RECOMMENDATION ITU-R SA.1159-2

PERFORMANCE CRITERIA FOR DATA DISSEMINATION AND DIRECT DATA READOUT SYSTEMS IN THE EARTH EXPLORATION-SATELLITE SERVICE AND METEOROLOGICAL-SATELLITE SERVICE USING SATELLITES IN GEOSTATIONARY ORBIT

(Question ITU-R 141/7)

(1995-1997-1999)

The ITU Radiocommunication Assembly,

considering

a) that the hypothetical reference system specified in Recommendation ITU-R SA.1020 defines links for data dissemination and direct data readout;

b) that performance objectives for these transmissions must be consistent with the attendant functional requirements and with the performance limitations associated with the systems and frequency bands in which the requirements will be fulfilled;

c) that performance objectives for representative systems operating in the Earth exploration-satellite service (EESS) and meteorological-satellite (MetSat) service are intended to provide guidelines for the development of actual systems;

d) that performance objectives may be determined using the methodology described in Recommendation ITU-R SA.1021;

e) that the performance objectives are a prerequisite for the determination of interference criteria,

recommends

1 that links associated with data dissemination and direct data readout from geostationary satellites in the EESS and MetSat service have the performance objectives specified in Table 1.

TABLE 1

Performance objectives for links in the EESS and MetSat service using geostationary orbits

Frequency band (MHz)	Satellite service	Modulation	Applicable elevation angle (degrees)	Minimum BER/*C*/*N*	Required time availability (%)	Function and type of earth station
1 670-1 710	Meteorological	QPSK	≥ 3	1×10^{-6}	99.9	Direct data readout, tracking antenna
		FM	≥ 3	10 dB	99.9	Data dissemination, tracking antenna
		BPSK	≥ 3	1×10^{-6}	99.9	Data dissemination, tracking antenna
7 450-7 550	Meteorological	Digital	≥ 5	1×10^{-6}	99.9	Direct data readout
25 500-27 000	Earth exploration	Digital	≥ 5	1×10^{-7}	99.9	Direct data readout

NOTE 1 – Performance objectives for specific systems may differ from the objectives presented in this Recommendation; however, the objectives defined herein are used as a basis for deriving permissible levels of interference that are the minimum interference thresholds to be accepted by specific systems.

NOTE 2 – Additional performance objectives could be specified for an availability of 99.99% of the time in relation to the need to synchronize the receiver to the data transmission frames and to avoid bit slips within a frame. However, for the purpose of deriving interference criteria, these objectives can be assumed to be met if the objectives associated with the above availability levels are met.

NOTE 3 – In all cases in the table, it is assumed that earth station sites are selected to yield average levels of environmental radio-frequency noise within the band. For direct data readout stations, which may be deployed in large numbers by various operating entities, there is a risk that randomly selected sites will exhibit higher than average levels of environmental noise (especially man-made noise) that may hamper the ability to achieve the stated performance objectives. However, the variance of this noise over all locations is not large in relation to receiver thermal noise, such that the performance objectives can generally be met at over 95% of the possible locations given link power margins of a few decibels.