



WRC-2012: Issues of Relevance to Space Services

S. SAYEENATHAN
Associate Director (Frequency Management)
ISRO HQ, Bangalore.

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WRC-12 Agenda Items related to Satellite services

- AI 1.7 :** meet requirements for AMS(R)S, while retaining the generic MSS allocation at 1525-1559 and 1626.5-1660.5 MHz

- AI 1.13 :** studies on spectrum usage of the 21.4-22 GHz band for the BSS and the associated feeder-link bands in Regions 1 and 3

- AI 1.18 :** extending existing primary and secondary RDSS (space-to-Earth) allocations at 2483.5-2500 MHz to make a global primary allocation

- AI 1.25 :** consider possible additional allocations to the MSS with particular focus on the bands between 4 GHz and 16 GHz

- AI 7:** Consider possible improvements to API, coordination, notification and recording procedures for satellite networks - Res. 86

WRC-12 Agenda Items Related to Science Services

- AI 1.6:** update spectrum use by passive services in 275-3000GHz, and possible procedures for free-space optical-links
- AI 1.11:** consider a primary allocation to the SRS (Earth-to-space) within the band 22.55-23.15 GHz
- AI 1.12:** protect primary services in the band 37-38 GHz from interference resulting from aeronautical mobile service operations
- AI 1.16:** needs of passive systems for lightning detection in MetAids, including possibility of allocation in range below 20 kHz
- AI 1.24:** consider extension to band 7850-7900 MHz of existing MetSat allocation at 7750-7850 MHz, for NGSO satellite. (space-to-Earth)

AI 1.7 : Requirements for AMS(R)S while Retaining the Generic MSS Allocation at 1525-1559 and 1626.5-1660.5 MHz

- Allocations for Mobile Satellite service in this band was made generic in 1997 to cater to the requirements of MSS in Maritime, Land and Aeronautical environments more efficiently.
- There are Radio Regulatory provisions to ensure the spectrum requirements of AMSS (R) for safety related communications are met in a prioritised manner.
- However there are views that , over the years these requirements are not addressed adequately by the MSS system operators while using the generic MSS spectrum
- It is also recognised that in practice, it would be difficult to devise a method to meet the spectrum needs in a real time mode
- Issues before WRC 12 are:
 - Finalising the spectrum requirements specifically for AMSS(R) in this band
 - Finalisation of suitable regulatory framework to address this difficult issue

AI 1.13 : Spectrum Usage of 21.4-22 GHz for BSS

- In accordance with ITU Radio regulations, allocation of 21.4-22 GHz for BSS became effective after 2007 and allocation to terrestrial services became secondary.
- Many countries have filed with ITU for BSS networks in this band
- The issues before WRC-2012 are:
 - Regulatory framework for treatment of many satellite network filings in this band
 - Feederlink spectrum finalisation for BSS in this band
 - Regulatory treatment of terrestrial services in this band
- India's position for WRC12 would be to try for a suitable regulatory framework addressing relevant aspect of national interests, including protection of already operational terrestrial services in this band.

AI 1.18 : Global Allocation to RDSS in 2483.5-2500 MHz band

- New global primary allocation to Radio Determination Satellite Service is being proposed in the band 2483.5-2500 MHz band
- Piloted by Europe for implementation in the future generation of Galileo navigation satellites of Europe
- Currently the allocation is primary only in selected countries
- China is already using this band in its navigation satellite constellation 'Compass'.
- India will be using this band in its forthcoming Indian Regional Navigation Satellite System (IRNSS)
- India's interest is in protecting the India's use of this band through suitable regulatory framework. Good progress has been made in APG forum

AI 1.25 : Additional Allocations to MSS in the range of 4 to 16GHz

- To address the estimated shortfall in MSS spectrum needs in the timeframe 2020, feasibility of allocation of additional spectrum is being explored in several bands in the range of 4 to 16 GHz
- These bands are:
 - 5 150-5 250 MHz , 7055-7250 MHz, 10.5-10.6GHz ,13.25-13.4GHz (downlink)
 - 8 400-8 500 MHz, 15.43-15.63 GHz (uplink)
- All these are already allocated to various services and are in use
- Coexistence of MSS with these services are found to be difficult
- In view of this main view emerging is there is no need to make any new allocations to MSS in these bands

AI 7 : Improvements in Coordination and Registration Procedures Pertaining to Satellite Networks

- This agenda discusses various issues related to regulatory procedures being adopted by ITU for coordination and registration of satellite networks filed to ITU.
- This involves:
 - requirements of technical data pertaining to satellite networks to be provided to ITU
 - requirement of modifying certain regulatory procedures pertaining to various phases of regulatory examination of satellite network filings.
- Suitable position is being taken on the relevant issues keeping over all efficiency in treatment of satellite network filings and national interests in mind

AI 1.6 : Update Spectrum use by Passive Services in 275-3000GHz, and Possible Procedures for Free-Space Optical-Links

- The frequency range 275-3000 GHz is currently used by the EESS (passive) (Earth Exploration Satellite Service) for passive microwave remote sensing of the Earth's atmosphere and environment
- Fundamental measurements related to global warming, climate change, ozone layer destruction process etc. are becoming more important
- Global water and carbon cycles need to be studied over decades to find the impact on earth's environment
- This frequency range important for Radio Astronomy and space Research (passive) also.
- Beyond 275 GHz, use of the frequencies for terrestrial frequencies is strongly constrained by Earth's atmosphere
- In view of the importance of passive research and measurement in the the range 275-3000 GHz , specific bands in the range 275-1000GHz have been identified. Active services can also be authorized by Administrations by ensuring due protection to passive services
- The range 1000-3000 GHz can be used by both passive and active services since radiations from active services on the ground are likely to affect passive services due to very strong atmospheric absorption in these frequency ranges.
- For free-space optical links (>3000 GHz), no issue is foreseen and no change in the Radio regulation is contemplated.

AI 1.11: Primary Allocation to SRS (Earth-to-space) within the Band 22.55-23.15 GHz

- To support space research mission in near earth orbit , including robotic and other missions in transit to the Moon and at or near the Moon, downlink transmission will operate in 25.5-27 GHz. This link will be used scientific data retrieval and voice/video communication with the Earth.
- To support the uplink transmission to spacecraft , a companion band is required and the suitable band is 22.55-23.15 GHz.
- There are very few earthstations in the world used for space research for these type of missions
- Studies concluded that sharing with terrestrial systems is possible using the coordination zone concept
- In view of this most of the countries , including APG are in agreement with this proposal.
- For India this allocation becomes very important since India is one of the few countries actively involved in space research

AI 1.12: Protection of Primary Services in the Band 37-38 GHz from Interference Resulting from Aeronautical Mobile Service Operations

- Primary services in the 37-38 GHz band include Space Research Service, Fixed satellite Service Mobile and Fixed Service
- Currently, under the Mobile service, Aeronautical Mobile service is possible and aviation community would like to investigate the possibility of using the band for Wireless Avionic Intra-aircraft Communication (WAIC)
- The issue is whether this can be allowed or not since AMS has the potential to cause harmful interference to the other Primary services.
- Studies have shown that Space Research satellite and Fixed Satellite Service receive earthstations would suffer from harmful interference and the protection requirements is very stringent and it would be difficult to meet in practice by AMS
- AMS would be affected by HDFS in this band.
- Hence allowing AMS in this band does not seem to be technically feasible and necessary modification to the Radio Regulations excluding AMS from MS is being considered.

AI 1.16: Needs of Passive Systems for Lightning Detection in MetAids --Allocation in Range below 20 kHz

- Long-range lightning detection using observations near 10 KHz assumes great importance and contribute toward safety of life of the global community.
- Since signals from natural phenomenon like lightning occur at specific frequencies these frequencies need to be protected from man-made interference in order to carry out the observations.
- Sharing with Radionavigation service is feasible
- In view of this, 8.3-11.3 KHz is proposed to be allocated to Meteorological Aids on a primary basis with suitable regulatory provisions for sharing with radio navigation service

AI 1.24: Extension of existing Non-GSO MetSat allocation at 7750-7850 MHz to 7750-7900 MHz

- Currently, operational non-geostationary Meteorological satellites use the downlink band 7750-7850 MHz for the purpose of sending the data gathered by meteorological instruments onboard satellite to the ground stations.
- For additional measurements to be performed the future satellites require more spectrum
- The necessary bandwidth for the downlink of the raw instrument data for future non-geostationary MetSat systems to meet the enhance data requirement of Meteorology and Climatology would be upto 150 MHz
- The sharing conditions currently inforce can be applied to the extended 50 MHz also to protect the terrestrial services
- In view of this, it is proposed to extend this allocation for non-gso MetSats.



THANK YOU