

# Day 2 Part1 course

POLICY AND REGULATORY GUIDELINES FOR SATELLITE SERVICES

# 1- Radio regulation organizations

## National spectrum management

Governments control the use made of radio by stations within their jurisdiction, typically by making spectrum management a function of a civil service department or by setting up an agency for the purpose. These national regulating bodies are known as 'administrations'.

A key function in spectrum management is the assignment of carrier frequencies to transmitting and receiving stations, to be used for approved purposes and within stated parameters. In making these assignments, an administration aims to enable radio operating organizations to achieve their objectives without suffering or causing interference while using the spectrum efficiently, so that subsequent applicants will also be able to get access to the radio medium. When it is necessary to take account of cross-frontier interference liabilities, these administrations collaborate with equivalent agencies in neighbouring countries.

# 1- Radio regulation organizations

## ITU

Where good use of the spectrum requires wider consultation or agreement to permanent policies and procedures, the administrations use the International Telecommunication Union (ITU) as their global forum.

Main decisions on policies and procedures are made at periodical World Radiocommunication Conferences (WRCs), held under the aegis of the ITU.

# 1- Radio regulation organizations

## Policy Making bodies on Satellite communications

Communications satellites are an important delivery platform for information society services as diverse as interactive TV and mobile broadband internet access.

Communication satellites are particularly useful in rural and undeveloped regions, where other systems are difficult to deploy on a commercial basis.

Satellites can play a crucial role in ensuring that individuals, companies, organizations and Governments around the world can access and disseminate high quality information services.

# 1- Radio regulation organizations

## Policy Making bodies on Satellite communications

### Federal Communications Commission (FCC)

The Federal Communications Commission (FCC) is an independent agency of the United States government, created, directed and empowered by Congressional statute , and with the majority of its commissioners appointed by the current President.

The FCC works towards six goals in the areas of :

- Broadband
- Competition
- The spectrum
- The media
- Public safety and homeland security
- And modernizing the FCC.



# 1- Radio regulation organizations

## Policy Making bodies on Satellite communications

### National Regulation Agencies (NRAs)

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## Policy Making bodies on Satellite communications

### National Regulation Agencies (NRAs) in Africa

COUNTRY	REGULATORY BODY	INDEPENDENT?	YEAR ESTABLISHED
Algeria	Ministere des Postes et Telecommunications	N	1983*
Angola	Angolan National Institute of Telecommunications	Y	1999
Benin	Ministry of Culture and Communications**	N	
Botswana	Botswana Telecommunications Authority	Y	1996
Burkina Faso	Autorité de Régulation des Communications électroniques	N	2005
Burundi	Telecommunication Regulation and Control Agency	Y	1997
Cameroon	Agence de Régulation des Télécommunication	Y	1999
Cape Verde	General Directorate of Communications	Y	1991

# 1- Radio regulation organizations

## Policy Making bodies on Satellite communications

### National Regulation Agencies (NRAs) in Africa: Listing incomplete

Central African Republic	Agence de Régulation des telecommunications***	Y	1996
Chad	Office Tchadien de Régulation des Telecommunications	Y	1998
Comoros	Study and Planning Office (BEP) of the Telecommunications Directorate	N	1997
Congo	Office National des Postes et Télécommunications (ONPT)	N	
Côte d'Ivoire	Agence des Telecommunications de Côte d'Ivoire	Y	1995
Djibouti	Office des Postes et Telecommunications	N	
DRC	Ministère des Postes et Télécommunications	N	
Egypt	Telecommunications Regulatory Authority	Y	1998
Equatorial Guinea	Directorate of Posts and Telecommunications	N	
Eritrea	Communications Department	Y	1996

## 2- Satellite policy principles

### Non Discriminatory Market Entry

The first prerequisite for an open, competitive market is a legal and regulatory structure that does not discriminate in favour of existing service providers, or otherwise limit the number of independent service providers that are permitted to provide satellite and telecommunications services to consumers.

## 2- Satellite policy principles

### Technology-Neutral Regulations and Licensing Requirements

Modern telecommunications services are being provided to consumers using a number of different technologies, such as wireline, satellite and terrestrial wireless networks. In order to facilitate fair competition between these technologies, regulators must strive, to the extent possible, to make their regulations, licensing requirements and regulatory fees technically neutral.

In order to ensure that regulations are technology-neutral, regulators should strictly limit their regulations and licensing requirements for satellite services, using them solely to (1) protect the public safety and (2) manage scarce public resources, such as frequency spectrum when there is more than a negligible risk of harmful interference.

## 3- Legal framework

### Legal framework

- United Nations Outer Space Treaty (1967)
  - Outer space free for exploitation and use by all states in conformity with international regulations
  - States retain jurisdiction and control over objects they have launched into outer space

## 3- Legal framework

### Legal framework

- United Nations Outer Space Treaty (1967)
- International Telecommunication Union
  - Allocation of frequency bands
  - Instruments (CS, CV, RR, RoPs, Recs)
  - Procedures, Plans, operational measures
  - Instruments (CS, CV, RR, RoPs, Recs)

## 4- Key regulatory and licensing trends

The public policy principles discussed above provide a clear road map for administrations seeking to establish a licensing and regulatory structure for satellite services, or to reform existing regulatory structure in order to facilitate competition.

Non-discriminatory licensing requirements provide a country with a useful tool to ensure safety and keep up to date with technology developments and demands. Licensing requirements and their associated costs vary worldwide, but a significant trend has emerged toward adopting more streamlined, publicly accessible licensing arrangements for satellite network operators and service providers.

This trend reflects the fact that - as discussed above - licensing of satellite services should be used solely for two purposes -to protect public safety and to manage spectrum resources in order to prevent unreasonable interference.

## 4- Key regulatory and licensing trends

### Space segment (Spectrum Management and Licensing)

The spectrum used via a satellite was historically distributed between the incumbent, military and related public service providers (police and emergency services).

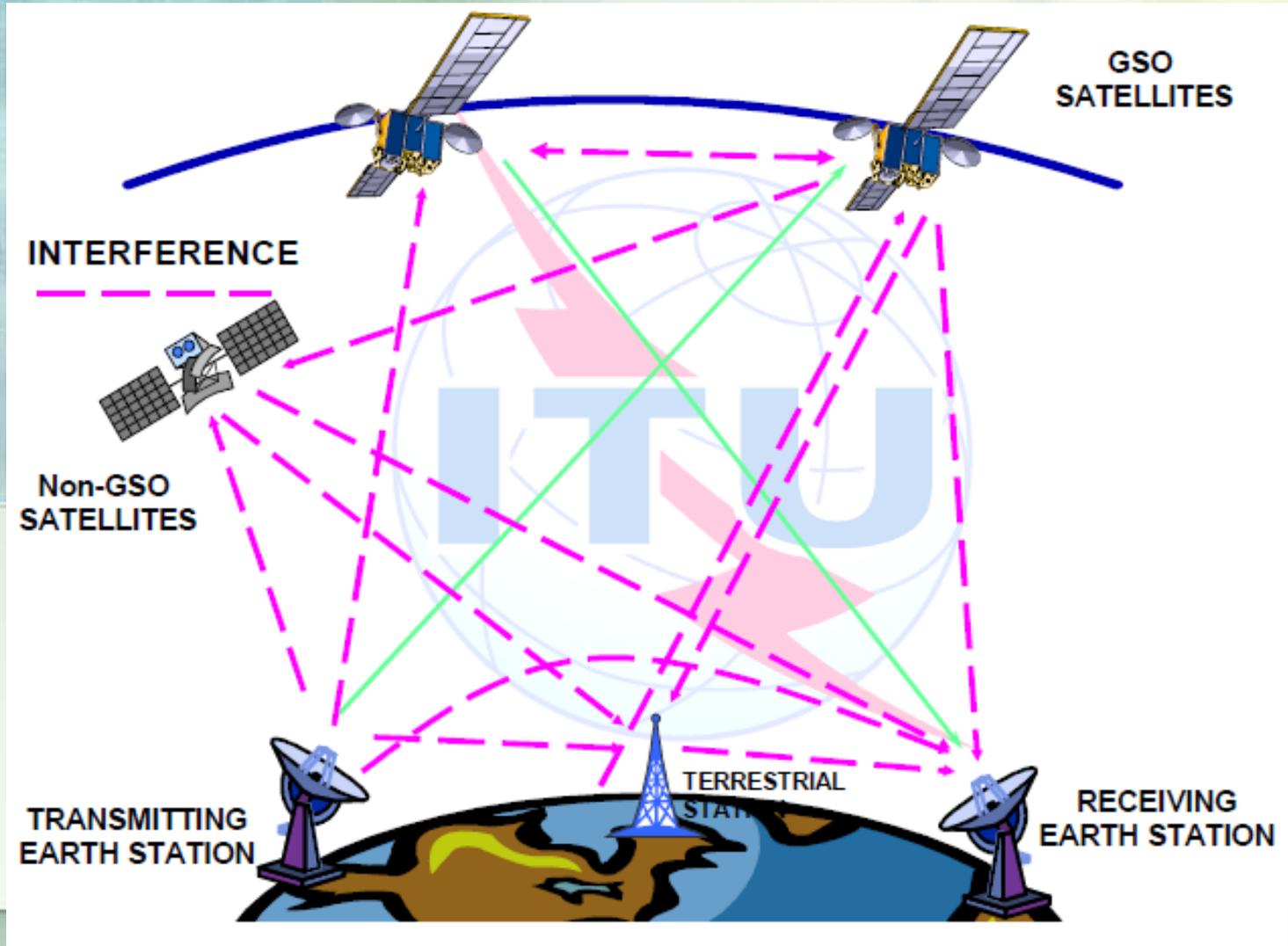
As countries began implementing 'Open Skies' policies, licensing of spectrum became an issue nationally. In particular, interference had to be minimized in the best interests of society.

Today, the ITU coordination process serves to avoid technical problems such as interference among global operators.

# 4- Key regulatory and licensing trends

## Space segment (Spectrum Management and Licensing)

### Interferences



## 4- Key regulatory and licensing trends

### Space segment (Spectrum Management and Licensing)

#### Interference-free operation

#### Propagation of Radio waves

- Laws of physics
- Radio waves do not stop at national borders



#### Interference

- possible between radio stations of different countries
- This risk is high in Space Radiocommunications



#### Radio Regulations (RR)

- One of its main purposes - Interference-free operation of RadioComms

## 4- Key regulatory and licensing trends

### Ground segment

In addition to licensing of the space segment, many administrations have attempted to create licensing regimes for the terrestrial segment of satellite networks.

Efforts to require licenses for the ground segment can be divided into two groups :

- authorization requirements for satellite service providers
- and individual licensing for earth station facilities.

Both approaches are discussed below.

## 4- Key regulatory and licensing trends

### Ground segment (Network Operator and Service Provider Licensing)

Many countries require that public network operators hold licenses so that there is some quality assurance of the service being provided to their public. A few countries have adopted this rule also for private VSAT services. As the nature of private satellite services is being understood better, the requirement for this type of license is declining.

These types of licenses can also be referred to as Service Provider Licenses, Value Added Service Licenses and sometimes certain types of Class Licenses.

## 4- Key regulatory and licensing trends

### Ground segment (Individual and Blanket Earth Station Licensing)

Traditionally, most governments have required each VSAT or mobile terminal to be licensed individually; this was in addition to requiring a network operator's license.

But more than 10 years ago, a new approach to regulating VSATs - "blanket licensing" began to be implemented and it has been successful.

With this regulation, VSATs are configured based upon technical criteria involving power level, frequency, etc. - that eliminate the risk of unreasonable interference. Thus, a single blanket license can be issued covering a very large number of VSAT terminals.

## 4- Key regulatory and licensing trends

### Ground segment (Individual and Blanket Earth Station Licensing)

#### EARTH STATION AND VSAT REGISTRATION

The ITU controls frequency allocations, permitted power levels and modes of operation. These restrictions are intended primarily to prevent interference between all types of systems employing radio communications and to protect some telecommunications services, such as emergency services.

In addition to that, many governments currently impose restrictions and regulations on service providers and users. These national regulations are specific to each particular country.

## 4- Key regulatory and licensing trends

### Ground segment (Individual and Blanket Earth Station Licensing)

#### EARTH STATION AND VSAT REGISTRATION

Due to the increasing uptake of sophisticated telecommunications systems, that are sold and used in all countries, the licensing regime for end-user equipment (such as VSAT terminals) is becoming simpler and less costly.

You will find the procedures and regulations that rule the installation and operation of VSAT terminals on regulations agencies in the countries or on ITU web site.

## 4- Key regulatory and licensing trends

### Ground segment (Individual and Blanket Earth Station Licensing)

#### EARTH STATION AND VSAT REGISTRATION

With blanket licensing, VSATs are configured based upon technical criteria (power level, frequency, etc.) to eliminate the risk of interference, so a single license can be issued covering a large number of VSAT terminals.

## 5- Means of monitoring and controlling the spectrum

The Main tasks of the regulation agency will consist of :

- Verify applicant's planned location of radio equipment before installation.
- Control the authorized equipment for proper application in conformity with the licensing conditions.
- Carry out pre-license and post-license granting conformity inspection
- Carry out random checking on installations to verify compliance to assigned specifications as well as the real condition of equipment declared to be unused.
- Survey and inspect radio communication installations.
- Ensure compliance of equipment and stations with the national rules and regulations.

## 5- Means of monitoring and controlling the spectrum

- Control the frequency spectrum, in relation to enforcement and monitoring aspects.
- Ensure compliance with national conditions of licenses.
- Control the technical and operational characteristics of radio equipment.
- Verify the compatibility and the interference free use of authorized emissions, to detect and identify the origin of interference and to resolve them.
- Detect and identify unauthorized transmissions.
- Determine channel and band usage, including assessment of channel availability.
- Aid to resolve interference problems

# 5- Means of monitoring and controlling the spectrum

The interferences and signal strengths can be measured using a measurement vehicle.

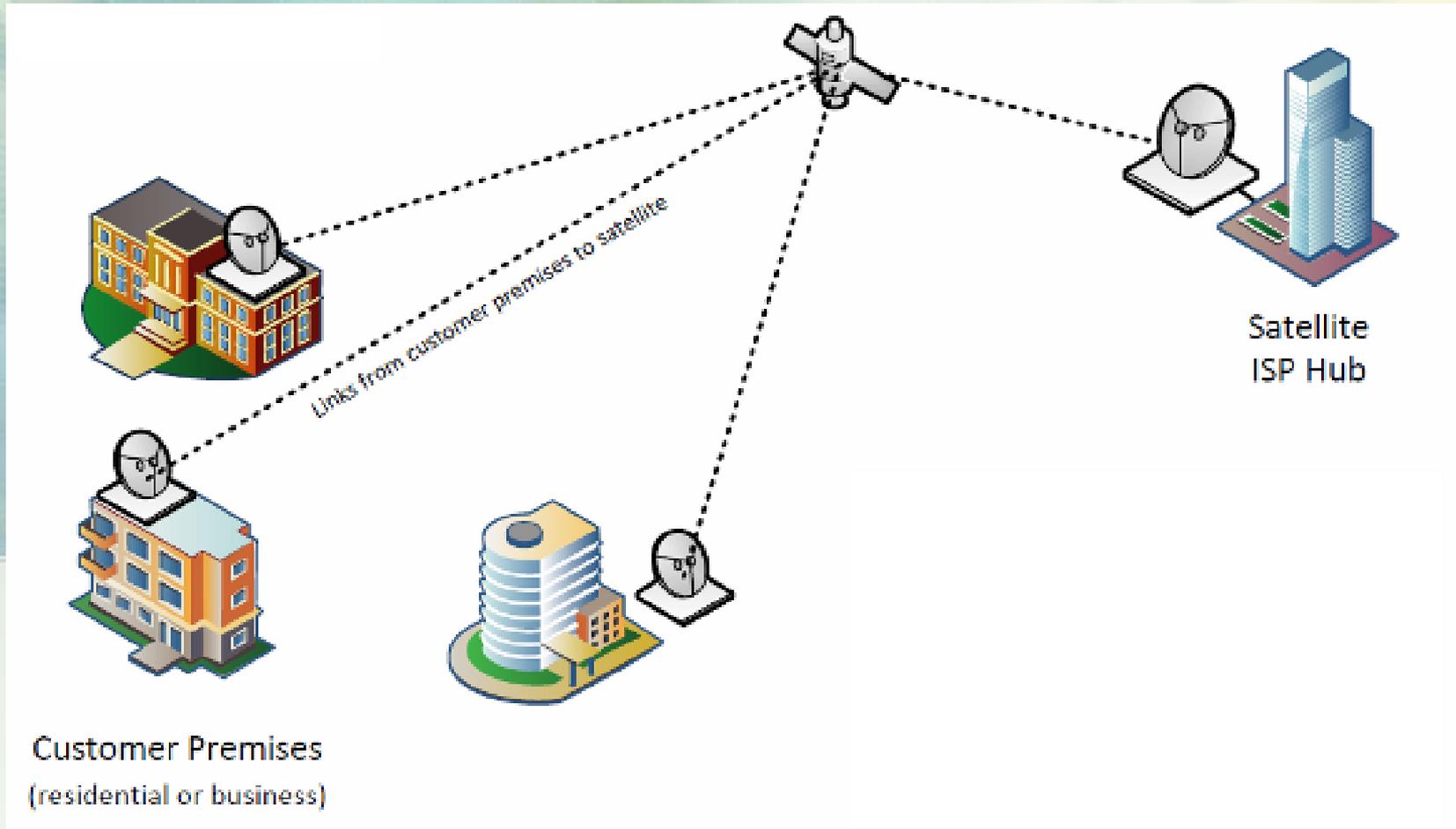


## 5- Broadband Applications

Satellite broadband is an option available for those who live in rural areas where traditional fixed-line based broadband services such as ADSL aren't available. It uses a satellite dish to provide two-way access to broadband services but speeds are generally lower than can be received over ADSL.

The main advantage of satellite broadband is that it can be provided virtually anywhere in the world. It is often seen as an option to fill in broadband coverage in hard to reach areas (like the final third which are unlikely to receive next-generation fibre broadband) but for many, it doesn't provide a comparable service to fixed broadband products.

# 5- Broadband Applications



## 5- Broadband Applications

### Bandwidth and Costs

Services available vary but generally offer speeds from 2Mbps up to around 10Mbps. Upload speeds used to be lower (128 / 256 Kbps) but following the launch of new Ka-band satellites, these have increased with Eutelsat able to offer up to 4Mbps upstream speeds. Costs for satellite broadband vary between around £30 per month up to £100+ depending on the amount of data you want to use. Generally only a low data usage allowance is included at the lower product prices. This makes satellite broadband unsuitable for heavy use such as downloading large files or catching up on TV through BBC iPlayer. Installation will require special hardware including a satellite dish and modem to be installed. These can often be installed by the user but start at a few hundred pounds.

## 5- Broadband Applications

### Latency

One problem often associated with satellite broadband is the high-latency that is encountered which is caused by the long distances (up to a satellite) that the broadband signal has to travel. People may be familiar with making phone calls to the other side of the world, and there being a delay of around a second. This high latency also seen on satellite broadband means that it limits the use of many real-time applications which are often seen as one of the benefits of a broadband connection. This includes Voice over IP (VoIP), video conferencing and online gaming.

## 5- Broadband Applications

### Weather

Satellite broadband is affected by the weather. It requires line of sight between the dish and the satellite orbiting above earth, and anything that gets in the way of this, such as moisture in rain, can cause errors on the link. Although a general rain shower shouldn't affect things, a large storm could cause disruption to your broadband link.

## 5- Broadband Applications

Broadcast and multicast	Unicast
Digital TV	Web browsing
Digital radio	FTP
Business TV	e-mail
Video streaming	VoIP
News tickers	Gaming
Content delivery	True video-on-demand
Software updates	Caching
Caching	
Stagger-cast movies, or	
Near movies-on-demand	

# End of Day 2 course Part1

POLICY AND REGULATORY GUIDELINES FOR SATELLITE SERVICES