



ASIA-PACIFIC TELECOMMUNITY

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Group for WRC-27 (APG27-2)**

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India (Republic of)

PROPOSAL FOR PRELIMINARY VIEWS ON WRC-27 AGENDA ITEM 1.18

Agenda Item 1.18:

to consider, based on the results of ITU Radiocommunication Sector studies, possible regulatory measures regarding the protection of the Earth exploration-satellite service (passive) and the radio astronomy service in certain frequency bands above 76 GHz from unwanted emissions of active services, in accordance with Resolution 712 (WRC-23);

Resolution 712 (Rev.WRC-23):

Studies on compatibility between the Earth exploration-satellite service (passive), the radio astronomy service in certain bands above 76 GHz, and active services in adjacent and nearby frequency bands

Background:

Agenda Item 1.18 of the World Radiocommunication Conference in 2027 (WRC-27) addresses the need for protecting passive Earth exploration-satellite service (EESS) and the Radio astronomy service (RAS) in specific frequency bands above 76 GHz from unwanted emissions of active services. This agenda item stems directly from Resolution 712 (Rev.WRC-23), which recognized the increasing potential for interference in these high-frequency bands and mandated ITU Radiocommunication Sector (ITU-R) studies on the compatibility between passive and active services.

Earth exploration-satellite service (EESS, passive) relies on the measurement of naturally emitted radiation from the Earth's surface, atmosphere, and oceans. These passive sensors operate in specific frequency bands that correspond to the spectral signatures of various geophysical parameters, providing crucial data for weather forecasting, climate monitoring, natural disaster assessment, and resource management. These measurements are extremely sensitive and even low levels of unwanted emissions from nearby active services can significantly degrade the quality and accuracy of the collected data.

Radio astronomy service (RAS) involves the reception of extremely weak electromagnetic radiation from celestial objects. Astronomers use highly sensitive radio telescopes operating in specific frequency bands to study the universe, investigate its origins, and understand astrophysical phenomena. Like passive EESS, RAS observations are highly susceptible to interference from terrestrial and space-based transmissions.

The frequency bands above 76 GHz are becoming increasingly attractive for various active services, including high-capacity broadband communications, satellite communications, and

Contact:

Email:

potentially future automotive radar and other applications. As the demand for spectrum in these bands increases, the potential for unwanted emissions from these active services to cause harmful interference to the sensitive passive EESS and RAS operations also increases.

Resolution 712 (Rev.WRC-23) therefore calls for comprehensive ITU-R studies to:

- i. Identify the specific frequency bands above 76 GHz used by passive EESS and RAS that are particularly vulnerable to interference.
- ii. Investigate the characteristics of unwanted emissions from various active services in adjacent and nearby frequency bands.
- iii. Assess the potential for harmful interference from these unwanted emissions to passive EESS and RAS operations (see Annexure-1).
- iv. Develop possible regulatory measures within the Radio Regulations to protect passive EESS and RAS from such interference. These measures could include, but are not limited to, setting limits on out-of-band and spurious emissions from active services, establishing coordination procedures, or considering guard bands.

The outcome of these ITU-R studies will provide the technical basis for discussions at WRC-27 aimed at establishing appropriate regulatory frameworks to ensure the long-term viability of passive Earth observation and radio astronomy in these increasingly utilized high-frequency spectrum ranges.

India's Preliminary Views:

India supports the ongoing ITU-R studies for the development and implementation of effective regulatory measures to protect passive EESS and RAS in specific frequency bands above 76 GHz from harmful interference caused by unwanted emissions from active services. India recognizes that the level of vulnerability and the potential for interference may vary across different frequency bands above 76 GHz. Therefore, we advocate for band-specific regulatory measures that are tailored to the unique characteristics and usage of each band by both passive and active services.

Annexure-1

resolves to invite the ITU Radiocommunication Sector to complete in time for the 2027 world radiocommunication conference

- 1 compatibility studies between the EESS (passive) and the corresponding active services in adjacent frequency bands as listed in Table 1 below:

TABLE 1

EESS (passive) frequency bands to be studied and corresponding active services to be included

EESS (passive) frequency band	Active service frequency band	Active service
86-92 GHz	81-86 GHz	Fixed-satellite service (FSS) (Earth-to-space), mobile service (MS)
	92-94 GHz	MS, radiolocation service (RLS)
114.25-116 GHz	111.8-114.25 GHz	Fixed service (FS), MS
164-167 GHz	158.5-164 GHz	FS, FSS (space-to-Earth), MS, mobile-satellite service (MSS) (space-to-Earth)
	167-174.5 GHz	FS, FSS (space-to-Earth), inter-satellite service (ISS), MS
200-209 GHz	191.8-200 GHz	FS, ISS, MS, MSS, radionavigation service (RNS), radionavigation-satellite service (RNSS)
	209-217 GHz	FS, FSS (Earth-to-space), MS

2 compatibility studies between the RAS and the active satellite services in certain adjacent and nearby frequency bands listed in Table 2 below with a view to setting the relevant threshold levels for unwanted emissions from any GSO and non-GSO space stations and revising and updating Resolution **739 (Rev.WRC-19)** accordingly:

TABLE 2

RAS frequency bands to be studied and corresponding active services to be included

Radio astronomy frequency band	Active satellite service frequency band	Active satellite service (space-to-Earth)
76-81 GHz	71-76 GHz	Fixed-satellite service (FSS), mobile-satellite service (MSS), broadcasting-satellite service (BSS)
130-134 GHz	123-130 GHz	FSS, MSS, radionavigation-satellite service (RNSS)
164-167 GHz	167-174.5 GHz	FSS
226-231.5 GHz	232-235 GHz	FSS