**Coordination Group for
Meteorological Satellites**

CGMS

CGMS-52-WGI-WP-03
24 April 2024

Prepared by: NOAA
Agenda Item 3.1
Discussed at WG1

Subject	***Report from the CGMS WGI Task Group on RFI detection, monitoring, and mapping (incl. latest ToR, status on current & proposed/planned activities)***
In response to CGMS action/recommendation	WGI/A51.04, WGI/A51.05
HLPP reference	2.2 Radio Frequency (RF) protection
Executive Summary	Working Group I tasked the TGRFI (Task Group on RFI detection, monitoring and mapping) to continue to pursue the establishment of a proposed set of best practices by CGMS-52 based on the common aspects of the approaches already adopted by members and to explore the potential / existing uses of AI/ML and pattern recognition in RFI detection. This paper outlines the Task Group status, describes its activities in the past year and the plans for the coming period.
Action/Recommendation proposed	Recommendation: Working Group I to instruct TGRFI to complete a proposed set of best practices by CGMS-53 WGI based on the common approaches already or planned for adoption by members for endorsement by CGMS-53 and to continue to explore the potential / existing uses of AI/ML and pattern recognition in RFI detection.

1 INTRODUCTION

The Task Group on RFI Detection, Monitoring and Mapping (TGRFI) was established in response to CGMS-49 request to establish the initial ideas about mechanisms regarding the detection, monitoring, and mapping of RFI, including the passive bands. The group began meeting in May 2022 and has continued meeting periodically since that original kick off.

This paper briefly summarizes the status of TGRFI, its activities to date, and its planned upcoming activities.

2 CURRENT STATUS

2.1 Membership
The current membership of the TGRFI, including guests, is listed:

Organization	Name	
CMA	NIE	Jing
CMA	WU	Shengli
ECCC	Alec	Casey
ESA	Yan	Soldo
EUMETSAT	Markus	Dreis
EUMETSAT	Simon	Elliott
EUMETSAT	Karolina	Nikolova
KMA	Junghun	Choi
KMA	Dohyeung	Kim
NOAA	Beau	Backus
NOAA	Skip	Dronen
WMO[1]	Jesse	Andries
Guest	Phillippe	Tristant

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[1] *WMO was formerly represented by Ken Holmlund. The TGFI meetings have also been supported by Zoya Andreeva and Heikki Pohjola from WMO.*

2.2 Terms of Reference

The tasks of the TGRFI team for this year include:

- Analyze the inputs provided by CMA, EUMETSAT, KMA, and NOAA on spectrum concerns and activities on RFI detection, monitoring, and mapping and…
- Continue to pursue the establishment of a proposed set of best practices by CGMS-52 based on the common aspects of the approaches already adopted by members.
- Explore the potential / existing uses of AI/ML and pattern recognition in RFI detection.

WGI, at the request of Simon Elliott, agreed that Beau Backus from NOAA would lead TGRFI.

2.3 Current and Upcoming Activities

2.3.1 TGRFI I (5 Oct 2023)

Review of team members and discussion on any additional members recommended to be invited. Discussion on the inputs previously provided by CMA, EUMETSAT, KMA, and NOAA regarding RF spectrum interference concerns and any activities on RFI detection, monitoring, and mapping. Began discussion on development of a draft set of best practices for CGMS-52 based on aspects of the approaches already adopted by members. Recognized upcoming World Radiocommunications Conference and planned to conduct further review of best practices just prior to the next meeting on 18 Jan 2024. Brief review of the potential or existing uses of AI/ML and pattern recognition for RFI detection. Members were not readily aware of this use of AI/ML.

2.3.2 TGRFI II (18 Jan 2024)

Members briefly reviewed the roster of team members. Two additional members identified. Most of the meeting spent in review and discussion of the member provided "Best Practice Brainstorming for RFI Detection, Monitoring, and Mapping" document. Members determined that additional time was needed for developing the Best Practice document and agreed to meeting again on 14 March.

2.3.3 TGRFI III (14 Mar 2024)

Members continued to review and discuss the updated version of the "Best Practice Brainstorming for RFI Detection, Monitoring, and Mapping" document. It was noted that the document had a primary focus on the passive band RFI issue, primarily viewed as the most pressing need for a best practice document. It was determined that an additional meeting would be needed prior to the CGMS-52 WGI meeting. Fourth

meeting scheduled for 26 March. Team ran out of scheduled time to discuss the AI/ML action item and noted it for the next meeting.

2.3.4 TGRFI IV (26 Mar 2024)

Members continued to review and develop the next version of the "Best Practice Brainstorming for RFI Detection, Monitoring, and Mapping" document. Added additional material to include "who" and "when" information. Determined that the document was not ready for endorsement at CGMS-52 and should be provided for review. Discussed the AI/ML and pattern recognition for RFI detection. Team recognized that AI/ML was a rapidly growing technical area and that members would review their agencies activities in this area for application to RFI identification and mitigation.

2.4 Upcoming Activities

The Task Group's next requested tasks are to complete a draft proposed set of best practices by CGMS-53 based on the common aspects of the approaches already or planned for adoption by members for endorsement by CGMS-53. Additionally, the Task Group will continue to explore the potential / existing uses of AI/ML and pattern recognition in RFI detection.

Once established, the best practices can be endorsed by CGMS-53 and used to assist members implement a standard approach for assessing RFI and developing more robust systems and processes for minimizing remote passive band sensor corruption.

Four intersessional meetings have been scheduled: on 12 September 2024, 14 November 2024, 9 January 2025, and 20 February 2025. Additional dates may be scheduled depending on the progress made by the team.

3   ACTIONS AND/OR RECOMMENDATIONS FOR CONSIDERATION BY CGMS WORKING GROUP I

Recommendation: Working Group I to instruct TGRFI to:

a) Complete a proposed set of best practices by CGMS-53 based on the common aspects of the approaches already or planned for adoption by members for endorsement by CGMS-53.
b) Explore the potential / existing uses of AI/ML and pattern recognition in RFI detection.

4   CONCLUSION

The Task Group on RFI Detection, Monitoring and Mapping began its work in 2022, and since then, has collected inputs describing how CGMS members are assessing the impact of RFI. The Group has since identified common ways of using this information as a basis for a set of best practices, which can ultimately be endorsed by CGMS and used to help members implement a standard approach for assessing, processing, and potentially mitigating RFI. The current Best Practice being developed is primarily focused on the most challenging of RFI, that of passive band corruption and will be presented for review at CGMS-52 WGI.