SFCG report (including WRC-23 and WMO OSCAR/Space items)

CGMS-51-CGMS-WP-01

Presented to CGMS-51 Working Group I session, agenda item 2.1

Coordination Group for Meteorological Satellites

EUMETSAT CGMS

The 41st annual meeting of the Space Frequency Coordination Group (SFCG) took place 19-27 July 2022.

The issues of relevance for CGMS that were discussed and progressed are:

- Update to SFCG Objectives for WRC-23 (extract in Attachment 1);
- SFCG process for gathering remote sensor information for updating the OSCAR/Space database (Attachments 2 & 3);
- Response from SFCG on CGMS activities regarding mechanisms for detection, long-term monitoring and mapping of RFI.

This paper also addresses the issues related to ITU-R Resolution 731 (Rev. WRC-19) which deals more generally with the consideration of sharing and adjacent-band compatibility between passive and active services above 71 GHz. This issue is related to WGI/A50.02.

Related to the activities for updating OSCAR/Space within SFCG, this document also responds to WGI/A50.04 which calls upon the SFCG Liaison Officer and WMO to propose a process for providing accurate and timely updates on satellite frequencies recorded in OSCAR/Space database.

SFCG Objectives for WRC-23 (Revised Resolution SFCG 40-1R4) and WMO Position for WRC-23 (1)

- The preparatory process for WRC-23 is getting into its final stages, with ITU Conference Preparatory Meeting (CPM23-02) concluded, the final regional preparatory meetings over the next half year and finally climaxing into the WRC-23, 20 Nov. – 15 Dec. 2023.
- Some WRC-23 agenda items are presented and the SFCG Objective (Status: February 2023) is provided in Attachment 1. For comparison with the SFCG Objectives, the positions of WMO (Status: October 2022, still before the final update 18-20 April by ET-RFC) are also provided in Attachment 1, which are usually largely in line with each other.
- Both position papers will still be updated to its final version, WMO at the meeting of ET-RFC in its yearly meeting at 18-20 April 2023 and SFCG-42 in June 2023.

SFCG Objectives for WRC-23 (Revised Resolution SFCG 40-1R4) and WMO Position for WRC-23 (2)

The WRC-23 agenda items of potential concern to CGMS members discussed in this document are:

- **Agenda items 1.2, 1.4, 9.1 Topic C related to IMT (5G) systems.**
- **Agenda items 1.16, 1.17, 1.18 and 9.1 Topic D related to new frequency usage of commercial satellite systems.**

Regarding WRC-23 agenda items of direct interest to CGMS:

- **Agenda Item 1.14: The objective of this agenda item is to ensure that passive microwave measurements in the frequency range 231.5-252 GHz are protected and the required spectrum is allocated to future passive microwave sensors, for example for the Ice Cloud Imager (ICI) instrument on Metop-SG satellites.**
- **Agenda Item 9.1 Topic A: The status is outlined in detail in CGMS-51-EUMETSAT-WP-06 (Frequency-related topics in support to space weather) to be presented to the Joint WGI-WGIV-SCWG session on 28 April 2023.**

Coordination Group for Meteorological Satellites

EUMETSAT CGMS

SFCG Objectives for WRC-23 (Revised Resolution SFCG 40-1R4) and WMO Position for WRC-23 (3)

WRC-23 will also determine the agenda for WRC-27. One possible new WRC-27 Agenda items, supported by WMO and SFCG, would be the following:

Agenda Item 1.xx: to consider, based on the results of ITU-R studies, possible regulatory measures regarding the protection of the Earth exploration-satellite service (passive) in frequency bands above 86 GHz from unwanted emissions of active services.

Background: Radio Regulations Resolution 750 deals with the compatibility between the Earth exploration-satellite service (passive) and relevant active services. It basically provides unwanted emission limits and levels of active service stations for the compatibility with EESS (passive) in adjacent bands, covered by RR No. 5.340.

This Resolution has been updated, as appropriate, in subsequent WRC (in particular WRC-19) to cover compatibility scenarios not previously addressed. The latest version of Resolution 750, approved by WRC-19, includes unwanted emission levels from the Fixed Service into the 86-92 GHz frequency band. However, unwanted emissions from other active services allocated in bands adjacent to the 86-92 GHz band and above 92 GHz are currently not included.

Taking into account the technological developments since 2007, and the increased interests for bands above 71 GHz by active services, it might be an appropriate time to study the adjacent band compatibility between active services and EESS (passive) above 86 GHz and to update Res. 750.

Generally, it should be noted that the proposals for WRC-27 from the individual regions/countries are still not formally finalised yet. Thus, an outlook on the WRC-27 agenda cannot be provided.

Coordination Group for Meteorological Satellites

EUMETSAT CGMS

ITU-R Resolution 731 currently addressed in ITU-R and proposed revision under WRC-23 Agenda Item 4 (1)

Background: Broadband usage of active services (FS, MS, FSS) and applications (e.g. IMT and UWB) demand using higher frequencies in the future. Only frequency spectrum in the higher GHz range could provide such bandwidth. **Thus, the pressure for using bands above 71 GHz, either in shared bands with EESS (passive) or even in purely passive bands (FN 5.340), is significantly increasing.**

ITU-R Resolution 731 (Rev. WRC-19) deals with the consideration of sharing and adjacent-band compatibility between passive and active services above 71 GHz.

In this context, among other tasks, the ITU-R is invited:

1) to continue its studies to determine if and under what conditions sharing is possible between active and passive services in the frequency bands above 71 GHz, such as, but not limited to, 100-102 GHz, 116-122.25 GHz, 148.5-151.5 GHz, 174.8-190 GHz, 190-191.8 GHz, 226-231.5 GHz and 235-238 GHz.

Unfortunately, the bands highlighted in red are covered by RR footnote 5.340, stating that all emissions are prohibited, in order to protect these specific passive bands.

This is interpreted by some ITU member states as if sharing could be envisaged in these purely passive bands, even against the ITU Rules of Procedure, stating the following:

"that for bands listed in FN 5.340, notification concerning any other use than those authorized in the band or on the frequencies concerned cannot be accepted even with a reference to No. 4.4; furthermore the administration submitting such a notice is urged to abstain from such usage."

Coordination Group for Meteorological Satellites

EUMETSAT CGMS

ITU-R Resolution 731 currently addressed in ITU-R and proposed revision under WRC-23 Agenda Item 4 (2)

Response to WGI/A50.02:

To preserve these unique spectrum resources (in frequencies above 71 GHz) that are increasingly challenged, as described in the previous slide, it will be important that CGMS members, urge their national regulatory authorities, when establishing new regulations for use of active services and applications, to appropriately taken into account the protection requirements of passive sensors and that the bands listed in RR FN 5.340 will not be opened for a shared use with active services.

WRC-23 provides a mechanism to eliminate the above described ambiguities in ITU-R Resolution 731 by means of a revision through the mechanism of the standing WRC agenda item 4. Attachment 1 contains the corresponding SFCG Objective and WMO position on this issue.

SFCG Process for gathering of remote sensing for updating the OSCAR/Space database (1)

- The SFCG has established a recurring action item requesting SFCG member agencies to provide information about their passive and active sensors, with the view of using that information to update the OSCAR/Space.
- To capture the updates to be incorporated in OSCAR/Space, SFCG has developed and updated Report SFCG 40-1R1 that is revised at every meeting triggered by an individual action item, for SFCG-42 in June 2023 this is Action Item 41/14 (Attachment 2).
- The information to be provided on passive and active sensors has been agreed with WMO and the individual data fields are explained in this Report SFCG 40-1R1. With highlighting of the updated information in a dedicated colour code, it is taken up by WMO and necessary updates are incorporated into OSCAR/Space.
- Regarding this mechanism for OSCAR/Space database updates, SFCG agreed to propose to CGMS to use the same template as provided in SFCG Report 40-1R1 (Extract in Attachment 3).
- To close the loop, WGI/A50.04 calls upon the SFCG Liaison Officer & WMO to propose to CGMS WGI a process for providing accurate and timely updates on satellite frequencies recorded in OSCAR/Space database. This process should ensure that CGMS agencies inputs to the database to WMO are aligned with SFCG inputs and activities.

Coordination Group for Meteorological Satellites

EUMETSAT CGMS

SFCG Process for gathering of remote sensing for updating the OSCAR/Space database (2)

Current process for OSCAR/Space updates (1):

- The current process for updating OSCAR/Space is based on the OSCAR/Space Support Team (O/SST) with the focal points nominated by CGMS Members in response to the request originally made in CGMS-45-WMO-WP-06. The present membership of O/SST is shown in the table below.

Agency	Focal Point
CMA	Feng Lu
CNES	Pierre Tabary, Adrien Deschamps
CNSA	Yong Gan
CSA	Ralph Girard
ECCC	Shannon Kaya, Christopher Linklater
ESA	Ivan Petiteville
EUMETSAT	Stephan Bojinski
IMD	A.K. Mitra
ISRO	Raj Kumar
JAXA	Toshiyuki Kurino
JMA	Takuya Sakashita
KMA	Dohyeong Kim
KARI	Lim Hyo-Suk
NASA	Charles Webb, Lacey McCarthy
NOAA	Natalia Donoho
ROSCOSMOS	Alexander Karelin
ROSHYDROMET	Sergey A. Uspensky

SFCG Process for gathering of remote sensing for updating the OSCAR/Space database (3)

Current process for OSCAR/Space updates (2):

- **The main mechanism for the WMO Space Programme Office to collect the relevant information is through templates submitted to the OSCAR/Space Support Team (O/SST) members, usually two to three times per year.**
- **The template was first introduced in working paper CGMS-47-WMO-WP-17b. An updated version of the template is provided to O/SST focal points according to records missing or recognized obsolete.**
- **O/SST focal points are expected to collect missing or outdate information within their respective organization or agency and to return the completed templates in a timely manner within the stated deadlines.**
- **In addition to the information collected through templates, O/SST members are expected to provide short-term updates as necessary in accordance with the O/SST Terms of Reference.**

SFCG Process for gathering of remote sensing for updating the OSCAR/Space database (4)

Proposed complement to current process for OSCAR/Space updates (1):

- Considering that the basic process for updating OSCAR/Space is already well established, it is proposed to complement this process with the same approach for providing updates to the remote sensor information in OSCAR/Space as established between the SFCG and WMO.
- It is proposed to use the same template for providing the information as given in Report SFCG 40-1R1 (see Attachment 3) with the same colour code for the indification of necessary updates.
- When taking the later approach for providing updates to the remote sensor information in OSCAR/Space through this existing process with the established O/SST focal points it should be ensured that these requests for updating particularly the remote sensor information are coordinated with the yearly update of this information through this yearly action in the framework of the SFCG (see Attachment 2) and that the with SFCG agreed templates are used. These templates for remote sensing frequency information could be made available online as for the other templates already used for updating OSCAR/Space.

SFCG Process for gathering of remote sensing for updating the OSCAR/Space database (5)

Proposed complement to current process for OSCAR/Space updates (2):

- **Considering that the current process through O/SST foresees an update exercise of usually two to three times per year, it should be determined in which intervals the remote sensor information in OSCAR/Space should be checked and updated. Several times per year are certainly not necessary as the information on the remote sensors, once included in the database, do not change very often.**
- **Furthermore, each agency has to ensure that the updates provided through SFCG and CGMS are aligned in order to not to present contradicting information to WMO.**
- **Action: WMO to introduce the templates agreed with the SFCG for updating the remote sensor information in OSCAR/Space into the current procedure through the OSCAR/Space Support Team (O/SST).**
- **The related action WGI/A50.04 can be closed.**

Response from SFCG on CGMS activities regarding mechanisms for detection, long-term monitoring and mapping of RFI

- The Liaison Officer between SFCG and CGMS informed SFCG about the work of a Task Group established in the framework CGMS Working Group I, dealing with RFI detection, monitoring and mapping.
- SFCG noted these developments in CGMS and will provide relevant information on this subject by means of the report of the Liaison Officer back to CGMS once there is something to report.
- However, SFCG is interest in the progress of this activity in the framework of CGMS.

To be considered by CGMS:

- CGMS is invited to note this report, conclude on the responses to actions WGI/A50.02 and WGI/A50.04, and to provide feedback and information on its activities via the CGMS/SFCG Liaison Officer to SFCG-42 (30 May – 7 June 2023) on any frequency related matter as appropriate.