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WRC-2003 Advisory Committee
IWG-2
Draft USA Proposal on WRC-03 Agenda Item 1.6

Agenda Item 1.6: to consider regulatory measures to protect feeder links (Earth-to-space) for the mobile satellite service which operate in the band 5150-5250 MHz, taking into account the latest ITU-R Recommendations (for example, Recommendations ITU-R S.1426, ITU-R S.1427 and ITU- R M.1454);

Background: The proliferation of transmitters in the Fixed and Mobile Services providing applications such as Radio Local Area Networks (RLANs) and other license exempt applications could cause interference to the feeder uplinks of non-GSO Mobile Satellite Service systems, operating in the Fixed Satellite Service. Regulatory measures must be considered to protect these links from interference.

The band 5150-5250 MHz is allocated on a primary basis to the FSS and its use is limited to non-GSO MSS feeder links by footnote S5.447A. This band is also allocated by footnote S5.447 to the mobile service (MS) on a co-primary basis in 27 countries in Regions 1 and 3 subject to S9.21. Administrations are currently considering the introduction of Fixed and Mobile Services in the band 5150-5250 MHz on a national and unlicensed, uncoordinated basis (see Recommendation ITU-R M.1454).

At WRC-2000, Resolution 1156 called for studies by the ITU-R leading to technical and operational recommendations to facilitate sharing between existing services and Fixed and Mobile Services, including RLANs in the bands 5150-5350 MHz and 5470-5725 MHz. It is anticipated that these studies will provide assurance that allocation to Fixed and Mobile Services, in these bands, can co-exist with incumbent non-GSO MSS feeder links and Aeronautical Radionavigation Service systems.

During the 1998-2000 study period, considerable time and effort was spent on the development of three ITU-R Recommendations addressing this topic.

JRG 8A-9B developed Recommendation ITU-R M.1454 entitled "EIRP Density Limit and Operational Restrictions for RLANs or Other Wireless Access Transmitters in order to Ensure the Protection of Feeder Links of Non-Geostationary Systems in the Mobile Satellite Service in the Frequency Band 5150-5250 MHz." This Recommendation calls for implementers of wireless access systems to limit the EIRP density of such transmitters to 10mW in any 1 MHz, operate these transmitters only indoors and ensure that the aggregate emissions of these transmitters do not exceed the power flux density limit given in Recommendation ITU-R S.1426.

Working Party 4A also considered the protection of MSS Feeder Links from wireless access system emissions and created two Recommendations in response to these studies. Recommendation ITU-R S.1426, entitled "Aggregate Power Flux Density Limits at the FSS Satellite Orbit for Radio Local Area Network (RLAN) Transmitters Operating in the 5150-5250 MHz Band Sharing Frequencies with the FSS (RR No. S5.447A)" imposes an aggregate power flux density limit on Fixed and Mobile Services equal to:

$$-124 - 20 \log10 (h_{sat} /1414) \text{ dB}(W/(m^2 \cdot 1 \text{ MHz}))$$

where h_{sat} is the altitude of the spacecraft in kilometers. This limit is for the protection of FSS satellites using full earth coverage receive antenna beams.

Further, WP 4A created Recommendation ITU-R S.1427, entitled "Methodology and Criterion to Assess Interference from Radio Local Area Network (RLAN) Transmitters to Non-GSO MSS Feeder Links in the Band 5150-5250 MHz." This Recommendation specified that interference from RLAN transmitters should be assessed on the basis of an increase in ΔT_{sat}, the satellite receiver noise temperature, and, to ensure protection, this increase should be no greater than 3%. A Note to the Recommendation indicated that the interference absorbed by the satellite system should not lead to a reduction in capacity of more than 1%.

Unconstrained deployment of Fixed and Mobile Service applications could cause unacceptable levels of interference into the feeder uplinks of the non-GSO MSS. Appreciating this fact, WRC-2000 developed agenda item 1.6 for WRC-2003, which calls for the consideration of regulatory measures to protect the FSS (Earth-to-space) allocation in the band 5150-5250 MHz from RLAN interference.

Proposal:

USA/ /1
ADD

S5.447x In order to protect the non-GSO MSS feeder links (Earth-to-space) in 5150-5250 MHz from interference caused by devices in the fixed and mobile services, the following measures shall be taken:

i) these devices shall be limited to a maximum average e.i.r.p. of 23 dBm and maximum average e.i.r.p. spectral density of 10 dBm in any 1 MHz;

ii) these devices shall be limited to indoor applications only;

iii) for signals with an occupied bandwidth less than or equal to 1 MHz, the e.i.r.p. spectral density shall not exceed $10 + 10\log_{10}(B)$ (dBm / B MHz), where B is the occupied bandwidth in MHz;

Reason: To provide reasonable regulatory measures for the protection of MSS feeder links (Earth-to-space) from interference from Mobile and Fixed Service transmitters while not unduly burdening the growth of those services.

USA/ /2
ADD

S5.447y Administrations should take into account the provisions of Recommendation ITU-R S.1426 for the protection of non-GSO MSS feeder links (Earth-to-space) in the 5150-5250 MHz band.

Reason: To provide reasonable regulatory measures for the protection of MSS feeder links (Earth-to-space) from interference from Mobile and Fixed Service transmitters while not unduly burdening the growth of those services.

USA/ /3
MOD

4 800-5 830 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
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5 150-5 250	AERONAUTICAL RADIONAVIGATION FIXED-SATELLITE SERVICE (Earth-to-space) S5.447A S5.446 S5.447 S5.447B S5.447C **ADD S5.447x** **ADD S5.447y**	
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Reason: Consequential