

RECOMMENDATION ITU-R F.1405^{*,**}**Guidance to facilitate coordination and use of frequency bands shared between the fixed service and mobile-satellite service in the frequency range 1-3 GHz**

(Questions ITU-R 201/8 and ITU-R 118/9)

(1999)

The ITU Radiocommunication Assembly,

considering

- a) that the fixed service (FS) is allocated in various portions of the 1-3 GHz frequency range and continues to be extensively used by many administrations in these bands;
- b) that recent world radiocommunication conferences have made new allocations to the mobile-satellite service (MSS), including provisions for satellites in non-geostationary-satellite orbit (non-GSO);
- c) that most of the new allocations for the MSS in the 1-3 GHz range have been established in frequency bands that were already allocated to the FS;
- d) that numerous ITU-R Recommendations have been developed and adopted by Radiocommunication Study Groups 8 and 9 regarding various aspects of frequency sharing between the FS and MSS, and that an analytical index which identifies and categorizes these Recommendations will facilitate their application;
- e) that in accordance with Article 9/Resolution 46 (Rev.WRC-97) and Appendix 7 of the Radio Regulations (RR), a coordination area is determined to identify FS stations which could affect or be affected by the operation of mobile earth stations, and analyses, if required, may be needed in the course of coordination to further define the potential for interference and identify design and operating constraints that may be needed to resolve any difficulties;
- f) that in order to prevent interference between MSS (space-to-Earth) transmissions and receiving FS stations, the RR specify thresholds of power flux-density (pfd) and fractional degradation in performance (FDP) as well as a system-specific methodology (RR Appendix 5/Resolution 46 (Rev.WRC-97)) to determine whether coordination is required, and analyses may be needed in the course of coordination to define the potential for interference and design and operating constraints that may be needed to resolve any difficulties;
- g) that RR Article 21 specifies limits on the e.i.r.p. of FS stations in bands shared between the FS and MSS (Earth-to-space), but these limits were developed for protection of systems in the fixed-satellite service (FSS) (Earth-to-space) using fixed earth stations that generally operate at e.i.r.p. levels that are substantially higher than those used by mobile earth stations,

* This Recommendation should be brought to the attention of Radiocommunication Study Group 8 (Working Party 8D).

** Radiocommunication Study Group 9 made editorial amendments to this Recommendation in 2001 in accordance with Resolution ITU-R 44.

noting

a) that in light of anticipated FS-MSS frequency sharing difficulties, Resolution 716 (Rev.WRC-2000) invited the ITU-R to develop planning tools to assist those administrations considering a replanning of their terrestrial fixed networks specially in MSS (Earth-to-space) in the frequency bands 1 980-2 010 MHz and 2 170-2 200 MHz in all three Regions, and 2 010-2 025 MHz and 2 160-2 170 MHz in Region 2, in order to facilitate the introduction of MSS systems in these bands,

recognizing

a) that the specific factors and methodologies applied in the course of coordination are subject to agreement of the parties concerned, and that the relevant ITU-R Recommendations are intended to provide impartial technical advice that may facilitate the coordination process;

b) that the technical aspects of coordination of frequency assignments for FS and MSS systems are complex and may require application of analyses using complicated computer software;

c) that the availability of ITU-R Recommendations relevant to coordination of FS and MSS frequency assignments may be particularly beneficial to developing countries in relation to protection of their FS systems, their introduction of MSS systems within their territories, and the introduction of MSS systems in neighbouring territories;

d) that administrations are submitting to the ITU Radiocommunication Bureau computer software that has been developed to facilitate bilateral coordination,

recommends

1 that the following Recommendations should be considered in the coordination of FS stations with MES stations (see Note 1):

- Recommendation ITU-R M.1469: Methodology for evaluating potential for interference from time division multiple access/frequency division multiple access (TDMA/FDMA) mobile-satellite service (MSS) (Earth-to-space) transmissions into line-of-sight fixed service receivers in the 2 GHz range.
- Recommendation ITU-R F.1245: Mathematical model of average and related radiation patterns for line-of-sight point-to-point radio-relay system antennas for use in certain coordination studies and interference assessment in the frequency range from 1 GHz to about 70 GHz.
- Recommendation ITU-R F.1336: Reference radiation patterns of omnidirectional, sectoral and other antennas in point-to-multipoint systems for use in sharing studies in the frequency range from 1 GHz to about 70 GHz;

2 that the following Recommendations should be considered in the coordination of FS systems with MSS (space-to-Earth) systems (see Note 1):

- Recommendation ITU-R M.1141: Sharing in the 1-3 GHz frequency range between non-geostationary space stations operating in the mobile-satellite service and stations in the fixed service.
- Recommendation ITU-R M.1142: Sharing in the 1-3 GHz frequency range between geostationary space stations operating in the mobile-satellite service and stations in the fixed service.
- Recommendation ITU-R M.1143: System specific methodology for coordination of non-geostationary space stations (space-to-Earth) operating in the mobile-satellite service with the fixed service.
- Recommendation ITU-R M.1319: The basis of a methodology to assess the impact of interference from a time division multiple access/frequency division multiple access (TDMA/FDMA) mobile-satellite service (MSS) satellite system operating in the 2 GHz range on the performance of line-of-sight fixed service receivers.
- Recommendation ITU-R F.1108: Determination of the criteria to protect fixed service receivers from the emissions of space stations operating in non-geostationary orbits in shared frequency bands.
- Recommendation ITU-R F.699: Reference radiation patterns for line-of-sight radio-relay system antennas for use in coordination studies and interference assessment in the frequency range from 1 GHz to about 70 GHz.
- Recommendation ITU-R F.1245: Mathematical model of average radiation patterns for line-of-sight point-to-point radio-relay system antennas for use in certain coordination studies and interference assessment in the frequency range from 1 GHz to about 70 GHz.
- Recommendation ITU-R F.1336: Reference radiation patterns of omnidirectional, sectoral and other antennas in point-to-multipoint systems for use in sharing studies in the frequency range from 1 GHz to about 70 GHz.
- Recommendation ITU-R M.1472: Methodology to evaluate the impact of interference from time division multiple access/frequency division multiple access (TDMA/FDMA) mobile-satellite service (MSS) systems operating in the 2 GHz range on baseband performance in frequency division multiplexing-frequency modulation (FDM-FM) analogue line-of-sight (LOS) fixed service receivers.

- Recommendation ITU-R M.1473: Methodology to evaluate the impact of interference from time division multiple access/frequency division multiple access (TDMA/FDMA) mobile-satellite service (MSS) systems operating in the 2 GHz range on video baseband performance in TV-FM analogue line-of-sight fixed service receivers.
- Recommendation ITU-R M.1474: Methodology to evaluate the impact of interference from time division multiple access/frequency division multiple access (TDMA/FDMA) mobile-satellite service (MSS) systems operating in the 2 GHz range on baseband performance in digital line-of-sight fixed service receivers based on statistics of radio-frequency interference;

3 that the following Recommendations should be considered in assessments of the potential for interference from FS transmitters to MSS space station receivers (see Note 1):

- Recommendation ITU-R M.1141: Sharing in the 1-3 GHz frequency range between non-geostationary space stations operating in the mobile-satellite service and stations in the fixed service.
- Recommendation ITU-R M.1142: Sharing in the 1-3 GHz frequency range between geostationary space stations operating in the mobile-satellite service and stations in the fixed service;

4 that the technical guidance and planning tool provided in Recommendation ITU-R F.1335 should be considered when planning the transition of FS systems from the bands 1980-2010 MHz and 2170-2200 MHz in all three Regions, and 2010-2025 MHz and 2160-2170 MHz in Region 2.

NOTE 1 – Radiocommunication Study Groups 8 and 9 should expand this list, as appropriate, and should consider establishing a finer categorization of the Recommendations included in the list.
