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GENERAL NOTICES • ALGEMENE KENNISGEWINGS

INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA**NOTICE 2678 OF 2024**

Consultation on the proposed new Licensing Framework for Satellite Services

1. The Independent Communications Authority of South Africa (“the Authority”) hereby gives notice of its intention to conduct an Inquiry into the licensing framework for Satellite Services pursuant to section 4B of the Independent Communications Authority of South Africa Act, 2000 (Act No. 13 of 2000) (“the Inquiry”).
2. The purpose of the Inquiry is to:
 - Determine a regulatory and/or licensing framework for Satellite Services in South Africa;
 - Determine the procedures that the Authority may implement for the provision of satellite services in South Africa;
 - Determine procedures for authorising user terminals, IoT terminals, earth station user terminals communicating with space station while in motion (ESIM/ESV), and ground earth stations in the South African territory.

- Consider the need to review spectrum fees, taking also into account the increasing amount of bandwidth used by satellite systems operating in higher frequency bands.
 - Determine procedures for registration of international satellite operators (including details of International Telecommunications Union (“ITU”) coordination status of the space segment) who intend to provide a service either directly or indirectly (through existing licensed operators) to South African consumers.
3. Interested persons and parties are hereby invited to submit written representations, including an electronic version of the representation in Microsoft Word, of their views on the proposed new licensing framework for Satellite Services by no later than 16h00 on 12 November 2024.
4. Written representations or inquiries may be directed to:

**350 Witch-Hazel Avenue, Eco Point Office
Park Eco Park, Centurion
South Africa**

**Private Bag X10,
Highveld Park 0169
Centurion, Pretoria,
Marked for the attention of:
Mr. Mandla Mchunu
satlicensing@icasa.org.za**

5. All written representations submitted to the Authority pursuant to this notice shall be made available for inspection by interested persons from 30 November 2024 at the ICASA website and copies of such representations and documents will be obtainable on payment of a fee.
6. Where persons making representations require that their

representation or part thereof be treated as confidential, then an application in terms of section 4D of the ICASA Act, 2000 (Act No. 13 of 2000) must be lodged with the Authority.

7. Any such request for confidentiality must be accompanied by a written statement explaining why the specific information should be treated as confidential in terms of section 4D(a) to (e) of the ICASA Act.
8. The Authority may then determine that such representations or any portion(s) thereof, are to be treated as confidential.
9. Where the request for confidentiality is refused, the person who made the request will be granted an opportunity to withdraw such representations or portion(s) thereof.
10. Persons submitting written representations are further invited to indicate as part of their submissions, whether they require an opportunity to make oral presentations to the Authority.
11. The guidelines for confidentiality requests are contained in Government Gazette Number 41839 (Notice 849 of 2018).



MOTHIBI RAMUSI

CHAIRPERSON

DATE: 12/08/2024

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1. Interpretation

The terms used in this Inquiry shall carry the interpretation used in the ITU Radio Regulations 2020 (RR20) ("the Radio Regulations"), the ECA, and regulations issued thereunder unless otherwise defined below:

"Broadcasting Satellite Service (BSS)" - A radiocommunication service in which signals transmitted or re-transmitted by space stations are intended for direct reception by the general public.

"Coordination" as described in Section II, Article 9 of Radio Regulations, is a formal regulatory obligation both for an administration seeking recognition of a frequency assignment for its network and for an administration whose existing or planned services may be affected by that assignment.

"Earth Station in Motion (ESIM)" - Earth stations placed on moving platforms that communicate with geostationary-satellite orbit (GSO) or non-GSO systems operating in the fixed-satellite service (FSS).

"Fixed Satellite Service (FSS)" - A radiocommunication service between earth stations at given positions, when one or more satellites are used. The given position may be a specified fixed point or any fixed point within specified areas. In some cases, this service includes satellite-to-satellite links, which may also be operated in the inter-satellite service. The fixed-satellite service may also include feeder links for other space radiocommunication service.

"Foreign Satellite System" - Satellite system that operates under the cover of a satellite network notified by a foreign Administration. The term is used to refer to operators providing satellite connectivity in a country outside of the jurisdiction of the satellite operator's host country of ITU satellite registration.

“Gateway” - Gateway earth stations linking one or more terrestrial networks and satellites.

“Geostationary-orbit (GSO) satellite” - A geosynchronous satellite whose circular and direct orbit lies in the plane of the Earth's equator and which thus remains fixed relative to the Earth; by extension, a geosynchronous satellite remains approximately fixed relative to the Earth.

“Ground Segment” - The Ground Segment refers to the network of gateways. Gateway earth stations link one or more terrestrial networks and the satellites.

“Harmful Interference” means interference that impairs the functioning of a Radiocommunication Service, or which materially degrades obstructs or repeatedly interrupts a Radiocommunication Service.

High Throughput Satellites (HTS)” are a new generation of communication satellites that use advanced technologies to provide higher data transmission capacity than traditional satellites. They use focused spot beams instead of wide beams, which can result in 10 to 100 times higher throughput.

“Landing Rights Permission/ Authorisation” - Administrative act by which ICASA confers the right to a natural or legal person to exploit the rights of emission and reception of signals, including broadcasting television content, and frequency bands associated with foreign satellite systems that cover and can provide services within the South African national territory.

“Mobile Satellite Services (MSS)” - A radiocommunication service between mobile earth stations and one or more space stations or between space stations used by this service; or between mobile earth stations using one or more space stations and includes any feeder links necessary for its operation.

“Non-Geostationary Orbit (NGSO, or non-GSO)” - An orbit that is not geostationary (GSO), and thus any spacecraft on such orbit will not be fixed to the Earth's rotation. There are many types of NGSO, such as Low Earth orbit (LEO), Medium Earth orbit (MEO), and High Elliptical orbit (HEO). Some NGSOs can also be circular (radius is constant, or eccentricity is zero), or elliptical (eccentricity is greater than 0 and no more than 1).

“Notification (ITU)” - means the Final stage of the procedure for assigning satellite orbits with their respective associated frequency bands before the ITU, which is intended to be registered in the Master International Frequency Register.

“Orbit” - A path of a satellite around the Earth.

“Power Flux Density (PFD)” - The amount of power flow through a unit area within a unit bandwidth. The units of power flux density are those of power spectral density per unit area, namely watts per hertz per square meter. These units are generally expressed in decibel form as dB(W/Hz/m²), dB(W/m²) in a 4 kHz band, or dB(W/m²) in a 1 MHz band.

“Radio Quiet Zone (RQZ)” is an area where radio transmissions are restricted to protect a radio telescope or communications station from radio frequency interference.

“Radio Regulations (RR)” are part of the Administrative Regulations of the legal framework of ITU that govern the global use of radio-frequency spectrum and satellite orbits. These have international treaty status and are thus binding on the ITU Member States.

“Satellite Capacity” - Quantity of radioelectric spectrum, quantified in hertz, capable of being supplied by a satellite system to carry traffic of satellite services.

Earth's surface, intended for either the transmission of radio signals to a space station or the reception of radio signals from a space station, or both.

"Satellite Capacity Provide" means the satellite system registered by ICASA to provide satellite capacity over the Republic of South Africa, whereby licensed telecommunications service providers and/or telecommunications network operators must procure satellite capacities from Registered Satellite Capacity Providers.

"Satellite Network" - Configuration of one or more satellites that provide(s) controlled radio transmission facilities and which interconnect(s) with earth stations. These networks consist, at the very least, of the establishment of transmission lines:

- between space segment and fixed earth stations which provide the link to the terrestrial public networks (feeder links);
- between space segment and end-user earth stations which may be fixed or mobile (service links);
- one or more fixed earth stations may have the function of controlling the system and/or interconnecting with other networks.

Also means a satellite system or a part of a satellite system consisting of only one satellite and the cooperating earth stations.

"Space Segment" - means the ground facilities providing the tracking, telemetry, and telecommand (TTC) functions and logistics support for the satellites.

"Space station" is a station located on an object that is beyond, is intended to go beyond, or has been beyond, the major portion of the Earth's atmosphere.

"Teleport Facility" is two or more non-transportable fixed satellite earth stations that collectively provide access to or from an electronic communications network, which are located at a single, physically demarcated geographic location, and which collectively are capable of transmitting on more than one frequency to more than one space station simultaneously using steerable antennas.

"Terminal" - The equipment used by customers to access the licensed service.

"TT&C" or **"Telemetry, Tracking and Command"** means the entirety of the facilities and necessary staff for the control of a Satellite System and to maintain its safe operations within its assigned orbital parameters.

"Telemetry, Tracking, and Command (TT&C)" - Subsystem for telemetry, monitoring, and control of a satellite with facilities on the ground. Telemetry consists of monitoring the status of the satellite through the collection, processing, and transmission of data from the various subsystems; tracking consists of determining the exact location of the satellite through the reception, processing, and transmission of tracking signals; and the adequate control of the satellite through the reception, processing, and implementation of commands transmitted from the Earth.

"Type Approval"- An administrative procedure of technical tests and vetting applied to items of telecommunication equipment, involving verification of the equipment's compliance with the applicable standards and other regulatory requirements, before they can be sold, used, imported, or interconnected with the public network.

Introduction

Technological advances have resulted in satellites having the ability to provide broadband connectivity to large areas (including entire regions) at minimal extra marginal cost. Satellites are also adept for the provision of connectivity services to remote and rural areas and are resilient when terrestrial services have been impacted, i.e., following natural disasters on land, such as earthquakes or

tsunamis. Additionally, satellite systems provide continuous and consistent services where terrestrial services cannot be provided, including earth stations affixed to ships and aircraft, known as ESIMs.

According to provision 18.1 of the Radio Regulations, “no transmitting station may be established or operated by a private person or by any enterprise without a licence issued in an appropriate form and in conformity with the provisions of these Regulations by or on behalf of the government of the country to which the station in question is subject”.

Furthermore, the World Radiocommunication Conference of 2019 (WRC-19) adopted Resolution 22 titled “Measures to limit unauthorised uplink transmissions from Earth stations” and Resolves 1 and 2 of this Resolution states that:

- “the operation of transmitting earth stations within the territory of an administration shall be carried out only if authorised by that administration”; and
- “the notifying administration for a satellite network or system shall, to the extent practicable, limit the operation of transmitting earth stations on the territory of an administration on which they are located and operated to only those licensed or authorised by that administration” respectively”.

Licensing is a matter under the jurisdiction of individual countries. Their licensing of satellite networks ensures that satellite operators and service providers follow the rules and conditions contained within the Radio Regulations and the outcomes of applicable bilateral discussions, including coordination. Each Country is also permitted to enact its own domestic rules and regulations, in line with the Radio Regulations.

In terms of section 31 (1) of the Electronic Communications, 2005 (Act 36 of 2005), as amended (“the ECA”), no person may transmit any signal by radio or use radio apparatus to receive any signal by radio, except under and in accordance with a radio frequency spectrum licence granted by the Authority to such person in terms of the ECA.

Further, section 31 (2) of the ECA states that a radio frequency spectrum licence is required in addition to any service licence contemplated in Chapter 3 of the ECA, where the provision of such service entails the use of radio frequency spectrum.

2. Background

Satellite networks are usually grouped into three different categories (*in terms of altitude*):

- Geostationary Earth Orbit ("GEO"),
- Medium Earth Orbit ("MEO"), and
- Low Earth Orbit ("LEO") systems.

GEO satellites, which orbit the Earth at an altitude of 35,786 km have a very wide coverage footprint area. This allows GEO systems to achieve global coverage with as few as three (3) satellites and can deploy more satellites with additional capacity, focused on areas of greatest demand. LEO constellations, however, require a large network of satellites to obtain the same level of coverage due to their lower altitudes. Improvements in satellite technology are resulting in the ever-increasing capacity and capability of next-generation satellites, commonly known as Very High Throughput Satellites ("VHTS"). VHTS networks offer significant advantages in data transmission rates due to narrower beams, increased power, and the ability to reuse the same frequencies with multiple steerable spot beams, increasing capacity in the allocated frequency band.

In the South African context, electronic communications services (ECSs) are subject to the ECA. According to section 1 of the ECA, Electronic Communication services (ECS) are any service that consists wholly or mainly of the conveyance, by any means, of electronic communications over an electronic communications network (ECN), regardless of whether such services are provided on a wholesale basis or to end-user subscribers. Satellite communications services are therefore considered to be electronic communication services under the ECA.

South Africa is a Member of the African Telecommunications Union ("ATU") which periodically seeks to harmonise regulatory processes within its Member States. In 2022, ATU embarked on a process of developing a suitable licensing framework aimed to harmonise to the greatest extent possible. This resulted in the publication

of a document titled "Harmonised Model Framework for Licensing of Satellite Services in Africa¹".

3. Objectives

The objectives of this inquiry are to:

- Develop a transparent and streamlined regulatory framework with clear rules to establish regulatory certainty for potential satellite operators in South Africa;
- Outline the procedures for the provision of satellite services in South Africa;
- Develop procedures for authorising user-terminals, IoT terminals, and earth station user terminals communicating with space station while in motion (ESIM/ESV and ground earth stations in the South African territory);
- Review spectrum fees, taking also into account the increasing amount of bandwidth used by satellite systems operating in higher frequency bands; and
- Develop a procedure for registration of international satellite operators (*including details of ITU coordination status of the space segment*) who intend to provide a service either directly or indirectly (through existing licensed operators) to South African consumers.

4. Applicable Legislation and Regulations

The following treaty documents, statutory instruments, and regulatory framework shall apply to the implementation of this inquiry:

- i. ITU Constitution (CS), Convention (CV) and the Radio Regulations (RR);
- ii. The Electronic Communications Act, 2005 (Act No. 36 of 2005), as amended;

¹ <https://atuuat.africa/atu-resource-centre/atu-r-framework/>

- iii.* The National Radio Frequency Plan 2021, published in Government Gazette Number 46088 of 25 March 2022;
- iv.* The Radio Frequency Spectrum Regulations, 2015, published in Government Gazette Number 38641 of 30 March 2015, as amended;
- v.* The Radio Frequency Spectrum Licence Fee Regulations, 2010, published in Government Gazette Number 33495 of 27 August 2010 as amended;
- vi.* Astronomy Geographic Advantage Act 21 of 2007, published in Government Gazette Number 31157 of 17 June 2008; and
- vii.* Regulations on the Protection of the Karoo Central Astronomy Advantage Areas, 2017, published in Government Gazette Number 41321 of December 2017.

This document recommends the following policy principles from ATU Member States in the development of national satellite licensing frameworks:

- a) Licensing process to be harmonised, as much as possible, among the ATU Member States.
- b) Licensing of satellite networks or services provision to follow the ITU instruments and regulatory procedures that govern the use of radio spectrum and associated orbital resources.
- c) Transparent regulatory frameworks with clear rules to establish regulatory certainty to support durable investment.
- d) Domestic user terminals to be licensed without the need for individual terminal-by-terminal authorisation (e.g., on a blanket licensing basis).
- e) Member States to take appropriate actions to publish in a timely manner, procedures for authorising user terminals operations in their countries.
- f) Designation of the relevant frequencies for use by satellite user terminals on a domestic, regional, or international basis consistent with Radio Regulations frequency allocation Table; and

- g) Reasonable spectrum fees, taking also into account the increasing amount of bandwidth used by satellite systems operating in higher frequency bands.

QUESTION 1

These are the policy principles from the ATU that ICASA seeks to align with.

Kindly provide comment(s) on the proposed policy principles and any further recommendations listed in the above section?

5. Scope of the Inquiry with respect to Radio frequency bands and services

This inquiry is only applicable to Fixed Satellite Services (FSS) Mobile Satellite Services (MSS) and Broadcasting Satellite Services (BSS). Satellite services such as radio navigation satellite services, amateur satellite services, earth exploration, and space research satellite services are not in the scope of this inquiry.

The typical radio frequency bands used by the services in consideration under this framework inquiry are contained in the following Table:

Service Category	Below 1GHz	L-band	S-band	Ku-band	Ka-band	Q & V-band
Non-voice NGSO MSS	137 – 138 MHz					
	148 – 150.05 MHz					
	399.9 – 400.05 MHz					
	400.15 – 401 MHz					
		1525 – 1559 MHz				

Voice MSS & narrowband MSS		1626.5 – 1660.5 MHz				
		1610 – 1626.5 MHz				
			2483.5 – 2500 MHz			
2GHz MSS			2000-2020 MHz			
			2180 – 2200 MHz			
GSO & NGSO FSS				10.7 – 12.2 GHz	18.3 – 18.8 GHz	40 – 42 GHz
				14 – 14.5GHz	19.7 – 20.2 GHz	47.20 – 51.40
				2	27.5 – 30GHz	
GSO & NGSO MSS					19.7 – 20.2 GHz	
					29.5 – 30GHz	

QUESTION 2

Do you agree with the exclusions of radio navigation satellite services, amateur satellite services, earth exploration, space research satellite services and radio astronomy services indicated above and others if applicable? If not, please explain your reasoning and propose an alternative to this proposal.

6. Types of licences/authorisations (where applicable) for Satellite Communications

A licence is an official authorisation granted by the Authority to entities on successful assessment of the applications. These licences are essential for

launching, operating, and providing a radiocommunication service. When providing a radiocommunication service, the operator has to respect the prescribed conditions. These conditions are found in general legislation, both international and national. They are a set of obligations and rights; some of them are general rules that operators must comply with, while others create a framework that may be applied to a specific network.

On the International level, provision No.18.1 of the Radio Regulations strictly expresses that "No transmitting station may be established or operated by a private person or by an enterprise without a licence issued in an appropriate form and in conformity with the provisions of these regulations by or on behalf of the government of the country to which the station in question is subject.

On the National level in terms of section 31 (1) of the ECA, no person may transmit any signal by radio or use radio apparatus to receive any signal by radio, except under and in accordance with a radio frequency spectrum licence granted by the Authority to such person in terms of the ECA.

It is for this reason that the Authority is proposing the three (3) following types of licences/authorisations:

- Satellite Gateway Earth Station Licence

Gateway Earth stations are hubs that connect the satellite network to terrestrial networks that is proposed to be authorised through the issue of a Satellite Gateway Earth station licence. The licence will specify the location from which the gateway earth station can be operated, the allocated spectrum authorised for use along with a range of licence conditions, such as national and international obligations and apparatus requirements.

- User-Terminal network licence.

Taking into consideration that the entity licensed for a Gateway Earth Station may not necessarily be the same entity providing a service to the end-user, the Authority is proposing a separate licence that authorises access to radio frequency spectrum for user terminals to communicate with satellites,

- Registration of Space Segment

As the name suggests, this is not a licence but rather some Space Segment registration regime for the Space segment operators who intend to include the territories of South Africa in its service area as described in section 10.1 of this document.

The Authority is also proposing to license each satellite network segment as indicated above separately.

QUESTION 3

Do you agree with the proposed approach of having a separate licence/authorisation (where applicable) for each segment of the Satellite Communication value chain? Please elaborate.

7. Satellite Gateway Earth Stations

Modern satellite systems have grown beyond the traditional C-band, Ku-band FSS and L-band MSS systems in geostationary orbit. Over the past two decades, the satellite industry has launched (and is continuing to launch) high throughput satellites (HTS) in the C, Ku, and Ka-bands, in both GEO and NGSO, to provide advanced broadband connectivity everywhere. In the future, such systems will also incorporate the Q and V-bands (*40/50 GHz bands*).

All of these new and emerging satellite systems require equitable access to spectrum to truly flourish and provide connectivity where it is needed at affordable prices. While South Africa has been successful in attracting a number of new satellite operators intending to establish and operate gateway earth stations in the country, there can be no doubt that South Africa would be an even more attractive market if its spectrum prices were cost-effective and in line with global benchmarks.

The creation of a Satellite Gateway earth station licence would allow the licensee to install and operate a Satellite Earth Station using a specified radio frequency band. This licence does not confer any right of ownership of the frequency spectrum., it simply allows the frequency channel to be used during the term of the licence in accordance with the conditions of the licence.

The Gateway Earth Station licensee may establish a Gateway in respect of one or more satellite systems in the Approved list of authorised Space Stations (ALOSS)

and it shall not be permitted to provide any telecommunication service or broadcasting service directly to the end-users, for the provision of which, a separate licence (radio spectrum licence, I-ECNS or ECS licence) is required from the Authority.

Applicants or holders of the Gateway Earth Station licence are legible to be treated under the Private Electronic Communication Network (PECN) licence regime. Only when they provide additional services to the end-user directly will they need to possess an I-ECNS licence. The Authority is cognisant of the fact that the Gateway operator may not necessarily be the same entity as the service provider to the end user. In some cases, the operator may choose locations of their Gateway Earth Stations outside South African territory for operational reasons. It is for this reason that the Authority will continue to issue separate licences for Gateway Earth Stations and service link licences.

DOTECON in its report² on "Satellite Earth Station Review "for Ireland, states that, "Among regulating authorities, there appears to be some trans-national competition in hosting ground stations, with some jurisdictions being particularly flexible when it comes to Satellite Earth Station licensing or even offering tax benefits and other incentives to attract satellite operators. Longer radio spectrum licence terms and renewal options provide important certainty and predictability to market entrants that can help justify the significant upfront and operational expenses necessary to deploy earth stations that can support connectivity for consumers and businesses. This creates an additional incentive for Global Ground Station operators to choose South Africa as the host of the Gateway Earth Station. The Authority recommends the Gateway Earth Station licence shall be valid for five years from the effective date of the licence with a provision of renewal for a further five (5) years at each instance of renewal".

QUESTION 4

Please provide your comments on the proposals in the preceding paragraph and the duration of the Gateway Earth Station licences.

² DotEcon Report -Satellite Earth Station Licensing Review (Reference: ComReg 21/135a-17 December 2021)

8. National and International Coordination

Depending on an earth station's operating frequencies and other technical characteristics, it may be necessary for the Authority to undertake a frequency coordination process with applicable jurisdictions. Co-ordination is required to mitigate the risk of cross-border interference and as a minimum, is expected to take four (4) months.

The coordination procedures under Appendix 7 of the ITU Radio Regulations shall be applicable to Satellite Gateway Earth Stations. In addition, an applicant requesting a satellite gateway earth station licence shall be required to submit detailed coordination contours and interference analysis where the operating band is allocated on a co-primary or secondary basis. However, there shall be no coordination requirement in exclusive primary allocations.

8.1 Radio Frequency Spectrum Licence Fees for Gateway Earth Station

Modern high throughput systems need access to unprecedented amounts of spectrum (4 GHz or more) to fully utilise their capabilities and deliver the best broadband experience to customers.

This was unforeseen when the radio frequency spectrum fee formulae were developed. The current radio frequency spectrum fees formula has proved to be unsustainable in a globally competitive environment, especially considering the large bandwidth requirements of modern HTS systems. When applied to the gateway stations of these systems, the fee formula results in high spectrum prices that have already deterred investments in the country by some satellite operators.

The Authority has on previous occasions made spectrum fee reviews to ease the burden on the spectrum fees paid by government security agencies. This was achieved by the introduction of a new factor in the spectrum fee formulae. This factor was termed the "security factor (SEC factor)" and has a value of 0.1 which effectively introduced a 90% discount to spectrum fees paid by government security agencies. The same principle can be applied to the fee formulae applicable to Gateway Earth Stations for frequency bands above 17.3 GHz. The rationale for the bands is that HTS and VHTS operate mainly in the Ka-band and above (starting at 17.3GHz).

The new factor will be termed "high throughput satellite factor" (HTSF) with a value (between 0.3 and 0.1) which will introduce a discount of between 70- 90% in the fee formulae.

Gateway station Fee = Max (R_{UL} ; UNIT * BW* HTSF).

The fee is the multiplication of the unit price (UNIT) by the bandwidth (BW) in MHz, and R_{UL} is the minimum fee for satellite uplink connections only applicable if **UNIT * BW** is less than the prescribed minimum fee. A new lookup table will be introduced as follows:

HTSF	Value of security factor
High throughput satellite factor	0.1, 0.2 or 0.3 (<i>to be determined</i>)
All other Gateway stations	1

An alternative radio spectrum fee model being considered by the Authority is based on variable fees per MHz depending on the frequency band in use. This model seeks to review the fee formulae for all frequency bands used for Gateway Earth Stations instead of only dealing with the High Throughput Satellite services. This model recognizes that radio frequency utilisation in the lower frequency bands typically has smaller channel widths, sometimes measured in kilohertz (kHz) rather than MHz. The proposed model for these lower frequency ranges takes into consideration the relative size of the frequency assignments and the limited amount of spectrum compared with the higher frequency bands.

For Gateway Earth Station Spectrum Licences, the Authority proposes to implement the following spectrum licence fees, applied per licence, not per Earth station: This takes into consideration that some non-geostationary satellite systems use a cluster of earth stations connecting to a single network in one location.

Item	Radio Frequency Band	Amount in Rands per MHz paired
A	$F < 1\text{GHz}$	2000
B	$1\text{GHz} \leq F < 3.3\text{GHz}$	500
C	$3.3\text{GHz} \leq F < 7.075\text{ GHz}$	200
D	$7.075\text{GHz} \leq F < 17.3\text{ GHz}$	150
E	$17.3\text{ GHz} \leq F \leq 51.4\text{ GHz}$	100
F	$F > 51.4\text{ GHz}$	50

QUESTION 5

Please comment on the above-mentioned alternative proposals to levy the spectrum fees for Gateway Earth Stations and indicate your preferred option. The Authority understands that there are other spectrum fee calculation methodologies used elsewhere in the world. Please give details of the methodologies which you believe would be most suitable for South Africa.

9. Satellite User Terminals

A licence may be required for the sale and installation service of satellite user terminal equipment in South Africa. Applicants are only required to register with the Authority to obtain a Radio Dealer Certificate through a procedure outlined in the National Spectrum Radio Regulations³. The following conditions apply:

- a) The licensee shall be a registered entity in South Africa,
- b) In the case of fixed satellite services, the licensee shall provide on an annual basis, a list of customers who have been provided with services, including:
 - I. Name and address of customer;
 - II. Type of equipment installed;
 - III. Band and frequencies utilized;
- c) All equipment sold/installed within the geographic limits of South Africa shall fully comply with the Equipment Type Approval National Regulations.

³ The Radio Frequency Spectrum Regulations, 2015, published in Government Gazette Number 38641 of 30 March 2015, as amended

d) The direct to home (DTH) receive terminals under the broadcasting service are exempted from licensing.

The Gateway Earth Station Licence alone does not confer any right to the Earth Station licensee for the provision of services to end users in South Africa. The Authority believes that there is merit to the introduction of blanket licensing of user terminals. This approach reduces the regulatory burden for both the licensee and the Regulator and it is easy to implement. This approach is very similar to the mobile/cellular environment, where devices are exempt from individual licensing i.e., blanket licence.

The Authority seeks to introduce a licence type to cover all user-terminal stations under FSS, and MSS. This licence type will be termed "Satellite User Terminals Network Licence". This licence would authorise access to spectrum for user terminals to communicate with satellites to deliver broadband connectivity on aircraft or ships, as well as to ground-based terminals delivering services such as residential and business broadband; private networks; and IoT applications.

Currently, the radio spectrum fee formula is specific to VSAT terminals. The proposal is to amend the title so that it is technology-neutral and therefore can be applied to various satellite terminals such as satellite phones, VSAT, ESIM, etc. This can be achieved by grouping these terminals under the Satellite User Station Network Licence category.

The fee formula applied to individual terminals was appropriate in previous years when the uptake of satellite services was limited. However, the Authority is anticipating continued high growth of satellite services in the future; spurred by amongst others NGSO mega-constellations and HTS technology. The current individual licensing of the terminals has the potential to raise regulatory costs, stifling the development/uptake of satellite services.

The ESIM on aircraft already licensed in another country, temporarily visiting South Africa, should be exempted from licensing, or at least be subjected to a simpler regime of registration. According to provision 37 (Recognition of licences issued by other countries") of The Radio Frequency Spectrum Regulations, 2015, the Authority may issue a radio frequency spectrum licence as required by the Act or these Regulations to a person who, in the opinion of the Authority, possesses a similar licence issued by an authority in another country despite the fact that

such person does not satisfy specific requirements stipulated by these regulations for the acquisition of the licence or certificate”.

The Authority believes that the above-mentioned Radio Regulations provision can be used by the Authority to implement the free circulation of ESIM devices as envisaged in the Communications Regulatory Association of Southern Africa (CRASA) Recommendation on a harmonised approach to domestic licensing and mutual licence recognition of ESIMs.

The proposed model for user-terminal fees will be based on the number of user terminals irrespective of the frequency band used in the Earth-to-Space direction. The following table outlines how the model will be implemented.

Number of terminals (n)	Fee per category of user terminal in South African Rands
$0 < n \leq 100$	A
$100 < n \leq 1000$	B
$1000 < n \leq 10000$	C
> 10000	D

QUESTION 6

Kindly comment on the section above and on the proposal for blanket licensing with a fee for a set number of terminals under a new proposed licence regime to be referred to as "Satellite User Station Network Licence". If possible, please provide a breakdown of the number of terminals with the corresponding spectrum fee values in South African Rands.

QUESTION 7

Kindly comment on the appropriateness of using regulation 37 of the ICASA radio regulations ("Recognition of licences issued by other countries") to recognize ESIM licences issued by other countries.

10. Space Segment Authorisation

Historically, governments developed policies to protect their countries' satellite systems and control market access. These policies required service providers to use only locally owned satellite capacity. Also, originally satellite operators were inter-governmental organizations owned by the incumbent telecommunication service providers, and consequently, space services could only be bought through an incumbent or telcos⁴.

Satellite landing rights were traditionally applied and/or enforced by governments in order to protect domestic satellite companies from foreign competition and to ensure that domestic operators have reciprocal market access (so-called "Closed Skies Policies").

However, due to the many benefits provided by satellite connectivity such as the ability to reach places where other land-based, wired, or wireless communications technologies cannot reach (including sparsely populated areas and aircraft/vessels), governments are realising that tremendous demand for internet, data, voice, video, and other essential services is best addressed by policies that permit open and direct access to all satellite resources, assuming that they have been properly co-ordinated through the ITU.

The "footprint" of a satellite – the region of the Earth served by a satellite – does not match national borders, making it necessary to regulate this matter through international agreements such as those developed under the auspices of the ITU. This approach is referred to as "Open Skies" and is being adopted by most administrations in every major region of the world⁵.

Satellite operators in support of the Open Skies Policies argue that satellites are global infrastructures and that their launch and operations are coordinated through the mechanisms of the ITU. Further, the operators argue that satellites that are launched are authorised by the satellite operator's home licensing administration and that there is no need for the authorisation of the space segment, i.e., no need for the so-called landing rights.

⁴ ITU (2012) "Regulations of Global Broadband Satellite Communications," Broadband Series, pg 38.

⁵ Hartshorn, David (2021) "Strengthening Access to Communications Policy & Regulatory Guidelines for Satellite Services," Online Journal of Space Communication: Vol. 2: Iss. 5, Article 15, pg 13

The argument against the landing rights is that the rights (i) create barriers to entry for foreign operators which in turn negatively affect competition, (ii) may result in the slow evolution of the enforcing country's communication systems and (iii) result in the reduction of benefits of satellite connectivity that would otherwise be immediately available or even lost on the other hand, satellite operators argue that having Open Skies Policies result in the increased competition which brings about more product choices, lower prices for consumers, stimulation of investment as well as economic growth.

While the policies being implemented today are not completely open, they all involve permitting increased access to orbital resources, regardless of the satellite operators' country of origin. "Open Skies" policies require satellite operators to compete for customers interested in obtaining satellite capacity. It has been proven that this competition can result in more options for local customers with a significant boost in quality and crucially, lower prices⁶.

Satellite landing rights or any other similar authorisation is related to the space segment of Foreign Satellite Operator systems to cover the national territory of a given country and operate on its recognized recorded frequency assignment in the ITU. Usually, this type of authorisation does not permit the provision of services to end-users, which requires a separate telecommunications licence⁷.

The ATU-R Framework advises that Member States are to consider the following recommendations⁸ to minimise regulatory hurdles:

- The authorisation should focus on establishing direct contact between the regulator and the satellite operator, without creating an additional burden to enter the market. If not implemented correctly, a landing rights regime may result in reduced choices for local service providers, insufficient capacity, and higher prices for end-users.
- It is very important to guarantee that the process of filing and authorisation is neither burdensome nor expensive. Landing rights duration should be equal to the lifespan of the satellite in order to

⁶ Hartshorn, David (2021) "Strengthening Access to Communications Policy & Regulatory Guidelines for Satellite Services," Online Journal of Space Communication: Vol. 2: Iss. 5, Article 15, pg 14

⁷ ATU-R Framework relating to harmonized model framework for licensing of satellite services in Africa, August 2022, pg 9.

⁸ ATU-R Framework relating to harmonized model framework for licensing of satellite services in Africa, August 2022, pg 9.

provide operators with the regulatory certainty required for the provision of satellite services to the country.

- No legal presence should be required to obtain the landing rights authorisation.
- Authorisation requirements for the space segment should be in accordance with the ITU regulatory framework. In any case, the authorisation of the space segment is already done by the satellite operator's filing administration in line with the ITU relevant procedures (articles 9 and 11 of Radio Regulations).
- No local entity requirements should be applicable to foreign satellite operators. Such requirements do not apply to entities that do not provide end-user services and would be very cumbersome and onerous, as it would ultimately lead to satellite operators providing connectivity solutions globally to have a presence in each territory they serve.
- A publication of a domestic register referring to the satellites operating in the country, contact details of operators, associated frequency bands, and landing rights duration could be useful for the service providers.

Case Study

1. Brazil (National Telecommunications Agency or Anatel)⁹

- 1.1. The process for granting satellite landing rights is established by the Brazilian General Telecommunications Law and regulated by the Satellite Landing Right Regulation.
- 1.2. The satellite landing right is the authorisation to use spectrum and orbit resources, to perform satellite communication and to provide satellite capacity, for both Brazilian and foreign satellites. The granting of the Satellite Landing Right is subject to the analysis of the documentation presented and the technical and regulatory aspects, which includes verification of compliance with the prior satellite coordination requirement.
- 1.3. The Satellite Landing Right is granted for a period of up to 15 (fifteen) years and can be renewed for up to 15 (fifteen) years. Anatel rules shall be observed during the whole period the authorisation is in force and the

⁹ <https://www.gov.br/anatel/pt-br/regulado/satellite/process-for-granting-satellite-landing-rights>

satellite operator shall operate under the applicable national and international operational conditions.

10.1 Proposal on Space Segment Authorisation in South Africa

Currently, South Africa does not have a landing right regime, and Satellite operators are not charged any "landing right" fee when providing satellite coverage over South Africa and its territories. Consequently, the satellite downlink (space-to-Earth direction) are not subject to protection in South Africa, unless the associated earth stations receiving such downlink signals are individually licensed.

To ensure protection is afforded to existing terrestrial services deployed in South Africa in the same frequency band with a co-primary allocation to space services, the Authority prepares responses/comments accordingly to the international satellite filing and coordination process of the ITU.

In this document, the Authority seeks to introduce what can be termed a "List of Authorised Space Stations" where registration shall be a simple administrative process that does not constitute a licence or permit to provide telecommunication services or to operate telecommunications networks in South Africa. A once-off nominal fee may be levied to cover the administrative cost of managing the "List of authorised Space Stations" for the duration or lifespan of the satellite network.

A satellite operator authorised by a foreign Administration can request, on its initiative, entry into the list of authorised Space Stations to provide satellite capacity over South Africa. Once the approval of the Authority is obtained, a foreign space station is eligible to serve the territory of South Africa and the name of that satellite shall be included in the list of "Authorised Space Stations".

The Authority is proposing that a satellite system filled with the ITU by a foreign Administration may provide satellite capacity over the territories of South Africa after registration with the Authority and entered into authorised list of Space Stations through the process outlined in section 10.2 and Appendix A of this inquiry. This registration does not grant the right to provide telecommunication services or/and telecommunications networks in South Africa, and a relevant Licence(s) are required in each case. Licensed network operators (e.g., I-ECNS, ECS licensees) may only procure satellite capacity to provide their services with

Satellite operators appearing in the publicly available authorised list of Space Stations.

A list of registered foreign satellite capacity providers will be published on the Authority's website. The duration of the registry will be the lifespan of the registered satellite system, if the satellite system is replaced, the registration will have to be updated within four (4) months of the change.

Applicants wishing for their system to enter the registry will have to, amongst others, provide the Authority with the following information, and all required documents.:

- a) Formally register a contact person with the Authority, with a commitment to keep this data up to date.
- b) Submit simplified technical information on the satellite system, indicating its possible.
- c) uses, orbiting parameters, frequency bands and geographical areas to be covered.
- d) (footprints) and any other relevant data.
- e) Submit any other documents issued by a competent authority showing the terms authorised in the country of origin for the use of the space segment.
- f) For the protection of the Radio Astronomy Advantage area, Licensees shall manage interference by limiting unwanted emissions. For non-geostationary orbit systems, this includes the suppression of satellite transmissions in the channel immediately adjacent to 10.7 GHz or taking other measures.
- g) NGSO satellites and earth stations communicating with NGSO satellite(s) shall ensure compliance with the relevant equivalent power flux-density limitations specified in Article 22 of the Radio Regulations in both the Earth-to-space and space-to-Earth directions.
- h) For NGSO satellite(s), licensees shall ensure compliance with the relevant power flux-density limitations in Article 21 of the Radio Regulations in the space-to-Earth direction.

The Authority does not propose the introduction of Landing rights but a registration service to record space stations that are authorised to provide capacity over the territories of the Republic of South Africa. These space station networks will be registered in the "Authorised List of Space Stations".

10.2 Process for inclusion of Space Station Network to Authorised List of Space Stations

Space Station operators will be first required to submit an application to be listed under the Authorised List of Space Stations. This is a pre-requisite measure to allow foreign operators to provide satellite capacity over South Africa. Once included in the Authorised list of Space Stations, a foreign entity will need additional radio frequency spectrum either by itself or through an already licensed Individual Electronic Communications Network Licence holder (I-ECNS) provider. According to provision 31(2) of the ECA, "a radio frequency spectrum licence is required in addition to any service licence contemplated in Chapter 3, where the provision of such service entails the use of radio frequency spectrum".

Where an entity is applying to be included in the Authorised list of Space Stations, it is required to provide the ICASA with a formal application that addresses a set list of information outlined in Appendix A of this document. This includes information such as the relevant timeframes for supplying services, information about potential customers, and technical details about the satellite and the applicant. The applicant will be required to detail what measures will be put in place to ensure compliance with the Regulation of Interception of Communications and Provision of Communication-related Information Act, 2002 (Act No. 70 of 2002) ("RICA"). RICA intends to regulate the interception of certain communications, the monitoring of certain signals and radio frequency spectrum, and the provision of certain communication-related information.

In other jurisdictions, it is a requirement for Space Station operators to have a Gateway Station in the country. The Authority's view is that this puts an unnecessary burden on the Space Station operator. The Authority is instead proposing undertaking/ commitment from the Space Station operator to ensure compliance with RICA. This is only applicable where the Space segment operator intends to provide retail service directly to the end user (i.e., not through the already licensed I-ECNS holders).

The Authority is obliged to ensure appropriate protections for radio astronomy from potential interference caused by space-to-Earth downlinks of NGSO (as well as GSO) systems operating in frequencies adjacent to those allocated for radio astronomy use. Although satellite services are already subject to international thresholds which protect radio astronomy in this band, enforcement through international bodies can be a lengthy process. A specific South African authorisation condition would provide the Authority with the ability to take direct enforcement action in any cases of harmful interference from NGSO constellations and remove interference more quickly than solely relying on international processes. Furthermore, the protection of our terrestrial networks is ensured by limiting the Power Flux Density (PFD) radiated by satellites on the surface of the earth. The introduction of the register of authorised space stations will ensure a speedy resolution of interference cases.

QUESTION 8

Please provide your comments and details of the best practices in other jurisdictions to fulfill the intentions of the Authority as indicated in the above section. Furthermore, considering the provision set out in the Astronomy Geographic Advantage (AGA) Act of 2007, and the requirements of the Radio Quiet Zone, what measures and techniques do you propose to be employed in mitigating the possible interference that may be caused by the satellites within the Astronomy radio frequency bands in South Africa?

11. The Satellite rollout obligations

The "Roll-out" obligations are a regulatory measure typically used to address the shortcomings of terrestrial operators, who tend to focus their network deployment on revenue generating areas. Unlike terrestrial networks, satellite coverage can immediately reach areas of the country that are not cost-effective for terrestrial networks to reach.

QUESTION 9

Please provide proposals on the role the Satellite operators can play in ensuring that broadband connectivity reaches the areas of the country in terms of community networks with Satellite connectivity as a backhaul.

Kindly provide a regulatory solution that can be applied by Satellite operators to address the shortcomings of terrestrial networks in providing to unserved and underserved areas of the country. This may include collaboration with government programs to reach out to those unserved and underserved areas of the country.

APPENDIX A

REGISTRATION OF SPACE STATION NETWORK TO THE AUTHORISED LIST OF SPACE STATIONS (ALOSS)

This procedure applies to all foreign satellites communicating with an earth station located in the territory of South Africa.

Main assessment criteria

- an ITU member administration has authorised the space station;
- the satellite network has been successfully coordinated via the appropriate ITU procedures and regulations (if coordination has not been completed, approval may be granted subject to successful completion); and
- the satellite station complies with national spectrum policy requirements, particularly regarding frequency allocations, utilization, efficiency, orderly deployment, and co-existence with other radio services and stations authorised for use in the same and adjacent frequency bands.

Information required for registration consideration.

- Give the full name and address of the applicant and a contact name, telephone number, fax number, and email address.
- Describe the nature of the relationship between the applicant and the satellite operator.
- Give the name of the satellite and the satellite operator. Include the name(s) of the satellite(s) as notified to the ITU, as well as the commercial name(s) of the satellite(s).
- Indicate the remaining life expectancy of the satellite.
- Name the administration responsible for the satellite and indicate whether the administration is a member of the ITU.
- Give the dates that the administration coordinated and notified the satellite network, in its current or proposed operating condition, to the International Telecommunication Union (ITU), and provide the ITU BRIFIC special section reference number and publication date for both filings. If the satellite network has not yet been notified or if the notice is not yet published, provide a list of administrations with which coordination is required and information describing the status of coordination for each of these administrations.
- For geostationary orbit satellites, provide the orbital position of the satellite in degrees West longitude.
- For non-geostationary orbit satellites, provide the number of orbital planes, the number of satellites in each orbital plane, the angle of inclination of each orbit, and the altitudes (in kilometres) of the apogee and perigee of the satellites.
- Describe the extent and nature of the satellite coverage in the country. Include coverage maps if necessary.

- List the frequency bands that will be used by the satellite and indicate which bands the associated earth station(s) will use in the country.
- Describe the types of services to be provided in the country.

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