CGMS-48-CGMS-WP-09
V1A, 30 April 2020

Prepared by EUMETSAT
Agenda Item: 5.1
Discussed in WG-I

Report from CGMS DCS sub-group

In response to CGMS action A47.06, A47.07, A46.06, A46.07, A46.08

At CGMS-46, WGI endorsed the proposal for the creation of a Data Collection Service (DCS) sub-group dedicated to DCS activities. The main purpose of the group was to make more effective progress with DCS activities and issues in the context of CGMS. The first task of the group has been to address the need for and make proposals for a new IDCS DCP standard, the development of DCS best practices for DCS data access and for DCP certification, as well as the inclusion of CGMS DCS webpage.

The DCS sub-group, consisting of DCS Managers from each of the satellite operators, have met virtually as part of the WGI Intersessional meetings, but also face-to-face in the context of other already scheduled DCS-related meetings. The last face-to-face took place in Boston as part of the AMS on 30 September and 1 October 2019.

This paper presents the status of the DCS sub-group activities and progress since CGMS-47. This has included the publication of a DCS Handbook. The CGMS Best Practice for DCS data access has been rewritten taking into account the comments during CGMS-47. The discussions of the Enhanced DCP (E-DCP) standard have continued and is a major topic for the sub-group.

Action/Recommendation proposed:

CGMS is invited to take note of the DCS sub-group activities and progress since CGMS-47 along with the following actions.

Action 47.07: Review and provide comments to Draft V1B of the DCS Handbook.
Action 47.06: DCS sub-group to coordinate the elaboration of the user requirements, the technical specifications, and potential applications new Enhanced DCP (E-DCP) standard and make a proposal to WGI
Action 46.06: The DCS sub group is invited to review and provide comments to the draft of the CGMS agency best practices in support to user DCS data access.

1 REPORT FROM DCS SUB-GROUP INTRODUCTION

This paper presents the report from the WGI Data Collection Services (DCS) sub-group. The DCS sub-group was endorsed at CGMS-46 . This report covers the group's activities since CGMS-47.

The main purpose of the group is to make continued effective progress with DCS activities and issues in the context of CGMS. The first task of the group has been to address the need for and make proposals for a new IDCS DCP standard, the development of DCS best practices for common DCS data access mechanisms and DCP certification, as well as the inclusion of CGMS DCS webpage.

The DCS sub-group, consisting of DCS Managers from each of the satellite operators, have met virtually as part of the WGI Intersessional meetings, but also face-to-face in the context of other already scheduled DCS-related meetings. The most recent DCS sub-group face-to-face meeting was held on the occasion of the AMS in Boston on the 30 September and the 1 October 2019.

2 SUB-GROUP STRUCTURE AND MANAGEMENT ARRANGEMENTS

2.1 Core Members

As part of WGI, all CGMS members are encouraged to participate in the DCS sub-group. The core members of this group are the DCS Managers from each of the following agencies:

EUMETSAT	Nicholas Coyne – Co-ordinator
EUMETSAT	Karolina Nikolova
NOAA	Richard Antoine
JMA	Kotaro Bessho

Also the following frequency managers:

NOAA	Beau Backus
EUMETSAT	Markus Dreis

A mailing list was generated for the WGI DCS Sub-group. The following people are included on the list.

Dr Werner BALOGH – WMO
Melanie Heil - ESA
Sean Burns - EUMETSAT
Natalia Donoho - NOAA
Juha-Pekka Luntama - ESA
Nancy Ritchey – NOAA
Thomas Feroli – NOAA

Olga Ryzhkova - Roshydromet
Yu Deng – NOAA

The co-ordinator should be informed of any CGMS members wishing to be included on the list.

2.2 Meetings

Boston DCS Sub-group

The most recent face-to-face meeting of the DCS sub-group took place during the AMS in Boston, USA on 30th September 2019.

Participants

- EUMETSAT: Nicholas Coyne, Sean Burns
- NOAA NESDIS: Richard Antoine, Beau Bachus, Letecia Reeves, Matt Sullivan, Travis Thorton
- Microcom: Brett Betsill
- University of Dundee: Paul Crawford (Webex),
- Aerospace Corporation: Dave Kunkee

Agenda:

1. Progress on the Enhanced DCP transmitter standard
2. Status of Small satellite project
3. Completion of the DCS Handbook
4. CGMS Best practice: Data Collection Systems Data Access
5. Benefits and outreach of DCS
6. WGI DCS Sub-Group actions review

The meeting agenda covered the DCS topics above. It was very beneficial to have a face-to-face meeting, which allowed detailed discussions. There was some progress presented for the Small Sat project and also an agreement to produce a system concept for the Small Sat. This would be led by Beau Bachus from NOAA. There was also detailed discussion on the enhanced DCP standard with Dr. Paul Crawford and Brett Betsill providing valuable inputs. A way forward for the use of the material produced by SCISYS still needs to be reached. Progress was also made on the DCS Handbook and the outline of the Best Practice for DCS Data Access. Outreach for DCS, emphasising the benefits was elaborated, noting that the DCS Handbook would be the first concrete step. The Actions of the DCS Sub-Group were reviewed and updates will be provided in the CGMS Action Database. There were plans to organise an additional face-to-face of the DCS Sub-group during the NOAA DCS Technical Working Group (TWG). Due to the COVID-19 situation these plans had to be cancelled.

Intersessionals

Following the Face-to-Face meeting in Boston the Sub-group has held 4 WebEx sessions covering dedicated topics. The group has now adopted a 6-weekly WebEx meeting pattern. It was also recommended to hold a face-to-face DCS sub-group

meeting on the occasion of the EUMETSAT DCS Workshop with the intention to hold this Workshop alongside the SATCOM Forum held every two years. The DCS Workshop will now be moved to Autumn 2021, in conjunction with the Satcom Forum and as part of the Meteorological World Expo which is expected to be held in Paris.

2.3 Reporting

This DCS sub-group provides a report of its Intersessional Meetings to WGI interested parties and a full report of its activities for review to CGMS WGI.

3 ACTIVITIES

3.1 DCS Handbook

The DCS handbook is now published. It has been tailored to readers with no previous knowledge of DCS, which could help them to assess whether DCS could answer some or all of their remote data collection requirements and how to make use of the available data collection services.

The DCS Handbook was inspired by the success of the Satcom Handbook produced by Mike Prior-Jones under the banner of the Satcom Forum. "Satellite Data Telecommunication Handbook (WMO No.1223)", and several members of the Satcom Forum assisted in the process.

The handbook is a CGMS document and CGMS DCS Sub-group members have been active in providing input and review of the content. The sub-group expects this Handbook to be a key element in allowing new and potential users of the DCS to gain an overview of all the DCS of the CGMS organisations.

The DCS Handbook is accessible through the CGMS DCS webpage.

Action 47.7 Review and provide comments to Draft V1B of the DCS Handbook is now proposed for closure.

3.2 New DCP Standards and Applications (A47.06)

The presentation on the new Enhanced DCP (E-DCP) standard was well received by the DCS sub-group. This may be seen as a starting point for a new CGMS standard, a possibility for a true international DCP that could be used on either EUMETSAT, NOAA or JMA satellites, and possibly other agencies operating DCS. Several questions still need to be addressed, including how the development of this standard will be funded, and which bandwidth could be used and selection of the target use. There is a lot of interest in the development of this new standard and a group of the interested parties were identified that could contribute to the formulation of a new standard. A group has now been formed to elaborate the user requirements, the technical specifications, potential applications also taking into account the Small Sat experiments, which are being conducted by NOAA (A Report and status of the small

satellite DCS use concept validation project is planned by Beau Backus - CGMS-48-NOAA-WP-02), comprising:

- Beau Backus NOAA Frequency Manager
- Richard Antoine NOAA DCS Manager
- Markus Dries EUMETSAT Frequency Manager
- Nicholas Coyne EUMETSAT DCS Manager
- Sean Burns EUMETSAT Head of Real Time Services and System Operations Division
- Karolina Nikolova EUMETSAT DCS Engineer
- Kotaro Bessho JMA DCS Manager
- Frank Zeppenfeld ESA
- Dr Paul Crawford Dundee University), co-author of the E-DCP document produced by SCISYS
- Brett Betsil Microcom

Some possibilities for further face-to-face meetings had been identified. It looks as though due to the COVID-19 situation these will not be possible. The group will keep looking to see if there are any opportunities. The next definite one would then be as part of the DCS workshop in Autumn 2021. In the meantime efforts will be made to use virtual meetings to progress.

Updated Action - A47.06: To coordinate the elaboration of the user requirements, the technical specifications, and potential applications for a new DCP Standard and make a proposal to WGI *also to include a section on DCP formats into the E-DCP Specification.* (see below)

A document has now been created describing possible application areas, user requirements and technical specification, initially based on ESA study. This document will be the basis for finalising the new standard. To be further elaborated at the DCS Sub-Group Meetings to be arranged after CGMS-48.

3.3 Use of standard formats for DCP messages

Daniel Lee from EUMETSAT provided a very good presentation on the BUFR coding standard during the DCS workshop. It became obvious from feedback from this presentation that a best practice handbook on this topic would be a good idea under CGMS. This idea has been taken further and it is the intention to include this aspect into the description of the new standard. An item that came out of the face-to-face in Boston was the inclusion of a DCP standard format that would include some fixed platform health parameters. In addition, the idea of having random repeats for alert messages was discussed.

3.4 Harmonised access to DCS data from the Satellite Operators supporting DCS (A46.06)

The previously presented in CGMS-47 Best practice on DCP Data Access (CGMS-47-CGMS-WP-17), has been rewritten after the comments from CGMS-47. The draft of this document CGMS-48-CGMS-WP-11 will be presented to CGMS-48 for review and endorsement.

Action 46.06 is now proposed for closure if the Best Practice is endorsed.

4 ACTIONS/RECOMMENDATIONS FOR CONSIDERATION BY CGMS-48 WGI

CGMS is invited to take note of the DCS sub-group activities and progress CGMS-47 along with the proposed updated action actions.

Action: A47.06: To coordinate the elaboration of the user requirements, the technical specifications, and potential applications for a new DCP Standard and make a proposal to WGI also to include a section on DCP formats into the E-DCP Specification.

Action: A46.06: The DCS sub group is invited to review and provide comments to the draft of the CGMS agency best practices in support to user DCS data access. This action is now proposed for closure if the data access Best Practice is endorsed.

Action: A47.07: Review and provide comments to Draft V1B of the DCS Handbook. This action is now proposed for closure

5 CONCLUSIONS

Since the creation of the WGI DCS sub-group, progress has been made in several areas including standardisation of data access and DCP certification. The DCS Handbook has been published. The group has identified the need for an improved IDCS standard, including a specification for DCS formats.

Annex A (A46.08)

Table 1 - DCS Satellite	Location	Transmission Rate	TX method	Band (MHz)	Data Distribution	Data Policy	Platforms allocated
Meteosat-11	0°	• 100 bps • 1200 bps	• Self-timed • Alert • Hybrid (Self-timed and Alert	Regional 402.0685 – 402.4345 International 402.0355 – 402.0655	• EUMETCast • GTS • Internet	Free for Environmental use for EUMETSAT Member States and WMO Members	1344 (119 HRDCP, 1225 SRDCP) (April 2020)
Meteosat-8	41.5°E	• 100 bps • 1200 bps (Capability, no platforms allocated)	• Self-timed • Alert • Hybrid (Self-timed and Alert	Regional 402.0025 – 402.0325 International 402.0355 – 402.0655	• EUMETCast • GTS • Internet	Free for Environmental use for EUMETSAT Member States and WMO Members	173 (25 HRDCP, 148 SRDCP) (April 2020)
Elektro N L2	76.1°E	• 100 bps • 1200 bps (260 platforms allocated)	• Self-timed • Alert • Hybrid (Self-timed and Alert	Regional 401.5 – 402.5 International 402.0 – 402.1*	• E-mail transmission service (regional users) • GTS (TBD)	Free for WMO Members	531
INSAT 3D	82°E	• 600 bps • 1200 bps • 2400 bps • 4800 bps • 9600 bps	• Self-timed	402.65 – 402.85	• GTS • Internet	Data collections – pertaining to Meteorology, snow & avalanche, river, AGROMET,	5000 Data Collection Platforms & 11000 Disaster Alert Transmitters

Table 1 - DCS Satellite	Location	Transmission Rate	TX method	Band (MHz)	Data Distribution	Data Policy	Platforms allocated
						Ocean, etc.	(April 2019)
INSAT-3DR	74°E	• 600 bps • 1200 bps • 2400 bps • 4800 bps • 9600 bps	• Self-timed	402.5 – 402.85	• Data collections – pertaining to Meteorology, snow & avalanche, river, AGROMET, Ocean, etc	Registered Users in India	Included as above (April 2019)
GSAT-17	93.5°E	• 600 bps • 1200 bps • 2400 bps • 4800 bps • 9600 bps	• Self-timed	402.5 – 402.85	• Data collections – pertaining to Meteorology, snow & avalanche, river, AGROMET, Ocean, etc	Registered Users in India	Included as above (April 2019)
FY2-E	86.5°E	• 100 bps	• Self-timed	Regional	• Internet	Free for Environmental	No 100 bps
FY4-A	104.7°E	• 600 bps (FY2E onwards)	• Alert • Hybrid (Self-timed and Alert	401.1 – 401.4 International	• GTS • CMACast	use for WMO Members	400 DCP on regional channels

Table 1 - DCS Satellite	Location	Transmission Rate	TX method	Band (MHz)	Data Distribution	Data Policy	Platforms allocated
				402.0 – 402.1*			600 bps
GOES-E (GOES-16)	75°W	• 300 bps • 1200 bps	• Self-timed • Alert • Interrogate** • Hybrid (Self-timed and Alert	Regional 401.7100 – 402.0325 International 402.0355 – 402.0655	• GTS • Internet • DOMSAT Commercial Satellite • LRIT Direct Distribution	Free for Environmental use for WMO Members and government agencies (domestic or international)	14,000 (December 2014)
GOES-W (GOES-17)	135°W	• 300 bps • 1200 bps	• Self-timed • Alert • Interrogate** • Hybrid (Self-timed and Alert)	Regional 401.7100 – 402.0325 International 402.0355 – 402.0655	• GTS • Internet • DOMSAT Commercial Satellite • LRIT Direct Distribution	Free for Environmental use for WMO Members and government agencies (domestic or international)	12,000 (December 2014)
Himawari-9	140.7°E	• 100 bps • 300 bps	• Self-timed	Regional 402.0685 – 402.4000 International 402.0355 – 402.0655	• GTS • Internet • E-mail	Free for Environmental use for WMO members	650 (December 2018)

Table 1 - DCS Information (A46.08) – Annex A