NATIONAL INFORMATION AND COMMUNICATIONS TECHNOLOGY AUTHORITY

National Information & Communication Technology Act 2009

National Information & Communication Technology (Radio Spectrum) Regulation 2010

Guideline Setting the Values of '*T*' & '*L*' Factors of the Annual Variable Spectrum Fee Formula

-Insert Guideline Number-

This guideline is issued by the National Information & Communication Technology Authority (NICTA) Pursuant to Section 6(7) of the *National Information & Communication Technology (Radio Spectrum) Regulation, 2010* (the "***Radio Spectrum Regulation***").

1. INTRODUCTION

NICTA is Papua New Guinea's ICT regulator and Licensing Authority. As the radio spectrum manager, NICTA regulates access to the radio frequency spectrum through three types of radiocommunications licences; Spectrum License, Apparatus License and Class License. The *Radio Spectrum Regulation* prescribes the method of calculating annual radiocommunications license fees for Apparatus Licences and Spectrum Licences issued on administrative basis. The fees are calculated in accordance with the Annual Variable Spectrum Fee (AVSF) formula set out in Schedule 2 of the *Radio Spectrum Regulation* taking into account relevant parameters and factors of the particular licence.

This guideline is issued by NICTA pursuant to Section 6(7) of the *Radio Spectrum Regulation*. The guideline describes the rationale for and sets the values for the Type of Service Factor (***T***) and the Location Factor (***L***).

Annual Variable Spectrum Fee (AVSF) FORMULA

The Annual Variable Spectrum Fee Formula is set out in Schedule 2 of the Radio Spectrum Regulations and reproduced below.

Annual Variable Spectrum Fee (AVSF) = V x 2600/F x B x T x L

Where '***V***' is 454, '***F***' is the Frequency, '***B***' is the frequency bandwidth (in MHz), '***T***' is the type of service Factor and '***L***' is the location factor.

2. VALUES OF "*L*" and "*T*" FOR APPARATUS LICENSES [Section 6(3) (c)]

3.1 Location Factor ("*L*")

Major Towns are ascribed the maximum value ***L*** = 1. The value of ***L*** is reduced for less populated locations where there is less economic activity and potential for congestion. The values of ***L*** are independent of type of apparatus and have the same ranges as shown in the tables below.

3.2 Type of Service Factor ("*T*")

Most fixed and mobile services use low transmit power and ***T*** is not dependent on power. The value of ***T*** = 1 is chosen as the reference value attributed to a fixed point to point link. Due to the directivity of links the same channel may be used at least 4 times in the same location. However with a point to multi point link reuse in the same location is not possible. Since a point to multi point link denies spectrum reuse 4 times more than a point to point link therefore the value of ***T*** = 4. Similarly, a corporate licence for a system comprising one repeater and several mobile and handheld stations denies the reuse of the same channel in the same area. However a handheld or mobile station would allow the same channel to be shared by others thus are attributed lower ***T*** values. The Values of ***T*** for various types of apparatus and services are shown in Table 1a, 1b, 1c.

Table 1a: *Values of **T** & **L** Factors for Apparatus licenses excluding Satellite and Broadcast stations*

Service Type	Apparatus type	T
Fixed	Point to Point Station	1.00
	Point to Multipoint Station	4.00
	Cellular Base Station	4.00
	ISM Point to Point	0.00
	ISM Point to Multipoint	0.00
Mobile	Corporate Station	4.00
	Cellular Base Station	4.00
	Repeater Station	1.00
	Base Station	1.00
	Aeronautical Station	1.00
	Coast Station	1.00
	Limited Coast Station	1.00
	Mobile Station	0.10
	Handheld Station	0.10
	Ship Station	0.10
	Aircraft Station	0.10
Amateur	Amateur Station	0.10
Radio Determination	Radio Location	4.00
	Radio Navigation	4.00
Meteorological	Meteorological Station	4.00

Locality	L
Major Towns	1.00
Minor Towns	0.60
Rural/Remote	0.30

EXAMPLE ONLY

Service Type	Apparatus	Fixed K	Band	Band Limits MHz	MHz	F MHz	B MHz	T	L	AVLF K
Fixed	Point to Point	1000	7 GHz	7425	7725	7575	14	1	1	2182
	Point to MP	1100	1.5 GHz	1428	1524	1476	2	4	1	6398
Mobile	Corporate(V)	700	VHF High	148	174	161	0.05	4	1	1466

Broadcasting services use a range of transmit power, which affects the value of ***T***, accordingly. High power transmitters pose greater denial and therefore ***T*** = 4 is the maximum for high power transmitters and decreases with lower power.

Table 1b: *Values of **T** & **L** Factors for Broadcast Apparatus*

Service Type	Apparatus Type	Power Levels	T
Broadcasting	VHF TV	>2-10kW	4.00
		2-5kW	2.00
		>1-2kW	0.80
		≤ 1kW	0.40
	UHF TV	200-1000W	0.40
		200-500W	0.02
		100-200W	0.08
		< 100W	0.04
	MMDS	2-10W	4.00
		2-5W	2.0
		1-2W	0.80
		< 1W	0.40
	FM Sound	500-1000W	4.00
		200-500W	2.00
		100-200W	0.80
		< 100W	0.40
	AM Sound		4.00
	Satellite		4.00

Locality	L
Major Towns	1.00
Minor Towns	0.60
Rural/Remote	0.30
Nationwide	7.00

EXAMPLE ONLY

Band	Band Limits		F	B	T	L	AVLF
	MHz	MHz	MHz	MHz			K
HF B/c	0.03	30	30	0.003	4	1	472
FM Sound (<100W, Remote)	88	108	98	0.2	0.4	0.3	289

Table 1c: *Values of **T** & **L** Factors for Satellite Apparatus*

Service Type	Apparatus type	T

Locality	L

Satellite Earth stations	Fixed Earth Station	0 or 4
Satellite Earth station Handheld	Mobile/Handheld Earth Station	0 or 0.1
Earth Station Receive Only	Earth Station Receive Only	0.00
Space Station		4.00

Major Towns	1.00
Minor Towns	1.00
Rural/Remote	1.00
Nationwide	3

The Values of T for Fixed Earth Stations can either be 0 or 4 depending on whether it has a separate space station license or not. If there is no spate space station license then a value of 4 will apply for the T Factor. The same reasoning will apply for Mobile /Handheld Earth station but the values of T will be either 0 or 0.1.

EXAMPLE ONLY

Band			F	B	T	L	AVLF
	MHz	MHz	MHz	MHz			K
ES Fixed (C-Band)	3700	6425	5063	1	4	1	933
ES Fixed (C-Band)	3700	6425	5063	0.5	4	1	466
ES Fixed (Ku-Band)	11700	14300	13000	2	4	1	726
ES Fixed (Ku-Band)	11700	14300	13000	1	4	1	363

4. VALUES OF "*L*" and "*T*" FOR SPECTRUM LICENSES

4.1 Type of Service Factor ("*L*")

For spectrum licences issued on administrative basis the coverage area will usually include more than one location. The value of ***L*** therefore should reflect the aggregate ***L*** values of all the locations covered by the spectrum licence taking into account the administrative cost savings made by issuing and administering a single license as opposed to multiple apparatus licenses. For nationwide licenses ***L*** = 7 and decreases for smaller coverage areas.

4.2 Type of Service Factor ("*T*")

A spectrum licence denies the use of the same spectrum by others in the same area and has therefore the maximum denial ***T*** = 4 irrespective of the technology or type of apparatus used.

Table 2: *Values of **T** & **L** Factors for Calculation of Fees for Spectrum licenses issued under Administrative Basis*

Service Type	Apparatus Type	T
Any	Any	4.00

Locality	L
Major Town	3.00
Minor Town	2.00
Rural/Remote	1.00
Nationwide	7.00

FOR EXAMPLE ONLY:

Band	Band Limits		F	B	T	L	AVLF
	MHz	MHz	MHz	MHz			K
850 - CDMA	800	880	840	22	4	7	865627
GSM - 900	880	960	920	26.667	4	7	1106497
GSM - 1800	1710	1880	1795	20	4	7	368258

5. CATEGORIES OF LOCATIONS

The locations used for the ***L*** factor are divided into three categories and are shown in the table below.

Category	Location
Major Towns	Port Moresby Lae Mt. Hagen
Minor Towns	All other provincial capitals excluding the ones mentioned above. Goroka Madang Wewak Kimbe Kokopo Daru Kerema Alotau Popondetta Mendi Wabag Kundiawa Vanimo Lorengau Kavieng Buka All other provincial capitals excluding the ones mentioned above
Rural/Remote	All other locations not specified above

The towns included in each category may change based on input from the relevant Government agencies.