

QUESTION ITU-R 222/1*

Definition of the spectral properties of transmitter emissions

(2000)

The ITU Radiocommunication Assembly,

considering

- a) that the current set of definitions of the spectral properties of transmitter emissions (necessary bandwidth, occupied bandwidth, out-of-band emission, spurious emission, etc.) contained in Article 1, Section VI, of the Radio Regulations (RR) essentially came into being through the work of the World Administrative Radio Conference (Geneva, 1979);
- b) that the successful determination of limits in respect of those properties and the ability to perform the corresponding monitoring by means of measurements depend to a large extent on the correctness and clarity of all those definitions, both individually and collectively;
- c) that the efforts by Radiocommunication Study Group 1 to develop limits for out-of-band emissions and to determine the boundaries between out-of-band and spurious emissions have met with difficulties, due in particular to the shortcomings of this set of definitions of spectral properties of emissions;
- d) that the existing definitions of necessary bandwidth and occupied bandwidth (RR Nos. 1.152 and 1.153, respectively) are not clear, insofar as these bandwidths do not show up at all in the emission spectrum unless additional calculations or additional specific measurements are performed;
- e) that difficulties are also encountered when reading off out-of-band emissions, since, according to RR No. 1.144, they begin immediately at the boundaries of the necessary bandwidth, which does not appear at all in the emission spectrum;
- f) that difficulties are also encountered when reading off the boundaries between out-of-band and spurious emissions, since, following the logic of the definitions of spectral properties given in RR, in § 1.1 of Recommendation ITU-R SM.329 they are determined on a percentage basis with respect to the necessary bandwidth, which does not show up at all in the emission spectrum;
- g) that despite the existence in RR No. 1.153 of a definition of occupied bandwidth as a function of power (the 0.5% criterion or $\beta/2\%$ of the mean power of the emission), it has already been over 50 years now that not one ITU-R document has given a single specific value for relative out-of-band power $\beta/2\%$, other than 0.5%, for determining the occupied bandwidth for a given class of emission, while the acceptability of that very value, namely 0.5%, is unsubstantiated and has not been corroborated for even one specific class of emission;

* In the year 2009, Radiocommunication Study Group 1 extended the completion date of studies for this Question.

h) that throughout this period of over 50 years, virtually no use has been made of occupied bandwidth, as defined in RR No. 1.153, either in the frequency assignment notification and registration process (the necessary bandwidth is notified and registered both directly and through the assigned frequency band) or in the monitoring process (the B_{26} bandwidth is monitored at -26 dB), all of which throws doubt on the practical usefulness of occupied bandwidth as currently defined,

decides that the following Question should be studied

1 What changes could be made to the definitions of spectral properties of emissions set out in Article 1, Section VI, of the RR in order to make those definitions, both individually and collectively, clearer and easy to regulate and monitor through measurements to enhance the efficient use of spectrum, and in particular:

1.1 How could the concept of occupied bandwidth be effectively used in the specification of out-of-band emissions?

1.2 What would be the advantages of moving from the existing power criterion in the definition of occupied bandwidth given in RR No. 1.153 (B_{β}) to the level criterion (B_x) as used in the definition of x dB bandwidth in § 1.14 of Recommendation ITU-R SM.328, and what level value(s) of x dB can be recommended for application?

further decides

1 that the results of the above studies should be included in (a) Recommendation(s);

2 that the above studies should be completed by 2012.

Category: S1