RECOMMENDATION ITU-R SA.1274*

CRITERIA FOR DATA RELAY SATELLITE NETWORKS TO FACILITATE SHARING WITH SYSTEMS IN THE FIXED SERVICE IN THE BANDS 2 025-2 110 MHz AND 2 200-2 290 MHz

(Questions ITU-R 118/7 and ITU-R 113/9)

(1997)

The ITU Radiocommunication Assembly,

considering

a) that systems in the space research, space operation and Earth exploration-satellite services (EESS) and the fixed service (FS) share the bands 2 025-2 110 MHz and 2 200-2 290 MHz;

b) that the space research, space operation and EESS operate space-to-space radiocommunication links in the bands 2 025-2 110 MHz and 2 200-2 290 MHz between geostationary data relay and low-Earth orbiting satellites (see Recommendation ITU-R SA.1018);

c) that these space-to-space links are designed to operate with margins on the order of 2 to 4 dB;

d) that the protection criteria for space stations in a data relay satellite (DRS) network are given in Recommendation ITU-R SA.1155;

e) that these space-to-space links are susceptible to interference from the emissions from FS systems within a field-of-view that is of large geographical extent;

f) that many systems in the FS are operational or planned for operation in the bands 2 025-2 110 MHz and 2 200-2 290 MHz bands;

g) that the number of FS systems in these bands may increase to an extent that practical sharing criteria that are less stringent than the protection criteria given in Recommendation ITU-R SA.1155 may need to be used,

recommends

1 that an aggregate interference power density level of –147 dB(W/MHz) from all sources should not be exceeded for more than 0.1% of the month at the input to the receiver of a spacecraft in either low-Earth or geostationary orbit (see Annex 1).

ANNEX 1

Considerations in the development of the sharing criteria

According to Recommendation ITU-R SA.1155 that specifies protection criteria for DRS systems. For the 2 GHz bands, an interference power density level of –181 dB(W/kHz) should not be exceeded for 0.1% of the time per orbital period in order to meet an interference-to-noise, *I*/*N*, power ratio of –10 dB, corresponding to a link margin degradation of 0.4 dB.

* This Recommendation was jointly developed by Radiocommunication Study Groups 7 and 9, and future revisions should be undertaken jointly.

To ensure a compatible sharing environment over the long term in these bands, preferred fixed service characteristics are given in Recommendation ITU-R F.1247. In addition, the protection criteria given in Recommendation ITU-R SA.1155 have been relaxed by 4 dB for these bands. This corresponds to an, *I*/*N*, of – 6 dB and a link margin degradation of 1 dB. The resulting permissible interference power density level is –177 dB(W/kHz) not to be exceeded for more than 0.1% of the time. An increase of this time percentage has been found not acceptable, however, the reference time period has been agreed to be one month rather than one orbital period thus allowing longer periods of interference in a particular orbit.

Traditionally, a reference bandwidth of 4 kHz has been used to protect analogue systems. For the most part, digital FS systems are being implemented and will represent the majority of FS systems in the long term. It is therefore appropriate to specify the power density in a 1 MHz reference bandwidth. On the assumption that the power spectral density is uniform over the 1 MHz reference bandwidth, the corresponding interference power density criterion is –147 dB(W/MHz).