



WGI key recommendations to CGMS plenary

Presented to CGMS-52 Plenary session, agenda item 5

Executive Summary

CGMS-52 WGI meeting on 22 April 2024.

All Task Groups presented the progress of their activities since CGMS-51.

WGI Outcomes

Key recommendations to Plenary:

- Updated CGMS WGI Terms of Reference for endorsement
- Enhanced Data Collection Platform (EDCP) standard proposal for endorsement
- Capture the process used for the analysis of Hybrid Space Observation Architectures and subsequently re-apply it for specific cases identified by WGIII's Gap Analyses
- New Co-Chair nomination for endorsement
- WGI Task Group nominations

Informational:

- Conclusions of analysis on low latency data access solutions for global timeliness improvements
- Best Practices for frequency spectrum progress
- Foundations of Task Group on Space Environment Sustainability
- World Radiocommunication Conference 2023 (WRC-23) outcomes

WGI Terms of Reference (1/3) – for endorsement

- CGMS WGI agreed to present the revised **Terms of Reference (ToR) for WGI**, to CGMS-52 Plenary for endorsement.
- In recent years, scope of WGI has gradually evolved to cover additional important systems operations topics, such as:

Low Latency Data
Access

Space Environment
Sustainability

Radio-Frequency
Interference (RFI)
detection, monitoring
and mapping

Satellite data formats
within CGMS
community
(transferred from
WGIV)

- Updated WGI ToRs reflect current objectives, structure, aligned with HLPP.

CGMS WGI recommends to CGMS Plenary:

The endorsement of the updated CGMS WGI Terms of Reference.

WGI Terms of Reference (2/3) – for endorsement

Aim of WGI on ‘Satellite Systems and Operations’: to keep CGMS aligned with the latest technological solutions that will operationally support the meteorological user community.

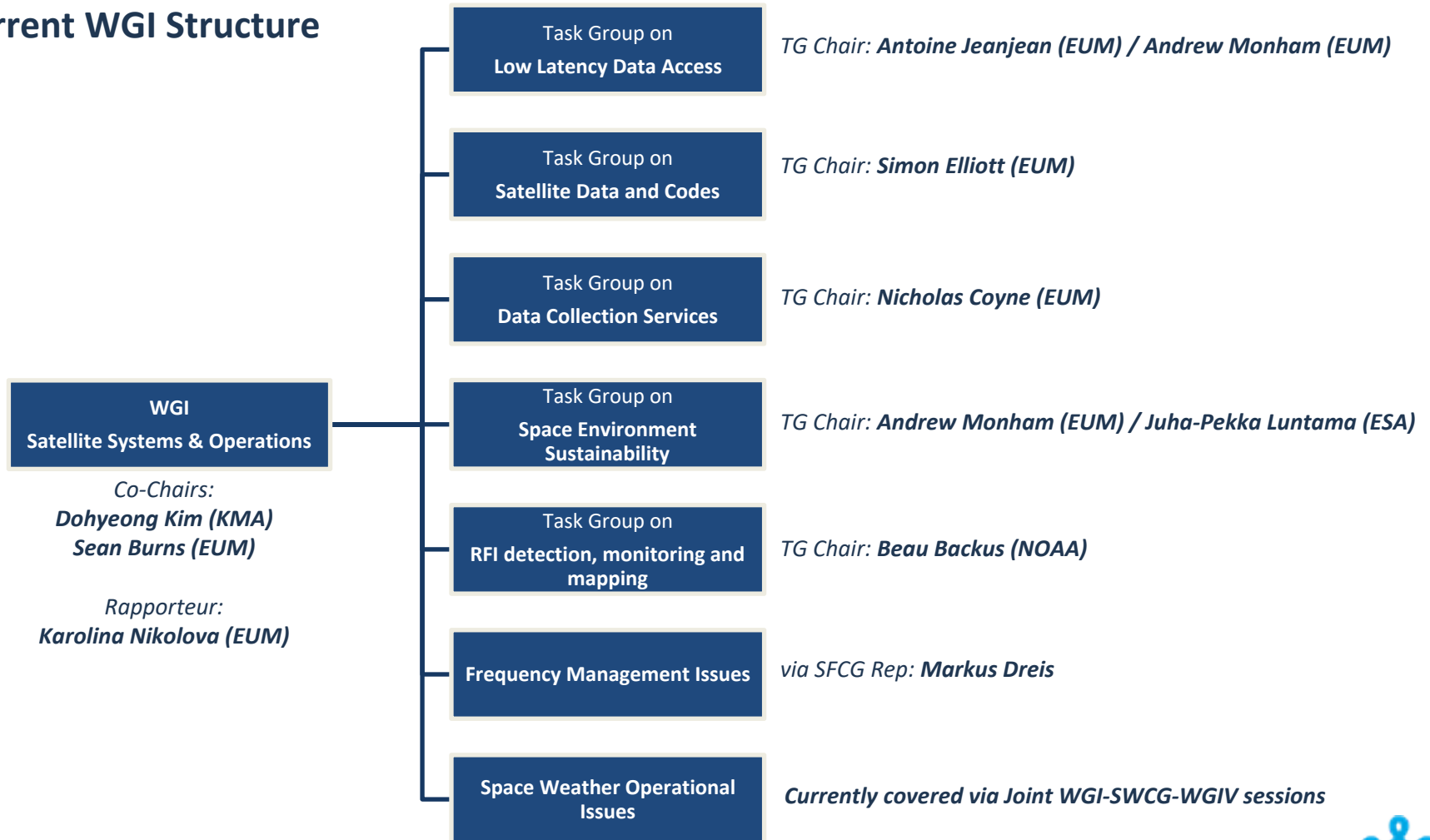
Objectives of CGMS WGI:

- 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**, to develop **best practices** and detailed technical standards where appropriate related to global/common aspects of satellite systems and operations;
- Support CGMS **in preparation of future generations** of meteorological satellite systems;
- Contribute to consolidation and updates of **interoperability and standardisation** imposed by technological evolution.

Objectives of WGI achieved via Task Groups: specific areas investigated in detail, with the aim of producing best practices and standards for current and future architectures and systems.

WGI Terms of Reference (3/3) – for endorsement

Current WGI Structure



WGI key recommendations – EDCP Standard Proposal (1/3)

- WGI agreed to present the **Enhanced DCP transmitter (EDCP) standard**, prepared by the WGI Task Group on DCS, to CGMS-52 Plenary for endorsement.
- Benefits of an EDCP standard:

Increased **robustness and reliability** - use of forward error correction to protect against message corruption

Ability for user to dynamically select the **modulation type** on the DCP transmitter (400 BPS/BPSK and 800 BPS/OQPSK)

Additional data embedded in the header providing DCP transmitter health status

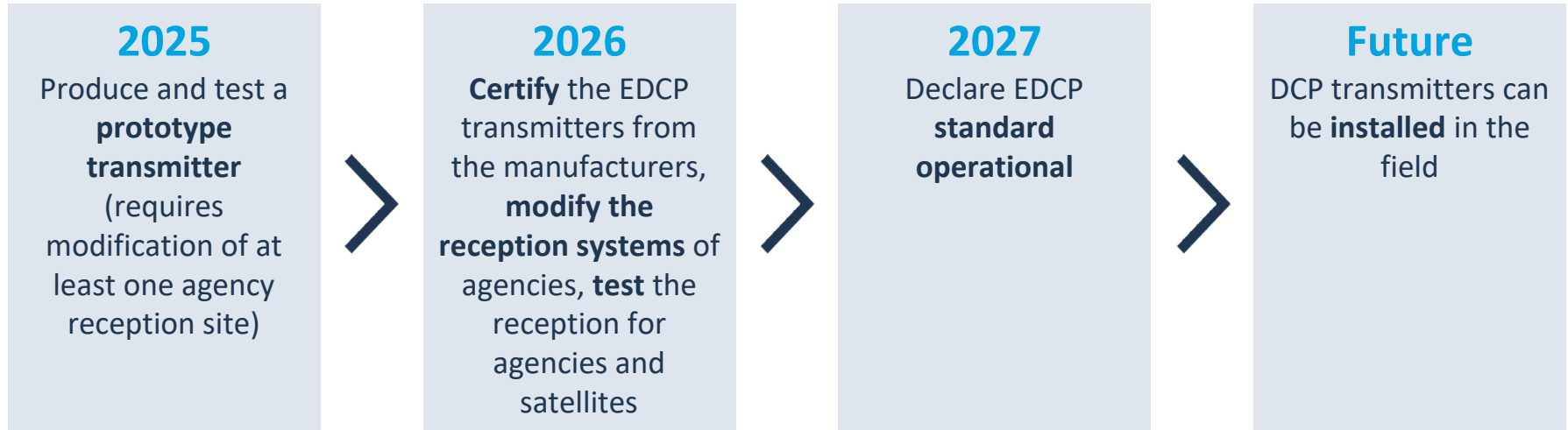
Ability to use **lower power modes** - especially useful for solar/battery powered installations

Improved use of **message length** - allowing better use of bandwidth

- If adopted across agencies, the standard would also allow for DCP use internationally and serve as a common standard for DCP transmitter manufacturers.

WGI key recommendations – EDCP Standard Proposal (2/3)

- A funding approach and timeline have been proposed to declare the standard operational by 2027:



- Operational usage and transition:
 - The new EDCP standard complements existing DCP standards, providing the opportunity for a common agency standard.
 - The utilisation and phasing-in of the EDCP standard would be up to each individual agency.

WGI key recommendations – EDCP Standard Proposal (3/3)

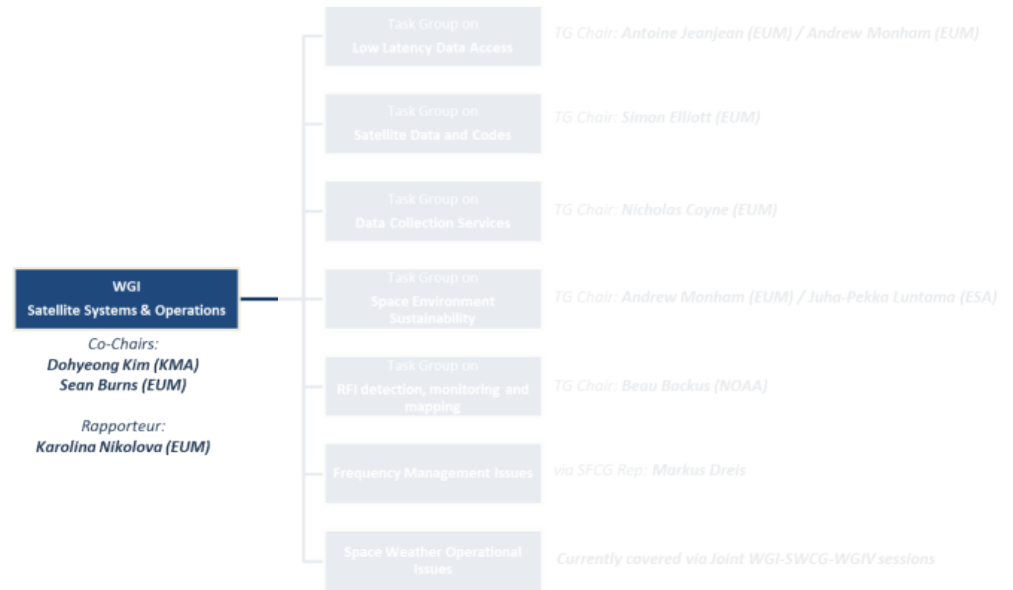
- Proposed funding approach for prototype transmitter:
 - Funding from NOAA (working with the manufacturer Microcom) and EUMETSAT (working with the manufacturer OTT-Sutron).
- If endorsed by CGMS-52 Plenary, the Task Group on DCS would proceed with producing and testing a prototype DCP transmitter in 2025 and present their progress in CGMS-53 WGI.

CGMS WGI recommends to CGMS Plenary:

The endorsement of the EDCP standard, as well as the proposed plan for activities leading up to declaring the EDCP standard as operational, and related timeline and funding approach.

WGI key recommendations – New Co-Chair nomination

- WGI agreed to nominate James Donnellon (NOAA) as WGI Co-Chair, replacing Sean Burns (EUMETSAT), to CGMS-52 Plenary for endorsement.

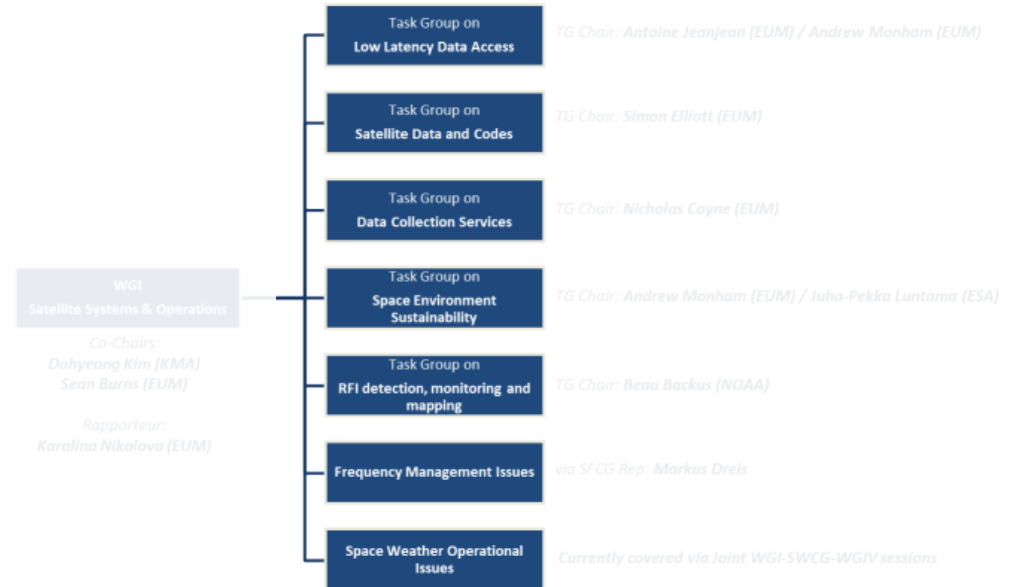


CGMS WGI recommends to CGMS Plenary:

The endorsement of James Donnellon (NOAA) as WGI Co-Chair, replacing Sean Burns (EUMETSAT).

WGI key recommendations – WGI Task Group nominations

- CGMS WGI also invites nominations to all WGI Task Groups by all agencies, noting especially the more recently formed Task Group on Space Environment Sustainability and Task Group on RFI, as well as the benefits of membership from all agencies in the Task Group on DCS.



Low Latency Data Access (LLDA) - informational

- WGI Task Group on LLDA completed SWOT analysis of current LEO weather satellites systems, identifying how low latency data access solutions could help in improving timeliness globally.

Direct broadcast

remains a better value for money solution to GEO IoT for instrument payload downlink

LEO relay IoT can

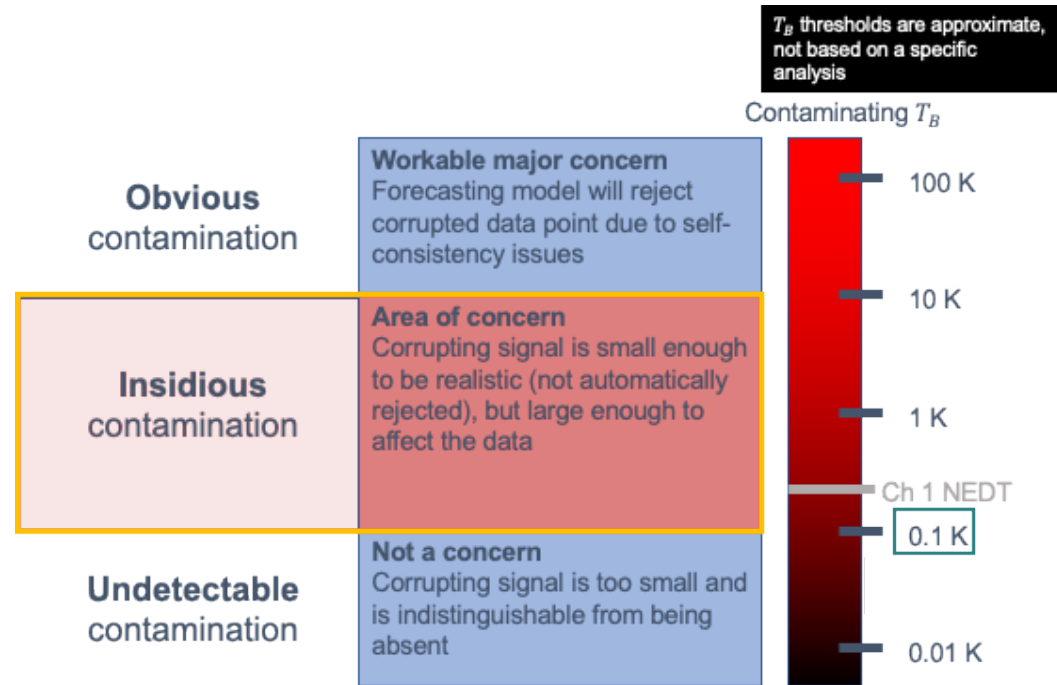
complement DCS in polar locations

GEO IoT can open new mode of operations for LEO meteorological satellites (e.g. TM&TC)

- In the lead up to CGMS-53, the Task Group will work on identifying concrete CGMS actions based on the LLDA SWOT, including priority areas and demonstration cases in agencies. E.g. cloud, TT&C, relation with private sector.

RFI detection, monitoring and mapping – informational

- WGI Task Group on RFI - progress on developing Best Practices for frequency spectrum protection, along with methods for monitoring and tracking interference issues.
- Draft set of best practices based on common aspects of already existing or planned for adoption approaches – to be presented for endorsement by CGMS-53.
- The Group will also explore potential and existing uses of AI/ML and pattern recognition in RFI detection.



Non-natural RF contamination will only increase, both in intensity and in spectrum proliferation (Source: WGI TG on RFI)

Space Environment Sustainability, Smallsat, Satellite Data and Codes – informational

Task Group on Space Environment Sustainability – established and foundations laid with ToRs

- All aspects of operations in the space environment. CGMS member coordination to support improvements in safety and sustainability of space operations for all space actors.
- Objectives include best practices for space traffic coordination, lifetime extensions, end-of-life disposal and mitigations of risk and effects of space weather.

NOAA Small Satellite project – aims to determine if DCS can support satellites equipped with Data Collection Platforms (DCPs)

- The initial concept for Satellite use of DCS was successfully validated through TES-10.
- Concept is valid and DCS can be utilised by satellites to some definable degree.
- In the lead up to CGMS-53, the Task Group on DCS will collect inputs from the DCS Satellite Operators on how their policies affect the usage of Smallsat.

Task Group on Satellite Data and Codes – ongoing successful development of new BUFR encoding sequences and Common Code Table entries

Frequency Management WRC-23 Outcomes – informational

All World Radiocommunication Conference 2023 (WRC-23) agenda items of relevance for CGMS were positively concluded with the views expressed in the corresponding HLPP, also in-line with the WMO positions as presented to WRC-23

- 1.14 New frequency allocations for the Earth Exploration Satellite Service (passive, 239.2-242.2 and 244.2-247.2 GHz) to provide protection of operation of passive microwave sensors for Ice cloud imaging

- 1.16 Protection of passive microwave sensor measurements (18.6-18.8 GHz and 36-37 GHz) from potential RFI
- 1.17 through establishment of appropriate power flux-density respectively e.i.r.p density limits for new non-geostationary satellite services and applications around those frequency bands

- 9.1 (D) 4 Strengthening of the status of passive microwave sensing by avoiding to study sharing with active communication services in frequency bands covered by the special provision of RR footnote 5.340 (all emissions are prohibited) by means of corrections to RR Resolution 731, relevant for all passive microwave sensors

- 1.4 No new frequency spectrum and regulations for active communication services in and around the MetSat
- 1.18 downlink band 1695-1710 MHz which could have otherwise negatively impacted future MetSat data downlinks and broadcasts

- 9.1 (A) First level of recognition of Space Weather in the RR due to a definition of space weather and its service designation under MetAids (space weather) and a new Resolution outlining the importance of space weather applications

Frequency Management WRC-27 Outlook on items identified in the HLPP – informational

2.2.1 Facilitate an effective preparation of national and ITU-R regional groups' positions for the World Radiocommunication Conference (WRC) 2027 favourable for CGMS-related issues, in particular but not exclusively with regard to the:

- 1.1** Establishment of protection for passive microwave sensors in the bands 50.2-50.4 GHz, 52.6-54.25 GHz
- 1.3** and in bands above 86 GHz from unwanted emissions from active services in neighbouring frequency
- 1.8** bands
- 1.18**

- 1.19** Possible new primary frequency allocations to the EESS (passive) in the 4200-4400 MHz and 8400-8500 MHz bands for Sea Surface Temperature (SST) measurements to complement the SST measurements in the 6/7 GHz range

- 1.7** Protection of the frequency bands 7450-7550 MHz, 7750-7900 MHz and 8025-8400 MHz, used for the downlink from MetSat and EO satellites, from possible future frequency usage by International Mobile Telecommunications (IMT)

To be considered by CGMS:

- CGMS is invited to note the outcome of WGI activities since last plenary.
- CGMS is invited to note the recommendations of WGI with respect to:
 - Capturing the process used for the analysis of Hybrid Space Observation Architectures and subsequently re-applying it for specific cases identified by WGIII's Gap Analyses.
 - WGI Task Group nominations.
- CGMS is invited to:
 - Endorse the updated CGMS WGI Terms of Reference.
 - Endorse the EDCP standard, as well as the proposed plan for activities leading up to declaring the EDCP standard as operational, and related timeline and funding approach.
 - Endorse James Donnellon (NOAA) as WGI Co-Chair, replacing Sean Burns (EUMETSAT).