GENERAL NOTICE

NOTICE 295 OF *2006*

INDEPENDENT COMMUNICATIONS AUTHORITY OF SOUTH AFRICA

NOTICE IN TERMS OF SECTION 27 OF THE TELECOMMUNICATIONS ACT, NO. 103 OF 1996 ("THE ACT") INVITING REPRESENTATIONS WITH REGARD TO THE SATELLITE LICENCING FRAMEWORK DISCUSSION DOCUMENT.

1. The Independent Communications Authority of South Africa ("the Authority") hereby provides notice and invites comment on the satellite licensing framework discussion document

2. Interested persons are hereby invited to submit written representations, including an electronic version of representation in Microsoft Word, of their views on the Satellite licensing framework discussion document by no later than 31st March 2006.

3. Persons making representations are further invited to indicate whether they are requesting an opportunity to make oral representations (and the estimated duration there of, which duration shall not exceed one hour).

4. Written representations may be posted or hand delivered for the attention of:

Mr. Mandla Mchunu
Manager: Spectrum Management,
Email: mmchunu@icasa.org.za;

Tel: +27 11-321-8323
Fax: +27 11-321-8538
Private Bag X10002 or Block A
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5. All written representations submitted to the Authority pursuant to this notice shall be made available for inspection by interested persons from 07 April 2006 at the ICASA Library and copies of such representations and documents will be obtainable on payment of a fee.

6. At the request of any person who submits a written representation or document pursuant to this notice, the Authority may determine whether such representation or document, or portion thereof, relates to the financial capacity or business plan of any person, or to any other matter reasonably justifying confidentiality, in which event such representation or document shall not be made available for inspection by members of public. If the request for non-disclosure to public is refused, the person making the request will be allowed to withdraw the representation or document in question.

7. With respect to the documentation determined not to be open to public inspection as aforementioned in paragraph 6 above, the Authority may direct that the public or any member or category thereof, shall not be present during the oral submission relating to such documentation; provided that those present shall have been notified of this intention, allowed to object thereto and after such objections had been considered by the Authority.

8. Representations may address any relevant issue, whether or not such issue has been raised in the Discussion Document. Furthermore, it is not a prerequisite that representations should address any or all of the issue raised in the Discussion Document.

9. The findings, recommendations and conclusions by the Authority following public comment, will be published in the Government Gazette in accordance with Sections 27 of the Act.

SATELLITE LICENCING FRAMEWORK

TABLE OF CONTENTS

INTRODUCTION

The following are the satellite services as classified in the South African Table of Frequency Allocations(SATFA).

- Earth exploration-satellite service
- fixed-satellite service
- aeronautical mobile-satellite service
- mobile-satellite service
- radionavigation-satellite service
- radiodetermination-satellite service
- broadcasting-satellite service
- meteorological-satellite service

Fixed Satellite Services (FSS).

The fixed-satellite service (FSS) forms an important part of telecommunications networks. While initially it was used extensively for intercontinental/international applications, in more recent years some countries have deployed satellite systems for domestic purposes. With the development of fibre optic cables, with their inherently high capacity, the use of satellite communications for intercontinental applications has reduced. However, as with other satellite services, the FSS is well suited to delivering communications over a wide area, be it country or region-wide. The fixed satellite service will continue to play an important role in the future delivery of broadband telecommunications services including direct-to-home (DTH) delivery. This type of application results in a proliferation of small earth stations/consumer terminals.

Earth Station on board vessels (ESV)

For many years, satellite communications for ships was limited to services provided by systems operating in the 1.5/1.6 GHz band. In the last decade however, operators have installed terminals on ships which operate in the fixed satellite service bands at 4/6 GHz, and at 11/12/14 GHz. These terminals are based on the design of conventional VSAT networks, but make use of highly

accurate stabilised platforms to maintain the necessary antenna tracking of the GSO space station, even while the vessel is in motion. Within the ITU, such terminals are known as Earth Stations on board Vessels (ESVs).

ESVs are often the only solution for users who require high communications bandwidth which cannot be met by the other maritime systems, and can be the most cost effective solution for users who require a modest bandwidth but "always on" capability. Example applications are:

- Large data transfer requirements for scientific research ships
- Passenger telephone and internet service for ferries and cruise ships
- Extension of the corporate LAN to the ship's bridge

The **4/6** GHz FSS satellites provide "global" beam coverage and are therefore used by ESVs on vessels on long distance ocean crossing routes. For other users, the area of operation can be limited to smaller regions (e.g. within the North Sea or Mediterranean) and hence use can be made of the "regional" beams typical of 1**1/14** GHz **FSS** networks.

A number of ITU-R Recommendations have been developed:

- **S.1587** - Provisional technical characteristics of earth stations on board vessels operating in the frequency bands 5 **925-6 425** MHz and **14-14.5** GHz which are allocated to the fixed-satellite service
- **SF.1585** - Example approach for determination of the composite area within which interference to fixed service stations from earth stations on board vessels when operating in motion near a coastline would need to be evaluated.
- **SF.1648** - Use of frequencies by earth stations on board vessels transmitting in certain bands allocated to the fixed-satellite service.
- **SF.1649** - Guidance for determination of interference from earth stations on vessels (ESVs) to stations in the fixed service when the ESV is within the minimum distance.
- **SF.1650** - The minimum distance from the coastline beyond which in-motion earth stations located on board vessels would not cause

unacceptable interference to the fixed service in the bands 5 925-6 425 MHz and 14-14.5 GHz.

At WRC-03, provisions relating to ESVs were agreed in Resolution 902 (WRC-03) and Recommendation 37 (WRC-03). The Resolution defines distances from the low-water mark as officially recognized by the coastal State within which permission from potentially affected administrations must be obtained. Although the regulatory provisions are a positive step towards the recognition and operation of ESVs, they give little guidance as to how administrations should handle ESV operations within the minimum distances from the low-water mark as officially recognized by the coastal State, and do not specifically address the licensing of ESVs.

Some portions of the bands used by ESVs are also allocated to terrestrial services. The minimum distances from the low-water mark as officially recognized by the coastal State which have been agreed within the ITU (300 km at 6 GHz and 125 km for 14 GHz) are based on the protection of fixed service systems. Under the Radio Regulations, transmissions from ESVs within these distances shall be subject to the prior agreement of the relevant administrations where the bands are allocated to the fixed or mobile services.

Considering the mobile nature of ESVs, another consideration is the intermittent nature of the interference (possibly also only short in duration) that will be caused to terrestrial services, which will be very difficult for operators to detect and pinpoint to a specific vessel. It will be virtually impossible for terrestrial Fixed Service (FS)operators (Telkom &SNO) to detect the cause of such interference and even worst to mitigate or remove it, because at the time the investigation starts the interference will have disappeared and maybe another vessel is causing interference to another FS system at another location. For this reason ICASA will allow use of ESV according to the provisions of Resolution XX. The

ESV operator should submit the information contained in ANNEX 2 a week prior to the operation of the ESV in South African territorial waters.

Mobile Satellite Services. (MSS).

The mobile-satellite service includes the Land mobile-satellite service, Maritime mobile-satellite service and Aeronautical mobile-satellite service. Aeronautical and maritime mobile-satellite services also provide important safety functions such as the Global Maritime Distress and Safety Service (GMDSS).

The mobile-satellite service (MSS) includes Land mobile, Maritime mobile and Aeronautical mobile satellite services as well as generic services such as Globalstar. Maritime and aeronautical satellite services, in addition to normal communications, also provide important safety functions such as the Global Maritime Distress and Safety Service (GMDSS). The mobile-satellite service provides a variety of voice, data, fax and messaging services throughout the world that complement the terrestrial cellular networks. The satellite component of 3rd generation mobile is expected to comprise of constellations of non-geostationary satellites using spectrum between 1 and 3 GHz.

Broadcasting Satellite Services (BSS).

Broadcasting by satellite encompasses individual reception, often called direct-to-home (DTH), or direct broadcasting by satellite (DBS) and community reception. Individual reception typically involves simple receiving installations with small antenna, requiring a strong signal from the satellite and very effective protection against interference.

FSS bands have been used extensively and are still being used for the distribution of DTH services, This activity was driven by the availability of surplus satellite transponder capacity and the relative ease in which coordination could be accomplished in the FSS bands as opposed to the BSS bands.

Use of Spectrum for satellite communication *in* South Africa

Frequency allocations for space radiocommunication services in South Africa are indicated in the South African Table of Frequency Allocations (SATFA). They conform to the ITU Allocations for Region 1. As indicated in SATFA, a significant number of the bands allocated to the space radiocommunication services are also allocated to one or more terrestrial services. This is particularly relevant in the case of bands used for telecommunication applications. The specific utilisation for the various bands is subject to particular implementation arrangements, such as the relevant intra / inter-service sharing and co-ordination considerations. These are normally derived from ITU and CEPT/ERC specified criteria.

A number of different entities are involved in the offering of telecommunications services using satellite technology. Having analysed the different possible systems which are known at the moment, ICASA defines Space Segment Operators (SSO), Satellite Network Operators, Service Providers and Subscribers. A single company can be in charge of the activities of several entities.

These entities are the following:

Entities involved	Services	Examples
Space Segment Operator (SSO)	**Space segment provision**	1) Iridium **2)INTELSAT**
Satellite Network Operator (SNO) (which includes gateway operator)	**Satellite Network (SN)** First group of network: **-VSAT -SNG -MSS**	1TELKOM 2) SNO
Service Provider (SP) (which generates services without its own infrastructure or which resells services)	**Telecommunications services** (example of services included: VAS, Voice-Telephony, Data, Reselling of transmission facilities and services)	1)Retailers
Subscriber	**Service access** All services must be accessed by relevant terminal equipment connected at the	1) and 2) Individual subscribers Hotel chain

	termination point of the network (fixed or mobile) and provision of services requires contracts between subscriber and SP even by electronic means.	

The Space Segment Operator (SSO)

Traditionally, satellite systems used for offering telecommunications services were operated by either Intergovernmental Satellite Organisations (ISO) e.g. EUTELSAT or National Satellite Organisations (NSO) e.g. HISPASAT. Since in the past, only satellite services offered by ISOs and NSOs were authorised, national authorities which are "Parties" of these ISO/NSOs did not implement detailed regulation and sometimes did not establish any regulation when the member of the ISO/NSO was a monopoly.

ICASA defines ***SSO*** as the entity which is responsible for the establishment and operation **of** one or more space stations (and possibly **for** providing space segment).

The Satellite Network Operator (SNO)

The Satellite Network Operator is the entity which has obtained space segment capacity and which is in charge of the transmission and routing of telecommunications services between the termination points of the satellite network in question. This entity may be either a company representing the SSO's interests in a region, or an entity independent from the **SSO.**

An SNO also generates telecommunications services and provides these services either through service providers or directly to subscribers by means of satellite transmission. SNO will be responsible for the establishment and operation of gateways, the purpose of which is to control the network and to provide interconnection with other networks.

ICASA defines SNOs as entities which are responsible, within a certain area, for the control of a configuration of one or more satellites which provide(s) radio transmission facilities and which interconnect(s) with earth stations. These networks consist, at the very least, in the establishment of transmission lines:
i) between space segment and fixed earth stations which provide the link to the terrestrial public networks (feeder links),
ii) between space segment and end user earth stations which may be fixed or mobile (service links).

The Service Provider (SP)

The service provider provides telecommunications services to subscribers. The **SP** may also generate the service by himself or resale services. However, the **SP** does not own the infrastructure.

ICASA defineS **SP** as the entity which is responsible within a certain territory for the provision of telecommunication services to subscribers. The services involved e.g. **VAS,** data services, voice telephony and the reselling of these services.

The Subscriber

Service providers provide services to subscribers connected at a termination point of the relevant 'network. The subscriber is therefore the entity which has contracted with the **SP.**

ICASA defines subscriber as a person, a company or a group of people and companies located at a termination point of a network and which has/have subscribed to the services provided by an SP.

The termination point of a satellite network is normally an earth station, which may belong to the subscriber, the SP or the SNO. When the entity owning the earth station is the subscriber, e.g.: a **VSAT** small antenna or **MSS** mobile terminal, the only authorisation required for these earth stations is a radio licence.

A Satellite Communication Station Licence may be granted the following classes of stations to enable the licensee to transmit, receive or transmit and receive messages by means of satellite communication

1. Very Small Aperture Terminals (VSAT)
2. Tracking, Telemetry and Command (TT&C) Earth Stations
3. Earth Stations, and
4. Portable Satellite Communication Terminals

Frequency assignment proceedings for earth stations

Prerequisites

The frequency assignment for an applied frequency use may be issued under the following basic conditions:

- the allocation to the service is included in the Table of Frequency Allocations,
- the frequency use is envisaged in the frequency usage plan,
- the frequency use applied for is compatible with existing frequency uses, i.e.
  - national frequency coordination,
  - international frequency coordination in accordance with the Radio Regulations, Appendix7,
- frequency use will take place within an internationally coordinated satellite network (Radio Regulations Articles 9 and 1I of the ITU),

Application

Applications for frequency assignment for an earth station should be submitted using the appropriate application form. Only completed forms can be processed. ICASA may request further

information regarding the subjective assignment requirements of the applicant with a view to an efficient and interference-free frequency use.

Frequency assignment

An individual assignment is in accordance with the provisions of the Act if it is required for guaranteeing an interference-free and efficient frequency use.

An individual assignment must be issued since to guarantee an interference-free and efficient frequency use the compatibility with radio stations of the same service and with radio stations of other services must be examined nationally and internationally.

The following major technical parameters are covered by the assignment:

- transmitting frequency
- bandwidth
- polarisation
- location of the earth station or location of deployment
- maximum permissible effective radiated power in the direction of the satellite
- maximum permissible transmitting power
- azimuth of the transmitting antenna
- elevation of the transmitting antenna
- ITU name of the satellite system
- commercial name of the satellite system
- orbital position of the satellite system in degrees East/West

As a rule, individual frequencies are assigned. In justified exceptional cases a frequency range may be assigned if the applicant has provided evidence for the necessity of such a step. In individual cases the frequency assignment may specify further parameters relating to the intended use. The frequency assignment

may be supplemented by collateral clauses to ensure an efficient and interference-free use.

Assignment prior to termination of international frequency coordination / site coordination

Since both the international frequency coordination of an earth station in accordance with the Radio Regulations, Appendix **7,** and site coordination may take up several months, frequency assignments for such earth stations are usually issued in advance. These frequency assignments comprise the following dissolving condition(s) as collateral clause:

"This assignment expires when the initiated site / international frequency coordination cannot be concluded successfully within 9 months after its issue. Until then, frequency use by the earth station(s) takes place on a „non interference basis" (NIB). This means that the use may not cause any interference to any other radio application."

Any costs which may accrue due to a change which needs to be made to the earth stations as a result of incompatibility with other telecommunications installations determined during coordination are not payable by ICASA. This also applies for a possible subsequent change of frequency.

Earth stations for Satellite News Gathering (SNG)

Earth stations for Satellite News Gathering (SNG) are used for short periods for the

transmission of picture and/or sound signals for the purpose of broadcasting distribution at changing locations.

The assignment for SNG applications is issued on a nationwide scale and on a frequencyrange- related basis (14.0 – 14.25 GHz or

14.0 – 14.5 GHz). The assignment entitles the use of one frequency (of a transponder) in the specified range. The use is only permitted within a coordinated satellite network.

ICASA must be informed well in advance about each deployment of the SNG earth station, quoting the licence number.

GMPCS.

GMPCS is a personal communication system providing transnational, regional or global coverage from a constellation of satellites accessible with small and easily transportable terminals. Whether the **GMPCS** satellite systems are geostationary or non-geostationary, fixed or mobile, broadband or narrowband, global or regional, they are capable of providing telecommunication services directly to end users. **GMPCS** services include two-way voice, fax, messaging, data and even broadband multimedia.

Annex A

Annual Licence Fee (Spectrum Occupancy)

This fee depends on the degree to which the earth station occupies spectrum, either by transmission or by requiring receiver protection. This fee also depends on whether the spectrum applied for is shared or un-shared. For the schedule of fees see Annex.

Frequencies shared with Terrestrial Services

In accordance with ITU Regulations, some of the frequency spectrum available for use by satellite services is shared with other services – including fixed radio links. Licensees are obliged to pay for satellite usage irrespective of whether the same spectrum is used for other services in the same or different geographical areas.

Licence Fees

The licensee shall pay annual station and spectrum usage fees as outlined below.

Station fee

The annual radio station fee payable by the licensee shall be as follows:

Antennae size less than or equal to **2.4'** meters

(a) **R2500**[2] for each fixed satellite earth station, up to a maximum of one thousand stations. and,

(b) A **R100** for each additional fixed satellite earth station, above one thousand.

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[1] **The antenna diameters** of **VSAT earth stations are normally limited to 2.4 m.**

[2] **We have charged Sentech R2500 per VSAT station, up to a** maximum of **one thousand stations (licence attached)**

Antennae size above 4 metres

(a) A R50 000[3] for each fixed satellite earth station, up to ten, and,

(b) A R5000 for each additional fixed satellite earth station, above ten.

Spectrum usage fees

Bandwidth of Radio Spectrum used	Fee payable in Rands
Less than or equal to 1 MHz	R770
Greater than 1 MHz	R770 per MHz[4], rounded up to the nearest MHz

Examples of fee calculation

Example 1

The total fee for a VSAT network of 100 dependant stations, utilizing a bandwidth of 500 KHz.

10 stations charged at a fee of R2500 each. (R25 000)

90 stations charged at a fee of R500 each (R45 000)

Spectrum fee for 500 KHz bandwidth charged at R500

Total Fee R70 500

[3] R50 000 is already charged for various types of satellite earth stations and we should be consistent.

[4] This fee is contained in the Radio Regulations and we should be consistent.

Example 2

Annual fee for one 8 meter earth station using *6* MHz bandwidth each direction

Station fee is R50 **000**

Uplink fee R770 X *6* MHz = R4 *620*

Downlink fee R770 X *6* = R4 620[5]

Total Fee R 59 240

[5] **We charge for downlink because the spectrum used for downlink cannot be used in the same geographical area for other services. Secondly, ICASA** will **be expected to ensure that those downlink frequencies are protected.**

ANNEX2

PARAMETERS THAT NEED TO BE SUBMITTED BY ESV NETWORK OPERATORS

An ESV network operator is required to submit to the Office the following parameters together with a declaration that their systems comply with the requirements of the ITU Resolutions.

- Network operator name
- Network operator address
- Contact name
- Contact telephone number
- Contact e-mail address
- Network Control Facility (NCF) designated point of contact
- NCF Contact name
- NCF Contact telephone number
- NCF Contact e-mail address

Technical Specification(s) of ESV type(s) used in the network

ESV Antenna

Antenna type

Antenna size

Transmit frequency bands

Transmit peak gain

Max e.i.r.p. per carrier

Min. operating elevation

Pointing accuracy

Waveform definition

Number(s) of carriers per ESV

Maximum occupied bandwidth(s) per carrier

Modulation

Multiple access scheme

Operating details of each satellite

- ITU Filing satellite name
- Satellite operator name
- GEO longitude
- Satellite service area (text description and/or a figure *of* the area)
- Forward Channel details (Satellite to ESV)
- Transponder downlink centre frequency
- Transponder downlink bandwidth
- Return Channel details (ESV to satellite)
- Transponder uplink centre frequency
- Transponder uplink bandwidth