# UNITED STATES OF AMERICA

# DRAFT PRELIMINARY VIEWS FOR WRC-19

**AGENDA ITEM 1.3**: to consider possible upgrading of the secondary allocation to the meteorological-satellite service (space-to-Earth) to primary status and a possible primary allocation to the Earth exploration-satellite service (space-to-Earth) in the frequency band 460-470 MHz, in accordance with Resolution **766 (WRC-15)**.

**ISSUE**: This agenda item relates to consideration of possible upgrade of the secondary allocation to the meteorological-satellite service (space-to-Earth) to primary status and a possible primary allocation to the Earth exploration-satellite service (space-to-Earth) in the frequency band 460-470 MHz, in accordance with Resolution **766** **(WRC-15)**.

The ITU-R is invited to study:

* Sharing and compatibility studies of such an upgrade while protecting existing primary fixed and mobile services.
* Determine the appropriate pfd limits to place on MetSat (space-to-Earth), and EESS (space-to-Earth) systems to protect existing primary services.

**BACKGROUND**: The 460-470 MHz band is allocated on a primary basis to the fixed and mobile services. The meteorological-satellite service currently has a secondary allocation in this band. Under **No. 5.289**, “*Earth exploration-satellite service applications, other than the meteorological-satellite service, may also be used in the bands 460-470 MHz for space-to-Earth transmissions subject to not causing harmful interference to stations operating in accordance with the Table*”.

Within this band, the Argos Data Collection System (ADCS) monitors more than 21,000 active Argos platforms collecting data for over 2,000 distinct projects in 100+ countries. The administration of the Argos program is under a joint agreement between the National Oceanic and Atmospheric Administration (NOAA) and the French Space Agency, Centre National d’Etudes Spatiales (CNES). Additional partners include the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT), and the Indian Space Research Organization (ISRO).

Critical applications of the ADCS include atmospheric and ocean monitoring/research, tropical cyclone forecasting, fishery management, oil spill tracking, fishing vessel tracking, search and rescue modeling (at sea), anti-piracy alerting, import/export and hazardous materials tracking, endangered species studies, migration mapping, and wildlife tracking and management.

The meteorological-satellite (space-to-Earth) service operates on a secondary basis to the fixed and mobile services and thus it must not interfere with these services. The Resolution 766 proposal has the potential to adversely impact approximately 127,000 licensed PLMR operations if not implemented in a way that ensures protection of terrestrial operations from harmful interference. Critical applications of licensees using this spectrum include Public Safety dispatch of first responders; correctional institution communications; state and local government operation and homeland security response; critical infrastructure communications (water, sewer, power and fuel pipeline control); and hospital operations. In addition, the 460-470 MHz band is used by alarm service providers to monitor at least 400,000 homes, businesses and government facilities in the United States (at least 600,000 worldwide) to detect fires and other emergencies and alert first responders. To protect the fixed and land mobile services within the United States, a power flux density (pfd) limit of -152 dBW/m2/4kHz has been imposed on the meteorological-satellite (space-to-Earth) service.

To provide added protection to existing services in the band, globally, the next generation of ADCS transmitters must implement direct sequence spread spectrum or equivalent technology in the satellite downlink to reduce the pfd in the 460-470 MHz band to less than -152 dBW/m2/4kHz, or such other level determined necessary to protect terrestrial operations, as discussed below.

Potential upgrade of EESS allocation to primary will bring confidence to the space agencies involved in Satellite Data Collection Programs and will ease coordination with Administrations. These space programs do represent a long-term effort and require decades of investment between the time the program is officially approved and the time the various satellites are in operation, keeping in mind that usually many satellites are deployed in order to provide a continuous service. For the specific case of this band, the number of satellites expected to be in operation is limited for cost reasons, and it is unlikely that two satellites will transmit at the same time over the same geographical area.

**U.S. VIEW**: In order to protect the investment and expansion of the ADCS systems, the United States supports conducting and completing sharing and compatibility studies. These studies would determine the feasibility of upgrading the MetSat (space-to-Earth) allocation to primary status, and the addition of a primary EESS (space-to-Earth) allocation in the frequency band 460-470 MHz, while protecting the current primary allocations for fixed and land mobile services and maintaining the conditions contained in No. **5.289**.

Should studies support the upgrade of the MetSat service and/or addition of a primary allocation to the EESS, the appropriate pfd limit should be determined for MetSat (space-to-Earth) and EESS (space-to-Earth) systems to protect the existing primary services in the frequency band 460-470 MHz. Should studies conclude that a less restrictive pfd limit than that contained in Resolution **766** (WRC-15) *considering further* a) can protect incumbent services, then the pfd limit (−152 dBW/m2 /4 kHz) shall apply. To the extent that field tests and other relevant input indicate that a more restrictive pfd limit is necessary to protect terrestrial operations, such more restrictive limit must be adopted. The land mobile community has provided input to the United States agencies concerned with implementation of satellite use of the 460-470 MHz band, and the alarm industry (through The Monitoring Association) has conducted testing with those agencies to simulate the potential for interference from the proposed primary use of the band by satellites. Such input and testing indicate that for certain incumbent users, -152 dBW/m2/4kHz was not sufficient protection at angles of satellite arrival below 25º. Affected industry sources have reached consensus with the U.S. agencies that the following levels of protection are needed in order to protect terrestrial users in the band:

TABLE 1

**PFD limits to protect incumbent services from EESS and METSAT   
service operations in the 460-470 MHz band**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Frequency band** | **Service** | **Limit dB(W/(m2·4 kHz)) for angles of arrival (θ) above the horizontal plane** | | | | **Reference bandwidth** |
| **0°-3°** | **3°-15°** | **15°-25°** | **25°-90°** |
| 460-470 MHz | MetSat, EESS | 2/3 θ -158 | -156 | 0.4 θ-162 | -152 | 4 kHz |

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