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# Spectrum Planning, Allocation and Assignment Practices

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**This document sets out the Practices to be followed by the Telecommunications and Radiocommunications Regulator in carrying out its responsibilities under the Act concerning radio spectrum management**

## Table of Contents

1. Introduction .....	3
2. Spectrum Management.....	3
3. Planning and allocation .....	3
4. practices for Planning and Allocation of Spectrum.....	4
5. Spectrum Engineering.....	4
6. Practices for Spectrum Engineering.....	5
7. Frequency Assignment .....	5
8. practices for Frequency Assignment.....	5
9. Radiocommunications Licensing .....	6
10. practices for Radiocommunications Licencing.....	6
11. Spectrum Charges and Fees.....	7
12. practices for Spectrum Charges and Fees.....	7
13. Monitoring, Enforcement and Control .....	8
14. practices for Monitoring, Enforcement and Control.....	8
15. International Cooperation.....	9
16. practices for International Cooperation.....	9

## 1. INTRODUCTION

Spectrum is a finite but non-exhaustible resource which is a vital input into an ever widening range of services. Use of the radio spectrum is crucial to communications in Vanuatu, and the national economy. Industries that use the spectrum, such as broadcasting and cellular mobile telephony, make substantial contributions to the economy, while other manufacturing and service industries use spectrum to increase their productivity.

In order to maximise the efficient and effective use of the radio spectrum by all sectors of society, the overall goal of radio spectrum in Vanuatu is to create a predictive environment for current and future spectrum usage, which is in the public interest.

As part of its function under Section 7(2) (e) of the Telecommunications and Radiocommunications Regulation Act (the Act), the Telecommunications and Radiocommunications Regulator (TRR) is responsible to allocate, assign and manage the radio spectrum.

This document sets out the Spectrum Management, Allocation and Assignment Practices which will be followed by TRR in carrying out its duties under Section 7 (2) (e).

## 2. SPECTRUM MANAGEMENT

The overall goal of spectrum management in Vanuatu is to create a predictable environment for current and future spectrum usage, which is in the public interest. The objective of the spectrum management practices is to achieve this goal.

The objectives of the spectrum management practices are to:

- a. develop practices with regard to the strategic planning of the radio spectrum in Vanuatu with the aim of optimising the use of radio spectrum and of avoiding harmful interference;
- b. ensure the effective implementation of radio spectrum practices to ensure the availability and efficient use of radio spectrum;
- c. ensure the views and requirements of users and other interested parties are taken into account on relevant issues through consultation processes;
- d. ensure the timely provision of information to stakeholders and users concerning the allocation, availability and use of radio spectrum;
- e. ensure the effective representation of national interests at international negotiations regarding radio spectrum use;
- f. review legislation in force from time to time to ensure it remains relevant and supportive of the needs of the spectrum management process;
- g. ensure compliance with Government policies and objectives.

## 3. PLANNING AND ALLOCATION

Careful planning and allocation of radio spectrum is necessary to ensure that the radio spectrum is as widely available as possible.

The objectives of the planning and allocation process are to ensure that adequate spectrum is available to:

- a. satisfy the requirements of international obligations and treaties;
- b. support economic growth and create employment;
- c. satisfy the spectrum requirements of sector members including those responsible for national security and defence;

- d. meet the needs of civil aviation and the maritime industries;
- e. support the introduction of more spectrally efficient technologies, including the timely introduction of digital broadcasting networks;
- f. provide for competitive telecommunication infrastructures through free and fair processes;
- g. enable the introduction of future generations of public and private mobile technologies;
- h. satisfy the spectrum requirements for internationally provided radio navigation services e.g. Galileo and GPS;
- i. facilitate the rollout of broadband telecommunications networks;
- j. facilitate regionally and globally harmonised frequencies for the PPDR (Public Protection and Disaster Relief) system, in order to help rescue and emergency teams communicate with each other,
- k. stimulate technological innovation and competitiveness in a technology neutral fashion;
- l. introduce new spectrum management techniques, where appropriate e.g. spectrum commons and spectrum property rights and trading;
- m. provide spectrum for rural telecommunications with a particular emphasis on the provision of spectrum for telecommunications services for educational (including art and culture) and other public interest (including health and emergency) purposes.

#### **4. PRACTICES FOR PLANNING AND ALLOCATION OF SPECTRUM**

- 1. The National Radio Frequency Spectrum Plan (NRSFP), shall reflect international obligations and national policy in support of the broader objectives for the telecommunications sector;
- 2. The form and content of the NRSFP shall be reviewed and revised periodically to ensure that it meets the needs of spectrum users and service providers, as well as manufacturers and importers and is consistent with current international and national use of spectrum;
- 3. Adequate spectrum shall be available for new technological developments in such a way as to support technology neutrality;
- 4. Adequate spectrum provision shall be provided to support emergency services and designated telecommunications services in the case of a national emergency, or in the case of natural and man-made disasters;
- 5. An appropriate re-farming or spectrum transfer procedures shall be adopted for circumstances where there is a justified requirement to transfer the use of a frequency band to another use e.g. from civil to defence or vice versa, or from one civil user to another;
- 6. Spectrum shall be managed as to make it as widely available as possible and to optimise the efficiency of use of radio spectrum. Systems which seek to employ low power, minimise interference to other users and which do not require additional protection from other users shall therefore be viewed favourably.

#### **5. SPECTRUM ENGINEERING**

Spectrum Engineering provides an important input to the development of frequency planning procedures and guidelines. It also provides the foundation for the formulation of technical policy needed to support spectrum management.

The objectives for spectrum engineering are to:

- a. facilitate the efficient allocation and assignment of frequency bands and frequencies;
- b. provide technical guidance on how to minimise interference between radio users especially in adjacent bands, frequencies and orbital positions;

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- c. facilitate the compatibility of different radio standards utilising the same frequency band;
- d. develop suitable and realisable spectrum masks for new and existing services;
- e. produce technical guidelines concerning the use of the radio spectrum.

## **6. PRACTICES FOR SPECTRUM ENGINEERING**

1. Radio interference shall be minimised through the judicious use of spectrum engineering;
2. Appropriate spectrum engineering tools and techniques shall be utilised to ensure the efficient and effective allocation and assignment of radio spectrum;
3. Personnel conducting spectrum engineering activities shall have sufficient radio engineering expertise to deliver effective spectrum engineering solutions;
4. No decisions regarding spectrum allocation and assignment shall be taken without reference to spectrum engineering issues.

## **7. FREQUENCY ASSIGNMENT**

Frequency assignment is the authorisation given by TRR, for a radio station to use a radio frequency or radio frequency channel under clearly defined conditions. Authorisation to use the assignment is given through the associated licence which will also mandate the user to comply with the specified conditions. An assignment must be supported by an appropriate form of licence before the associated radio equipment can be taken into service.

In identifying frequency assignments in Vanuatu, the objective is to:

- a. minimise the incidence of harmful interference occurring between licensed Radiocommunications stations;
- b. maximise the efficient use of radio spectrum;
- c. ensure that all assignment (and licensing) records are accurate;
- d. utilise the most appropriate frequency assignment and planning tools available;
- e. make all frequency assignment rules and guidelines publicly available to aid transparency in decision making;
- f. issue frequency assignments in a timely manner and in accordance with published quality criteria, in support of the overall licensing process;
- g. ensure that assignment staff understand the various techniques and methods employed in frequency assignment and when they should be used;
- h. place information on specific categories of frequency assignments in the public domain by means of the Internet whenever feasible.

## **8. PRACTICES FOR FREQUENCY ASSIGNMENT**

1. The process of assigning frequencies shall be open, transparent and non-discriminatory for all users. It shall encourage efficient spectrum use and support the promotion of competition in the telecommunications sector;
2. Frequency assignments for all users shall be in accordance with the NRFSP and clearly defined conditions;
3. Such conditions shall be contained in clearly specified documentation (for example the associated licence or authorisation);

4. State of the art tools and working methods shall be employed in the frequency assignment process;
5. Regular reviews shall be convened to ensure that frequency assignment methods employed maintain the objective of maximising spectrum usage whilst minimising harmful interference to other spectrum users;
6. Frequency assignments shall be revoked if it is determined that it is in the national interest to reorganise frequency allocations in the NRFSP. In such cases replacement frequency assignments may be offered;
7. Frequency assignments shall be made on a 'use it or lose it' basis. Within a specified period, if an assigned frequency is not used, it shall be deemed to have been returned by the licensee to TRR and shall be free for re-assignment to another user if required;
8. All licences or authorisations for stations or networks to which frequencies have been assigned may be withdrawn if brought to the attention of the TRR and has been verified that the assigned frequency or the radio frequency spectrum provided is not used within a specified period.

## **9. RADIOCOMMUNICATIONS LICENSING**

The objectives of spectrum licensing are to:

- a. fulfil legal responsibilities in managing the radio spectrum;
- b. assist in minimising the occurrence of harmful interference;
- c. clearly document and record the administrative and technical conditions associated with all radio spectrum usage in Vanuatu in an uncomplicated and wherever feasible, standardised format;
- d. enable access to the radio spectrum to as many users as possible taking into account public interest obligations;
- e. simplify licensing processes and administrative intervention wherever possible and thus ensure transparency in the licensing processes;
- f. enable market forces to resolve conflicting requirements for access to radio spectrum designated for users and ensuring that the maximum economic benefit is derived from the use of the radio spectrum;
- g. introduce on-line licensing and payment processes for appropriate licensing categories as soon as practicably possible;
- h. ensure that access to the radio spectrum is provided in a timely and appropriate fashion.

## **10. PRACTICES FOR RADIOCOMMUNICATIONS LICENSING**

1. Use of the radio spectrum shall be subject, in accordance to the Act, to the user obtaining a suitable licence, or authorisation in the case of users which fall under the terms of general user radio licences;
2. Licensing and other forms of authorisation shall provide a means of authorising spectrum use and documenting the specified conditions associated with the use of the radio spectrum;
3. Failure of spectrum users to comply with the licensing regime may result in the revocation or non-renewal of a licence, or the imposition of fines or other penalties as permitted in the Act.
4. Various methods of licensing shall be available and used as appropriate:
  - i. Where demand does not exceed supply, simple administrative processes shall be employed, for example, first come-first served;

- ii. Where demand exceeds supply, a market-based spectrum management technique shall be employed unless there are over-riding public interest reasons not to.
5. Licensing processes and conditions shall be developed so as to enable the economic potential of the radio spectrum to be realised to the fullest extent possible; technology neutral licensing and spectrum trading shall be implemented when it is possible to do so without violating other policy objectives;
6. Licences and authorisations for the establishment of radiocommunication stations shall normally be for a specified fixed term, renewable on the anniversary of the date of issue. However, if the licence is associated with the provision of a telecommunications service, any radiocommunication station directly associated with the provision of that service shall be licensed for the same term as the associated telecommunication licence;
7. Light licences or general authorisations shall be implemented for specific categories of uses who utilise non-exclusive spectrum (e.g. short range, low power devices) in accordance with technical regulations concerning frequency of operation and radiated output power;
8. Administrative processes associated with licensing and authorisations shall be regulatory reviewed in order to simplify procedures (including on-line processes) and to ensure the expeditious process of applications.

## 11. SPECTRUM CHARGES AND FEES

Spectrum pricing will be set using:

- I. **Administrative Incentive Pricing.** A formula taking account of the spectrum band, transmission characteristics and geographical parameters will be applied in the calculation of fees. These fees are set at a level to provide incentives for users to make effective use of the radio spectrum. For existing licensees, this is the only method available to take account of congestion/scarcity.
- II. **Spectrum Auctions.** Licences are packaged and then auctioned to the highest bidder. Such a mechanism is highly transparent and (in theory) yields the price for the spectrum that the market supports, rather than a price which has been calculated using the formula.

Where Service Licences have been issued which include spectrum the service Licence fee will include the fee for the original spectrum allocated to the Licensee. Additional spectrum may attract charges and fees.

A Regulation will be developed in accordance with the Act concerning charges and fees.

The objectives of spectrum charges and fees are to:

- a. recover the cost of managing the radio spectrum where there is no congestion;
- b. encourage efficient use of the radio spectrum;
- c. accelerate the migration of spectrum users from one band to another where re-farming is necessary;
- d. reflect the socio-economic or market value of radio spectrum where such spectrum can be shown to be congested or scarce;

## 12. PRACTICES FOR SPECTRUM CHARGES AND FEES

1. The price of a spectrum licence shall comprise two elements; a spectrum charge and a spectrum fee;
2. Unless otherwise covered within an existing Licence all users of spectrum shall pay a spectrum charge, calculated according to the amount of spectrum consumed or denied to

other users (calculated as a function of spectrum band, channel bandwidth, geographic coverage, and other such relevant factors);

3. The total of all such spectrum charges shall recover the total of the direct and indirect costs incurred in managing the radio;
4. All users of spectrum which is either congested or where there is excess demand/competition for access, shall pay the spectrum fee;
5. The spectrum fee for licences granted to users on an administrative basis shall be set using Administrative Incentive Pricing techniques;
6. The spectrum fee for licences granted to users using a market mechanism (for example an auction) shall be determined by the market (i.e. the successful bid price);
7. Spectrum charges and spectrum fees payable by each category of radiocommunication service or user-group and the means by which charges and fees are calculated, shall be prepared and published in publicly available guidelines;

### **13. MONITORING, ENFORCEMENT AND CONTROL**

In accordance with the Act the radio spectrum shall not be used without a suitable licence and, further, licensed spectrum users are required to comply with licence requirements and technical rules and regulations.

The objectives of spectrum monitoring include:

- a. ensuring compliance with spectrum management regulations;
- b. maximising the benefit of the limited spectrum resource to society;
- c. the timely resolution of interference problems, particularly to safety-of-life services;
- d. identification of possible cases of unauthorised spectrum usage for subsequent investigation;
- e. the gathering of evidence to support successful prosecution;
- f. the collection of data on channel and band occupancy to support the assignment process and thus improve efficiency of spectrum use;
- g. assessing availability of spectrum for future uses;
- h. provision of monitoring data to support ITU activities;
- i. provision of assistance in providing acceptable coverage of public services.

### **14. PRACTICES FOR MONITORING, ENFORCEMENT AND CONTROL**

1. Appropriate monitoring equipment shall be employed and operated by suitably trained staff from within those spectrum management organisations empowered with monitoring the spectrum;
2. Interference which impedes the correct operation of licensed radiocommunications systems (especially those concerned with safety of life) shall be investigated and resolved expeditiously;
3. Action shall be taken, in line with the Act and the Licence, against any unlicensed or unauthorised user of the radio spectrum or user operating outside the terms of its licence or authorisation;
4. Proactive monitoring activities shall be planned and carried out in order to support spectrum allocation and assignment activities;



5. An inspection regime shall be adopted to ensure that equipment deployed meets appropriate standards and is installed and operated in accordance with the specified licence or authorisation conditions;
6. Means shall be implemented to ensure that licensed radiocommunications stations are maintained within the limits specified in the guidelines published by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and that such stations comply with any radiation emission standards adopted and published from time to time by ICNIRP;
7. Vanuatu shall participate in international monitoring activities as required.

## **15. INTERNATIONAL COOPERATION**

Vanuatu has a number of international obligations to satisfy in the spectrum management sector. The Constitution, Convention and Radio Regulations (including the Table of Frequency Allocations) of the International Telecommunication Union (ITU) are treaty based and will need to be respected in Vanuatu's policy and guidelines.

The objectives of international cooperation are to:

- a. participate effectively in ITU activities concerning equipment standardisation, spectrum sharing studies and radio wave propagation;
- b. participate effectively as required, in other spectrum management related international activities with neighbouring countries, at the regional level (e.g. in PITA, APT/AWG) and at the international level (e.g. in ICAO, IMO and WTO);
- c. ensure that international obligations arising from the ITU Radio Regulations are effected e.g. co-ordination and notification of assignments and orbital positions, as appropriate.

## **16. PRACTICES FOR INTERNATIONAL COOPERATION**

1. Vanuatu's strategy for spectrum management matters shall be developed and agreed in respect of foreign administrations, regional bodies (e.g. PITA and APT/AWG) and International organisations (e.g. International Telecommunication Union (ITU), International Civil Aviation Organization (ICAO), and International Maritime Organisation (IMO));
2. In order to advise the Minister responsible for Telecommunications, proposals for delegations to participate in international forums addressing spectrum management activities shall be formulated by TRR;
3. In revising and maintaining the NRFSP, due account shall be taken of the need to promote and support the harmonising of spectrum usage within the Region, thus maximising economies of scale and reducing equipment costs for users as well as reducing the likelihood of cross-border interference;
4. All frequency assignments capable of causing interference to, or requiring protection from, the stations of other administrations, shall be co-ordinated with the administration concerned; and
5. The ITU advance publication process for space radiocommunication systems shall be monitored to identify at an early stage whether co-ordination should be initiated with the notifying administration.