



NATIONAL PREPARATORY COMMITTEE TOWARDS WRC-27 AGENDA ITEM 1.17 BRIEF

Chapter: 4

Service: Science issues / Meteorological Aids (MetAids)

Agenda Item: 1.17

Description of Agenda Item: Consideration of regulatory provisions and potential primary allocations to the meteorological aids service (space weather) to accommodate receive-only space weather sensor applications in the Radio Regulations, in accordance with Resolution 682 (WRC-23).

Objective: To introduce new primary frequency allocations to the meteorological aids service (MetAids) (space weather), limited strictly to receive-only sensors, and establish regulatory mechanisms to notify these passive installations in the Master International Frequency Register (MIFR).

Statutory Mandates: Resolution 682 (WRC-23)

The technical and regulatory tasks assigned to the ITU Radiocommunication Sector must be completed in time for WRC-27 and are structured as follows:

- **Resolves 1:** Studies on spectrum needs, appropriate protection criteria, and system characteristics for receive-only space weather sensors.
 - **Resolves 2:** Sharing and compatibility studies pertaining to potential new primary allocations to MetAids (space weather) in six specific candidate frequency bands for receive-only sensors.
 - **Resolves 3:** Studies on possible regulatory provisions to accommodate the mechanism for an administration to notify a receive-only space weather sensor station for inclusion in the Master International Frequency Register (MIFR).
 - **Further Resolves 1:** Moratorium on any notification of frequency assignments to a space weather observation station under MetAids (space weather) until WRC-27 introduces the corresponding allocations in Article 5.
 - **Further Resolves 2:** A mandatory, legally binding condition stating that any possible new primary MetAids (space weather) allocations *shall not* claim protection from, or constrain the future development of, incumbent services in these frequency bands or in adjacent bands.
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2. Spectrum Profile under Study & Potential Services Affected

Because receive-only space weather sensors capture low-level emissions from the Sun, Earth's atmosphere, and other celestial bodies, their operational frequencies are dictated entirely by the physical properties of the natural phenomena being observed.

Candidate Frequency Bands Under Review

Sharing and compatibility simulations evaluate potential primary receive-only MetAids (space weather) allocations across six discrete frequency blocks:

- 27.5-28.0 MHz
 - 29.7-30.2 MHz
 - 32.2-32.6 MHz
 - 37.5-38.325 MHz
 - 73.0-74.6 MHz
 - 608 -614 MHz
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B. Potential Services Affected

- **Incumbent Terrestrial and Space Services:** Active primary mobile, fixed, amateur, broadcasting, space operation, space research, and radionavigation networks operating heavily throughout these low-VHF and UHF blocks. Under the statutory mandate and proposed footnote constraints, these services are fully insulated from any negative operational or future development impact.
 - **Meteorological Aids (MetAids) Subset (Space Weather):** Operational space weather monitoring, prediction, and warning systems. While these sensors produce forecasts critical to public safety, economy, and national security, the high-priority safety provisions of Nos. 1.59 and 4.10 do not apply to them.
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3. Driving Anchor Documents

- **Resolution 675 (WRC-23):** Defines space weather and formally designates space weather sensors to the meteorological aids service as the subset "MetAids (space weather)".
 - **Report ITU-R RS.2456-1:** Compiles the underlying technical summary of spectrum-reliant space weather sensors and globally deployed monitoring, prediction, and warning systems.
 - **WDPDN Report ITU-R RS.SW_STUDIE**
: Advanced technical study document detailing instrument behaviors (riometers and solar flux tracking) and spectral requirements within the targeted frequency bands.
 - **Question ITU-R 256/7:** The foundational study question driving ongoing ITU-R work to determine the exact spectrum requirements and protection criteria for receive-only space weather sensors.
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Status of Studies & Referenced Documentation

studies focus on the impact of incumbent networks on the sensors to ensure local operational safety without imposing constraints on pre-existing services.

Sensor Profiling & Spectrum Needs Analysis

- **Referenced Document: Report ITU-R RS.2456-1** and WDPDN Report ITU-R RS.[SW_STUDIES].
- **Studies Carried Out (Resolves 1):** Working Party 7C (WP 7C) evaluated the baseline spectrum needs of globally deployed instrumentation. Technical studies concluded that the six bands specified in Resolution 682 are necessary to cover operational usage.
 - **Instruments Below 75 MHz (Riometers):** Studies show that by observing frequencies typically between 20–60 MHz, riometers contribute directly to understanding disruptions to High-Frequency (HF) communications, particularly in polar regions.
 - **Solar Radio Flux Observations:** Studies also demonstrate that solar radio flux observations across 20 MHz to 2 GHz are essential for forecasting.
- **Output:** Documented that sensors and technical equipment for space weather observations are often not distinct and are simultaneously used for applications under other services. Therefore, a dual-status approach was established: when operating in the MetAids (space weather) service, the protection criteria defined in this document apply; when operating under another service, the sensors operate with the protection criteria and corresponding status of that specific service, ensuring zero impact on alternate operations.

Compatibility Analyses & Registration Procedures

- **Referenced Document:** Document towards draft CPM text for WRC-27 agenda item 1.17.
- **Studies Carried Out (Resolves 2 & 3):** Studies remain ongoing in WP 7C to elaborate the impact of incumbent services on receive-only space weather sensors as well as to develop the corresponding ITU-R Recommendation on protection criteria. Because this agenda item restricts studies to receive-only sensors, no compatibility studies assessing the impact of these sensors on incumbent networks are needed.
- **Technical Findings on Registration:** Based on studies conducted in WP 7C, modification of RR Article 11 to allow for notification of a frequency assignment to a receive-only space weather sensor is required. Concurrently, a modification of Annex 1 of RR Appendix 4 is necessary to facilitate including characteristics of a receive-only station operating in the meteorological aids service (space weather) in the MIFR.

5. CPM Methods Matrix (The Legislative Options for Debate)

The draft Conference Preparatory Meeting (CPM) text structures the regulatory options into clear methods for the WRC-27 plenary:

Proposed Methods	Spectrum Band	Regulatory Wording
Method A: Primary Allocation of All Six Bands	• 27.5-28.0 MHz • 29.7-30.2 MHz • 32.2-32.6 MHz • 37.5-38.325 MHz • 73.0-74.6 MHz • 608-614 MHz	Proposes new primary allocations to the MetAids (space weather) service across all six studied bands, adding new footnotes in the Table of Frequency Allocations of RR Article 5. • Footnote 5.A117 limits the allocations strictly to ground-based receive-only sensors. • Footnotes 5.B117 through 5.N117 stations shall not claim protection from, nor constrain the future development of, incumbent primary services Modifies RR Article 11 (ADD 11.12bis) and Appendix 4 Annex 1 to allow formal notification and recording into the MIFR. Consequentially suppresses Resolution 682 (WRC-23).
Method B: Primary Allocation Excluding the 600 MHz Band	• 27.5-28.0 MHz • 29.7-30.2 MHz • 32.2-32.6 MHz • 37.5-38.325 MHz • 73.0-74.6 MHz	Proposes new primary allocations to MetAids (space weather) excluding the 608-614 MHz band, inserting new Article 5 footnotes. • Limits the allocations strictly to ground-based receive-only sensors, mandating that they shall not claim protection from, nor constrain the future development of, incumbent services Modifies RR Appendix 4 – Annex 1 to allow for registration in the MIFR and consequentially suppresses Resolution 682 (WRC-23).

Conclusion

The technical text compiled by Working Party 7C establishes that space weather monitoring is essential for producing the forecasting models and real-time warnings used by global bodies like the ICAO to secure civil aviation safety, protect national communications backbones, and minimize disruptions to critical infrastructure. Because these observations are bound to specific bands by the laws of nature to track natural thermal phenomena and solar radio bursts, international regulatory recognition is required to integrate them into the Radio Regulations.

The regulatory analyses demonstrate that both Method A and Method B satisfy the

objective of the agenda item while respecting national sovereignty. By establishing primary receive-only allocations wrapped in strict, non-negotiable "no-constraint" footnotes, WRC-27 can successfully grant international recognition and notification procedures for these critical non-ubiquitous scientific installations while guaranteeing total, uninterrupted protection for incumbent terrestrial and space infrastructure from new operational or development constraints.

Recommendations

While considering the long-term stability of local telecommunications infrastructure and the public safety benefits of space weather forecasting, Uganda adopts the following technical positions:

- **Support Method B (Primary Allocations Across 5 Bands- excluding the 600MHz Band):** Approve the insertion of primary MetAids (space weather) receive-only allocations across all the five studied bands (excluding the 608-614 MHz. Method B ensures that our local scientific tracking arrays receive full international recognition and recording privileges across the entire operational spectrum required for riometers and solar flux instruments, provided that footnotes 5.A117 through 5.N117 are adopted verbatim to enforce zero impact on active incumbent services.
- **Support the Modifications to Article 11 and Appendix 4:** Endorse ADD 11.12bis and MOD 11.31.3 to establish the necessary mechanism to notify terrestrial receive-only space weather stations under Article 11, ensuring that notices are examined solely for conformity with the Table of Frequency Allocations since probability-of-interference examinations are not applicable to passive systems.