earth stations (satellite terminals) in some parts of the 28 GHz band, whilst the whole band is being used for wide-band gateways earth stations on a coordinated basis. For gateways, access to the full band is critical as, depending on the satellite system design, a reduced bandwidth will not only lead to reduced throughput, but also coverage gaps and service discontinuity to the whole region the gateway serves.

Across Europe, including Slovenia, advanced High-Throughput Satellites (HTS) are operating in GSO and NGSO orbits. In Europe, these HTS satellites include the Eutelsat KA-SAT and Konnect satellites, several ASTRA satellites and the O3b Medium Earth Orbit (MEO) constellation operated by SES, the Inmarsat GX satellites acquired by Viasat, and the HYLAS satellites operated by Avanti. In addition, more GSO and NGSO satellite networks, like SES' O3b mPOWER or Viasat's Very High Throughput (VHTS) ViaSat-3 EMEA satellite, are set to be operational imminently to serve Europe's high-speed broadband requirements. OneWeb also is using the full Ka-band for its gateways to serve its 618 LEO satellites already in orbit, while Telesat Lightspeed and Amazon Kuiper LEO systems are planning to use the full Ka band for both user terminals and gateway operations. These satellites are being used for a wide portfolio of services across Europe, including direct consumer broadband services. In addition, the satellites are providing broadband on aircraft, ships, and land vehicles, including emergency vehicles. Viasat acquired Inmarsat that provides maritime services ranging from crew to technical management and health and safety on board vessels though a leading ship management company in the Baltic region. O3b connects ships that are cruising in various channels and canals across Europe.

The 28 GHz band usage for "earth stations in motion" (ESIM, also called ESOMPs)[2], providing broadband connectivity to ships, aircraft, and land vehicles, is expanding fast.

The London School of Economics (LSE) has forecasted a booming of ubiquitous global connectivity on aircraft through Earth Stations on Mobile Platforms (ESOMPs) by 2035, for the benefit of airlines, content providers, retail goods suppliers, hotel and car suppliers, and advertisers[3]. LSE has also explained that the digital transformation of the airline industry is giving rise to the "connected aircraft" facilitated by satellite communications to create an Internet of Things (IOT) environment delivering significant commercial efficiencies for airline operations[4].

Global shipping and passenger vessels also rely on ESOMPs for navigation and broadband communications, benefiting cargo, passengers, and crew. In Slovenia, global maritime operators are relying on ESOMPs in national waters and ports to serve European cruise ships and freight transport and provide high- speed access to the Internet and VoIP supporting passengers, crew, and fleet digitisation.[5]

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2 ESOMP is the term used in CEPT. The ITU and other countries use the term Earth Stations in Motion (ESIM).

3 *See* London School of Economics, *Sky High Economics – Chapter One: Quantifying the commercial opportunities of passenger connectivity for the global airline industry* (September 2017), https://www.lse.ac.uk/business/consulting/reports/sky-high-economics.

4 *See* London School of Economics, Sky High Economics – Chapter Two: Evaluating the Economic Benefits of Connected Airline Operations (June 2018), https://www.lse.ac.uk/business/consulting/assets/documents/sky-high-economicschapter-two-evaluating-the-economic-benefits.pdf.

5 *See* for instance Marlink maritime VSAT service: https://marlink.com/solutions/maritime-vsat/ or Inmarsat Fleet One: https://www.inmarsat.com/en/solutions-services/maritime/services/fleet-one.html.

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Trains, buses, and other land-based vehicles also rely on satellite broadband services for passenger connectivity, operations and maintenance support and fleet tracking. All of these uses are being deployed throughout Europe.

It is no coincidence that the ITU, the CEPT and the EU have excluded the 28 GHz band from terrestrial 5G/IMT identification, and GSOA recommends that the AKOS plans for spectrum effectively ensure the actual availability of adequate Ka-band spectrum for satellite broadband services in Slovenia.

Validation of Satellite Broadband Services in 28 GHz

All these developments have been made possible thanks to the decisions adopted by the CEPT on the usage of the 28 GHz band by GSO and NGSO systems. Over the last 15 years, the ECC has indeed validated the operation of fixed and mobile satellite earth stations in the 27.5-30 GHz bands. ECC Decision (05)01 has long established a European band plan for the uncoordinated Earth stations of the FSS (Earth-to-space) and the FS in the 27.5-29.5 GHz band[6]. The same ECC Decision also makes provisions for the *coordinated* FSS earth station such as gateways to use the whole 27.5-29.5 GHz[7].

Further, ECC Decision 15(04)[8] on the harmonised use, free circulation and exemption from individual licensing of Land, Maritime and Aeronautical Earth Stations On Mobile Platforms (ESOMPs) operating with NGSO FSS satellite systems in the frequency ranges 17.3-20.2 GHz, 27.5-29.1 GHz and 29.5-30.0 GHz; and ECC Decision 13(01)[9] on the use, free circulation, and exemption from individual licensing of Earth stations on mobile platforms (ESOMPs) in the frequency bands available for use by uncoordinated FSS Earth stations within the ranges 17.3-20.2 GHz and 27.5-30.0 GHz have paved the way to the deployment of GSO and NGSO satellite systems. Both ECC Decision 15(04) and ECC Decision 13(01) contain technical and operational requirements to protect the operations of the Fixed Service (FS) in the portions on 28 GHz band while enabling FSS access to it (Annex 2).

It is important to recall that, prior to WRC-19, the Radio Spectrum Policy Group (RSPG), in its Opinion on WRC19, clearly stated that "[t]he RSPG recommends that the European Commission propose an EU position to the Council opposing any consideration of the 27.5 - 29.5 GHz band under Agenda item 1.13 [of WRC-19]"[10]. For the last several years, the CEPT Roadmap has also unambiguously rejected the use of the adjacent 28 GHz band for terrestrial IMT/5G, and the CEPT reconfirmed this position after WRC-19 stating that "...*Europe has harmonised the 27.5-29.5 GHz band for broadband satellite*

6 *See* ECC Decision (05)01, *The use of the band 27.5-29.5 GHz by the Fixed Satellite Service and uncoordinated Earth staJons of the Fixed-Satellite Service (Earth-to-space)*, (approved 18 March 2005, amended 8 March 2019), https://docdb.cept.org/download/2856.

7 ECC Decision (05)01 (see section 3 of the explanatory memorandum): "This ECC Decision identifies bands for FS and uncoordinated FSS earth stations, taking into account the existing channel arrangement for the FS as detailed in CEPT Recommendation T/R 13-02. However**, coordinated FSS earth stations can still make use of the whole band 27.5-29.5 GHz**, using established coordination procedures."

8 ECC/Dec(15)04 https://docdb.cept.org/download/1496 with O3b currently no8fied to the ECC.

9 ECC/Dec(13)01 https://docdb.cept.org/download/3452 with Inmarsat, Eutelsat, Viasat, Telenor, Thales currently notified to the ECC.

10 *See* https://circabc.europa.eu/sd/a/7ab8a6bb-f59a-434f-9b66-606b5a8067ce/RSPG18-023final-Opinion_WRC19for_public_consultation.pdf.

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and is supportive of the worldwide use of this band for ESIM. This band is therefore not available for 5G [IMT]"[11].

GSOA welcomes the opportunity to comment on the AKOS strategy as a key element to offer a predictable and stable environment for the satellite telecommunications providers. However, the approach suggested on the 28 GHz does create uncertainty with regards to the deployment of satellite services based-technology in the core and critical satellite band for uplink to the satellites.

The ITU, CEPT and the EU have excluded the 28 GHz band from terrestrial 5G/IMT identification. Furthermore, there is mounting evidence that the business case for building mobile networks in high bands with poor propagation is very challenging. South Korea, a leading proponent of millimeter wave 5G, just cancelled all of their millimeter wave 5G licenses for failure to build out. Evidence from Japan, another early adopter of millimeter wave 5G, shows that 5G millimeter wave networks are carrying only about 0.2% of all 5G traffic. Even in the United States, data show that 5G handsets are connected to millimeter networks less than 1% of the time.

GSOA respectfully urges AKOS to maximize the efficiency of spectrum use by enabling the operation of gateway-type satellite earth stations on coordinated basis in 27.5-30 GHz. This also supports the drives from administrations to maximize the use of spectrum. CEPT has produced thorough Decisions and Reports to this end[7,8,9,12,13,14]. ECC/DEC/(05)01[15] provides terrestrial fixed service and satellite service equal access to the entirety of 28 GHz band using established coordination procedures. Therefore, GSOA urges AKOS not to include 28GHz in any tender for terrestrial 5G/IMT. Instead, AKOS, who has already implemented ECC DEC (05)01 since 2009 should continue to follow European harmonization and initiate a proceeding to enable the shared use of the entire 28 GHz band by satellite gateway operations, as well as implement ECC Decision 15(04) and ECC Decision 13(01) for operation of uncoordinated FSS earth stations in portions of the band.

Conclusions

In conclusion, GSOA respectfully requests that AKOS, recognising the satellite role in contributing to fixed and mobile communications in Slovenia and Europe, the recent increase of use and competition of the 28 GHz band for FSS, the need for satellite operators to continue to have a predictable and stable environment in the middle of the deployment of many constellations to not pursue awarding the spectrum for terestrial 5G /IMT.

GSOA remains at AKOS's disposal to further explain and discuss the above concerns of our members and the options to maintain FSS access to this spectrum.

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11 *See* https://cept.org/ecc/topics/spectrum-for-wireless-broadband-5g and Action B.3, https://www.cept.org/Documents/ecc/57839/ecc-20-055-annex-15_cept_5g_roadmap.

12 ECC Report 217 https://docdb.cept.org/download/1162.

13 ECC/Report 304 https://docdb.cept.org/download/1401.

14 ECC/Report 184 https://docdb.cept.org/download/692.

15 *See* ECC Decision (05)01, *ECC Decision of 18 March 2005 on the use of the band 27.5-29.5 GHz by the Fixed Service and uncoordinated Earth stations of the Fixed-Satellite Service (Earth-to-space)* at https://docdb.cept.org/document/384.

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Ka-band satellites

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This indicative list is essentially made up of commercial satellites and doesn't include defense and government-owned satellites. Other satellite constellations than OneWeb and SpaceX also use Kaband for satellite links with gateways (e.g. Iridium).

Satellite Operator	SATELLITES	TYPE	COVERAGE
Amazon	Kuiper Constellation (at least 3,236)	NGSO (LEO)	Global
Amos Spacecom	AMOS-3, AMOS-4, AMOS-17	GSO	AMOS-3: Europe, Middle East and US East Coast AMOS-4: Asia and Africa AMOS-17: Africa, Middle East and Asia
ARABSAT	ARABSAT-5C, BADR-5, BADR6, BADR-7, ARABSAT-5A, ARABSAT-6A	GSO	Europe, Middle East, Africa, Asia
AsiaSat	AsiaSat 7, AsiaSat 9	GSO	Regional
Avanti	HYLAS-2, HYLAS-3, HYLAS-4	GSO	Europe, Middle East, Africa, Americas
Chinasatcom	Chinasat-16, Chinasat-26 (2021)	GSO	China, South East Asia
EchoStar/Hughes	EchoStar IX, EchoStar XVII (Jupiter 1), EchoStar XIX (Jupiter 2), EchoStar XXIV (Jupiter 3) (2023), Spaceway (SW03)	GSO	Americas
Eutelsat	EUTELSAT 172B, EUTELSAT 65WA, EUTELSAT 3B, KONNECT VHTS, KONNECT, EUTELSAT 7B, EUTELSAT 7C, EUTELSAT 10B, HOTBIRD F1, HOTBIRD F2, EUTELSAT 16A, EUTELSAT 36C, EUTELSAT 139WA	GSO	Asia Pacific, Americas, Europe, Africa
Hispasat	HISPASAT-30W-5, HISPASAT-30W-6, HISPASAT-36W-1, AMAZONAS-3, AMAZONAS-5, HISPASAT-74W-1 AMAZONAS NEXUS	GSO	Europe, North Africa, Americas
Intelsat	IS-33e, IS-37e, IS-20, Galaxy 15R, Galaxy 30, IS-40e, Galaxy 23, Galaxy 28, IS-32e	GSO	Global
Kacific	Kacific-1	GSO	South Asia, Pacific
Measat	MEASAT-5, MEASAT-3d	GSO	Asia
NBN Co.	SkyMuster	GSO	Australia
NIGCOMSAT Ltd	NIGCOMSAT-1R, NIGCOMSAT-2B, NIGCOMSAT-2D	GSO	Nigeria, South Africa and Europe
Nilesat	Nilesat 201, Nilesat 301	GSO	Middle East
OneWeb	618 in orbit	NGSO (LEO)	Global

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OHB	Future H2Sat	GSO	Global
Rivada Space Networks	Constellation of 576 satellites (2025+)	NGSO (LEO)	Global
Satellite Operator	**SATELLITES**	**TYPE**	**COVERAGE**
Satria Nusantara Tiga (SNT)	Multifunction Satellite of Satria-1	GSO	Indonesia
SES	Astra 1L, 1Q (future), 2E, 2F, 2G, 3B, 4A, 5B, AMC-15, SES-1, SES-2, SES-3, SES-5, SES-8, SES-9, SES-10, SES-12, SES-14, SES-15, SES-17, SES-26 (future)	GSO	Global
SES O3b	20 in orbit for O3b MEO constellation 11 next generation O3b mPower (2022+)	NGSO (MEO)	Global
SpaceX	Starlink Constellation (#3,600, to increment to 12,000)	NGSO (LEO)	Global
Telenor	THOR 5, THOR 6, THOR 7	GSO	Europe, Middle East
Telesat	Anik F2, Anik F3 T12V T18V T 19V Telesat Lightspeed™ (2026+)	GSO GSO GSO GSO NGSO (LEO)	North America Eastern Seaboard SE Asia North Atlantic, Caribbean, Northern Canada Global
Thaicom	THAICOM 4 (IPSTAR)	GSO	Asia Pacific
Turksat	Turksat 4A, Turksat 4B, Turksat 5B	GSO	Europe, Middle East, Central, Africa
Viasat	WildBlue-1 ViaSat-1 ViaSat-2 ViaSat-3 Americas ViaSat-3 EMEA ViaSat-3 APAC ViaSat-4 Inmarsat-5 F1, F2, F3, F4, GX-5, Inmarsat-6 F1, Inmarsat-6 F2	GSO	Global
Yahsat	AY2, AY3	GSO	Middle East, Africa, Americas, Asia