



NATIONAL RADIO RULES

PART II

DEFINITIONS

**BHUTAN INFORMATION, COMMUNICATIONS AND MEDIA AUTHORITY
(BICMA)**

**Royal Government of Bhutan
THIMPHU: October 2011**



**BHUTAN INFOCOMM & MEDIA
AUTHORITY**

Royal Government of Bhutan



Chairperson

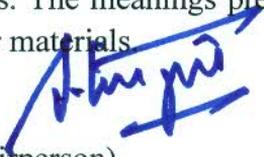
14th October 2011

FOREWORD

Radio frequency spectrum is a natural asset and national resource with limited amount which have to be managed properly for effective and fair utilization. The demand for application of frequencies is growing daily and it is a predominant need of all equipments which are in operation using energy of electromagnetic waves. Airplanes, ships, satellites, radars, cell phones, sound and TV broadcasters, TV receivers, radio transceivers, microwave links, radio trunk, cordless phones, handsets, wireless apparatus, home appliance, industrial and medical equipments, weather forecasters and many other applications are managed internationally and nationally to take benefit of spectrum.

Fairly and efficiently regulating of spectrum employment among numerous radio applications and disparate users requires an adequate amount of transparent executive rules and terms of reference. Fortunately, the Bhutan Information, Communications and Media Act – 2006 provides Bhutan InfoComm and Media Authority (BICMA) with sufficient authority to regulate Radiocommunications activities inside the Kingdom and to represent national interests in international entities.

Part II of National Radio Rules provides a unified definition of essential words and terms having technical and legal measures throughout the provisions and other regulatory products in Radio Rules. The meanings prescribed here do not necessarily applicable in other materials


(Chairperson)

BHUTAN INFOCOMM & MEDIA AUTHORITY

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CHAPTER 1 – DEFINITION

All terms used in these Rule shall have the same meaning as accorded to them in the Act. In addition for the purpose of these rules following terms shall have described meaning*.

Section I – General terms

1.1 *Act*: means the Bhutan Information, Communications and Media Act 2006;

1.2 *administration*: Any governmental department or service responsible for discharging the obligations undertaken in the Constitution of the International Telecommunication Union, in the Convention of the International Telecommunication Union and in the Administrative Regulations.

In case of the Kingdom of Bhutan, Information, Communications and Media Authority (BICMA) takes place of Administration.

1.3 *telecommunication*: Any transmission, *emission* or reception of signs, signals, writings, images and sounds or intelligence of any nature by wire, *radio*, optical or other electromagnetic systems.

1.4 *radio*: A general term applied to the use of *radio waves*.

1.5 *radio waves* or *hertzian waves*: Electromagnetic waves of frequencies arbitrarily lower than 3 000 GHz, propagated in space without artificial guide.

* NOTE – If, in the text of a definition, a term is appeared/printed in italics, this means that the term itself is defined in this Chapter.

- 1.6** *radiocommunication*: Telecommunication by means of *radio waves*.
- 1.7** *terrestrial radiocommunication*: Any *radiocommunication* other than *space radiocommunication* or *radio astronomy*.
- 1.8** *space radiocommunication*: Any *radiocommunication* involving the use of one or more *space stations* or the use of one or more *reflecting satellites* or other objects in space.
- 1.9** *radiodetermination*: The determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to these parameters, by means of the propagation properties of *radio waves*.
- 1.10** *radionavigation*: *Radiodetermination* used for the purposes of navigation, including obstruction warning.
- 1.11** *radiolocation*: *Radiodetermination* used for purposes other than those of *radionavigation*.
- 1.12** *radio direction-finding*: *Radiodetermination* using the reception of *radio waves* for the purpose of determining the direction of a *station* or object.
- 1.13** *radio astronomy*: Astronomy based on the reception of *radio waves* of cosmic origin.
- 1.14** *Coordinated Universal Time (UTC)*: Time scale, based on the second (SI), as defined in Recommendation ITU-R TF.460-6. (WRC-03)

For most practical purposes associated with the Radio Regulations, UTC is equivalent to mean solar time at the prime meridian (0° longitude), formerly expressed in GMT.

- 1.15** *industrial, scientific and medical (ISM) applications* (of radio frequency energy): Operation of equipment or appliances designed to generate and use locally radio frequency energy

for industrial, scientific, medical, domestic or similar purposes, excluding applications in the field of *telecommunications*.

Section II – Specific terms related to frequency management

- 1.16** *allocation* (of a frequency band): Entry in the Table of Frequency Allocations of a given frequency band for the purpose of its use by one or more terrestrial or space *radiocommunication services* or the *radio astronomy service* under specified conditions. This term shall also be applied to the frequency band concerned.
- 1.17** *allotment* (of a radio frequency or radio frequency channel): Entry of a designated frequency channel in an agreed plan, adopted by a competent conference, for use by one or more administrations for a terrestrial or space *radiocommunication service* in one or more identified countries or geographical areas and under specified conditions. BICMA has also authorization, by the Act, to adopt domestic plans for such a similar use for different geographical areas of country.
- 1.18** *assignment* (of a radio frequency or radio frequency channel): Authorization given by an administration for a radio *station* to use a radio frequency or radio frequency channel under specified conditions.

Section III – Radio services

- 1.19** *radiocommunication service*: A service as defined in this Section involving the transmission, *emission* and/or reception of *radio waves* for specific *telecommunication* purposes.

In these Regulations, unless otherwise stated, any radiocommunication service relates to *terrestrial radiocommunication*.

- 1.20** *fixed service*: A *radiocommunication service* between specified fixed points.
- 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*.
- 1.22** *inter-satellite service*: A *radiocommunication service* providing links between artificial *satellites*.
- 1.23** *space operation service*: A *radiocommunication service* concerned exclusively with the operation of spacecraft, in particular space tracking, space *telemetry* and space *telecommand*.

These functions will normally be provided within the *service* in which the *space station* is operating.

- 1.24** *mobile service*: A *radiocommunication service* between *mobile* and *land stations*, or between *mobile stations*.

In case of the Kingdom of Bhutan, this definition does not include *maritime mobile service*.

- 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.

- 1.26** *land mobile service: A mobile service between base stations and land mobile stations, or between land mobile stations.*
- 1.27** *land mobile-satellite service: A mobile-satellite service in which mobile earth stations are located on land.*
- 1.28** *maritime mobile service: A mobile service between coast stations and ship stations, or between ship stations, or between associated on-board communication stations; survival craft stations and emergency position-indicating radiobeacon stations may also participate in this service.*

In spite of this definition, there is no actual usage for this *radiocommunication service* in the Kingdom of Bhutan and BICMA may decide to allocate designated frequency bands for utilization of alternative *radiocommunication service*.

- 1.29** *maritime mobile-satellite service: A mobile-satellite service in which mobile earth stations are located on board ships; survival craft stations and emergency position-indicating radiobeacon stations may also participate in this service.*

In spite of this definition, there is no actual usage for this *radiocommunication service* in the Kingdom of Bhutan and BICMA may decide to allocate designated frequency bands for utilization of alternative *radiocommunication service*.

- 1.30** *port operations service: A maritime mobile service in or near a port, between coast stations and ship stations, or between ship stations, in which messages are restricted to those relating to the operational handling, the movement and the safety of ships and, in emergency, to the safety of persons.*

Messages which are of a *public correspondence* nature shall be excluded from this service.

In spite of this definition, there is no actual usage for this *radiocommunication service* in the Kingdom of Bhutan.

1.31 *ship movement service*: A *safety service* in the *maritime mobile service* other than a *port operations service*, between *coast stations* and *ship stations*, or between *ship stations*, in which messages are restricted to those relating to the movement of ships.

Messages which are of a *public correspondence* nature shall be excluded from this service.

In spite of this definition, there is no actual usage for this *radiocommunication service* in the Kingdom of Bhutan and BICMA may decide to allocate designated frequency bands for utilization of alternative *radiocommunication service*.

1.32 *aeronautical mobile service*: A *mobile service* between *aeronautical stations* and *aircraft stations*, or between *aircraft stations*, in which survival craft stations may participate; emergency position-indicating radiobeacon stations may also participate in this service on designated distress and emergency frequencies.

1.33 *aeronautical mobile (R)* service*: An *aeronautical mobile service* reserved for communications relating to safety and regularity of flight, primarily along national or international civil air routes.

1.34 *aeronautical mobile (OR)** service*: An *aeronautical mobile service* intended for communications, including those relating to flight coordination, primarily outside national or international civil air routes.

1.35 *aeronautical mobile-satellite service*: A *mobile-satellite service* in which *mobile earth stations* are located on board

* (R): route.

** (OR): off-route.

aircraft; *survival craft stations* and *emergency position-indicating radiobeacon stations* may also participate in this service.

1.36 *aeronautical mobile-satellite (R)* service*: An *aeronautical mobile-satellite service* reserved for communications relating to safety and regularity of flights, primarily along national or international civil air routes.

1.37 *aeronautical mobile-satellite (OR)** service*: An *aeronautical mobile-satellite service* intended for communications, including those relating to flight coordination, primarily outside national and international civil air routes.

1.38 *broadcasting service*: A *radiocommunication service* in which the transmissions are intended for direct reception by the general public. This service may include sound transmissions, *television* transmissions or other types of transmission.

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*.

1.40 *radiodetermination service*: A *radiocommunication service* for the purpose of *radiodetermination*.

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.

1.42 *radionavigation service*: A *radiodetermination service* for the purpose of *radionavigation*.

- 1.43** *radionavigation-satellite service*: A *radiodetermination-satellite service* used for the purpose of *radionavigation*.

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

- 1.44** *maritime radionavigation service*: A *radionavigation service* intended for the benefit and for the safe operation of ships.

In spite of this definition, there is no actual usage for this *radiocommunication service* in the Kingdom of Bhutan and BICMA may decide to allocate designated frequency bands for utilization of alternative *radiocommunication service*.

- 1.45** *maritime radionavigation-satellite service*: A *radionavigation-satellite service* in which *earth stations* are located on board ships.

In spite of this definition, there is no actual usage for this *radiocommunication service* in the Kingdom of Bhutan and BICMA may decide to allocate designated frequency bands for utilization of alternative *radiocommunication service*.

- 1.46** *aeronautical radionavigation service*: A *radionavigation service* intended for the benefit and for the safe operation of aircraft.

- 1.47** *aeronautical radionavigation-satellite service*: A *radionavigation-satellite service* in which *earth stations* are located on board aircraft.

- 1.48** *radiolocation service*: A *radiodetermination service* for the purpose of *radiolocation*.

- 1.49** *radiolocation-satellite service*: A *radiodetermination-satellite service* used for the purpose of *radiolocation*.

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

- 1.50** *meteorological aids service*: A radiocommunication service used for meteorological, including hydrological, observations and exploration.
- 1.51** *Earth exploration-satellite service*: A radiocommunication service between *earth stations* and one or more *space stations*, which may include links between *space stations*, in which:
- information relating to the characteristics of the Earth and its natural phenomena, including data relating to the state of the environment, is obtained from *active sensors* or *passive sensors* on *Earth satellites*;
 - similar information is collected from airborne or Earth-based platforms;
 - such information may be distributed to earth stations within the system concerned;
 - platform interrogation may be included.
- This service may also include *feeder links* necessary for its operation.
- 1.52** *meteorological-satellite service*: An *earth exploration-satellite service* for meteorological purposes.
- 1.53** *standard frequency and time signal service*: A radiocommunication service for scientific, technical and other purposes, providing the transmission of specified frequencies, time signals, or both, of stated high precision, intended for general reception.
- 1.54** *standard frequency and time signal-satellite service*: A radiocommunication service using *space stations* on earth satellites for the same purposes as those of the *standard frequency and time signal service*.

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

- 1.55 *space research service*: A radiocommunication service in which *spacecraft* or other objects in space are used for scientific or technological research purposes.
- 1.56 *amateur service*: A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest.
- 1.57 *amateur-satellite service*: A radiocommunication service using *space stations* on earth satellites for the same purposes as those of the *amateur service*.
- 1.58 *radio astronomy service*: A service involving the use of *radio astronomy*.
- 1.59 *safety service*: Any radiocommunication service used permanently or temporarily for the safeguarding of human life and property.
- 1.60 *special service*: A radiocommunication service, not otherwise defined in this Section, carried on exclusively for specific needs of general utility, and not open to *public correspondence*.

Section IV – Radio stations and systems

- 1.61 *station*: One or more transmitters or receivers or a combination of transmitters and receivers, including the accessory equipment, necessary at one location for carrying on a radiocommunication service, or the *radio astronomy service*.

Each station shall be classified by the service in which it operates permanently or temporarily.

1.62 *terrestrial station*: A station effecting terrestrial radiocommunication.

In these Regulations, unless otherwise stated, any *station* is a terrestrial station.

1.63 *earth station*: A station located either on the Earth's surface or within the major portion of the Earth's atmosphere and intended for communication:

- with one or more *space stations*; or
- with one or more *stations* of the same kind by means of one or more reflecting *satellites* or other objects in space.

1.64 *space station*: A station located on an object which is beyond, is intended to go beyond, or has been beyond, the major portion of the Earth's atmosphere.

1.65 *survival craft station*: A mobile station in the *maritime mobile service* or the *aeronautical mobile service* intended solely for survival purposes and located on any lifeboat, life-raft or other survival equipment.

1.66 *fixed station*: A station in the *fixed service*.

1.66A *high altitude platform station*: A station located on an object at an altitude of 20 to 50 km and at a specified, nominal, fixed point relative to the Earth.

1.67 *mobile station*: A station in the *mobile service* intended to be used while in motion or during halts at unspecified points.

1.68 *mobile earth station*: An *earth station* in the *mobile-satellite service* intended to be used while in motion or during halts at unspecified points.

1.69 *land station*: A station in the *mobile service* not intended to be used while in motion.

- 1.70** *land earth station*: An *earth station* in the *fixed-satellite service* or, in some cases, in the *mobile-satellite service*, located at a specified fixed point or within a specified area on land to provide a *feeder link* for the *mobile-satellite service*.
- 1.71** *base station*: A *land station* in the *land mobile service*.
- 1.72** *base earth station*: An *earth station* in the *fixed-satellite service* or, in some cases, in the *land mobile-satellite service*, located at a specified fixed point or within a specified area on land to provide a *feeder link* for the *land mobile-satellite service*.
- 1.73** *land mobile station*: A *mobile station* in the *land mobile service* capable of surface movement within the geographical limits of a country or continent.
- 1.74** *land mobile earth station*: A *mobile earth station* in the *land mobile-satellite service* capable of surface movement within the geographical limits of a country or continent.
- 1.75** *coast station*: A *land station* in the *maritime mobile service*. Such a station is not implementable in the territory of the Kingdom of Bhutan.
- 1.76** *coast earth station*: An *earth station* in the *fixed-satellite service* or, in some cases, in the *maritime mobile-satellite service*, located at a specified fixed point on land to provide a *feeder link* for the *maritime mobile-satellite service*. Such a *station* is not implementable in the territory of the Kingdom of Bhutan.
- 1.77** *ship station*: A *mobile station* in the *maritime mobile service* located on board a vessel which is not permanently moored, other than a *survival craft station*. Such a station is not implementable in the territory of the Kingdom of Bhutan.

- 1.78** *ship earth station*: A *mobile earth station* in the *maritime mobile-satellite service* located on board ship.
- 1.79** *on-board communication station*: A low-powered *mobile station* in the *maritime mobile service* intended for use for internal communications on board a ship, or between a ship and its lifeboats and life-rafts during lifeboat drills or operations, or for communication within a group of vessels being towed or pushed, as well as for line handling and mooring instructions. Such a station is not implementable in the territory of the Kingdom of Bhutan.
- 1.80** *port station*: A *coast station* in the *port operations service*. Such a station is not implementable in the territory of the Kingdom of Bhutan.
- 1.81** *aeronautical station*: A *land station* in the *aeronautical mobile service*.
- In certain instances, an *aeronautical station* may be located, for example, on board ship or on a platform at sea.
- 1.82** *aeronautical earth station*: An *earth station* in the *fixed-satellite service*, or, in some cases, in the *aeronautical mobile-satellite service*, located at a specified fixed point on land to provide a *feeder link* for the *aeronautical mobile-satellite service*.
- 1.83** *aircraft station*: A *mobile station* in the *aeronautical mobile service*, other than a *survival craft station*, located on board an aircraft.
- 1.84** *aircraft earth station*: A *mobile earth station* in the *aeronautical mobile-satellite service* located on board an aircraft.
- 1.85** *broadcasting station*: A *station* in the *broadcasting service*.

- 1.86** *radiodetermination Station:* A station in the radiodetermination service.
- 1.87** *radionavigation mobile station:* A station in the radionavigation service intended to be used while in motion or during halts at unspecified points.
- 1.88** *radionavigation land station:* A station in the radionavigation service not intended to be used while in motion.
- 1.89** *radiolocation mobile station:* A station in the radiolocation service intended to be used while in motion or during halts at unspecified points.
- 1.90** *radiolocation land station:* A station in the radiolocation service not intended to be used while in motion.
- 1.91** *radio direction-finding station:* A radiodetermination station using radio direction-finding.
- 1.92** *radiobeacon station:* A station in the radionavigation service the emissions of which are intended to enable a mobile station to determine its bearing or direction in relation to the radiobeacon station.
- 1.93** *emergency position-indicating radiobeacon station:* A station in the mobile service the emissions of which are intended to facilitate search and rescue operations.
- 1.94** *satellite emergency position-indicating radiobeacon:* An earth station in the mobile-satellite service the emissions of which are intended to facilitate search and rescue operations.
- 1.95** *standard frequency and time signal station:* A station in the standard frequency and time signal service.
- 1.96** *amateur station:* A station in the amateur service.
- 1.97** *radio astronomy station:* A station in the radio astronomy service.

- 1.98** *experimental station*: A station utilizing radio waves in experiments with a view to the development of science or technique.
- This definition does not include *amateur stations*.
- 1.99** *ship's emergency transmitter*: A ship's transmitter to be used exclusively on a distress frequency for distress, urgency or safety purposes. Such a station is not implementable in the territory of the Kingdom of Bhutan.
- 1.100** *radar*: A radiodetermination system based on the comparison of reference signals with radio signals reflected, or retransmitted, from the position to be determined.
- 1.101** *primary radar*: A radiodetermination system based on the comparison of reference signals with radio signals reflected from the position to be determined.
- 1.102** *secondary radar*: A radiodetermination system based on the comparison of reference signals with radio signals retransmitted from the position to be determined.
- 1.103** *radar beacon (racon)*: A transmitter-receiver associated with a fixed navigational mark which, when triggered by a *radar*, automatically returns a distinctive signal which can appear on the display of the triggering *radar*, providing range, bearing and identification information.
- 1.104** *instrument landing system (ILS)*: A radionavigation system which provides aircraft with horizontal and vertical guidance just before and during landing and, at certain fixed points, indicates the distance to the reference point of landing.
- 1.105** *instrument landing system localizer*: A system of horizontal guidance embodied in the *instrument landing system* which indicates the horizontal deviation of the aircraft from its optimum path of descent along the axis of the runway.

- 1.106** *instrument landing system glide path*: A system of vertical guidance embodied in the *instrument landing system* which indicates the vertical deviation of the aircraft from its optimum path of descent.
- 1.107** *marker beacon*: A transmitter in the *aeronautical radionavigation service* which radiates vertically a distinctive pattern for providing position information to aircraft.
- 1.108** *radio altimeter*: *Radionavigation* equipment, on board an aircraft or *spacecraft*, used to determine the height of the aircraft or the *spacecraft* above the Earth's surface or another surface.
- 1.109** *radiosonde*: An automatic radio transmitter in the *meteorological aids service* usually carried on an aircraft, free balloon, kite or parachute, and which transmits meteorological data.
- 1.109A** *adaptive system*: A radiocommunication system which varies its radio characteristics according to channel quality.
- 1.110** *space system*: Any group of cooperating *earth stations* and/or *space stations* employing *space radiocommunication* for specific purposes.
- 1.111** *satellite system*: A *space system* using one or more artificial earth *satellites*.
- 1.112** *satellite network*: A satellite system or a part of a satellite system, consisting of only one satellite and the cooperating *earth stations*.
- 1.113** *satellite link*: A radio link between a transmitting *earth station* and a receiving *earth station* through one *satellite*.

A satellite link comprises one up-link and one down-link.

1.114 *multi-satellite link*: A radio link between a transmitting *earth station* and a receiving *earth station* through two or more *satellites*, without any intermediate *earth station*.

A multi-satellite link comprises one up-link, one or more satellite-to-satellite links and one down-link.

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.

Section V – Operational terms

1.116 *public correspondence*: Any *telecommunication* which the offices and *stations* must, by reason of their being at the disposal of the public, accept for transmission.

1.117 *telegraphy*¹: A form of telecommunication in which the transmitted information is intended to be recorded on arrival as a graphic document; the transmitted information may sometimes be presented in an alternative form or may be stored for subsequent use.

1.118 *telegram*: Written matter intended to be transmitted by *telegraphy* for delivery to the addressee. This term also includes *radiotelegrams* unless otherwise specified.

In this definition the term *telegraphy* has the same general meaning as defined in the Convention.

¹1.117.1 A graphic document records information in a permanent form and is capable of being filed and consulted; it may take the form of written or printed matter or of a fixed image.

- 1.119** *radiotelegram*: A *telegram*, originating in or intended for a *mobile station* or a *mobile earth station* transmitted on all or part of its route over the *radiocommunication* channels of the *mobile service* or of the *mobile-satellite service*.
- 1.120** *radiotelex call*: A *telex call*, originating in or intended for a *mobile station* or a *mobile earth station*, transmitted on all or part of its route over the *radiocommunication* channels of the *mobile service* or the *mobile-satellite service*.
- 1.121** *frequency-shift telegraphy*: *Telegraphy* by frequency modulation in which the telegraph signal shifts the frequency of the carrier between predetermined values.
- 1.122** *facsimile*: A form of *telegraphy* for the transmission of fixed images, with or without half-tones, with a view to their reproduction in a permanent form.
- 1.123** *telephony*: A form of *telecommunication* primarily intended for the exchange of information in the form of speech (CS 1017).
- 1.124** *radiotelephone call*: A telephone call, originating in or intended for a *mobile station* or a *mobile earth station*, transmitted on all or part of its route over the *radiocommunication* channels of the *mobile service* or of the *mobile-satellite service*.
- 1.125** *simplex operation*: Operating method in which transmission is made possible alternately in each direction of a *telecommunication* channel, for example, by means of manual control².

² **1.125.1, 1.126.1 and 1.127.1** In general, *duplex operation* and *semi-duplex operation* require two frequencies in *radiocommunication*; *simplex operation* may use either one or two.

- 1.126** *duplex operation*: Operating method in which transmission is possible simultaneously in both directions of a *telecommunication* channel².
- 1.127** *semi-duplex operation*: A method which is *simplex operation* at one end of the circuit and *duplex operation* at the other.²
- 1.128** *television*: A form of *telecommunication* for the transmission of transient images of fixed or moving objects.
- 1.129** *individual reception* (in the broadcasting-satellite service): The reception of *emissions* from a *space station* in the *broadcasting-satellite service* by simple domestic installations and in particular those possessing small antennas.
- 1.130** *community reception* (in the broadcasting-satellite service): The reception of *emissions* from a *space station* in the *broadcasting-satellite service* by receiving equipment, which in some cases may be complex and have antennas larger than those used for *individual reception*, and intended for use:
- by a group of the general public at one location; or
 - through a distribution system covering a limited area.
- 1.131** *telemetry*: The use of *telecommunication* for automatically indicating or recording measurements at a distance from the measuring instrument.
- 1.132** *radiotelemetry*: *Telemetry* by means of *radio waves*.
- 1.133** *space telemetry*: The use of *telemetry* for the transmission from a *space station* of results of measurements made in a *spacecraft*, including those relating to the functioning of the *spacecraft*.
- 1.134** *telecommand*: The use of *telecommunication* for the transmission of signals to initiate, modify or terminate functions of equipment at a distance.

- 1.135** *space telecommand*: The use of *radiocommunication* for the transmission of signals to a *space station* to initiate, modify or terminate functions of equipment on an associated space object, including the *space station*.
- 1.136** *space tracking*: Determination of the *orbit*, velocity or instantaneous position of an object in space by means of *radiodetermination*, excluding *primary radar*, for the purpose of following the movement of the object.

Section VI – Characteristics of emissions and radio equipment

- 1.137** *radiation*: The outward flow of energy from any source in the form of *radio waves*.
- 1.138** *emission*: *Radiation* produced, or the production of *radiation*, by a radio transmitting *station*.
- For example, the energy radiated by the local oscillator of a radio receiver would not be an emission but a *radiation*.
- 1.139** *class of emission*: The set of characteristics of an *emission*, designated by standard symbols, e.g. type of modulation of the main carrier, modulating signal, type of information to be transmitted, and also, if appropriate, any additional signal characteristics.
- 1.140** *single-sideband emission*: An amplitude modulated *emission* with one sideband only.
- 1.141** *full carrier single-sideband emission*: A *single-sideband emission* without reduction of the carrier.
- 1.142** *reduced carrier single-sideband emission*: A *single-sideband emission* in which the degree of carrier suppression enables the carrier to be reconstituted and to be used for demodulation.

- 1.143** *suppressed carrier single-sideband emission*: A *single-sideband emission* in which the carrier is virtually suppressed and not intended to be used for demodulation.
- 1.144** *out-of-band emission*: *Emission* on a frequency or frequencies immediately outside the *necessary bandwidth* which results from the modulation process, but excluding *spurious emissions*.
- 1.145** *spurious emission*: *Emission* on a frequency or frequencies which are outside the *necessary bandwidth* and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic *emissions*, parasitic *emissions*, intermodulation products and frequency conversion products, but exclude *out-of-band emissions*.
- 1.146** *unwanted emissions*: Consist of *spurious emissions* and *out-of-band emissions*.
- 1.146A** *out-of-band domain* (of an emission): The frequency range, immediately outside the necessary bandwidth but excluding the *spurious domain*, in which *out-of-band emissions* generally predominate. *Out-of-band emissions*, defined based on their source, occur in the out-of-band domain and, to a lesser extent, in the *spurious domain*. *Spurious emissions* likewise may occur in the out-of-band domain as well as in the *spurious domain*. (WRC-03)
- 1.146B** *spurious domain* (of an emission): The frequency range beyond the *out-of-band domain* in which *spurious emissions* generally predominate. (WRC-03)
- 1.147** *assigned frequency band*: The frequency band within which the *emission* of a *station* is authorized; the width of the band equals the *necessary bandwidth* plus twice the absolute value of the *frequency tolerance*. Where *space stations* are

concerned, the assigned frequency band includes twice the maximum Doppler shift that may occur in relation to any point of the Earth's surface.

1.148 *assigned frequency*: The centre of the frequency band assigned to a *station*.

1.149 *characteristic frequency*: A frequency which can be easily identified and measured in a given *emission*.

A carrier frequency may, for example, be designated as the characteristic frequency.

1.150 *reference frequency*: A frequency having a fixed and specified position with respect to the *assigned frequency*. The displacement of this frequency with respect to the *assigned frequency* has the same absolute value and sign that the displacement of the *characteristic frequency* has with respect to the centre of the frequency band occupied by the *emission*.

1.151 *frequency tolerance*: The maximum permissible departure by the centre frequency of the frequency band occupied by an *emission* from the *assigned frequency* or, by the *characteristic frequency* of an *emission* from the *reference frequency*.

The frequency tolerance is expressed in parts in 10^6 or in hertz.

1.152 *necessary bandwidth*: For a given *class of emission*, the width of the frequency band which is just sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions.

1.153 *occupied bandwidth*: The width of a frequency band such that, below the lower and above the upper frequency limits, the *mean powers* emitted are each equal to a specified percentage $\beta/2$ of the total *mean power* of a given *emission*.

Unless otherwise specified in an ITU-R Recommendation for the appropriate *class of emission*, the value of $\beta/2$ should be taken as 0.5%.

- 1.154** *right-hand* (clockwise) *polarized wave*: An elliptically- or circularly-polarized wave, in which the electric field vector, observed in any fixed plane, normal to the direction of propagation, whilst looking in the direction of propagation, rotates with time in a right-hand or clockwise direction.
- 1.155** *left-hand* (anticlockwise) *polarized wave*: An elliptically- or circularly-polarized wave, in which the electric field vector, observed in any fixed plane, normal to the direction of propagation, whilst looking in the direction of propagation, rotates with time in a left-hand or anticlockwise direction.
- 1.156** *power*: Whenever the power of a radio transmitter, etc. is referred to it shall be expressed in one of the following forms, according to the class of *emission*, using the arbitrary symbols indicated:
- peak envelope power (PX or pX);
 - mean *power* (PY or pY);
 - carrier power (PZ or pZ).

For different *classes of emission*, the relationships between *peak envelope power*, *mean power* and *carrier power*, under the conditions of normal operation and of no modulation, are contained in ITU-R Recommendations which may be used as a guide.

For use in formulae, the symbol *p* denotes power expressed in watts and the symbol *P* denotes power expressed in decibels relative to a reference level.

- 1.157** *peak envelope power* (of a radio transmitter): The average power supplied to the antenna transmission line by a

transmitter during one radio frequency cycle at the crest of the modulation envelope taken under normal operating conditions.

- 1.158** *mean power* (of a radio transmitter): The average power supplied to the antenna transmission line by a transmitter during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating conditions.
- 1.159** *carrier power* (of a radio transmitter): The average power supplied to the antenna transmission line by a transmitter during one radio frequency cycle taken under the condition of no modulation.
- 1.160** *gain of an antenna*: The ratio, usually expressed in decibels, of the power required at the input of a loss-free reference antenna to the power supplied to the input of the given antenna to produce, in a given direction, the same field strength or the same power flux-density at the same distance. When not specified otherwise, the gain refers to the direction of maximum *radiation*. The gain may be considered for a specified polarization.

Depending on the choice of the reference antenna a distinction is made between:

- a) absolute or isotropic gain (G_i), when the reference antenna is an isotropic antenna isolated in space;
- b) gain relative to a half-wave dipole (G_d), when the reference antenna is a half-wave dipole isolated in space whose equatorial plane contains the given direction;
- c) gain relative to a short vertical antenna (G_v), when the reference antenna is a linear conductor, much shorter than one quarter of the wavelength, normal to the surface of a

perfectly conducting plane which contains the given direction.

- 1.161** *equivalent isotropically radiated power (e.i.r.p.):* The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (*absolute or isotropic gain*).
- 1.162** *effective radiated power (e.r.p.)* (in a given direction): The product of the power supplied to the antenna and its *gain relative to a half-wave dipole* in a given direction.
- 1.163** *effective monopole radiated power (e.m.r.p.)* (in a given direction): The product of the power supplied to the antenna and its *gain relative to a short vertical antenna* in a given direction.
- 1.164** *tropospheric scatter:* The propagation of *radio waves* by scattering as a result of irregularities or discontinuities in the physical properties of the troposphere.
- 1.165** *ionospheric scatter:* The propagation of *radio waves* by scattering as a result of irregularities or discontinuities in the ionization of the ionosphere.

Section VII – Frequency sharing

- 1.166** *interference:* The effect of unwanted energy due to one or a combination of *emissions, radiations, or inductions* upon reception in a *radiocommunication* system, manifested by any performance degradation, misinterpretation, or loss of information which could be extracted in the absence of such unwanted energy.

- 1.167** *permissible interference*³: Observed or predicted *interference* which complies with quantitative *interference* and sharing criteria contained in these Regulations or in ITU-R Recommendations or in special agreements as provided for in these Regulations.
- 1.168** *accepted interference*³: *Interference* at a higher level than that defined as *permissible interference* and which has been agreed upon between two or more administrations without prejudice to other administrations.
- 1.169** *harmful interference*: *Interference* which endangers the functioning of a *radionavigation service* or of other *safety services* or seriously degrades, obstructs, or repeatedly interrupts a *radiocommunication service* operating in accordance with Radio Regulations.
- 1.170** *protection ratio* (R.F.): The minimum value of the wanted-to-unwanted signal ratio, usually expressed in decibels, at the receiver input, determined under specified conditions such that a specified reception quality of the wanted signal is achieved at the receiver output.
- 1.171** *coordination area*: When determining the need for coordination, the area surrounding an *earth station* sharing the same frequency band with *terrestrial stations*, or surrounding a transmitting *earth station* sharing the same bidirectionally allocated frequency band with receiving *earth stations*, beyond which the level of *permissible interference* will not be exceeded and coordination is therefore not required. (WRC-2000)

³ **1.167.1** and **1.168.1** The terms “permissible interference” and “accepted interference” are used in the coordination of frequency assignments between administrations.

- 1.172** *coordination contour*: The line enclosing the *coordination area*.
- 1.173** *coordination distance*: When determining the need for coordination, the distance on a given azimuth from an *earth station* sharing the same frequency band with *terrestrial stations*, or from a transmitting *earth station* sharing the same bidirectionally allocated frequency band with receiving *earth stations*, beyond which the level of *permissible interference* will not be exceeded and coordination is therefore not required. (WRC-2000)
- 1.174** *equivalent satellite link noise temperature*: The noise temperature referred to the output of the receiving antenna of the *earth station* corresponding to the radio frequency noise power which produces the total observed noise at the output of the *satellite link* excluding noise due to *interference* coming from *satellite links* using other *satellites* and from terrestrial systems.
- 1.175** *effective boresight area* (of a steerable satellite beam): An area on the surface of the Earth within which the boresight of a *steerable satellite beam* is intended to be pointed.
- There may be more than one unconnected effective boresight area to which a single *steerable satellite beam* is intended to be pointed.
- 1.176** *effective antenna gain contour* (of a steerable satellite beam): An envelope of antenna gain contours resulting from moving the boresight of a *steerable satellite beam* along the limits of the *effective boresight area*.

Section VIII – Technical terms relating to space

- 1.177** *deep space*: Space at distances from the Earth equal to, or greater than, 2×10^6 km.

- 1.178** *spacecraft*: A man-made vehicle which is intended to go beyond the major portion of the Earth's atmosphere.
- 1.179** *satellite*: A body which revolves around another body of preponderant mass and which has a motion primarily and permanently determined by the force of attraction of that other body.
- 1.180** *active satellite*: A *satellite* carrying a *station* intended to transmit or retransmit radiocommunication signals.
- 1.181** *reflecting satellite*: A *satellite* intended to reflect radiocommunication signals.
- 1.182** *active sensor*: A measuring instrument in the *earth exploration-satellite service* or in the *space research service* by means of which information is obtained by transmission and reception of *radio waves*.
- 1.183** *passive sensor*: A measuring instrument in the *earth exploration-satellite service* or in the *space research service* by means of which information is obtained by reception of *radio waves* of natural origin.
- 1.184** *orbit*: The path, relative to a specified frame of reference, described by the centre of mass of a *satellite* or other object in space subjected primarily to natural forces, mainly the force of gravity.
- 1.185** *inclination of an orbit* (of an earth satellite): The angle determined by the plane containing the *orbit* and the plane of the Earth's equator measured in degrees between 0° and 180° and in counter-clockwise direction from the Earth's equatorial plane at the ascending node of the *orbit*. (WRC-2000)
- 1.186** *period* (of a satellite): The time elapsing between two consecutive passages of a *satellite* through a characteristic point on its *orbit*.

- 1.187** *altitude of the apogee or of the perigee:* The altitude of the apogee or perigee above a specified reference surface serving to represent the surface of the Earth.
- 1.188** *geosynchronous satellite:* An earth *satellite* whose period of revolution is equal to the period of rotation of the Earth about its axis.
- 1.189** *geostationary 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* which remains approximately fixed relative to the Earth. (WRC-03)
- 1.190** *geostationary-satellite orbit:* The *orbit* of a *geosynchronous satellite* whose circular and direct *orbit* lies in the plane of the Earth's equator.
- 1.191** *steerable satellite beam:* A *satellite* antenna beam that can be re-pointed.

Section IX – Terms relating to the planning, licensing and permitting

- 1.192** *Minister:* means a member of the Cabinet and who is in-charge of the Ministry of Information and Communications acting solely in his official capacity.
- 1.193** *Authority:* The Bhutan InfoComm and Media Authority (BICMA);
- 1.194** *spectrum plan:* A plan to divide radio frequency spectrum into several frequency bands for certain purposes.
- 1.195** *frequency band plan:* A plan to identify usage of frequency bands and contained radio frequency channels in a given area or period.

- 1.196** *marketing plan*: A plan to measure economic potential of market for conduction of specific business, required resources, entering method and trading off among key parameters including possible services, regulations, dimensions, social characteristics, statistics, expenditures and revenues.
- 1.197** *person*: includes any individual, partnership, company, unincorporated organization, Government, Governmental agency, trustee, executor, administrator or other legal representative.
- 1.198** *spectrum license*: A license issued to authorize a person to establish, to own, to install and to operate *radiocommunications apparatus* under the terms specified in the license.
- 1.199** *apparatus license*: A license that issued to authorize a person to establish, to own, to install and to operate a *radiocommunication apparatus* under the terms specified in the license.
- 1.200** *ICT system*: An *ICT network service* and *ICT network facility* used by a *person* or another *person* to provide *ICT* and *media service*; unless otherwise stated, *ICT system* relates to *public ICT system*.
- 1.201** *Public ICT system*: An *ICT network facility* and *ICT network service* used by a *person* to provide *ICT service* to the public for compensation.
- 1.202** *ICT network facility*: Any element or combination of elements of physical infrastructure used principally for, or in connection with, the provision of *ICT services*, but does not include customer equipment, and includes such other facilities as may be prescribed by Rules; unless otherwise stated, *ICT network facility* relates to public *ICT network facility*.

- 1.203** *ICT network service:* Any element or combination of elements of *ICT services* provided with the use of any *ICT facility* or combination of *ICT facilities*, and includes such other services as may be prescribed by Rules; unless otherwise stated, ICT network service relates to public ICT network service.
- 1.204** *ICT service:* Any or all of the following services: *telecommunications* services, like public *telephony*, *telegraphy*, *facsimile*, cellular telephony, and pay-phone/communication services, *broadcasting services*, like *satellite broadcasting*, broadcasting distribution (cable television), *mobile satellite*, subscription broadcasting, and terrestrial free-to-air *television* and radio broadcasting, information technology services, like Internet service, web-casting, e-mail and all other sorts of e-services, Internet Protocol (IP) telephony, digital library and commercial information services, network-based information and related specialised professional services provided by electronic means, public-switched data and any other similar service, and includes such other services as may be prescribed by Rules; unless otherwise stated, ICT service relates to public ICT service.
- 1.205** *ICT facility:* Any facility, apparatus or other thing that is used or is capable of being used principally for, or in connection with, the provision of *ICT services*, and includes a transmission facility as well as any or all of the following facilities: *fixed links* and cables, computer facilities, pay-phone/communication facilities, *radiocommunication* transmitters, receivers and links, satellite *earth stations*, towers, poles, and ducts and pits used in conjunction with other facilities. This term does not include customer equipment, but includes such other services as may be prescribed by Rules; unless otherwise stated, ICT facility relates to public ICT facility.

- 1.206** *Media service*: Service provided through any mode of *media* and made available to the general public.
- 1.207** *Media*: Relevant ICT services, including *broadcasting* and where pertinent, also includes: newspapers, books, journals, periodicals, brochures, pamphlets, circulars, magazines, publications and other works made available to the general public in printed and/or electronic form or format; cinematographic films, performance of dramas and other entertainments made accessible to the general public; *radio* and *television* channels and/or stations broadcasting to the general public (whether terrestrial or *satellite*-based); the Internet accessible to the general public; Internet-based suppliers of information, news and entertainment accessible to the general public; and news agencies engaged in collecting, processing and collating news reports, feature articles and/or other material, or supplying such material to any of the aforesaid media, for the purposes of public dissemination.
- 1.208** *Radiocommunication apparatus*: An apparatus capable to transmit and/or receive *radio waves* for the purpose of *radiocommunications*;
- 1.209** *Appellate Tribunal*: The Bhutan InfoComm and Media Appellate Tribunal as established under the *Act*.
- 1.210** *The Register*: The registry of particulars, information and history of applications and granted licenses.
- 1.211** *Class license*: A license that authorises any *person*:
- a) to operate a *radiocommunications apparatus* or *device* of a specified kind; or
 - b) to operate a *radiocommunications apparatus* or *device* for a specified purpose; or

c) to operate a *radiocommunications apparatus* or *device* of a specified kind for a specified purpose.

1.212 *device*: In this *Radio Rules*, any equipments which is capable to use *radio wave* for a purpose not necessarily *radiocommunications*.

1.213 *Restricted (certificate of proficiency)*: A type of certificate which a person required to obtain before the operation of an amateur station in given frequency bands and predetermined technical conditions under this *Radio Rules*.

1.214 *General (certificate of proficiency)*: A type of certificate which a person required to obtain before the operation of an amateur station in given frequency bands and predetermined technical conditions under this *Radio Rules*.

1.215 *Novice (certificate of proficiency)*: A type of certificate which a person required to obtain before the operation of an amateur station in given frequency bands and predetermined technical conditions under this *Radio Rules*.

1.216 *Inspector*: The Authority or any officer who has been authorised by the Authority to have power to inspect stations or apparatuses and obtain information, wherever necessary, from all licensees, as to the production of the license, or of such other evidence of the licensing of the station or apparatus.

1.217 *Permit*: A formal permission granted by authority in pursuant to subsections **27(3)(j)**, **85(1)(a)** and **85(1)(b)**.

1.218 *cordless telephone (CT)*: An apparatus intended for short range communication and usually consists of a base unit (land station) and handset(s), providing, single or multiple, interconnection with the Public Switched Telephone Network (PSTN), and a portable unit.

- 1.219** *wireless local loop (WLL)*: A commercial arrangement between a telecommunication operator and a person for the service provider to provide a connection between a telecommunications network and a device owned or used by the person, as the "last mile / first mile" connection, by means of wireless link.
- 1.220** *Radio-frequency identification (RFID)*: RFID is a technology that uses communication via electromagnetic waves to exchange data between a terminal and an object such as a product, animal, or person for the purpose of identification and tracking. Some tags can be read from several meters away and beyond the line of sight of the reader. Radio-frequency identification involves interrogators (also known as readers), and tags (also known as labels).