

14. Satellite Services

14.1. Demand

Satellites can provide global, ubiquitous and multipoint communications.

A comprehensive telecommunications strategy includes the provisioning of satellite services as part of its communications infrastructure. Broadband has long been recognized as an enabler for economic growth. Satellite services are sometimes the only solution to connect remote areas in the country or to provide coverage where terrestrial infrastructure just is not feasible due to terrain. Satellite systems also provide an important part of a strategy for international communications.

The number of satellite subscribers is forecast to grow to 6 Million.⁶⁶

Figure 19: Projected Growth in Satellite Broadband Subscribers



There are a broad variety of services provided by the 994 satellites that orbit the earth as depicted in the figures below⁶⁷.

⁶⁶ ITU News N° 5 2012 > Satellite broadband

⁶⁷ Satellite Industry Associations, SATELLITE 101: Satellite Technology and Services Satellite Industry Association (May 2012)

Figure 20: commercial Communications Satellites – Geosynchronous Orbit

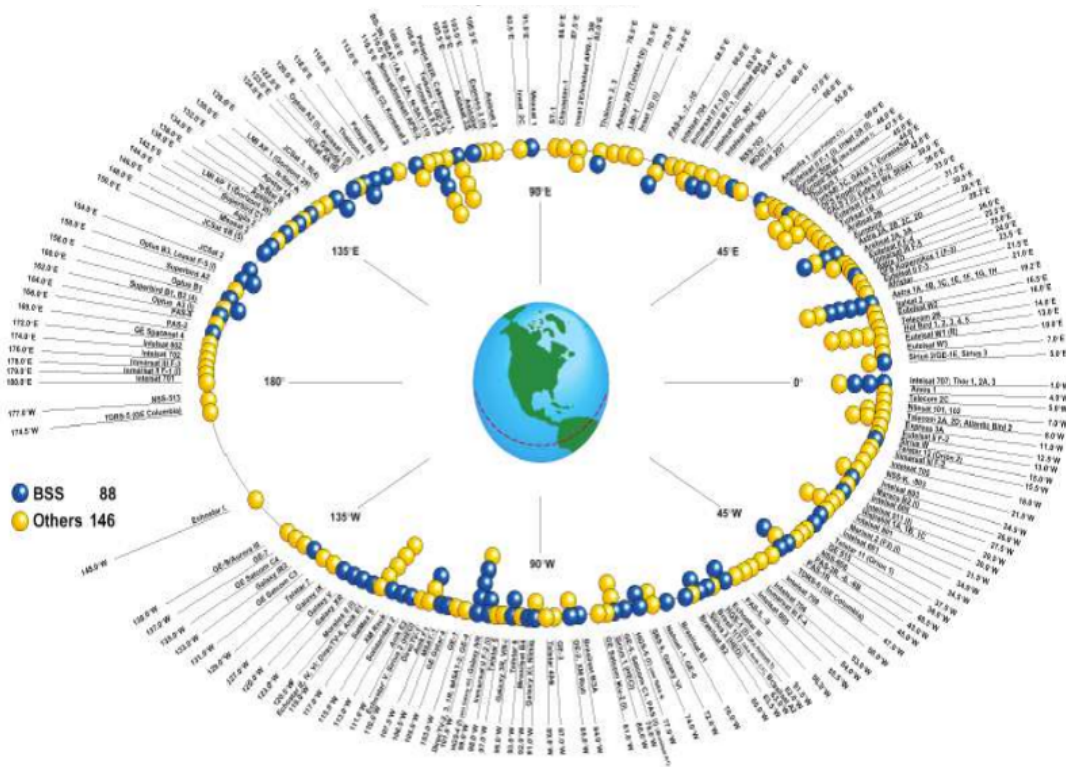
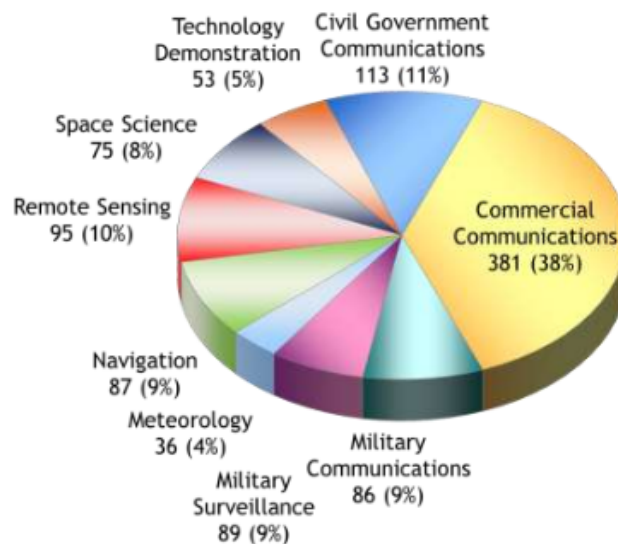


Figure 21: Operational Satellites (May 2012) by Function



Myanmar

Myanmar geographical characteristics impose challenges including mountainous terrain and a widely dispersed population most of who are in rural communities. The unique attributes offered by satellites can play a vital role in providing telecommunications and broadcasting infrastructure.

The licensing of commercial satellites in Myanmar will help to ensure that users have

- Access to the satellite capacity that they need in order to carry out their respective functions; and,
- Ubiquitous services across Myanmar.

An appropriate regulatory framework will help to provide assurance to stakeholders that Myanmar is an attractive place to invest when compared with other jurisdictions. While licensing requirements are addressed in the Spectrum Rules and operator requirements in the Licensing Rules, there are many complex policy issues that need to be addressed as part of an appropriate framework.

14.2. Technologies

Satellite technology has become a flexible and cost-effective solution for domestic and international networks, irrespective of the user's geographic location. There are a host of diverse purposes encompassing: wide area communications networks, backhaul for commercial fixed and mobile services, Internet and DTH television broadcasting and connecting rural areas.

Satellite systems have unique attributes:

- Large Geographic Coverage
- Allow for the interconnection of widely distributed networks
- Provide broadcasting services over a country, region, or entire hemisphere
- Providing "last mile" connectivity for telecom services, broadband and video services
- Instant infrastructure, a key requirements emergency and disaster communications support
- Fixed or Mobile voice, data or broadband or mobile video

Traditional satellite technology uses a broad single beam to cover entire continents and regions. More recently, the use higher Ka band frequencies and deployment of multiple narrowly focused spot beams and illuminating a smaller area (100s of kilometres instead of 1 000s of kilometres) allows for frequency reuse, providing increased bandwidth compared to traditional satellites. However, the higher attenuation experienced at higher frequencies places limitations on these bands. New technologies are being implemented to mitigate fading due to propagation. Despite the higher costs associated with spot beam technology, the overall cost per circuit is considerably lower than for shaped beam technology.

Satellite broadband services are offered in five basic technology categories:

1. C-band (4–6 GHz) fixed-satellite service (FSS)
2. Ku-band (11–14 GHz) fixed-satellite service (FSS)
3. Ka-band (20–30 GHz) bent pipe (with no on-board processing in the satellite)
4. Ka-band (20–30 GHz) with on-board processing in the satellite
5. L-band (1.5–1.6 GHz) mobile-satellite service (MSS).

Stepping-up its initiative to develop this sector of its connectivity objectives Myanmar hosted Satellite forum 2015, as part of Communicast showcase, scheduled for November 18, in Yangon.

14.3. Global Satellite Regulatory Framework

ITU is mandated by its Constitution to allocate spectrum and register frequency assignments, orbital positions and other parameters of satellites, “in order to avoid harmful interference between radio stations of different countries”. The international spectrum management system is therefore based on regulatory procedures for frequency notification, coordination and registration.

Major tasks of ITU-R also include developing standards for radiocommunication systems, ensuring the effective use of the radio-frequency spectrum and studies concerning the development of radiocommunication systems.

Radiocommunication systems have been expanding at an incredible rate in the last decades. Their importance as development infrastructure and as a major asset for governments, the telecommunications industry and the general public is unquestionable.

Radio-frequency spectrum is a natural resource, and its rational and efficient exploitation can enhance a nation's productivity as well as the quality of life of its citizens. In order to derive its full benefits, it is critical to develop and implement efficient national frameworks for spectrum management.

The ITU Radio Regulations, and particularly its Table of Frequency Allocations, have been revised and updated almost regularly in view of the enormous demand for spectrum utilization. This is critical to keep pace with the rapid expansion of existing systems as well as the spectrum-demanding advanced wireless technologies that are being developed. The ITU World Radiocommunication Conference (WRC), which convenes every three to four years, is at the core of the international spectrum management process and constitutes the starting point for national practices. WRC reviews and revises the Radio Regulations, an international treaty establishing the framework for the utilization of radio frequencies and satellite orbits among ITU member countries, and considers any question of a worldwide character within its competence and related to its agenda.

Equitable access to spectrum and orbital resources is of special concern, given the uneven needs of developed and developing countries. As a consequence, the principle of a priori planning of spectrum and orbit resources is considered in conjunction with a series of plans established by radiocommunication conferences.

Through its various activities covering the implementation of Radio Regulations to the establishment of recommendations and guidelines on the usage of radio systems and spectrum/orbit resources, ITU-R plays a vital role in the global management of radio-frequency spectrum and satellite orbits. These limited natural resources are increasingly in demand from a large and growing number of services such as fixed, mobile, broadcasting, amateur, space research, meteorology, global positioning systems, and environmental monitoring that depend on radiocommunication to ensure safety of life on land, at sea and in the skies.⁶⁸

⁶⁸ Extract from ITU, see <http://www.itu.int/net/about/itu-r.aspx>

14.3.1.ITU Definition of satellite services

There are a variety of satellite services. The ITU Radio Regulations Article 1, Terms and Definitions provides a description of each service:

1.21 *fixed-satellite service*: 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 services*.

1.25 *mobile-satellite service* : 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* by means of one or more *space stations*.

This service may also include *feeder links* necessary for its operation.

1.39 *broadcasting-satellite service*: A radiocommunication service in which signals transmitted or retransmitted by *space stations* are intended for direct reception by the general public.

In the broadcasting-satellite service, the term “direct reception” shall encompass both *individual reception* and *community reception*.

1.41 *Radiodetermination-satellite service*: A radiocommunication service for the purpose of *radiodetermination* involving the use of one or more *space stations*.

This service may also include *feeder links* necessary for its own operation.

1.115 *feeder link*: A radio link from an *earth station* at a given location to a *space station*, or vice versa, conveying information for a *space radiocommunication service* other than for the *fixed-satellite service*. The given location may be at a specified fixed point, or at any fixed point within specified areas.

Simplifying, Fixed satellite services are systems communications are established between fixed earth stations via satellite (FSS) or communications via satellite with stations in motion (MSS) as well as broadcast services distributing broadcast programming (BSS).

14.3.2.ITU Regulatory Framework for Space Services

Myanmar has expressed interest in provisioning domestic satellite services. Initially, this would be done through leasing capacity via a service provider while the longer term plans would be to establish its own domestic satellite service.

The rights and obligations of ITU member states in the domain of international frequency management of the spectrum/orbit resources are incorporated in the Constitution (CS) and the Convention (CV) of the ITU and in the Radio regulations that compliment them.

These instruments contain the main principles and lay down the specific regulations governing the following major elements as follows:

- Frequency spectrum allocations to different categories of radiocommunication services;

- Rights and obligations of member administrations in obtaining access to the spectrum/orbit resource-;
- International recognition of these rights by recording frequency assignments and, as appropriate, any associated orbits, including the geostationary-satellite orbits (GSO) used or intended to be used in the Master International Frequency Register (MIFR).

The above regulations are based on the main principles of efficient use of and equitable access to the spectrum/orbit resource- laid down in provision No. 196 of the ITU Constitution (Article 44), which stipulates that "In using frequency bands for radio services, Members States shall bear in mind that radio frequencies and any associated orbits, including the geostationary-satellite orbits are limited natural resources and that they must be used rationally, efficiently and economically, in conformity with the provisions of the Radio Regulations, so that countries or groups of countries may have equitable access to those orbits and frequencies, taking into account the special needs of the developing countries and the geographical situation of particular countries". As indicated in the above provision, further detailed regulations and procedures governing spectrum/orbit use are contained in the Radio Regulations, which is a binding international treaty (No. 31 of the ITU Constitution).

Specific procedures have been established to ensure international recognition of the frequencies used and to safeguard the rights of administrations when they comply with those procedures. The fact that the ITU Constitution and Convention

And the Radio Regulations that complement them are intergovernmental treaties ratified by governments-means that those governments undertake:

- To apply the provisions in their countries; and
- To adopt adequate national legislation that includes, as the basic minimum, the essential provisions of this international treaty.

The international Radio Regulations are nevertheless oriented mainly towards matters of a global or regional character, and in many areas there is scope for making special arrangements on a bilateral or multilateral basis.⁶⁹

The NFAT allocates a number of frequency bands for fixed, broadcasting and mobile satellite services. Specific requirements for bands or services are sometimes established and these may evolve as needed in the future.

14.4. Other countries

It is useful to look at developments in neighbouring countries in order to assess relative positioning of existing services, considerations for development and state of competitiveness. Below are examples of developments and plans in nearby countries, as well as, potential developments in Asia as a region.

Malaysia

⁶⁹ Extract from ORBIT/ SPECTRUM ALLOCATION PROCEDURES REGISTRATION MECHANISM, Yvon Henri, Space Services Department, Radiocommunication Bureau, ITU

MEASAT Satellite Systems Sdn. Bhd, formerly Binariang Satellite Systems Sdn. Bhd is a [Malaysian communications satellite](#) operator, which owns and operates the MEASAT (Malaysia East Asia Satellite) and AFRICASAT spacecraft. The company provides satellite services to leading international broadcasters, Direct-To-Home (DTH) platforms and telecom operators. With capacity across six (6) communication satellites, the company provides satellite services to over 150 countries representing 80% of the world’s population across Asia, Middle East, Africa, Europe and Australia.⁷⁰

Singapore

The IDA Master Frequency plan identifies the following frequencies for the FSS: 4-6 GHz, 7- 8 GHz, 11-14 GHz, and 17-19 GHz, as per the table below, with additional allocations of bands >20 GHz but none currently assigned. Companies in Singapore can select any fixed satellite network to set up communications to their remote overseas offices to provide point-to-point international leased circuit (ILC) connectivity using Very Small Aperture Terminal (VSAT) technology. This ILC can be used for a variety of applications (telephone, data, fax, video-conferencing, etc.).

Table 11: Singapore Fixed Satellite Service

Frequency Range	Uplink/Downlink
3400-4200 MHz	Downlink
4500-4800 MHz	Downlink
5850-7075 MHz	Uplink
7250-7750 MHz	Downlink
7900-8400 MHz	Uplink
10.7-11.7 GHz	Downlink
12.2-12.75 GHz	Downlink
13.75-14 GHz	Uplink
14-14.5 GHz	Uplink
17.3-18.1 GHz	Uplink
18.1-18.4 GHz	Downlink
18.4-19.3 GHz	Downlink

Source: Radio Spectrum Master Plan, iDA Singapore (2014)

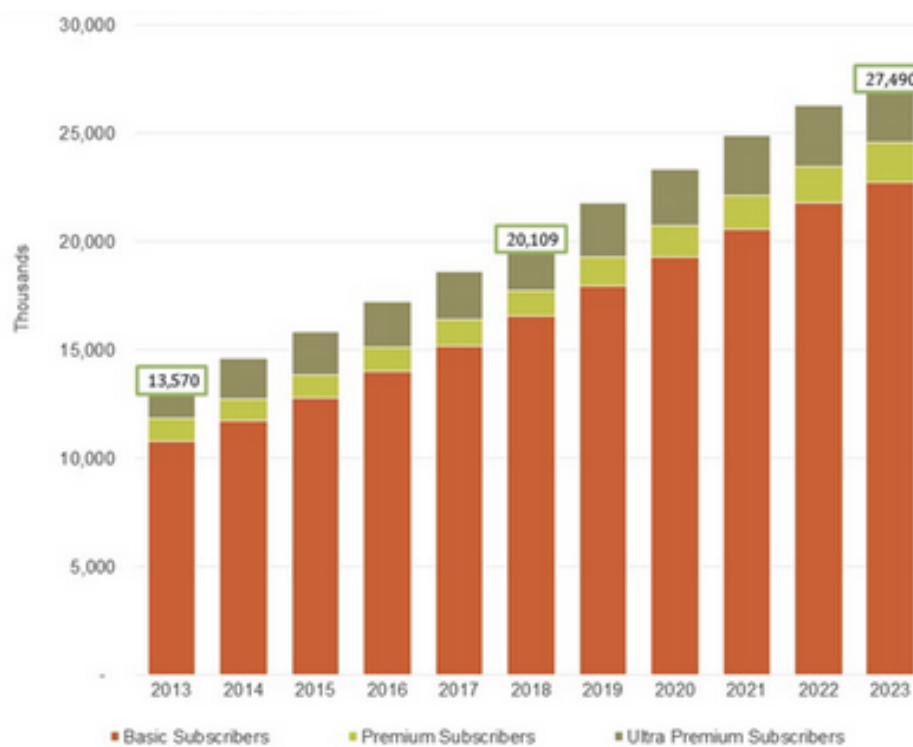
⁷⁰ https://en.wikipedia.org/wiki/MEASAT_Satellite_Systems

Asia

A 2012 ITU Report, based on a survey of satellite operators (sourcing: Satellite-link.co.uk/directory/aonexplorer.html) stated Asia had the largest number of operators, at the time 9 International and 18 Regional with more planned. The report cited that Asia’s rural areas were largely underserved due to poor infrastructure penetration, attributed at least partly to the difficult mountainous terrain. These conditions make for opportunities for existing and new satellite operators. More recent reports (2012) indicate a flourishing DTH industry across Asia⁷¹.

According to NorthernSky Research, the SEA market is set for some exceptional DTH growth.

Figure 22: SEA DTH subscribers, by Type

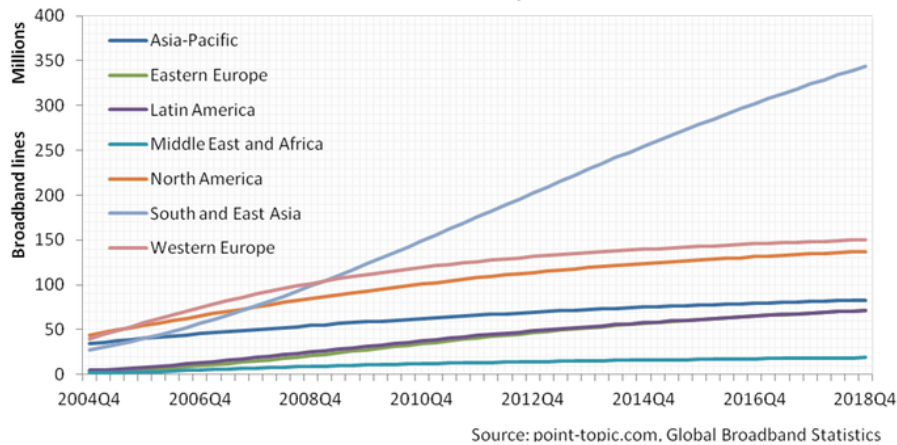


Source: NorthernSky Research

While growth projections are encouraging, the competition is fierce due to the number of operators. Developed and fast-developing countries such as Indonesia, Thailand, Philippines, and Vietnam drive estimates. It is important to note that markets are fragmented due to the various countries’ different stages of development. DTH growth stimulates growth of other satellite services.

⁷¹ <http://www.satellitetoday.com/publications/2013/04/01/dth-flourishes-across-asia/>

Figure 23: World Broadband Subscriber Forecasts, to 2018



At the end of 2018, South and East Asia will have by far the greatest volume of broadband subscribers. Point Topic forecasts that subscriber numbers will grow by 70% over the next five years. In particular, this is due to strong growth expected in Indonesia and Thailand. Growth will be slowest in the developed markets of Western Europe, Asia-Pacific and North America.

14.5. Current

In accordance with the Spectrum Rules, PTD may authorize communications as well as content services using a satellite for the purpose of providing Telecommunications Services to themselves or for sale to third party End Users. The rules indicate that licenses will generally be granted on a first-come, first-served basis.

Spectrum Rules require Satellite Spectrum Licenses that may be granted include (but are not limited to) those for:

- i) Very Small Aperture Terminals (VSAT);
- ii) Satellite News Gathering (SNG);
- iii) Satellite Radio Apparatus installed on ships and aircraft;
- iv) Earth Stations transmitting to satellites;
- v) Mobile Satellite Service (e.g., portable satellite communication terminals); and
- vi) Satellite broadcasting (one-way) services, including Direct-to-Home (DTH).
- vii) Such authorizations may include handheld, portable, transportable (vehicle mounted and re-locatable) and fixed Radio Apparatus.

International Satellite Operators may provide services to End Users in Myanmar and/or may provide capacity to satellite service providers offering services to End Users (both businesses and individuals).

- i) A Satellite Spectrum License will be issued to authorize the use of specific frequencies and Radio Apparatus.
- ii) Such operators must also obtain the appropriate Associated Operating License as set

forth in the Licensing Rules if Telecommunications Services are provided to End Users.

- iii) If an international satellite operator directly, or through an Affiliate, sells or otherwise distributes Radio Apparatus to End Users, it must obtain the technical standard approval of the Department as required by Section 27 of the Telecommunications Law.

Receive-only Radio Apparatus that is only capable of receiving transmissions from a satellite (no transmit capability) does not require an individual Satellite Spectrum License, but may need a Telecommunications Equipment License, per Section 13 of the Telecommunications Law.

Entities, including affiliates, providing Telecommunications Services through the use of receive-only apparatus sold or otherwise distributed to End Users must obtain the appropriate Associated Operating License and must obtain the technical standard approval of the Department as required by Section 27 of the Telecommunications Law.

DTH satellite broadcasting providers or other one-way services (e.g., Direct-to-Home video programming or data broadcasting) must obtain a Satellite Spectrum License.

Providers of satellite broadcasting services may also be required to obtain a separate broadcasting service License from the Ministry of Information. An authorization from the Ministry of Information is required prior to applying for a satellite-broadcasting spectrum License.

Services pertaining to satellite systems in Myanmar are currently limited services provided by foreign owned satellite systems. There is currently no published policy framework concerning the provisioning of services and what satellites are approved to provide services.

A variety of satellite services are being provided within Myanmar today.

14.6. Going forward

14.6.1.Strategy

The Government of the Republic of Union of Myanmar has formulated a space program (the “Myanmar Space Program”) that aims at embedding the space aspirations of the Republic of Union of Myanmar. These aspirations seek to strike a balance strategic and commercial objectives including

- Acquisition of broadcast independence;
- Gaining control over strategic national communications;
- Creating a commercially viable and sustainable satellite based communication industry in Myanmar; and,
- Building a selective position as provisioning in regional and multi-regional markets.

MCIT proposes the establishment of a comprehensive satellite policy guiding the provision of services in Myanmar. A consultation on this subject can be expected in due course.

In response to the evolving market for broadband data services that has developed to support growing demand by business, government and the general public, PTD will permit the provisioning of its own satellite services. The process has been initiated by releasing a RFP through the lease of multiple satellite transponders in the C-band and Ku-band.

The following services are envisioned, as a minimum in the short to medium term:

- a) Commercial VSAT services;
- b) Broadcast services;
- c) Trunking services/cellular backhaul

Discussions have been initiated which are expected to lead to a policy framework for the services envisioned. The policy framework would also layout the criteria for the orderly provision of satellite services via domestic, regional and global satellite systems in Myanmar and the regulatory licensing process to be used to award authorizations.

Myanmar plans to lease satellite capacity to offer domestic satellite services, with plans to pursue the process to secure their position for the provision of a domestic satellite service; however, a policy framework has yet to be developed.

Question 20 (Satellite):

Q20 (a): (Note: MCIT/PTD is currently pursuing the provision of domestic satellite services.) Do you agree that MCIT/PTD should, in consultation with stakeholders, develop a policy and licensing guideline for the provision of satellite services in Myanmar?

Q20 (b) Please comment on the proposed features of the policy and licensing guideline as set out below:

- i) Authorization process of Foreign satellite service providers.
- ii) A published list of authorized foreign satellite providers ensuring the operation of their systems comply with Myanmar's table of frequency allocations and spectrum utilization plans proposed for all bands.
- iii) Procedure to be used when submitting licence applications for fixed earth stations operating in any space radiocommunication service.
- iv) Procedures for the licensing of operators of satellite news gathering (SNG) earth stations, including foreign operators.
- v) Requirements for the coordination of proposed assignment with other existing domestic assignments.

Q20 (c): What other considerations should be factored into a policy and licensing procedure for satellite services?

Q20 (d): What changes should be considered to the current Spectrum Rules concerning Spectrum Licence requirements?

15. Aeronautical

Aeronautical frequencies bands are allocated internationally within the ITU and support the domestic and international communications of Aeronautical services.

The International Civil Aviation Organization (ICAO) in cooperation with Member States and industry groups to reach consensus on international civil aviation Standards and Recommended Practices. They plan and coordinate the use of radiofrequency assignments.

15.1. Demand

Bands are internationally prescribed. As broadcasting sectors grow, consideration needs to be given to possible radio frequency interference, particularly from CATV, FM radio broadcasting and aeronautical obstructions from radio antenna structures.

15.2. Current Assignments

Under the MOT the Department of Civil Aviation (DCA) is responsible for:

- Air Traffic Services
- Communication and Radio Navigation Facilities
- Licensing of pilots and aircraft maintenance engineers and flight checks
- Construction, maintenance and management of airports
- Airworthiness Control
- Issue of permits and licences to domestic and international airlines
- Conclusion of bilateral air agreements
- Relations with ICAO and other international organizations
- Training of civil aviation personnel

Aeronautical Frequencies are currently prescribed in Spectrum Rules Annex F – Frequencies related to Aeronautical Mobile are provided based on ITU RR.

15.3. Going forward

No specific initiatives concerning release of new spectrum for aeronautical services is planned.

16. Maritime

16.1. Demand

The maritime mobile service includes those bands used for communications between ship stations as well as with coast stations to coordinate the safe movement of shipping traffic. Users in this band include: the naval branch of the armed forces ensuring the safety and security of coastal waters; Commercial fisheries comprising coastal or inshore fisheries, and offshore or deep-sea fisheries; Commercial shipping; and other domestic and international shipping traffic.

In Myanmar, the Department of Marine Administration is responsible for the following tasks:

1. Maritime Legislation
2. Maritime Incident, Accident Investigation and Arbitration
3. Maritime Safety
4. Maritime Environmental Protection
5. Maritime Security
6. Port State Control Implementation
7. Flag State Control Implementation
8. Coastal State Control Implementation
9. Conducting International Ships and Port Facilities Security Code
10. Ship Survey
11. Ship Registration
12. Conducting the Maritime Education and Training
13. Seafarers Certification and Verification
14. Myanmar Seafarers Registration
15. Controlling Myanmar Seafarers Recruitment and Placement Services Companies
16. Conducting the Myanmar Seafarers Services
17. Conducting the Myanmar Seafarers Affairs
18. Conducting Coastal and Inland Water Vessel Business Licensing
19. Focal Department for International Maritime Organization
20. Focal Department for ASEAN Maritime Affairs
21. Focal Department for ASIAN Coast Guard Agency

16.2. Current Assignments

ITU related reference:

International Telecommunication Union - Radio Regulations

- Article 5, Chapter VII (Articles 30 to 34) and Chapter IX (Articles 46 to 58); and
- Appendices 15, 17, 18, and 25.

Maritime bands include a broad range of frequencies including VLF Very-low Frequency (3-30 kHz), LF Low-frequency (30-300 kHz), MF Medium-frequency (300-3000 kHz), HF High-frequency (3-30 MHz), VHF Very-high Frequency (30-300 MHz), UHF Ultra-High Frequency (300-3000 MHz) and SHF Super Ultra-High Frequency (3-30 GHz).

As part of their ongoing spectrum allocation activities, the PTD have identified the bands allocated for use by stations in the Maritime Mobile Service frequency bands indicated in the Spectrum Rules – Annex E. Bands are in conformance with ITU allocated bands, Appendices S 17 and S 18. These are the most commonly used bands HF and VHF. Spectrum Rules - Annex B incorporates the Distress and Safety frequencies for non- Global Maritime Distress and Safety (GMDSS) and GMDSS.

While it is anticipated that there will be a continued increase in maritime traffic and a related increase in communications technologies deployed, at the time of writing of this document, the Department of Marine Administration had not expressed the need for more frequencies to MCIT/PTD,



16.3. Going forward

Action Planned by MCIT/PTD:

No specific initiatives concerning release of new spectrum is planned.

17.WRC – 15

As per WRC-15, agenda Item 1.1,

- To consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Resolution **233 (WRC-12)**

Appendix B includes the Agenda items for WRC-15.



Appendix A: List of telecommunications services Licensees in Myanmar

The following link provides the latest information on licensees (operators) in the telecommunications services in Myanmar.

Website Link: [http://www.mcit.gov.mm/sites/default/files/Licence%20Issued%20List\(6.5.15\).pdf](http://www.mcit.gov.mm/sites/default/files/Licence%20Issued%20List(6.5.15).pdf)

Appendix B: WRC-15 Agenda Items

WRC-15 Agenda Item	Title
1	On the basis of proposals from administrations, taking account of the results of WRC-12 and the Report of the Conference Preparatory Meeting, and with due regard to the requirements of existing and future services in the bands under consideration, to consider and take appropriate action in respect of the following items:
1.1	To consider additional spectrum allocations to the mobile service on a primary basis and identification of additional frequency bands for International Mobile Telecommunications (IMT) and related regulatory provisions, to facilitate the development of terrestrial mobile broadband applications, in accordance with Resolution 233 (WRC-12) ;
1.2	To examine the results of ITU-R studies, in accordance with Resolution 232 (WRC-12) , on the use of the frequency band 694-790 MHz by the mobile, except aeronautical mobile, service in Region 1 and take the appropriate measures;
1.3	To review and revise Resolution 646 (Rev.WRC-12) for broadband public protection and disaster relief (PPDR), in accordance with Resolution 648 (WRC-12) ;
1.4	To consider possible new allocation to the amateur service on a secondary basis within the band 5 250-5 450 kHz in accordance with Resolution 649 (WRC-12) ;
1.5	To consider the use of frequency bands allocated to the fixed-satellite service not subject to Appendices 30, 30A and 30B for the control and non-payload communications of unmanned aircraft systems (UAS) in non-segregated airspaces, in accordance with Resolution 153 (WRC-12) ;
1.6	To consider possible additional primary allocations:
1.6.1	To the fixed-satellite service (Earth-to-space and space-to-Earth) of 250 MHz in the range between 10 GHz and 17 GHz in Region 1;
1.6.2	To the fixed-satellite service (Earth-to-space) of 250 MHz in Region 2 and 300 MHz in Region 3 within the range 13-17 GHz;
	And review the regulatory provisions on the current allocations to the fixed-satellite service within each range, taking into account the results of ITU-R studies, in accordance with Resolutions 151 (WRC-12) and 152 (WRC-12) , respectively;
1.7	To review the use of the band 5 091-5 150 MHz by the fixed-satellite service (Earth-to-space) (limited to feeder links of the non-geostationary mobile-satellite systems in the mobile-satellite service) in accordance with Resolution 114 (Rev.WRC-12) ;
1.8	To review the provisions relating to earth stations located on board vessels (ESVs), based on studies conducted in accordance with Resolution 909 (WRC-12) ;
1.9	To consider, in accordance with Resolution 758 (WRC-12) :
1.9.1	Possible new allocations to the fixed-satellite service in the frequency bands 7 150-7 250 MHz (space-to-Earth) and 8 400-8 500 MHz (Earth-to-space), subject to appropriate sharing conditions;
1.9.2	The possibility of allocating the bands 7 375-7 750 MHz and 8 025-8 400 MHz to the maritime-mobile satellite service and additional regulatory measures, depending on the results of appropriate studies;
1.10	To consider spectrum requirements and possible additional spectrum allocations for the mobile-satellite service in the Earth-to-space and space-to-Earth directions, including the satellite component for broadband applications, including International Mobile Telecommunications (IMT), within the

WRC-15 Agenda Item	Title
	frequency range from 22 GHz to 26 GHz, in accordance with Resolution 234 (WRC-12) ;
1.11	To consider a primary allocation for the Earth exploration-satellite service (Earth-to-space) in the 7-8 GHz range, in accordance with Resolution 650 (WRC-12) ;
1.12	To consider an extension of the current worldwide allocation to the Earth exploration-satellite (active) service in the frequency band 9 300-9 900 MHz by up to 600 MHz within the frequency bands 8 700-9 300 MHz and/or 9 900-10 500 MHz, in accordance with Resolution 651 (WRC-12) ;
1.13	To review No. 5.268 with a view to examining the possibility for increasing the 5 km distance limitation and allowing space research service (space-to-space) use for proximity operations by space vehicles communicating with an orbiting manned space vehicle, in accordance with Resolution 652 (WRC-12) ;
1.14	To consider the feasibility of achieving a continuous reference time-scale, whether by the modification of coordinated universal time (UTC) or some other method, and take appropriate action, in accordance with Resolution 653 (WRC-12) ;
1.15	To consider spectrum demands for on-board communication stations in the maritime mobile service in accordance with Resolution 358 (WRC-12) ;
1.16	To consider regulatory provisions and spectrum allocations to enable possible new Automatic Identification System (AIS) technology applications and possible new applications to improve maritime radiocommunication in accordance with Resolution 360 (WRC-12) ;
1.17	To consider possible spectrum requirements and regulatory actions, including appropriate aeronautical allocations, to support wireless avionics intra-communications (WAIC), in accordance with Resolution 423 (WRC-12) ;
1.18	To consider a primary allocation to the radiolocation service for automotive applications in the 77.5-78.0 GHz frequency band in accordance with Resolution 654 (WRC-12) ;
2	To examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution 28 (Rev.WRC-03) , and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with the principles contained in Annex 1 to Resolution 27 (Rev.WRC-12) ;
3	To consider such consequential changes and amendments to the Radio Regulations as may be necessitated by the decisions of the Conference;
4	In accordance with Resolution 95 (Rev.WRC-07) , to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;
5	To review, and take appropriate action on, the Report from the Radiocommunication Assembly submitted in accordance with Nos. 135 and 136 of the Convention;
6	To identify those items requiring urgent action by the Radiocommunication Study Groups in preparation for the next world radiocommunication conference;
7	To consider possible changes, and other options, in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, an advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution 86 (Rev.WRC-07) to facilitate rational, efficient, and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;
8	To consider and take appropriate action on requests from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required, taking into account Resolution 26 (Rev.WRC-07) ;

WRC-15 Agenda Item	Title
9	To consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the Convention:
9.1	On the activities of the Radiocommunication Sector since WRC-12;
9.1.1	Protection of the systems operating in the mobile-satellite service in the band 406-406.1 MHz
9.1.2	Studies on possible reduction of the coordination arc and technical criteria used in application of No. 9.41 in respect of coordination under No. 9.7
9.1.3	Use of satellite orbital positions and associated frequency spectrum to deliver international public telecommunication services in developing countries
9.1.4	Updating and rearrangement of the Radio Regulations
9.1.5	Consideration of technical and regulatory actions in order to support existing and future operation of fixed satellite service earth stations within the band 3 400-4 200 MHz, as an aid to the safe operation of aircraft and reliable distribution of meteorological information in some countries in Region 1
9.1.6	Studies towards review of the definitions of fixed service, fixed station and mobile station
9.1.7	Spectrum management guidelines for emergency and disaster relief radiocommunication
9.1.8	Regulatory aspects for nano- and picosatellites
9.2	On any difficulties or inconsistencies encountered in the application of the Radio Regulations; and
9.3	On action in response to Resolution 80 (Rev.WRC-07) ;
10	To recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, in accordance with Article 7 of the Convention.

Source: ITU-R Preparatory Studies for WRC-15, available at: <http://www.itu.int/net/ITU-R/index.asp?category=study-groups&link=rcpm-wrc-15-studies&lang=en#{C4B1254B-0A2F-4AED-9668-3D91F9613047}>