Technical Guideline for Terrestrial Broadcasters

TRBR
Telecommunications, Radiocommunications & Broadcasting Regulator

+678 27621
enquiries@trbr.vu
PO Box 3547, Port Vila, Vanuatu
www.trbr.vu

Contents

Introduction 3
Scope 3
Current Status of Technical Guideline for Broadcasting in Vanuatu 4
Technical Guideline for Sound Broadcasting 4
MF AM Sound Broadcasting 4
VHF FM Sound Broadcasting 5
Technical Guideline for Video Broadcasting 6
Analogue Broadcasting 6
Digital Broadcasting 6
Conclusion 7
Recommendations 7
Bibliography 8

+678 27621
enquiries@trbr.vu
PO Box 3547, Port Vila, Vanuatu
www.trbr.vu

Introduction

As part of the Telecommunications Radiocommunications and Broadcasting Regulator (TRBR) 2021 and Onwards Annual Work Plan (TRBR, TRBR 2021 and Onwards work plan, 2021), the TRBR is to do a research and consult with the Regulator through a report on the potential of introducing a technical guideline for broadcasting services in Vanuatu. The TRBR has witnessed notable growth in the broadcasting industry in the past years and likewise continues to receive complaints on interference issues from license broadcasting stations. Further, other industries such as the licensed Telecommunication Operators have express Interference concerns on their network from broadcasting stations and have involved the TRBR in several investigations that have confirmed the claims. The TRBR technical team have also performed several drive tests and identified that broadcasting services specifically sound broadcasting has very weak signals in some areas, and that confirms the concerns raised from the public on the poor signal experienced throughout some areas in the urban areas of Port Vila and Luganville, and some Islands in Vanuatu. These issues prompted the need for introducing a guideline to ensure that broadcasters must broadcast their signal at a standard that is fair, of the highest quality and must be in compliance with international standards and likewise the TRBR guideline that is proposed through this report.

Scope

To Develop technical guideline for transmission standards for:

- AM sound broadcasting
- FM sound broadcasting at VHF
- Analog and Digital Television broadcasting

+678 27621
enquiries@trbr.vu
PO Box 3547, Port Vila, Vanuatu
www.trbr.vu

Current Status of Technical Guideline for Broadcasting in Vanuatu

The TRBR is mandated by the Telecommunications Radiocommunications and Broadcasting Regulation Act No 30 of 2009 as amended by Amendment 22 of 2018 (the Act), to regulate the broadcasting industry in Vanuatu, and to issue broadcasting licenses to those who formally apply and meet the requirement as required by the Regulator. The TRBR is also mandated under the Act *Part 3 (12)(2)(i)* to issue licenses to broadcaster who wishes to install a radio transmitting device within Vanuatu.
"(2). A person must not install or operate a radiocommunications device in Vanuatu or its territorial waters or airspace, or in any ship or aircraft registered in or under the law of Vanuatu, except:

(i). under and in accordance with a licence or exception; or "

In terms of monitoring, the TRBR has no legal framework or guideline to ensure that broadcasters are operating in accordance with a set standard, thus this makes it difficult to deal with matters that concerns the technical aspect of broadcasting.

Technical Guideline for Sound Broadcasting

The two categories to focus on for sound broadcasting are the AM (Amplitude Modulation) and FM (Frequency Modulation) sound broadcasting, these categories are the major broadcasting areas where a lot of concerns have been raised from the consumers. As such, it is recommended that a guideline should be developed for these specific areas, specifically to set the threshold and other technical features for transmitting signals for compliance in Vanuatu and must be in line with ITU and other international standards.

MF AM Sound Broadcasting.

The MF-AM sound broadcasting service in Vanuatu is allocated spectrum in the band 521 to 1,612 kHz, the planning of MF-AM services has historically been based on the processes detailed in the Final Acts of the Regional Administration LF/MF Broadcasting Conference (Regions 1 and 3) Geneva 1975. These processes have been updated and information on MF broadcasting extended in the following ITU-R Recommendations (ITU, Broadcasting service (sound), 2021), therefore the planning in Vanuatu will take into considerations the following recommendations:

- BS.560, Radio Frequency Protection Ratios in LF, MF and HF Broadcasting;
- BS.415-2, Minimum performance specifications for low-cost sound broadcast receivers;
- BS.598, Factors influencing the limits of amplitude-modulation sound broadcasting in band 6 (MF);
- BS.703, Characteristics of AM sound broadcast reference receiver for planning purposes;
- P.368, Groundwave propagation curves for frequencies between 10 kHz and 30 MHz;
- P.832, World Atlas of Ground Conductivities (New Zealand Figure 40);
- P.1147, The prediction of sky-wave field strength at frequencies between 150 and 1,700 kHz; and
- P.1321, Propagation factors affecting systems using digital modulation techniques at LF and MF.

+678 27621
enquiries@trbr.vu
PO Box 3547, Port Vila, Vanuatu
www.trbr.vu

VHF FM Sound Broadcasting.

VHF FM Sound Broadcasting (FMBC) services are allocated spectrum in the band 87.5 to 108 MHz. The bands 88.4 to 106.63 MHz are administered under the Radio Apparatus Licensing regime, while the two bands: 87.5 to 88.4 MHz and 106.63 to 107.7 MHz bands are available only for low-power FM broadcasting under the General User Radio License.
FMBC licenses shall be based on analogue services only, with restrictions in the conditions of current long-term licenses to limit any digital use.

The planning of FMBC services in Vanuatu should be based on the processes detailed in the following ITU-R Recommendations (ITU, Broadcasting service (sound), 2021):

- BS.412 Planning standards for terrestrial FM sound broadcasting;
- BS.415 Minimum performance standards for low-cost sound broadcasting receivers;
- BS.450 Transmission standards for FM sound broadcasting at VHF;
- BS.642 Limiters for High-Quality Sound Programme Signals;
- BS.643 Radio data system for automatic tuning and other applications in FM radio receivers for use with the pilot tone system;
- BS.704 Characteristics of FM Sound Broadcasting Reference receivers for Planning Purposes;

The proposed guideline to be developed for both MF-AM and FMBC aims to provide a significant planning parameter that will outline the following:

- New band plans with a channel separation as specified in the ITU Recommendations;
- Determine the maximum permitted interfering signal level requirements that are based on ITU Recommendations; and
- Develop a guideline that takes into consideration the landscape of Vanuatu and likewise the signal levels for operations in urban and rural areas.

+678 27621
enquiries@trbr.vu
PO Box 3547, Port Vila, Vanuatu
www.trbr.vu

Technical Guideline for Video Broadcasting

The market for video broadcasting specifically digital and analog television is not big in Vanuatu, so there are not many issues that are being faced in these specific areas. However, having two different standards of digital television currently operating in Vanuatu i.e., the Chinese and the European standards, present a need for development of a technical planning guideline to accommodate these standards.

Analogue Broadcasting

Although terrestrial broadcasting is on the threshold of a revolutionary transition to digital broadcasting worldwide, Vanuatu currently has a few analogue television broadcasters. The frequency band I, III, IV and V are plan for Analogue Television and is used with 6 MHz for NTSC, PAL-M is 7 MHz and 8 MHz for PAL-B/G.

However, there are no approved plan, the planning criteria for analogue television in Vanuatu should be based on the following standards (ITU, Broadcasting service (television), 2021):

- BT. 417-4: Minimum field strengths for which protection may be sought in planning a television service;
- BT. 655-6: Radiofrequency protection ratios for AM VSB terrestrial television interfered with by unwanted analogue vision signals and their associated sound signals;
- BT.419-3: Directivity and polarisation discrimination of antennas in the reception of television broadcasting;
- BT.804: Characteristics of TV receivers essential for frequency planning with PAL/SECAM/NTSC television systems;
- BT. 1123: Planning methods for 625 - line terrestrial television in VHF/UHF bands; and
- BT. 805: Assessment of impairment caused to television reception by a wind turbine.

Digital Broadcasting

The frequency band 510 to 686 MHz is allocated for Digital Terrestrial Television (DTT) licensing and is planned for use with an 8 MHz channel bandwidth.

The planning criteria for digital television in Vanuatu should be based on the following standards (ITU, Broadcasting service (television), 2021) (ETSI, 2021):

- Digital Video Broadcasting – Terrestrial DVB-T conforming to ETSI standard ETS 300 744;
- Digital Video Broadcasting – Terrestrial DVB-T2 conforming to ETSI standard EN 302 755;
- Recommendation ITU-R BT.1206-1 Spectrum shaping limits for digital terrestrial television broadcasting; and
- Recommendation ITU-R BT.1368-11 Planning criteria for digital terrestrial television services in the VHF/UHF bands.

+678 27621
enquiries@trbr.vu
PO Box 3547, Port Vila, Vanuatu
www.trbr.vu

The proposed guideline aims to provide a significant planning parameter for digital broadcasting services in Vanuatu, that will outline the following:

- New band plans with a channel separation as specified in the ITU Recommendations;
- Determine the maximum permitted interfering signal level requirements that are based on ITU Recommendations;
- Minimum field strength determination; and
- Considerations of the different digital TV standards like DVB-Y, DVB-T2 and DTMB.

Conclusion

In 2018 the TRR Act was amended to the TRBR Act with the Addition of Broadcasting Regulatory role, so that TRBR could also regulate the broadcasting industry, in addition to the radio apparatus licensing for the use of the radio spectrum which TRBR has been already managing. The TRBR has witnessed in the past years notable growth in the broadcasting industry which comes with it, issues of interference and poor coverage/signal. Therefore, the TRBR believes that it is timely to introduce a technical guideline to set standards for broadcasters to comply to, thus providing a reliable service and one that does not cause issues with the existing telecommunications and broadcasting industry.

Recommendations

The TRBR shall develop a broadcasting technical guideline that:

- Comply with International Radio Standards/Regulations;
- Propose a frequency planning for AM, FM, Digital TV and Analogue TV;
- Take into considerations the different digital Television standards;
- Set signal standards that protects broadcasting services and other services from interference issues;
- Set signal standards that consider the landscape of Vanuatu and by considering the signal level at urban and the rural areas of Vanuatu;
- Introduce conditions that requires broadcasters to provide predicated coverage on a quarterly basis; and
- Introduce conditions that requires broadcasters to provide a coverage map on areas which have coverage.

+678 27621
enquiries@trbr.vu
PO Box 3547, Port Vila, Vanuatu
www.trbr.vu

Bibliography

ETSI. (2021, July 1). *Broadcast*. Retrieved from ETSI: https://www.etsi.org/committee/broadcast

ITU. (2021, June 25). *Broadcasting service (sound)*. Retrieved from ITU: https://www.itu.int/rec/R-REC-BS/en

ITU. (2021, June 23). *Broadcasting service (television)*. Retrieved from ITU: https://www.itu.int/rec/R-REC-BT/en

TRBR. (2009, January 11). *ACT.* Retrieved from Telecommunications Radiocommunications and Broadcasting Regulator : https://www.trbr.vu/attachments/article/195/Telecommunications_and_Radiocommunications_Regulation_Act_2009.pdf

TRBR. (2021, January 1). *TRBR 2021 and Onwards work plan.* Retrieved from Telecommunications Radiocommunications and Broadcasting Regulator : https://www.trbr.vu/attachments/article/825/trbr_2021_and_onwards_external_work_plan_final.pdf

+678 27621
enquiries@trbr.vu
PO Box 3547, Port Vila, Vanuatu
www.trbr.vu