

5th India Spectrum Management Conference



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Outline of Agendas on Satellite services



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Background, Protection of Services

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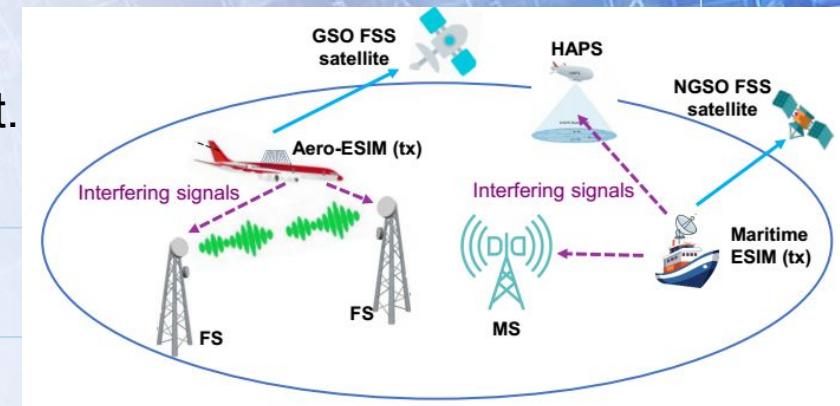
ISRO View

Agenda Item 1.1

Agenda Item 1.1: New Service, for ESIMs in V band (47.2-50.2 GHz and 50.4-51.4 GHz)

Background:

- ESIMs, in V band for both GSO and N-GSO (~4 GHz).
- FS and MS primary in the bands, HAPS in 47.2- 47.5 GHz, 47.9-48.2 GHz & IMT in 47.2- 48.2 GHz are under study.
- Aeronautical and Maritime ESIMS, Land ESIMS subject to national prerogative.
- Not to be used for Safety of life applications
- Globally this band is being used mainly for feeder link, Alphasat.
- Frequency band used on GSAT-29 satellite .



• Sharing & Compatibility studies of existing services:

- ✓ Already existing FSS: For GSO FSS from GSO ESIMs: envelope of typical ES characteristics and coordination agreements.
- ✓ For GSO FSS from NGSO ESIMs: Ongoing discussion on applicability of current framework for typical NGSO ES to NGSO ESIMs
- ✓ Feeder links to BSS. - No particular technical conditions yet identified to protect BSS.
- ✓ HD FSS (ES) - No particular technical conditions yet identified to protect receiving HDFSS ES

Agenda Item 1.1

Agenda Item 1.1: New Service, ESIMs for in V band (47.2-50.2 GHz and 50.4-51.4 GHz)

Protection mechanisms:

- Power-flux density limits on the Earth's surface
- Regulatory provisions and administration responsibility for operation of ESIMs.
- New recommendation for NCMC.

EESS (passive) in adjacent band

- ✓ 50.2 – 50.4 GHz
- ✓ GSO and NGSO sensors
- ✓ Studies on aggregate impact from GSO and NGSO ESIMs.

Protection mechanism:
From aeronautical and maritime ESIMs: Limits for unwanted emissions from single ESIM falling into the passive band (TBD)

Radio astronomy

- ✓ In-band 48.94 - 49.04 GHz
- ✓ In adjacent band under national arrangements (51.4 - 54.25 GHz)*

Protection mechanism:

From aeronautical and maritime ESIMs: Pfd limit on the Earth's at radio astronomy sites from single ESIM
[-251.5dBW/m²/Hz]

* Divergent views were expressed on the protection of RAS observations under national arrangements.

ISRO View:

ISRO supports this Agenda item for introduction of new services.

Regulatory framework

- ✓ Two draft new Resolutions addressing GSO and NGSO ESIMs separately.

Further discussions required on:

- ✓ RAS observations in adjacent band (under national arrangements)
- ✓ Availability on elements related to NCMC
- ✓ GSO networks from NGSO ESIMs

Agenda Item 1.2: Reduction in antenna diameter in 13.75-14 GHz to allow the use of uplink fixed-satellite service earth stations.

Background:

- WARC-92 allocated 13 GHz band to FSS.
- Asymmetry in Ku band allocation.
- Requirement for more uplink spectrum in 13-15 GHz
- Congestion in the GSO orbit.
- Enhancement of operating conditions required for efficient usage.
- Frequency band used on GSAT-31 and GSAT-7A Indian satellites.

Sharing & Compatibility Studies required:

- Protection of existing services:
 - ✓ Radio Location Service (RLS).
 - ✓ Space Research Service (SRS).

Agenda Item 1.2

Agenda Item 1.2: Reduction in antenna diameter in 13.75-14 GHz to allow the use of uplink fixed-satellite service earth stations.

Sharing & Compatibility Studies:

- Estimation of Interference into RLS and SRS assuming a single and multiple FSS interferer cases.
- Different methodologies have been used in the studies:
 - A statistical approach to simulate the dynamic nature of the radar and of the interference.
 - A static geometrical approach to determine the impact of interference on the detection range of radars operating in the RLS.
 - Discussions on core assumptions such as percentages of time associated with protection criteria, deployment models, methodologies.

ISRO View:

ISRO supports this Agenda item as this increases the efficient use of this band.

India has submitted joint input contribution for sharing and compatibility studies

Agenda Item 1.3: Use of 51.4-52.4 GHz by gateway earth stations of N-GSO systems

Background:

- Satellite systems increasingly being used to deliver broadband services.
- Band identified for GSO networks.
- Spectrum requirement exists for N-GSO feeder link
- The current frequency allocations to the FSS in the frequency band 51.4-52.4 GHz do not enable its use by non-geostationary-satellite orbit (non-GSO) gateway operations.

Sharing & Compatibility Studies required :

- Protection of existing services:
 - ✓ FSS from N-GSO FSS gateways.
 - ✓ EESS (Passive).
 - ✓ Radio astronomy.

ISRO View:

Subject to protection of in band and adjacent services, ISRO supports this additional allocation.

Agenda Item 1.3

Agenda Item 1.3: Use of 51.4-52.4 GHz by gateway earth stations of N-GSO systems

Sharing & Compatibility Studies required :

- Protection of GSO space stations receivers from the possible interference non-GSO FSS gateways.
 - ✓ Extension of current regulation of Q/V band to this band
 - ✓ Applying EPFD in this band.
- To assess the unwanted emissions limits for non-GSO FSS gateways to protect EESS (passive) band 200 MHz away from the frequency band 51.4-52.4 GHz.

ISRO View:

- ***Broadband services require multiple beams and hence more feeder link spectrum.***
- ***Subject to protection of in band and adjacent services, ISRO supports this additional allocation.***

Agenda Item 1.4: Possible new primary allocation: FSS (□) in 17.3-17.7 GHz & BSS (□) in 17.3-17.8 GHz in Region 3.

Background:

- Broadband applications and UHD TV applications.
- In R3, covered under ITU RR AP30A category (□)
- Asymmetry in Ka band allocation.(□: 4 GHz; □: 3.5 GHz)
- Harmonized radio regulations
- Frequency band used on GSAT-24 satellite (□).

Sharing & Compatibility Studies required :

- Protection of existing services:
 - ✓ FSS: 17.7 – 19.7 GHz .
 - ✓ EESS (active): 17.2 – 17.3 GHz
 - ✓ Feeder link to BSS (AP30A)

Agenda Item 1.4

Agenda Item 1.4: Possible new primary allocation: FSS (□) in 17.3-17.7 GHz & BSS (□) in 17.3-17.8 GHz in Region 3.

Sharing & Compatibility Studies required:

- Consider a possible new primary allocation to the FSS (space-to-Earth) in the frequency band 17.3-17.7 GHz for Region 3.
- Consider a possible new primary allocation to the BSS (space-to-Earth) in the frequency band 17.3-17.8 GHz for Region 3.
- Consider the applicability of Region 2 non-GSO FSS epfd limits pertaining to the frequency band 17.3-17.7 GHz to Regions 1 and 3, so as to ensure the protection of GSO networks.

ISRO View:

ISRO supports this Agenda item due to increased spectrum usage.

Thank you for your attention