RECOMMENDATION ITU-R SF.1484-1*

Maximum allowable values of power flux-density at the surface of the Earth produced by non-geostationary satellites in the fixed-satellite service operating in the 37.5-42.5 GHz band to protect the fixed service

(Questions ITU-R 217/9 and ITU-R 250/4)

(2000-2002)

The ITU Radiocommunication Assembly,

considering

a)   that the band 37.5-42.5 GHz is allocated to the fixed service (FS) and the fixed-satellite service (FSS) (space-to-Earth) on a co-primary basis;

b)   that the World Radiocommunication Conference (Istanbul, 2000) (WRC-2000), on a provisional basis as described in No. 21.16.11 of the Radio Regulations (RR) the revised the power flux-density (pfd) limits for non-geostationary (non-GSO) FSS satellites in the range 37.5-40 GHz and established pfd limits for non-GSO FSS satellites in the range 40.5-42.5 GHz;

c)   that it is necessary to ensure that emissions from satellites do not cause unacceptable interference to FS systems in the band 37.5-42.5 GHz;

d)   that FS systems can be adequately protected from the aggregate emissions from multiple satellites by placing suitable limits on the pfd in a reference bandwidth produced by individual satellites at the surface of the Earth;

e)   that any limitations of the pfd produced at the surface of the Earth should not place undue restrictions on the design of non-GSO FSS systems;

f)   that any limitations of the pfd produced at the surface of the Earth should ensure a proper balance in terms of the impact on both the FS and space services sharing the same band;

g)   that within the band 39.5-42 GHz, some administrations plan to deploy FSS systems using ubiquitous very small aperture terminals;

h)   that Resolution 84 (WRC-2000) invited ITU-R to conduct as a matter of urgency and in time for WRC-03, studies to determine whether the pfd limits included in RR Table 21-4 adequately protect the fixed service in the bands 37.5-40 GHz and 42-42.5 GHz from FSS and mobile-satellite service (MSS) space-to-Earth transmissions;

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* This Recommendation should be brought to the attention of Radiocommunication Study Groups 4 (Working Party (WP) 4A), 6 (WP 6S), 7 (WP 7E), 8 (WP 8D) and 9 (WP 9A, WP 9B and WP 9D).

j)   that Resolution 84 (WRC-2000) also invited ITU-R to conduct as a matter of urgency and in time for WRC-03, studies to determine whether the pfd limits in RR Table 21-4 adequately protect the fixed service in the band 40.5-42 GHz from FSS space-to-Earth transmissions, taking into account the requirements of the FSS and *considering* g) above;

k)   that some FS systems employing small net fade margins may not be fully protected from interference from FSS systems without unduly constraining those systems;

l)   that several non-GSO satellite systems have been advance published in the 37.5-40.5 GHz and 40.5-42.5 GHz bands, and that the largest number of spacecraft in any one of the published non-GSO satellite systems is 99 spacecraft,

noting

a)   that RR No. 5.551AA provides that in the bands 37.5-40 GHz and 42-42.5 GHz, non-GSO satellite systems in the FSS should employ power control or other methods of downlink fade compensation of the order of 10 dB, such that the satellite transmissions are at power levels required to meet their desired link performance while reducing the level of interference to the fixed service;

b)   that non-GSO satellite systems for which RR No. 5.551AA applies, would operate in clear-sky conditions at pfd levels below the maximum allowable pfd,

recommends

1   that in the band 37.5-42.5 GHz, the maximum allowable pfd at the surface of the Earth from any one non-GSO satellite should not exceed, in any 1 MHz band:

1.1   for the bands 37.5-40 GHz and 42-42.5 GHz:

-120	$dB(W/m^2)$	for $0° \leq \theta \leq 5°$
$-120 + 0.75(\theta - 5)$	$dB(W/m^2)$	for $5° < \theta \leq 25°$
-105	$dB(W/m^2)$	for $25° < \theta \leq 90°$

where θ is the angle of arrival (degrees above the horizontal);

1.2   for the band 40-42 GHz:

-115	$dB(W/m^2)$	for $0° \leq \theta \leq 5°$
$-115 + 0.5(\theta - 5)$	$dB(W/m^2)$	for $5° < \theta \leq 25°$
-105	$dB(W/m^2)$	for $25° < \theta \leq 90°$

where θ is the angle of arrival (degrees above the horizontal);

2   that the aforementioned limits relate to the pfd which would be obtained under assumed free-space propagation conditions;

3   that further study be conducted before the values in *recommends* 1 may be applied to any non-GSO FSS system with a larger number of spacecraft than the number identified in *considering* l).

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