



# Report on the outcome of WGI activities since last plenary

Presented to CGMS-51 Plenary session, agenda item .1

## Executive Summary

CGMS-51 WGI meeting took place on 24 April 2023.

All Task Groups presented the progress of their activities since CGMS-50.

Highlights:

- The topic of Radio Frequency Interference (RFI) is now well covered by the recently formed Task Group on RFI and generated a lot of discussion on passive bands spectrum protection and methods for monitoring and tracking interference issues.
- The SWOT analysis on Low Latency Data Access from LEO meteorological satellites was concluded, noting the importance of keeping the end-to-end data acquisition and provision under agency responsibility to be complemented by commercial services, and aiming to reduce the gap between global and regional services.
- Work on a new Data Collection Platform technical standard is progressing and should be ready for endorsement, along with an implementation plan at CGMS-52.
- The proposals from the CGMS 2022+ for work to be led by WGI were welcomed, many of which fitted into existing activities within the various Task Groups.

## WGI and its role within CGMS

### Working Group I – SATELLITE SYSTEMS and OPERATIONS

- Co-chair: Dohyeong Kim (KMA), Sean Burns (EUMETSAT)
- Rapporteur: Karolina Nikolova (EUMETSAT)

**The aim of WGI is to keep CGMS in line with the latest technological solutions that will operationally support the meteorological user community.**

### Objectives of WGI

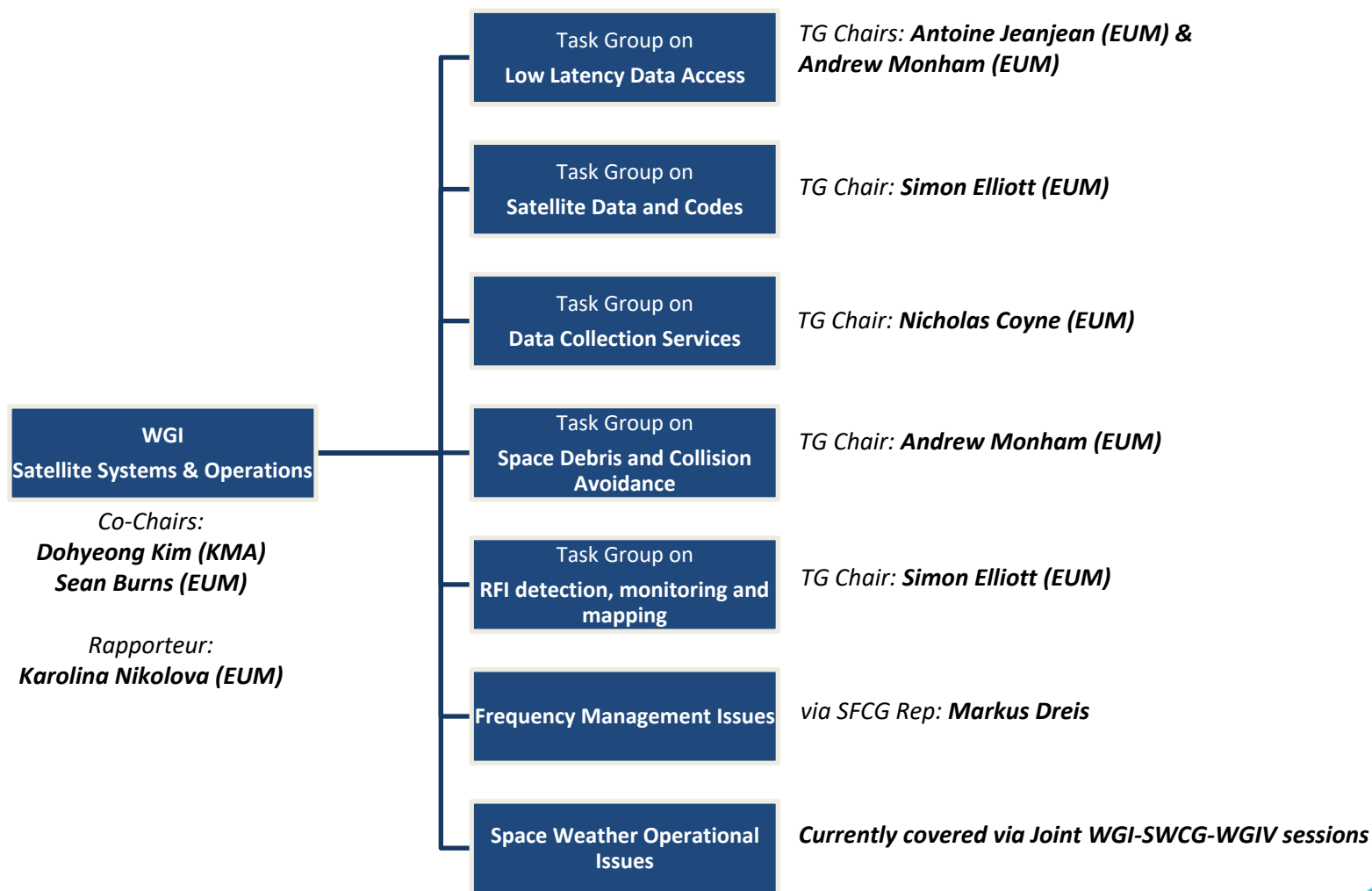
- Provide a regular forum for CGMS agencies to address topics of interest in areas related to global coordination of satellite systems and telecommunication
- Allow agencies to share experiences, lessons learnt and to develop best practices and detailed technical standards where appropriate related to global/common aspects of satellite systems and operations
- Preparation of satellite and ground systems/operations/architecture for the future generation of meteorological satellite systems
- Contribute to consolidation and updates of interoperability and standardisation imposed by technological evolution
- Address relevant aspects on the implementation of the global contingency plan when agreed by Plenary (as proposed by WGIII)
- Address topics from the CGMS High Level Priority Plan within the scope of WGI

### The objectives of WGI are achieved via the:

- Task Group on RFI detection, monitoring and mapping
- Task Group on Satellite Data and Codes
- Task Group on Low Latency Data Access (*merge of Direct Broadcast Systems & Coordination of LEO Orbits*)
- Task Group on Space Debris and Collision Avoidance
- Task Group on Data Collection Services

**The Task Groups are set up to look at specific areas in detail, with the aim of producing best practices, standards, future architectures and systems.**

## Current WGI Structure



## WGI main outcomes and future work (1)

### Frequency Management

- WGI noted the status of discussion on frequency matters and preparations for the WRC-23. In mid-June 2023, the SFCG rep circulated the final WMO preliminary position paper on WRC-23. CGMS members will need to ensure the WMO positions are known to its members' national and international preparation processes for WRC-23.
- SFCG Liaison Officer and WMO proposed a process for providing accurate and timely updates on satellite frequencies recorded in OSCAR/Space database. WMO will 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 importance of synchronisation between the SFCG and OSCAR/Space databases was highlighted.

## WGI main outcomes and future work (2)

### Task Group on RFI detection, monitoring and mapping

- The WGI Task Group on RFI (TGRFI) has now been formed and inputs on the topic of spectrum issues and RFI detection, monitoring and mapping have been provided by CMA, EUMETSAT, KMA, NOAA and WMO in intersessional meetings.
- The Group will proceed with analysing the provided inputs and pursue the establishment of a draft set of best practices by CGMS-52, based on the common aspects of the approaches already adopted by members.
- Beau Backus (NOAA) presented a paper raising awareness of the proposals and plans for spectrum sharing that may impact meteorological and climatological data.
  - The implementation of 5G and following generations of broadband are expected to affect the EESS (passive) bands, as well as commercial non-geostationary satellite constellations.
  - Recommended emphasis on the development and implementation of RFI identification and sensor robustness measures.
  - Highlighted areas where efforts are underway to develop different methods and technologies that may reduce the risk of data corruption and loss.
  - Highlighted importance of CGMS members continuous monitoring of the WRC agenda items that may affect satellite remote passive sensing, noting that continuous effort in the regulatory area and policy is necessary to prevent or delay RFI contamination in passive bands.
- The topic of RFI in the context of space weather was also discussed in the joint WGI-WGIV-SWCG

## WGI main outcomes and future work (3)

### Task Group on Satellite Data and Code

- The WGI Task Group on Satellite Data and Codes (TGSDC) has been actively supporting the coordination of work on satellite product format issues within the CGMS community and providing support to the work of WMO's expert teams.
- The Task Group has worked with the WMO Secretariat and the WMO Expert Team on Data Standards (ET-Data) and its Task Team on Table Driven Code Forms (TTTDCF) on the development of a number of new BUFR encoding sequences and Common Code Table entries, such as for FY-4B GIIRS, TROPICS and Metop-SG.
- Note: WGI encourages active participation in the work of the Task Group from all satellite operators.

## WGI main outcomes and future work (4)

### **Task Group on Low Latency Data Access (*merge of Direct Broadcast Systems & Coordination of LEO Orbits*)**

- The WGI Task Group on Direct Broadcast Systems and WGI Task Group on the Coordination of LEO Orbits have completed the SWOT analysis on Low Latency Data Access from LEO meteorological satellites.
- The SWOT analysis also concluded on the importance of keeping the end-to-end data acquisition and provision under agency responsibility to be complemented by commercial services.
- The analysis has explored the pros and cons of emerging technologies which could remove the historical architectural boundaries between global data access and direct broadcast systems, providing low latency data delivery for both global and local applications.
- The Group will distribute a summary outcome of the SWOT analysis to the remaining CGMS Working Groups, and will keep the SWOT analysis current as part of the routine activities of the merged Task Group.



## WGI main outcomes and future work (5)

### **Task Group on Low Latency Data Access (*merge of Direct Broadcast Systems & Coordination of LEO Orbits*)**

- WGI endorsed the proposal of the two groups to merge their activities into a single “Low latency Data Access from LEO Satellites” task group, with Andrew Monham (EUM) and Antoine Jeanjean (EUM) as Co-chairs.
- The new LLDA TG will present finalised Terms of Reference for endorsement to CGMS-52. The Best Practices of the two groups will be merged into a single LLDA Best Practices document and a draft presented to CGMS-52.
- Membership list will be reviewed and updated to reflect the merge.
- Additionally, the merged TG will analyse the potential role of satellite platform as a service (SPaaS) and report findings to CGMS-52.

## WGI main outcomes and future work (6)

### Task Group on Space Debris and Collision Avoidance

- The WGI Task Group on Space Debris and Collision Avoidance has not met since CGMS-50.
- In order for the Task Group to proceed with its activities, the paper proposed the following next steps:
  - Identify leadership and membership of the Space Debris and Collision Avoidance TG;
  - Build on the NOAA-EUMETSAT work already performed, with wider Agency participation;
  - Propose to integrate agreed steps from the final SSA Position Paper with appropriate delivery dates.
- A discussion on the leadership of the Group took place, and WGI endorsed Andrew Monham (EUMETSAT) as interim Chair of the Task Group.
- The Group will build on the NOAA and EUMETSAT work performed so far, and work towards the establishment of best practices on collision avoidance and debris mitigation.
- Wider CGMS agency participation in the future activities is strongly encouraged.

## WGI main outcomes and future work (7)

### Task Group on Data Collection Services

- The WGI Task Group on DCS has made progress on the discussions for an Enhanced DCP (E-DCP) standard, with inputs from DCP manufacturers.
  - The Group presented an initial draft of an EDCP design, which will only require firmware updates to existing systems.
  - The group will finalise the EDCP technical standard proposal and present it for endorsement to CGMS-52.
  - If endorsed, next steps in the period 2024-2027 could be to develop a prototype transmitter, test and certify it, and eventually modify the reception systems for all agencies.
  - These steps would require funding, for which a solution needs to be identified. Furthermore user engagement would be necessary and user take-up would be a longer term activity.

## WGI main outcomes and future work (8)

### Task Group on Data Collection Services

- The progress on the items part of the DCS SWOT analysis was presented, including RFI mitigation, joint DCS promotional materials, DCS introduction video, and manufacturers workshop.
  - The Task Group will complete the DCS SWOT analysis and provide current conclusions and recommendations to WGI, then maintain the SWOT updated as part of its routine activities.
  - The topic of RFI is important for DCS, and the Task Group has agreed to develop a DCS RFI interference register. The output of the DCS RFI register will be provided to the TG on RFI, for potential input in the best practices on RFI.
- WGI encouraged active participation in the work of the Task Group from all satellite operators.

WGI main outcomes and future work (9)

## Task Group on Data Collection Services

- Beau Backus (NOAA) presented updates on the status of the Small Satellite project, which aims to determine if DCS can support satellites equipped with data collection platforms (DCPs).
- The Task Group on DCS will prepare a proposal on the agreed permitted Smallsat use of DCS by satellite systems and under what conditions, for discussion and endorsement at CGMS-52.

## WGI main outcomes and future work (10)

### CGMS Future direction 2022+ project

- Sean Burns presented the latest status and way forward for the CGMS Future direction 2022+ project. WGI was invited to take note of the status of CGMS future direction 2022+ project. WGI agreed to the proposals for leadership of the different strategic themes.
  - Socio-economic benefits – *proposed to be led by WGIII*
  - Research to operations – *proposed to be led by WGIV*
  - Future observing (hybrid) space infrastructure – *proposed to be led by WGI (Simon Elliott)*
  - Future information technologies – *proposed to be led by WGI, WGIV (Cloud), WGII (AI/ML)*
  - Relationship with the private sector – *proposed to be led by WGIII*
  - Climate and Earth system monitoring – *proposed to be led by WGII*
  - Space situational awareness – *proposed to be led by WGI and SWCG*
  - + A topic for all: supporting developing countries

## Items for Plenary

- The HLPP was updated following review of WGI related matters. The revised HLPP will be presented to plenary for endorsement.
- The WGI Co-chairs encouraged CGMS agencies to consider nominating additional members for all the WGI Task Groups, especially ones where no representatives of the agencies are currently participating in the Task Group(s).
- WGI agreed to continue the approach of each of the Task Groups regularly presenting their latest Best Practices and status of Best Practices implementation, as well as proposals for future activities based on up-to-date SWOT analyses.
- WGI will present its latest Terms of Reference to CGMS-52.
- WGI confirmed the continued availability of Dohyeong Kim (KMA) and Sean Burns (EUMETSAT) as Co-Chairs, and Karolina Nikolova (EUMETSAT) as WGI Rapporteur.
- CGMS Members are invited to nominate candidates for Co-Rapporteur and Co-Chair of WGI.

## Key issues of relevance to CGMS:

- The topic of RFI is now well covered by the recently formed Task Group on RFI and generated a lot of discussion on passive bands spectrum protection and methods for monitoring and tracking interference issues.
- The SWOT analysis on Low Latency Data Access from LEO meteorological satellites was concluded, noting the importance of keeping the end-to-end data acquisition and provision under agency responsibility to be complemented by commercial services, and aiming to reduce the gap between global and regional services.
- Work on a new Data Collection Platform technical standard is progressing and should be ready for endorsement at CGMS-52.
- The proposals from the CGMS 2022+ for work to be led by WGI were welcomed, many of which fitted into existing activities within the various Task Groups.





## To be considered by CGMS:

- CGMS is invited to note the outcome of WGI activities since last plenary
- For actioning:
  - CGMS agencies to consider nominating additional members for all the WGI Task Groups, in particular those where no representatives of the agencies are currently participating in the Task Group(s).