



Telecommunications &
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Regulator

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30 October 2015

ALLOCATION OF 700 MHz BAND SPECTRUM IN VANUATU

REQUEST FOR EXPRESSIONS OF INTEREST

Background

The Office of the Telecommunications and Radiocommunications Regulator (TRR) released a Public Consultation document on 30th April 2014 inviting public comment and input on the *Planning of the 700MHz Band in Vanuatu*. Following that public consultation process, on 14 August 2014 TRR made a Decision about the future allocation of the 700 MHz band (Decision 01 of 2014). (This Decision is set out in Annex 3 and a signed copy can be downloaded from <http://www.trr.vu/index.php/en/public-register/determinations/decisions/2014>).

In accordance with that Decision, TRR now seeks expressions of interest from parties who wish to have spectrum in the 700 MHz band assigned to them. The terms and conditions for the allocation of this spectrum, and the process to be followed, are set out below. (For the information of applicants, the requirements are summarised in the Table at Annex 1).

What Spectrum is being offered?

TRR is seeking to allocate the spectrum band between 698 MHz and 806 MHz (the 700 MHz band) using spectrum licences covering the whole of Vanuatu. The band is being planned in accordance with the APT 700 MHz FDD plan (see Figure 1).

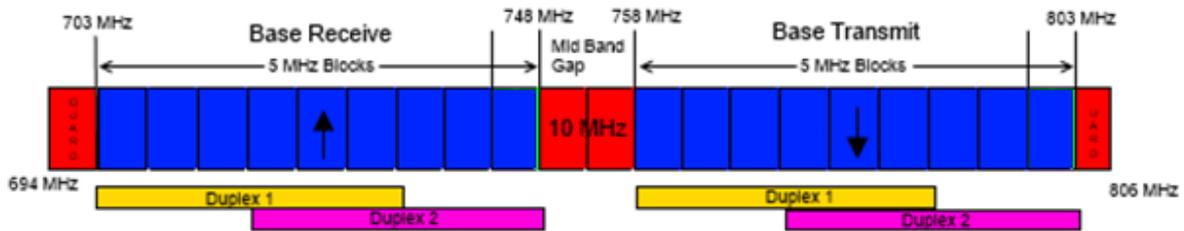


Figure 1: APT 700 MHz FDD Plan. Proposed guard bands are shown in red. Lots expected to be available for assignment are in blue.

Configuration of the Spectrum

As indicated in Figure 1, the 700 MHz band will be available in blocks of 2 x 5 MHz pairs (in the proposed configuration there are a total of nine blocks of 2 x 5 MHz each). Subject to conditions set out in this Request for Expressions of Interest, applicants may be able to acquire multiple 2 x 5 MHz blocks. When an applicant seeks such multiple lots, wherever possible, TRR will endeavour to assign contiguous lots to the applicant (that is, the lots would be adjacent to each other).

TRR may decide to make spectrum available for a Public Protection and Disaster Relief (PPDR) broadband network. A decision on whether this spectrum would be made available in the 700 MHz band or another suitable band (e.g. the 800 MHz band), will be made after receipt of Expressions of Interest for this band. If TRR decides to make this spectrum available for PPDR in the 700 MHz band, this will restrict the amount of spectrum remaining in the band for allocation to other users.

TRR may decide to set aside 2 x 15 MHz spectrum in the 700 MHz band for a new carrier (other than the current mobile service providers, namely Telecom Vanuatu Limited and Digicel (Vanuatu) Limited). A Decision on whether or not to set aside this spectrum for a new carrier will be made after receipt of Expressions of Interest for this band.

At this stage, TRR has not made any decision to limit the total amount of spectrum in the 700 MHz band that can be assigned to any single applicant. TRR reserves the right to make such a decision to impose a maximum spectrum assignment limit following receipt of Expressions of Interest for this band.

Applicants responding to this Request for Expressions of Interest should indicate how much spectrum they wish to obtain (in blocks of 5 MHz pairs), together with their preference, if any, for particular blocks of spectrum within the overall band, the type of service to be provided together with a preliminary rollout plan.

Process for Assigning Spectrum

TRR will decide on the final process for assigning spectrum to applicants following receipt of Expressions of Interest. Consistent with the terms of Decision 01 of 2014, TRR may assign the 700 MHz spectrum band to licensees, or service providers by means of a spectrum auction.

TRR will proceed to a spectrum auction for the 700 MHz band if it receives Expressions of Interest for more spectrum than is available in the band.

TRR may also decide to proceed to a spectrum auction for the band if it is unable to satisfy preferences of responders for particular parts of the band.

A flow chart describing the process for assigning the spectrum is set out in Annex 2.

Other Conditions

Type of Licence

TRR will assign spectrum to an applicant under a Spectrum Licence as required by the *Telecommunications and Radiocommunications Regulation Act 2009 (“the Act”)* and in accordance with Part III of the *Radio Apparatus Licence and Spectrum Licence (Fees) Regulation, Order No. 153 Of 2012*. The Regulator will also be guided by the Spectrum Planning, Allocation and Assignment Practices when issuing spectrum licences.

All spectrum holders (licensees) must, at all times, comply with the requirements of the Act, the *Radio Apparatus Licence and Spectrum Licence (Fees) Regulation, Order No. 153 of 2012* and the terms and conditions of their licence as determined by the Regulator.

Licence Fees

If, following receipt of Expressions of Interest, TRR decides to assign licences for spectrum in the 700 MHz band without holding a spectrum auction, the resulting licences will be subject to spectrum fees to be determined by TRR.

If TRR decides to assign licences for spectrum in the 700 MHz band by means of a spectrum auction, TRR will specify the level of fees, if any, to be applied to the licences before the start of the auction. TRR will also specify the rules of the auction, including any minimum bid prices.

Applications to be treated as ‘Commercial in Confidence’

TRR will treat all responses to this Request for Expressions of Interest as being ‘commercial in confidence’. It will not disclose any details of any responses except with the permission of the relevant applicant.

Technical Rules and Conditions

TRR will allocate the 700 MHz band for use by licensees or service providers or potential service providers, to provide mobile broadband services using 4th Generation Long Term Evolution (LTE) technologies, or technologies that will be compatible with LTE services under the technical parameters and conditions as outlined in the Schedule attached to Decision 01 of 2014 (see Annex 3). In particular, applicants should note that any use of the band must be in accordance with the technical conditions set down in the Schedule to the Decision.

In responding to this Request for Expressions of Interest, applicants should indicate the technology they propose to use in the band.

Response Date and Address for Expressions of Interest

All responses to this Request for Expressions of Interest must be delivered to the address below by 4.30PM on 30 November 2015.

EOI: 700 MHz Band Allocation

Telecommunications and Radiocommunications Regulator

Attn: The Regulator – RONALD BOX

A: PO Box 3547, 1st Floor Oceanwalk Building, Lini Highway, Port Vila, VANUATU

Tel: +678 27621

E-mail: ronbox@trr.vu

Website: www.trr.vu

700 MHz BAND ALLOCATION EXPRESSIONS OF INTEREST: INFORMATION FOR APPLICANTS

Question	Terms and Requirements
What spectrum is being offered?	TRR is seeking to allocate the spectrum band between 698 MHz and 806 MHz (the 700 MHz band) using spectrum licences covering the whole of Vanuatu. Spectrum to be offered is in paired bands between 703 MHz to 748 MHz, paired with 758 MHz to 803 MHz.
How is the spectrum being configured?	The 700 MHz band will be available in blocks of 2 x 5 MHz pairs (in the proposed configuration there are a total of nine blocks of 2 x 5 MHz each). Subject to conditions set out in this Request for Expressions of Interest, applicants may be able to acquire multiple 2 x 5 MHz blocks.
Which spectrum blocks may be available?	<p>Available blocks are expected to be:</p> <ul style="list-style-type: none"> • 703-708 MHz paired with 758-763 MHz • 708-713 MHz paired with 763-768 MHz • 713-718 MHz paired with 768-773 MHz • 718-723 MHz paired with 773-778 MHz • 723-728 MHz paired with 778-783 MHz • 728-733 MHz paired with 783-788 MHz • 733-738 MHz paired with 788-793 MHz • 738-743 MHz paired with 793-798 MHz • 743-748 MHz paired with 798-803 MHz <p>Applicants are invited to submit expressions of interest setting out how many of these blocks they wish to acquire. If applicants have a preference for particular blocks, they should indicate this in their expression of interest.</p>
Will TRR set aside spectrum for a PPDR network?	TRR has indicated its intention to set aside spectrum for a Public Protection and Disaster Relief (PPDR) broadband network. However, no decision has yet been taken on whether this spectrum would be made available in the 700 MHz band or another suitable band (e.g. the 800 MHz band). A decision on this will be made after receipt of Expressions of Interest.
Will TRR set aside spectrum for a new carrier?	The Regulator may decide to set aside 2 x 15 MHz spectrum in the 700 MHz band for a new carrier (other than the current mobile service providers, namely Telecom Vanuatu Limited and Digicel (Vanuatu) Limited). The decision whether or not to set aside this spectrum for a new carrier will be made after receipt of Expressions of Interest.
What will be the process for assigning spectrum to applicants?	<p>TRR will decide on the final process for assigning spectrum to applicants following receipt of Expressions of Interest. TRR may assign the 700 MHz spectrum band to licensees, or service providers by means of a spectrum auction.</p> <p>TRR will proceed to a spectrum auction for the 700 MHz band if it receives Expressions of Interest for more spectrum than is available in the band. However if the spectrum requests from all responders to this Request can be met from within the total amount of spectrum available for assignment, TRR may decide to assign licences without</p>

	<p>holding a spectrum auction.</p> <p>A flow chart setting out the process for deciding on the method of assignment is set out in Annex 2.</p>
What type of licence will TRR issue to successful applicants?	TRR will assign spectrum to an applicant under a Spectrum Licence under Part III of the <i>Radio Apparatus Licence and Spectrum Licence (Fees) Regulation</i> , Order No. 153 of 2012.
Will the 700 MHz band be subject to spectrum fees?	<p>If TRR decides to assign licences for spectrum in the 700 MHz band without holding a spectrum auction, the resulting licences will be subject to spectrum fees to be determined by TRR.</p> <p>If TRR decides to assign licences for spectrum in the 700 MHz band by means of a spectrum auction, TRR will specify the level of fees, if any, to be applied to the licences before the start of the auction. TRR will also specify the rules of the auction, including any minimum bid prices.</p>
What technical rules and conditions will apply to 700 MHz licences? What can the spectrum be used for?	TRR will allocate the 700 MHz band for use by Licensees or service providers or potential service providers to provide mobile broadband services using 4 th Generation Long Term Evolution (LTE) technologies, or technologies that will be compatible with LTE services under the technical parameters and conditions as outlined in the Schedule attached to Decision 01 of 2014. Applicants should note that while TRR will not prescribe particular technologies or network architectures, any use of the band must be in accordance with the technical conditions set down in the Schedule to the Decision. In responding to this Request for Expressions of Interest, applicants should indicate the technology they propose to use in the band.
What other conditions will apply to this allocation?	<p>Licences issued will be subject to the requirements of the <i>Telecommunications and Radiocommunications Act</i> No. 30 of 2009, and of the <i>Radio Apparatus Licence and Spectrum Licence (Fees) Regulation</i>, Order No. 153 of 2012.</p> <p>TRR will treat all responses to this Request for Expressions of Interest as being ‘commercial in confidence’. It will not disclose any details of any responses except with permission of the relevant applicant.</p> <p>The decision whether to assign spectrum to a particular applicant, or whether to assign the 700 MHz at all, is at the sole discretion of the Regulator.</p> <p>Applicants must comply with the rules set out by TRR in this Request for Expressions of Interest, with all licence conditions, with other relevant policies including the Universal Access Policy, and with all relevant legislation.</p>
What is the closing date for applications?	Applications close at 4.30pm on Monday 30 November 2015.
Where should Expressions of Interest be sent?	<p>Expressions of Interest must be delivered to the following address:</p> <p>EOI: 700 MHz Band Allocation Telecommunications and Radiocommunications Regulator Attn: The Regulator – RONALD BOX A: PO Box 3547, 1st Floor Oceanwalk Building, Lini Highway, Port Vila, VANUATU Tel: +678 27621 E-mail: ronbox@trr.vu Website: www.trr.vu</p>

700 MHz Assignment Process Flow Chart

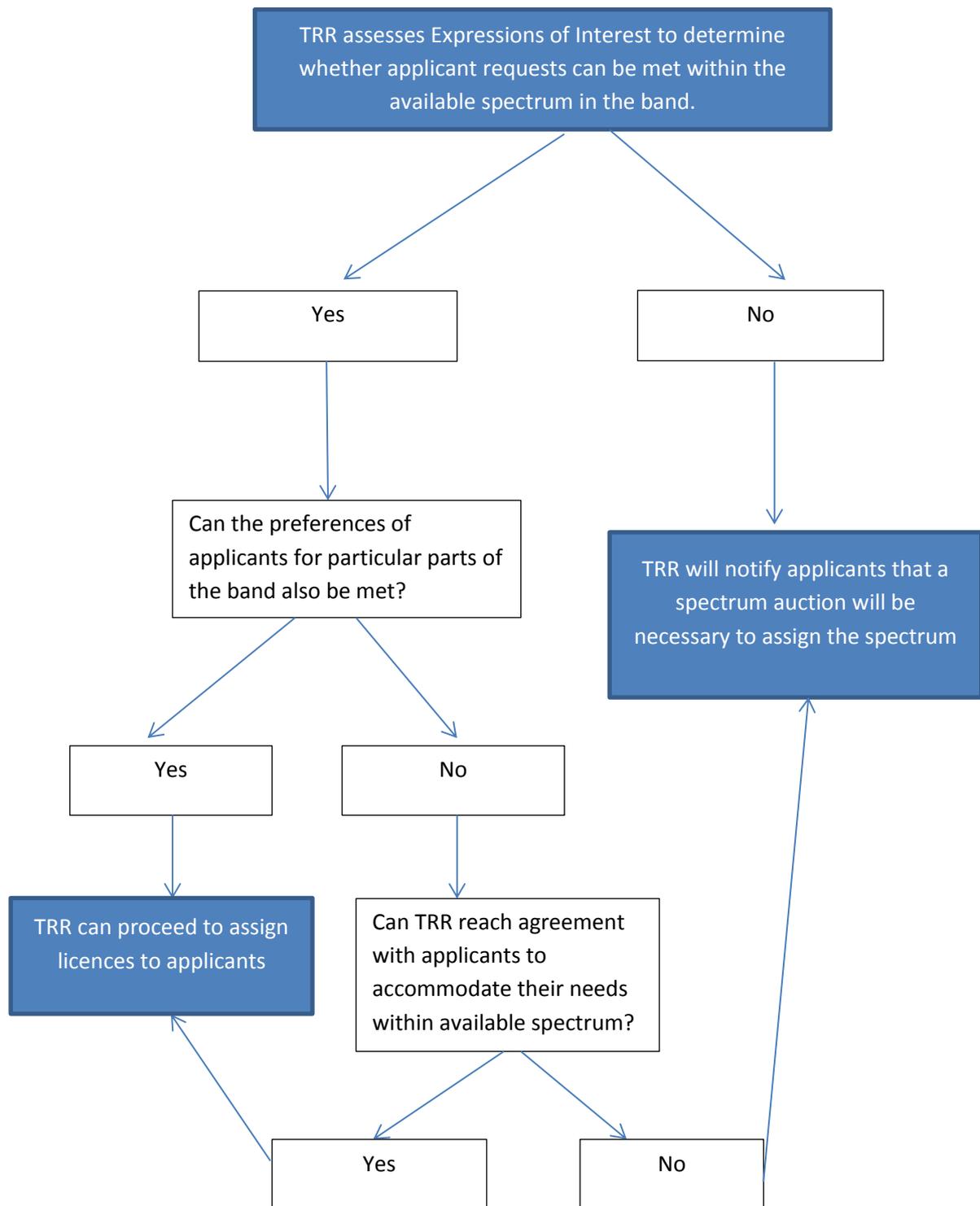


Figure 2: Assignment Process Flow Chart

DECISION 01 OF 2014

The Telecommunications and Radiocommunications Regulator's Decision on Planning for the 700MHz Band in Vanuatu

Background

The office of the Telecommunications and Radiocommunications Regulator released a Public Consultation document on 30th April 2014 inviting public comment and input on the planning of the 700MHz Band in Vanuatu. During the consultation period, TRR received comments and feedback from service providers and interested persons, which has assisted the Regulator in the making of this decision.

Decisions:

After assessing all the comments and feedback received from the service providers and interested persons, and in the exercise of its powers and duties under the Telecommunications and Radiocommunications Regulation Act 2009 ("the Act") I, the Telecommunications and Radiocommunications Regulator ("the Regulator") hereby make the following decisions.

1. The Regulator shall allocate the 700 MHz band (698-806 MHz) for use by Licensees or service providers or potential service providers to provide mobile broadband services using 4th Generation Long Term Evolution (LTE) technologies, or technologies that will be compatible with LTE services under the technical parameters and conditions as outlined in the Schedule hereto attached to this decision.
2. The Regulator may assign the 700 MHz spectrum band to licensees, or service providers by means of a spectrum auction.
3. In order to assess the level of demand for spectrum in the 700 MHz band in advance of the auction, the Regulator will call for Expressions of Interest in acquiring spectrum in the band. Potential service providers will be asked to nominate how much spectrum they would be seeking to acquire and to indicate their preference, if any, for particular parts of the band. In particular:
 - a. All Expressions of Interest shall be treated as confidential (Commercial in Confidence) and will not be made public unless permitted by the Act.

- b. After receiving Expressions of Interest, the Regulator may decide not to proceed to an auction of 700 MHz band spectrum if it decides that the level of demand for spectrum can be satisfied without a competitive process.
4. The Regulator may set aside 2 x 15 MHz spectrum in the 700 MHz band for a new carrier (other than the current mobile service providers, namely Telecom Vanuatu Limited and Digicel (Vanuatu) Limited).
5. The Regulator may decide not to proceed in accordance with paragraph 4 above if, following receipt of Expressions of Interest, it considers that there is sufficient spectrum in the band to provide for new entrant(s).
6. In the event where the Regulator decides to assign spectrum in the 700 MHz band without an auction, the licensees, service providers or potential service providers will be subject to Radio Spectrum Fees as prescribed by the Regulator.
7. The Regulator may make spectrum available for a Public Protection and Disaster Relief broadband network. A decision on whether this spectrum would be made available in the 700 MHz band or another suitable band (e.g. 800 MHz band), will be made after receipt of Expressions of Interest.

Made this 14th day of August 2014

Ronald Box
Telecommunications and Radiocommunications Regulator



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Radiocommunications
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SUMMARY OF REASONS RELATING TO THE DECISIONS ON PLANNING FOR THE 700MHz BAND IN VANUATU

1. Having considered the views of responders to its public consultation on Planning for the 700 MHz Band in Vanuatu, the Regulator has concluded that it is in the public interest to proceed to allocate the 700 MHz band for mobile broadband services. It has also decided that the 700 MHz band should be made available for services using 4th Generation Long Term Evolution (LTE) technologies, or technologies that will be compatible with LTE services under the technical parameters and conditions as set out in the Decision.

In reaching this decision, the Regulator has taken into account:

- a. The significant benefits that mobile broadband can bring to Vanuatu in terms of increased access to broadband services, greater productivity in the economy and better international roaming opportunities both for visitors to Vanuatu and for Vanuatu residents travelling to other countries;
 - b. The general level of support amongst respondents for the allocation of the 700 MHz band;
 - c. The benefits for international roaming if Vanuatu adopts the same or similar technologies adopted in other countries in the region and elsewhere;
 - d. The widespread adoption of LTE technologies internationally;
 - e. The support amongst most responders for the technical conditions proposed in the Consultation Paper; and
 - f. The need to ensure that interference to, from and between services using the band is manageable.
2. The Regulator has concluded that the best way of assigning this spectrum is by means of a spectrum auction. In reaching this decision, the Regulator has taken into account:
 - a. The requirement under the Radio Apparatus Licence and Spectrum Licence (Fees) Regulation (Order No 153 of 2012) that the Regulator is to “charge the assignment of spectrum using the administrative incentive pricing or spectrum auctions whichever is appropriate under the circumstance”;
 - b. The greater fairness and transparency of a spectrum auction compared to other assignment methods;

- c. The prospect that there may be more demand for this spectrum than can be met by the available supply, based on requests to the Regulator for access to this spectrum;
 - d. The lack of information currently available to the Regulator to enable the setting of an administrative incentive price for this spectrum.
3. The Regulator has decided that in preparation for an auction of the 700 MHz band, it will call for Expressions of Interest in acquiring spectrum in the band. Potential licensees will be asked to nominate how much spectrum they would be seeking to acquire and to indicate their preference, if any, for particular parts of the band. In reaching this decision The Regulator has taken into account:
 - a. The need to test the level of demand for spectrum in the band;
 - b. The possibility that requests for access to the band can be met without an auction if projected demand fails to materialise.
4. The Regulator's decision to set aside 2 x 15 MHz spectrum for a new mobile operator is based on the advantages that would arise to consumers from an increase in competition in the Vanuatu markets for mobile and broadband services.
5. The Regulator has decided that if it proceeds to assign spectrum in the 700 MHz band without an auction, the licences will be subject to Radio Spectrum Fees to be determined by the Regulator. This is consistent with the requirements of the Radio Apparatus Licence and Spectrum Licence (Fees) Regulation (Order No 153 of 2012) that the Regulator is to "charge the assignment of spectrum using the administrative incentive pricing or spectrum auctions whichever is appropriate under the circumstance". The administrative incentive price would be the Radio Spectrum Fee.
6. The Regulator's decision to make available spectrum for a Public Protection and Disaster Relief broadband network, either in the 700 MHz band or another suitable band is based on:
 - a. The advantages that access to broadband services would bring for emergency services and defence agencies in the event of natural disasters and other emergencies; and
 - b. The uncertainty as to whether there will be sufficient spectrum in the 700 MHz band for both this purpose and for commercial users. In the event that sufficient spectrum is not available for both, the Regulator will make an allocation in another suitable band (e.g. the 800 MHz band).

SCHEDULE:

TECHNICAL PARAMETERS AND CONDITIONS

1.1 BASIS OF PARAMETERS

The limits for the technical framework for the terminal stations are based on 3GPP values for a 5 MHz E-UTRA (LTE) channel.

The limits for base stations are based on a combination of the European values and the values currently being used in the 800 MHz band in Australia. In order to help preserve options for future planning of the frequencies above 803 MHz, an additional requirement is for out-of-band emissions above 806 MHz. Since there is not yet any decision on what will eventually occupy this spectrum, these values have been determined based on both the values given in 3GPP TS36.104 v10.3.0 and the European values, with an additional 10-15dB of filtering. It is also in line with the out-of-band values currently for the 890 MHz boundary in the 800 MHz band.

Any system which meets the 3GPP standards for Band 28 will be able to operate in Vanuatu.

The powers are expressed as radiated powers, these are the powers transmitted from the antenna of the system.

1.2 OUT OF BAND LIMITS

The out of band and out of licence limits are shown in Table 1 below.

These limits are expressed in terms of EIRP and the onus is on the operator to ensure the combination of transmitter powers, feeder loss and antenna gain results in an emission within these limits.

Non-spurious out-of-band emission limits

For transmitters operating in the lower band (703-748 MHz) emissions falling:

- (a) above 694 MHz, at frequencies offset from the upper and lower limits of the licence:
 - (i) between 0 MHz and 1 MHz – a radiated maximum true mean power of -15dBm/30kHz;
 - (ii) between 1 MHz and 5 MHz – a radiated maximum true mean power of -10dBm/MHz;
 - (iii) between 5 MHz and 10 MHz – a radiated maximum true mean power of -13dBm/MHz;
 - (iv) greater than 10 MHz – a radiated maximum true mean power -25dBm/MHz;
- (b) between 673-694 MHz:
 - a radiated maximum true mean power of -34dBm/MHz (averaged over a 7 MHz bandwidth)
- (c) below 673 MHz
 - a radiated maximum true mean power of -34dBm/MHz (averaged over a 7 MHz bandwidth).

For transmitters operating in the upper band (758-803 MHz) emissions falling:

- (a) between 748-806 MHz, at frequencies offset from the upper and lower limits of the licence:
 - (i) between 0 MHz and 5 MHz – a radiated maximum true mean power of +15dBm/MHz;
 - (ii) between 5 MHz and 10 MHz – a radiated maximum true mean power of +11dBm/MHz;
 - (iii) greater than 10 MHz – a radiated maximum true mean power of +9dBm/MHz.
- (b) between 806-813 MHz – a radiated maximum true mean power of -6dBm/MHz
- (c) above 813 MHz and below 748 MHz – a radiated maximum true mean power of -15dBm/MHz.

Table 1 Out of band and out of licence limits.

Figures 1 and 2 illustrate these out-of-band emission limits. In both figures, the blue lines indicate emission limits at the edge of the entire lower band block (703-748 MHz), while the red lines illustrate the limits for a hypothetical licence located somewhere within the band.

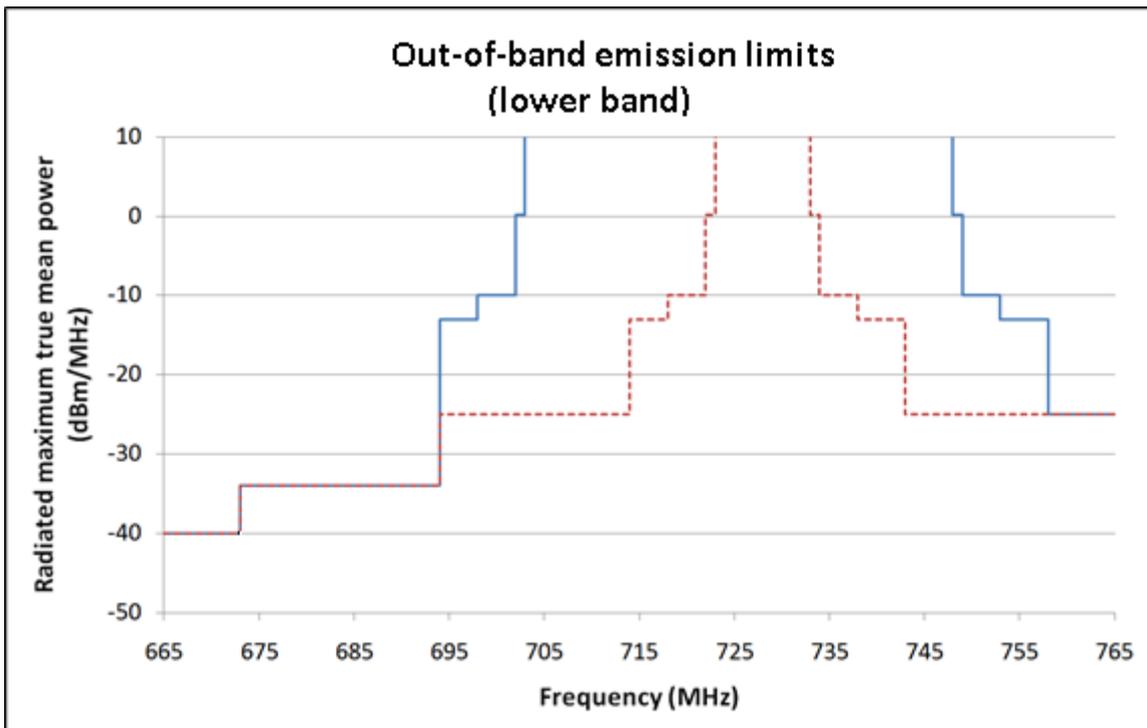


Figure 1 Out of band/licence limits for lower band.

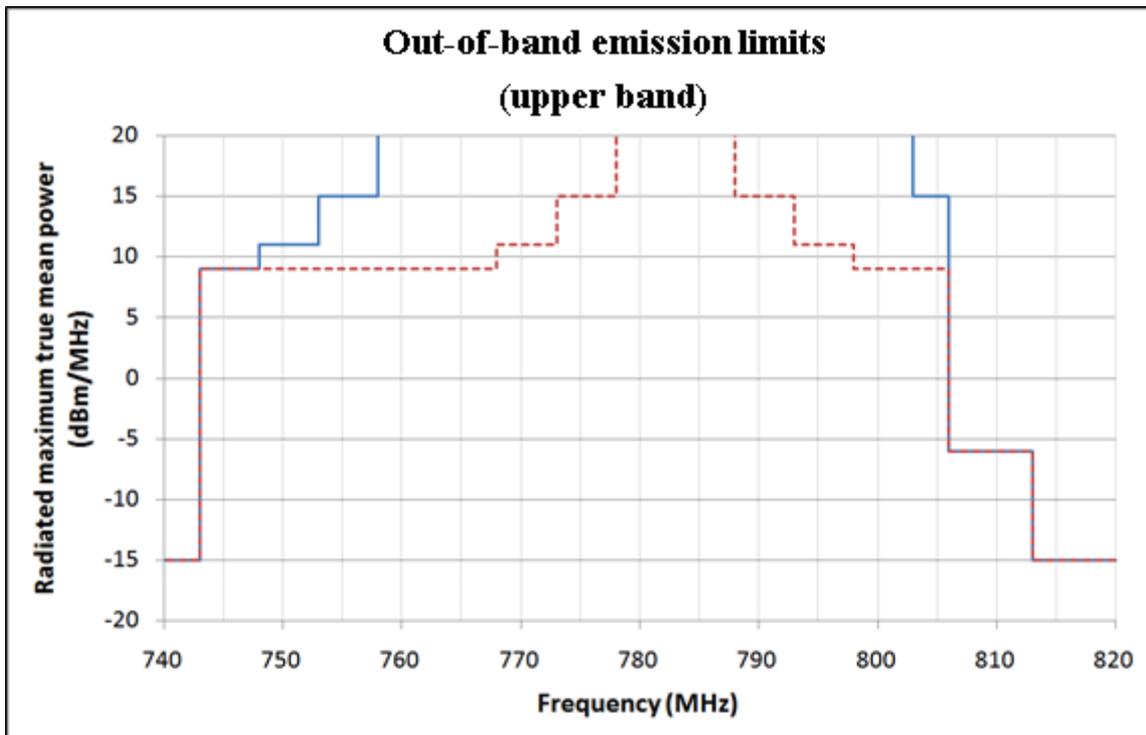


Figure 2 Out of band/licence limits for upper band

1.3 OUT OF BAND SPURIOUS EMISSION LIMITS

Limits on spurious emissions protect other services from aggregate out of band noise caused by communications devices. The spurious limits are common to those accepted by equipment vendors and no additional requirements than those contained in standards are necessary.

The limits for spurious emissions have been based on arrangements and limits found in CEPT/ERC/REC 74-01 and ITU-R Radio Regulations Appendix 3 and ITU-R Recommendation SM 329. These limits are applicable outside of the band 694-803 MHz.

Note that these limits are expressed in terms of EIRP and the onus is on the operator to ensure the combination of transmitter powers, feeder loss and antenna gain results in an emission within these limits.

The maximum permissible level of spurious emissions from a transmitter operated under a 700 MHz band spectrum licence is a radiated mean power of:

- 36dBm per 1 kHz within the band 9 kHz to 150 kHz;
- 36dBm per 10 kHz within the band 150 kHz to 30 MHz;
- 36dBm per 100 kHz within the band 30 MHz to 1 GHz; and
- 30dBm per 1 MHz within the band 1 GHz to 12.5 GHz.

Table 2 Transmitter spurious limits

The maximum permissible level of spurious emissions from a receiver operated under a 700 MHz spectrum licence is a radiated mean power of:

- 57dBm per 100 kHz within the band 30 MHz to 1 GHz; and
- 47dBm per 1 MHz within the band 1 GHz to 12.5 GHz.

Table 3 Receiver spurious limits

1.4 REFERENCE STANDARDS

The following references were used to determine the technical parameters described above.

Reference technology	Applicable standards and reports
UMTS (UTRA, WCDMA, HSPA, HSPA+)	ITU-R Report M.2039-2, 3GPP TS 25.101, 3GPP TS 25.104, 3GPP TS 24.942, ECC Report 82, ECC Report 96
LTE (E-UTRA, LTE-Advanced)	ITU-R Report M.2039-2, 3GPP TS 36.101, 3GPP TS 36.104, 3GPP TS 36.942

Table 4 Reference Standards used in the 700 MHz Band Plan