PRINCIPLES OF FREQUENCY ASSIGNMENT

2017

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1 BACKGROUND AND INTRODUCTION

The demand for the use of frequencies and the range of the services in Samoa for which spectrum is used has increased dramatically in recent years and is expected to continue to grow at a rapid pace. The most remarkable example of this rapid growth is the demand for wireless services with the growth of mobile telephony service not only in Samoa but worldwide. Also the number of broadcasting companies submitting applications for frequency authorizations to improve their coverage adds to this increasing usage.

Under the Telecommunications Act 2005 as amended, Office of the Regulator is charged with the responsibility to manage the RF spectrum in Samoa. In doing so OOTR Regulator has taken steps to continually improve the Samoa Radio Spectrum Management Regime in order to provide the users with an incentive to use it effectively and efficiently.

In doing so, all Frequency assignment processes in Qatar are being undertaken on the basis of the individual allocation of band to different services as defined by the National Table of frequency Allocation (NTFA). Within a band, allocation is made to different services on primary, co-primary or secondary status. The same status is reflected while providing frequency assignments approval to the applicants. The allocation of bands to services is done in accordance with the latest ITU Allocation table (Article 5 of ITU Radio Regulations) with the following objectives:

- Optimise spectrum use in accordance with international best practice
- Support and promote innovation and encourage competition
- Promote the economic and societal benefits from use of all spectrum
- To ensure full advantage can be taken of international market and technology developments by ensuring the timely availability of the requisite radio spectrum, and

2 OBJECTIVES

The objective of this document is to articulate the principles guiding the frequency assignment process for Samoa. The intent is to ensure that:

- A transparent, non-discriminatory and predictable approach to spectrum assignment is adopted
- spectrum is made available for new technologies and services,
- flexibility is preserved to adapt to new market needs
- Least intrusive regulatory interventions are required while achieving public policy objectives and efficient spectrum use

3 SCOPE

This document applies to all assignments made by OOTR irrespective of the nature of allocation and its intended use.

4 STAGES INVOLVED IN ASSIGNING RADIO FREQUENCY SPECTRUM

The access to any radio frequency band, sub-band or spot frequencies is granted through a series of stages explained below:

4.1 *Stage 1: Allocation*

First stage is an allocation which is an entry in a table of frequency allocations which sets out the use of a given frequency band for use by one or more radiocommunication services. The term allocation is also applied to the frequency band concerned. An allocation then is a distribution of frequencies to radio services. For purposes of allocation, the world is divided into three Regions referred to as Regions 1, 2 and 3. A precise definition of the boundaries between Regions may be found in Article 5 of the ITU Radio Regulations. Samoa is included in Region 2 of ITU-R regions.

Global harmonized band allocations are achieved during World Radiocommunication Conferences which are then reflected in the national legal framework (usually secondary legislation) by updating NTFA.

4.2 *Stage 2: Allotment*

Second Stage is an *allotment* which is an entry of a designated channel in a plan for use by one or more countries in those countries or within designated areas for a radiocommunication service under specified conditions. An allotment then is a distribution of frequencies to geographical areas or countries. It may be noted that not all allocated bands undergo allotment procedure regionally or globally.

4.3 *Stage 3: Assignment*

Final Stage is an *assignment* which is an authorization given for a radio station to use a radio frequency or a radio frequency channel under specified conditions. An assignment then is a distribution of a frequency or frequencies to a given radio station. Assignment is done by national spectrum Manager i.e OOTR for Samoa in-line with adopted NTFA.

5 RADIO FREQUENCY ASSIGNMENT PRINCIPLES

Principles underpinning approach to assigning spectrum flow from OOTR objectives, Primary and secondary legal framework on Spectrum Management and the NTFA. The telecommunication Act of Samoan allows OOTR for assignments of frequency through spectrum licensing. Based on these guiding documents the Radio spectrum (that can be assigned) can be segregated into following categories.

These categories reflect the demand and availability of a particular band for an allocated service.

***Uncongested**:* A band allocated for a particular service (or a set of services) in which availability of radio frequencies, spectrum band, spectrum sub-band and/or spot frequency is more than the demand

***Congested**:* A band allocated for a particular service (or a set of services) in which availability of radio frequencies, spectrum band, spectrum sub-band and/or spot frequency is less than the demand. Congested band can be:

a. *Commercial:* A congested Spectrum required for provision of service intended to generate commercial activity

b. *Non-Commercial:* A congested Spectrum required for provision of service with no commercial intention

***Shared**:* Spectrum allocated for use by more than one service or users

On the basis of above categorization, following approaches are being followed for frequency assignment procedures.

5.1 *First Come First Served (FCFS)*

If spectrum is plentiful and no rationing (*no reservation of spectrum for any future need*) is required as per the allocation plan, then all available frequency bands is to be assigned on a FCFS basis. Usually these are the bands where congestion is unlikely and/or spectrum is used to support internal business activities (closed user group). OOTR will apply this principle so as to have greater sharing of spectrum and its efficient use. Furthermore Spectrum management techniques such as link length policies, polarization and geographic reuse are to be applied. Generally this principle is adopted for PMR, TMR and Fixed links etc which have localized requirements and helps in conserving the spectrum resource while ensuring that undue costs are not imposed on users.

This approach is to be adapted for assignment of uncongested and non-commercial congested bands.

5.2 *Competitive Assignment Process*

For public services like Cellular Mobile Networks (UMTS, GSM and 3G) competitive assignment processes are typically required to meet competition objectives – competition for the market is important as well as competition in the market when the number of licences is limited by spectrum availability. Two options are available in this regards; Spectrum Auctions or beauty contests; *Spectrum auctions* are generally considered to be more efficient, transparent and timely than beauty contests and this is why they have been adopted worldwide to assign spectrum. However, if there are other qualitative criteria (*i.e. parameters related to issues other than spectrum Management*) or public policy issues which make these options impractical in then a comparative tender or beauty contest is used.

At this point of time Samoan market is not considered to be suitable to be allocated spectrum through auction. Nevertheless OOTR will continue to monitor the market maturity and competition in order to consider the use of auctions procedures as the first option for assignment in commercial congested spectrum.

5.3 *Direct Assignment*

Direct assignment is generally not considered efficient method of spectrum Management. However, direct assignment at an opportunity cost based price may be efficient for assigning small blocks of spectrum that complement incumbent operators' (e.g. mobile or BWA operators) larger spectrum holdings.

Although OOTR is legally responsible for planning spectrum use but there are areas where it may be more efficient for major users to undertake detailed planning and assignment activities because of their detailed knowledge of the radio systems used and operational requirements. OOTR will apply this on case to case basis with regards to applicants from defence forces, aeronautical and maritime bodies, telecom operators, amateur societies and some large users to undertake detailed management of blocks of spectrum they have been assigned.

However in all such cases, detailed technical usage of assignments has to be notified to the regulator so that the spectrum as a whole can be managed (e.*g. to resolve interference disputes and change allocations*).

5.4 *Temporary Frequency Assignments*

For ease of frequency planning for events, trial demonstrations and for other applicants requiring frequency assignment on defined temporary basis, OOTR will maintain a temporary frequency assignment pool. This pool covers the bands and services which have high demand for temporary assignments. The frequencies in the temporary assignment pool remain in the national Master Frequency Register (MFR) but be clearly marked as reserved for temporary assignment. All the temporary assignment is done strictly on the basis of NTFA. The temporary frequency pool register is considered to be live document for regular evaluation by OOTR for any addition or subtraction or modification.

5.5 *Class Authorization and R&TTE*

All the radio devices having limited short range of operations are class licensed in Samoa. The frequency bands/spot frequencies, allowed operational radio characteristics and applicable standards are determined by OOTR and would be made public. Equipment Type approval regime is being used as a regulatory tool for implementation of this management method. Secondary and Shared spectrum use is accorded in light of with these guidelines. Frequency authorization is provisionally allowed for such case provided the usage on non-commercial basis and the operations would be on non-protection and non-interference basis.

There have been various applications for usage of identified ISM bands in for outdoor applications (e.g. fixed point to point link, outdoor WiFi for closed user group). The provisional approval is granted for fixed geographic location of transmitter, Receiver or transceiver, as the case may be, and high frequency licensing fees are imposed in order to discourage use of ISM bands for outdoor purposes. Furthermore; to encourage innovation bringing new technologies in Samoa, reduce instances of harmful interferences and remove possibility of congestion, a free of cost light license could be accorded if radio transmission is done in very high frequency (generally above 70GHz and for small P2P links)

It is pertinent to mention here that

a. All assignments of frequency bands, sub-bands, spot frequencies or paired frequencies etc. are made in accordance with service allocation of band defined in NTFA.

b. Unless a subsidy is granted, all frequency assignments would be charged as per the Radio spectrum Fee regime in-force.

c. The authorized users must use radio frequencies, bands, sub-bands spot frequencies subject to ALL the conditions and criteria upon which the Authorization was accorded. These conditions may be revoked or modified without any obligation or notification especially in cases of, but not limited to, spectrum re-farming, conformance to new or revised or amended regulatory instruments, avoidance of harmful interference, etc;

6 PARAMETERS REQUIRED FOR FREQUENCY ASSIGNMENT

The table below summarizes the parameters required for taking frequency assignment decisions. Based on values submitted by applicant against these parameters any assignment decision is taken provided they are accordance with their spectrum v/s service allocation as per frequency allocation table.

	PMR / TMR	Point to point and Point to Multipoint Fixed service	Broadcasting	Satellite Earth station	Public Mobile Access Radio (GSM, LTE etc.)
Bandwidth	Required	Required	Required	Required	Required
Coverage Area	Required	Not applicable	Required		As per their License requirements
Transmitter Power	Required	Required	Required	Required	As per their License requirements
No. of Base stations	Required	Required	Required	Not applicable	As per their License requirements
No. of Handhelds	Required	Not applicable	Not applicable	Not applicable	Not required
Population density	Required	Required	Required	Required	Required
Link length	Not applicable	Required	Not applicable	Not applicable	Not applicable
Antenna Height	Required	Required	Required	Antenna characteristics required	As per their License requirements
No. of satellites (along with operational frequency bands in UL or DL)	Not applicable	Not applicable	Not applicable	Required (satellite networks have be coordinated)	Not applicable
No. of terminal (VSAT)	Not applicable	Not applicable	Not applicable	Required	Not applicable

Table 1: *Frequency Assignment parameters*

7 FREQUENCY COORDINATION

Approvals for frequency assignment and/or update to frequency assignment schedule of a Licensee requiring provision of following services would be subject to coordination with relevant authorities. It is pertinent to mention here that although OOTR would do its best to speed up the coordination process but it should be kept in mind that these processes may require a long time and without any guarantee of success.

7.1 *Broadcast services*

Samoa is signatory of relevant of treaties and assigns the frequencies according to associated plans and coordination requirements. Furthermore all assignments for any Broadcast (whether included in fore-mentioned plans or not) are subject to required approvals from any other relevant government ministries of department.

7.2 *Satellite Service*

The coordination of satellite bands would be done in accordance with established ITU processes. Entry in National Frequency Register (NFR) would only be made after all the steps of these guidelines are completed.

7.3 *Maritime and Aeronautical services*

The usage of the spectrum allocated for Maritime and Aeronautical services in the territory or airspace or waters administered by Samoa would be subject to co-ordinations with relevant Authorities. These also include all kind of long and medium range radars in the bands provided they operate in the bands allocated for these services. All provisions of the Appendices (including but not limited to) 15, 17, 18, 26 and 27 etc. of the Radio regulations would be considered before making assignments for these services.

8 CONFIDENTIALITY

Both NTFA and NFR are considered national level documents. However NFR is neither considered a public document nor its access is deemed suitable to persons outside OOTR. Within OOTR only the staff of spectrum management department can have full access to NFR. All other staff of OOTR may access the same but only for information purposes i.e. *read only permission*. Apart from this, permissions can be provided to any person or organization after written approval from top Management of OOTR. The reasons stipulated for restricted access policy are:

a. NFR contains frequencies related to national security and defense. These are classified information and may cause irreparable damage to the country, if falls in wrong hands.

b. NFR contains frequencies related to operation, production and administration of major companies and financial agencies as well as diplomatic missions located in Samoa. Disclosure of their wireless frequencies may make them vulnerable to being monitored by unauthorized persons.

c. If the NFR is made public, all occupied and vacant frequency spots will be known to everyone. This will encourage targeted interference cases as well as unlicensed use of vacant frequency spots.

ABBREVIATIONS

National Assignments	Authorization given by OOTR for a radio station to use a radio frequency or radio frequency channel under specified conditions.
NFR	National Frequency Register
NFAP	National Frequency Allocation Plan
NFAT	National Frequency Allocation Table
ITU	The International Telecommunication Union
RR	The Radio Regulations of ITU
SNG	Satellite News gathering
R&TTE	Radio and Telecom Terminal Equipment
SRD	Short Range Devices
PMR	Private Mobile radio
TMR	Trunked Mobile Radio
VSAT	Very Small Aperture Terminal
GSM	Global System for Mobile Communications
BWA	Broadband Wireless Access
ISM	Industrial. Scientific and Medical band