INTERNATIONAL TELECOMMUNICATION UNION

Radiocommunication Bureau
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Circular Letter   4 April 2011
   CCRR/43

To Administrations of Member States of ITU

Subject: Draft Rules of Procedure

To the Director-General

Dear Sir/Madam,

Please find enclosed proposals for the addition and modification of some Rules of Procedure (Edition of 2009) related to the Regional Agreement concerning the use by the broadcasting service of frequencies in the medium frequency bands in Regions 1 and 3 and in the low frequency bands in Region 1 (Geneva 1975).

In accordance with No. **13.17** of the Radio Regulations, these proposals are made available to administrations for comment before being submitted to the RRB pursuant to No. **13.14**. As indicated in No. **13.12A** *d)* of the Radio Regulations, any comments that you may wish to submit should reach the Bureau not later than **16 May 2011**, in order to be considered at the 57th meeting of the RRB, scheduled for 13-21 June 2011. All e-mail comments should be sent to: brmail@itu.int.

Yours faithfully,

François RANCY
Director, Radiocommunication Bureau

Annex: 1

Annex 1

PART A3

Rules concerning the Regional Agreement concerning the use by the broadcasting service of frequencies in the medium frequency bands in Regions 1 and 3 and in the low frequency bands in Region 1 (Geneva, 1975) (GE75)

Art. 4

Procedure for modification to the Plan

An. 2

Technical data used in the preparation of the Plan and to be used in the application of the Agreement

CHAPTER 1

Definitions

Low-power channel (LPC)

Channel used by medium frequency broadcasting stations employing a maximum e.m.r.p. of 1 kW (c.m.f. of 300 V) for analogue modulation and 0.22 kW (c.m.f. of 140 V) for digital modulation.

Reasons: to take into account the maximum allowed e.m.r.p. for frequency assignments using digital modulation that would result in the same coordination distance as frequency assignments using analogue modulation.

4.1

4.1   NOC

4.2   NOC

4.3   NOC

MOD

4.4   *Protection ratios:* In applying the Agreement, the values of the co-channel and adjacent channel protection ratios given below should be used unless otherwise agreed between the administrations concerned. In the case of fluctuating wanted or unwanted signals, the values of the protection ratio apply for at least 50% of the nights of the year at midnight.

However, Resolution 8 of the Regional Administrative Conference (Regions 1 and 3) for drawing up frequency assignment plans for LF and MF broadcasting (Geneva, 1975) states:

"1.   that broadcasting stations may provisionally use bandwidth saving modulation methods on condition that interference in the same or adjacent channels concerned does not exceed the interference resulting from the application of double sideband modulation with full carrier (A3E);

2.   that any administration which envisages using these methods of emission shall seek the agreement of all affected administrations by following the procedure specified in Article 4 of the Agreement.".

After consideration of the relevant ITU-R studies, the Board decided that frequency assignment for AM broadcasting in the Plan may ~~provisionally~~ be ~~used~~ notified to be recorded in the Master Register (MIFR) with digital modulation (transmission types DRM[1] A2 or B2), provided the radiation is reduced by at least 7 dB in all directions, compared to the radiation of the AM modulated frequency assignment in the Plan.

The power of the transmitter to be notified in case of digital modulation shall be the total power within the necessary bandwidth.

The Board further decided that in the application of Article 4 of the Agreement the protection ratios between analogue and digital assignments (transmission types DRM A2 and B2) and digital and digital assignments in Part B Section B7 shall be used.

~~In the examination of the probability of interference from notices related to assignments using digital modulation, the Bureau shall use a co-channel protection ratio increased by 7 dB, and an adjacent channel protection ratio increased by 1 dB compared to the one applicable to the interfered transmitter.~~

~~When the proposed assignment using digital modulation is recorded into the Plan following the application of Article 4, it shall bear a symbol indicating that the recording is provisional. The reference situation shall be determined as if it were an AM transmission using an audio-frequency modulating signal of 4.5 kHz and a high degree of compression.~~

Reasons: It is proposed that the provisional nature of the implementation of a frequency assignment using analogue modulation in the Plan by a frequency assignment using digital modulation in the Master Register of Frequencies be reconsidered and submitted for approval by a next competent conference.

The modification concerning the protection ratios takes into account the specific protection criteria for the relevant cases as provided in ITU-R Recommendation BS.1615 which has been modified to provide this information subsequent to the approval of this Rule of Procedure.

The suppression of the provisional status in the Plan of frequency assignments using digital modulation would ensure that the modification of frequency assignments using analogue modulation to digital modulation would retain the same status and rights as the original assignment recorded in the Plan.

4.5

MOD

4.5   *Minimum Value of Field Strength*

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[1] The DRM system is described in Recommendation ITU-R BS.1514.

4.5.1   The following minimum values of field strength necessary to overcome natural noise (at 1 MHz) for frequency assignments using analogue modulation in the three zones A, B and C have been adopted:

Zone A: + 60 dB/1µVm

Zone B: + 70 dB/1µVm

Zone C: + 63 dB/1µVm

For frequency assignments using digital modulation the minimum usable field-strength values in Part B Section B7 shall be used.

Reasons: to take into account the minimum usable field-strength values to be protected for assignments using digital modulation.

4.8.3

MOD

4.8.3   In the application of Article 4 (paragraph 3.3.1) of the Agreement, the table reproduced below will be used:

c.m.f. (V)		e.m.r.p. (kW)		Limiting distance (km)
Analogue modulation	**Digital modulation**	**Analogue modulation**	**Digital modulation**	
300	140	1.0	0.22	600
260	116	0.75	0.15	500
212	95	0.5	0.1	400
150	67	0.25	0.05	200, 300*
95	–	0.1	–	70, 250*
67	–	0.05	–	50, 200*

*   Values for a propagation path over sea.

NOTE – Corresponding coordination distances for frequency assignments using digital modulation was obtained by reducing the e.m.r.p. by 6.6 dB, which presents the worst-case increase in protection ratios for the case of assignments using digital modulation interfering with assignments using analogue modulation compared with the cases of assignments using analogue modulation interfering mutually.

Reasons: to take into account the equivalent maximum e.m.r.p. values for assignments using digital modulation that would result in the same coordination distances of assignments using analogue modulation.

PART B

SECTION B7

Rules concerning the protection ratio values and minimum field-strength values to be used in the case of digital modulation transmission systems when applying the provisions of Article 4 of the GE75 Regional Agreement

1   Introduction

This section provides the protection ratios and the minimum usable field-strength values for the various interference cases where digital modulation transmission systems are used. The values of the protection ratios were obtained from Recommendation ITU-R BS.1615. Only the cases involving digital modulation systems using robustness modes A2 and B2 are considered.

2   RF protection ratios

Table 2.1 provides the relative protection ratios for the case of AM transmission systems interfered with by systems using digital modulation. It should be noted that these values are for analogue systems using a high degree of AM compression. These values should be used to adjust protection ratio values provided in §§ 4.4.1 and 4.4.2.1 of Chapter 4 of Annex 2 of the GE75 Agreement for the co-channel case and adjacent channel cases according to the different degrees of AM compression (Cases A to D).

TABLE 2.1

Relative RF protection ratios between broadcasting systems below 30 MHz (dB)
AM interfered with by digital

Wanted signal	Unwanted signal	Frequency separation, $f_{unwanted} - f_{wanted}$ (kHz)													Parameters	
															B_{DRM} (kHz)	A_{AF} [1],[2] (dB)
		−20	−18	−15	−10	−9	−5	0	5	9	10	15	18	20		
AM	DRM_A2	−48.9	−47	−43.6	−34.5	−29.8	3.4	6.6	3.4	−29.8	−34.5	−43.6	−47	−48.9	9	−
AM	DRM_B2	−48.8	−46.9	−43.5	−34.4	−29.7	3.4	6.5	3.4	−29.7	−34.4	−43.5	−46.9	−48.8	9	−

Tables 2.2 and 2.3 provide the relative RF protection ratios for cases of digital modulation transmission systems interfered with by AM transmission systems or by digital modulation transmission systems. These tables have been prepared for systems using robustness modes A2 and B2, 64-QAM and protection level No. 1. In order to obtain the applicable RF protection ratio for a specific case, the relevant S/I value from Tables 2.2 and 2.3 should be added to the relative protection ratio along with the relevant S/I correction value from Table 2.4 in order to make provision for systems using a different modulation and protection level.

TABLE 2.2

Relative RF protection ratios between broadcasting systems below 30 MHz (dB)
Digital (64-QAM, protection level No. 1) interfered with by AM

Wanted signal	Unwanted signal	Frequency separation, $f_{unwanted} - f_{wanted}$ (kHz)													Parameters	
															B_{DRM} (kHz)	S/I (dB)
		−20	−18	−15	−10	−9	−5	0	5	9	10	15	18	20		
DRM_A2	AM	−54.7	−52.4	−48.8	−42.9	−34	−6.5	0	−6.5	−34	−42.9	−48.8	−52.4	−54.7	9	6.7
DRM_B2	AM	−54.6	−52.4	−48.8	−42.8	−33.7	−6.4	0	−6.4	−33.7	−42.8	−48.8	−52.4	−54.6	9	7.3

TABLE 2.3

Relative RF protection ratios between broadcasting systems below 30 MHz (dB)
Digital (64-QAM, protection level No. 1) interfered with by digital (identical
robustness modes and spectrum occupancy types)

Wanted signal	Unwanted signal	Frequency separation, $f_{unwanted} - f_{wanted}$ (kHz)													Parameters	
		−20	**−18**	**−15**	**−10**	**−9**	**−5**	**0**	**5**	**9**	**10**	**15**	**18**	**20**	B_{DRM} (kHz)	S/I (dB)
DRM_A2	DRM_A2	−55.1	−53.1	−49.6	−40.8	−38.3	−3.8	0	−3.8	−38.3	−40.8	−49.6	−53.1	−55.1	9	15.3
DRM_B2	DRM_B2	−55.1	−53.1	−49.5	−40.7	−38.1	−3.7	0	−3.7	−38.1	−40.7	−49.5	−53.1	−55.1	9	15.9

TABLE 2.4

S/I correction values to be used in Tables 2.2 and 2.3 for other
combinations of modulation scheme and protection level No.

Modulation scheme	Protection level No.	Average code rate	Correction values (dB) for DRM robustness mode/spectrum occupancy type	
			A2 (9 kHz)	**B2 (9 kHz)**
16-QAM	0	0.5	−6.7	−6.6
	1	0.62	−4.6	−4.6
64-QAM	0	0.5	−1.2	−1.2
	1	0.6	0.0	0.0
	2	0.71	1.8	1.8
	3	0.78	3.4	3.4

3   **Minimum usable field-strength values**

Table 3.1 provides the minimum usable field-strength values to achieve a BER of 1×10^{-4} for DRM robustness modes A2 and B2 and different modulation schemes and protection levels for the cases of ground wave and ground wave in the presence of sky wave.

TABLE 3.1

Minimum usable field strength (dB(μV/m)) to achieve a BER of 1×10^{-4} for DRM robustness modes A2 and B2 and different modulation schemes and protection levels for the case of ground-wave propagation and ground wave in the presence of sky-wave propagation

Modulation scheme	Protection level No.	Average code rate	Minimum usable field strength (dB(μV/m))			
			Ground wave		Ground wave and sky wave	
			A2 (9 kHz)	B2 (9 kHz)	A2 (9 kHz)	B2 (9 kHz)
16-QAM	0	0.5	32.1	33.8	33.9	34.7
	1	0.62	35.2	35.8	36.0	37.6
64-QAM	0	0.5	38.6	39.2	39.4	40.1
	1	0.6	39.8	40.4	40.8	41.4
	2	0.71	41.6	42.2	43.7	44.2
	3	0.78	43.2	43.8	46.5	46.8

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