

5th India Spectrum Management Conference



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Outline of Agendas on Satellite services



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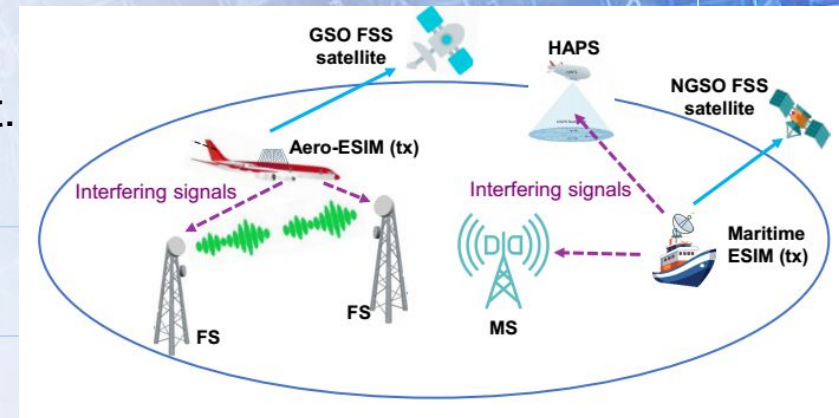
ISRO View

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.

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

ISRO View:

ISRO supports this Agenda item for introduction of new services.

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.

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

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

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

