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India (Republic of)

PROPOSAL FOR PRELIMINARY VIEWS ON WRC-27 AGENDA ITEM 1.16

Agenda Item 1.16:

*to consider studies on the technical and regulatory provisions necessary to protect radio astronomy operating in specific Radio Quiet Zones and, in frequency bands allocated to the radio astronomy service on a primary basis globally, from aggregate radio-frequency interference caused by non-geostationary-satellite orbit systems, in accordance with Resolution **681 (WRC-23)**;*

Resolution 681 (Rev.WRC-23):

Studies of technical and regulatory provisions necessary to protect radio astronomy operating in specific Radio Quiet Zones and, in radio astronomy service primary allocated frequency bands globally, from aggregate radio-frequency interference caused by systems in the non-geostationary-satellite orbit

Background:

Agenda Item 1.16 of the upcoming World Radiocommunication Conference in 2027 (WRC-27) focuses on 2 critical issues related to the growing impact of non-geostationary satellite orbit (NGSO) systems on radio astronomy observations. This agenda item stems directly from **Resolution 681 (WRC-23)**, adopted at the World Radiocommunication Conference in Dubai in 2023.
Resolution 681 (WRC-23) acknowledges several key factors:

a. The pivotal role of radio astronomy - It recognizes radio astronomy as a crucial scientific discipline for understanding the universe.
b. Increased NGSO satellite launches - The resolution notes the significant increase in NGSO satellite deployments and the anticipated continuation of this trend.
c. Definition of Radio Quiet Zones (RQZs) - It refers to Report ITU-R RA.2259 for the definition of an RQZ as a recognized geographic area where spectrum management procedures are modified to minimize interference to radio telescopes but that they may not be applicable to satellite operations.
d. Aggregate interference: It highlights that the cumulative emissions from multiple NGSO satellites can cause harmful interference to radio astronomy, even within RQZs, making national regulations alone potentially insufficient.
e. Future use of NGSO in terrestrial networks - The resolution acknowledges the potential integration of NGSO systems into mobile-satellite services (MSS), further increasing the density of potential interference sources.
f. Existing national RQZ regulations - It recognizes that national regulations for radio astronomy in the RQZ may be different for each administration, leading to varying protection measures.

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g. ITU-R Study Group 7 mandate **-** The 2023 Radiocommunication Assembly instructed ITU-R Study Group 7 to enhance information sharing and coordination between satellite operators and radio astronomy sites, including the development of an RQZ database for information purposes only.
h. Wider frequency range needs for a small number of stations of the Radio Astronomy Service (RAS) **-** The resolution points out that a few radio astronomy observatories need to operate in much broader frequency ranges than currently allocated to the service.

The core objectives of Resolution 681 (WRC-23) and consequently Agenda Item 1.16 (WRC-27) are**:-**

1. Studies on how to protect some RAS allocated bands from interference from satellite services operating in adjacent bands **-** To investigate how unwanted emissions from NGSO satellite systems operating in the frequency bands adjacent to primary radio astronomy bands listed in table 1 of Resolution 681 (WRC-681) affect radio astronomy observations.
2. Developing regulatory measures **-** Based on the outcomes of the studies, to consider appropriate regulatory provisions necessary to protect radio astronomy in the bands listed in table 1 of Resolution 681 (WRC-23) from the single-entry interference caused by NGSO systems.
3. Potential solutions for characterizing RQZs - To explore ways to formally recognize and characterize Radio Quiet Zones within the Radio Regulations and/or WRC resolutions.

Resolution 681 (WRC-23) explicitly mentions relevant ITU-R Recommendations (RA.769, RA.1031, RA.1513, M.1583, S.1586) that should form the basis of these studies.
India emphasizes the need to address the lack of current regulatory measures to protect radio astronomy observations from the impact of NGSO constellations in the bands primary allocated to RAS listed in table 1 of Resolution 681 (WRC-23), as this poses a unique challenge that could prevent the development of new radio astronomy research facilities focusing on bands above 10 GHz.

India's Preliminary Views:

Recognizing the immense scientific value of radio astronomy and the growing challenges from proliferating NGSO satellite systems, India supports protecting radio astronomy **services** in bands where RAS has primary allocation and advocates for robust measures to safeguard radio astronomy observations from harmful interference.
India's also supports technical and regulatory studies to find solutions to protect radio astronomy from the increasing interference risks posed by various Radio services including NGSO satellite systems, while also considering the broader context of spectrum utilization and the needs of other radio-communication services. Therefore, India stresses the importance of international collaboration and consensus within ITU-R to establish effective and globally harmonized measures while keeping in mind that RQZ must remain a strictly national matter so that administrations do not impose undue constraints to systems operating in other administrations.