Report from the CGMS WGI Task Group on Data Collection Services (incl. latest ToR, status on current & proposed/planned activities)

Presented to CGMS-51 Working Group I session, agenda item 8.1

Executive summary of the WP

The primary 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 Task Group on DCS, 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.

This paper presents the status of the Task Group on DCS activities and progress since CGMS -50. The discussions of the Enhanced DCP (E-DCP) standard have continued and is a major topic for the group. The group has developed a proposal for the way forward in developing a new IDCS/E-DCP standard but need some guidance.

Core Members

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

EUMETSAT	Nicholas Coyne – Co-ordinator
EUMETSAT	Karolina Nikolova
EUMETSAT	Wil Doran
NOAA	William Dronen
NOAA	Letecia Reeves
JMA	Kotaro Bessho
JMA	Yasutaka Hokase

Also the following frequency managers:

NOAA	Beau Backus
EUMETSAT	Markus Dreis

A mailing list server for the WGI Task Group on DCS has been setup - WGI_DCS@LISTSERV.EUMETSAT.INT

Additional Members

The following people are included on the list in addition to those listed above.

Anne Taube	CGMS
Dave Kunkee	Aerospace Corp
Juha-Pekka Luntama	ESA
Mark W. Turner	NOAA
Melanie Heil	ESA
Nancy Ritchey	NOAA
Olga Ryzhkova	Roshydromet
Sean Dominic Burns	EUMETSAT
Thomas Feroli	NOAA
Yu Deng	NOAA
Hassan Haddouch	WMO

The co-ordinator should be informed of any CGMS members wishing to be included

Intersessional Meetings

The group has held regular intersessional meetings since the last CGMS report. The plan of a face-to-face meeting at the Met Tech Expo in Paris in October 2022 was finally possible after the lifting of the COVID restrictions. This was a DCS workshop combined with the Satcom Forum. The DCS part focused on reports from each of the member organisations and we were finally able to have some discussions about the Enhanced DCP standard.
The intersessional meetings continued after CGMS-50 with a monthly frequency due to the discussions on the Enhanced DCP standard. In fact there where some meetings every two weeks during the beginning of 2023 to cover the discussions about the EDCP.

DCS Workshop 12th October 2022

It has finally been possible to have a face to face meeting. This happened as part of the DCS workshop which was organised by the DCS Group. It took place alongside the Satcom Forum. The venue was the Met Tech Expo in Paris and way from the 11th until the 13th of October 2023. Below is the agenda for the DCS workshop.

DCS Workshop 12th October 2022

Day 2: 12 October (Wednesday) All sessions today form part of the Data Collection System (DCS) Workshop		
09:00 – 09:40	DCS workshop (Introduction and Overview, CGMS coordination)	Day2-DCS Workshop-welcome
09:40 – 10:00	DCS workshop (EUMETSAT DCS Overview)	Day2-EUMETSAT DCS
10:00 – 10:20	DCS workshop (GOES DCS Overview)	
10:20 – 10:40	DCS workshop (JMA DCS Overview)	Day2-JMA DCS-Hokase
10:40 – 11:20	DCS workshop (WMO Overview) DCS workshop (WMO WIS2 Presentation)	Day2-WIS2-Rémy GIRAUD
11:20 – 11:40	DCS workshop (Questions time)	
11:40 – 12:00	Improving Situational Awareness with Real-time Weather Observations using Satellite (Synoptic data)	
12:00 – 13:00	Lunch break	
13:00 – 13:30	DCS workshop (Interference register)	
13:30 – 14:00	DCS workshop (Small Satellite DCS Use as an Operational Concept - Beau Backus)	Day2-NOAA-Beau Backus
14:00 – 15:30	DCS workshop (User and Manufacturer Round Table Focusing on Enhanced DCP Standard)	Day2-EDCP
15:30 – 16:00	Coffee break	
16:00 – 17:00	DCS Workshop (User and Manufacturer round table focusing on Enhanced DCP Standard - continued)	
17:00 – 17:30	DCS workshop (Summary of Outcome Actions Next Events)	

Coordination Group for Meteorological Satellites

EUMETSAT CGMS

DCS Workshop 12th October 2022 Attendance

There were also DCS related topics within the Satcom Forum and the agenda and access to the presentations can be found under the following link:-
https://community.wmo.int/en/meetings/satcom-forum-2022

On the DCS Task Group side the following people attended in person

EUMETSAT	Nicholas Coyne – Co-ordinator
EUMETSAT	Karolina Nikolova
NOAA	William Dronen
NOAA	Beau Backus
WMO	Remy Giraud

Externals

Microcom	Brett Betsill
Satcom Forum	Mike Prior Jones

The following attended virtually

JMA	Kotaro Bessho
JMA	Yasutaka Hokase

Externals

OTT	Christopher Buchner

DCS Workshop 12th October 2022 Conclusion

In conclusion the DCS workshop was a great success and proved to be the very catalyst needed to start the Enhanced DCP ball really rolling. Evidence of that can be seen in the next section.

New DCP Standards and Applications (A49.03)

The group had moved further with the subject of new standards and have identified a draft standard. We believe that we have locked down the key elements of the standard. There is still work to be done though. We will present this current draft standard and hope for the endorsement from CGMS-51. We would also request that the CGMS indicate to the group the next steps and inform us how these steps are to be financed.

New EDCP

As previously reported we had aimed at realising a new standard that would only require firmware changes to current transmitters and receivers. We have worked with the support of the two main manufacturers to try to achieve this. The two manufacturers are:

Microcom

OTT

We have not been able to get involvement from Signal Engineering or FTS.

Draft DCP Standards

From the study funded by ESA for ATRES 5.2 it was clear that a target baud rate of 400 should be the target. We have had some very constructive discussions in the intersessional meeting and now have a draft standard based around 400 baud. We have also taken many other ideas into account and included these within the standard. From our discussion Microcom produced the following table which we used as our discussion point.

Conclusion DCP Standards

The main points to note are that we have defined something that will only require firmware updates to the existing transmitters. The receivers would eventually also need to be modified as well and this would also be expected to be realised with firmware updates. It would take 1500Hz of bandwidth. It can operate at 400 or 800 baud dependant on the modulation type. It can optionally use different code block sizes. There is a new header defined that would allow the GPS co-ordinates, battery voltage etc. to be included in each transmission. There are some of these aspects that we need to refine and agree upon. Some of them would be of benefit to the operators and manufacturers and some would be of benefit to the users. There is naturally a trade of between the size of the header and using this capacity for the message package. We believe this could be made configurable. The 400-baud setting would provide a platform which would be more robust to movement and interference at the cost of speed. The 800 would provide the speed at the cost of robustness. The best mode could be chosen for the environmental conditions. This operational mode would be automatically detected on the receiver side making it very flexible.

Conclusion of EDCP

There are still refinements needed but the main elements have been defined. We need to have some additional sessions to finalise those. We propose to capture the EDCP standard in a separate document with a view to publishing the first draft version in Q3 2023.

Way Forward – Schedule Ideas

After this draft is reviewed and endorsed, we would could imagine the following schedule:

2024

Finalise the EDCP standard with the agreement of all agencies and CGMS.
Relocate current DCPs away from the international identified channels.
Define how the project would be funded.

2025

Produce and test a prototype transmitter.
Modify on of the receive sites to enable the reception of the EDCP.
Test the system and verify the performance of the prototype and ensure it covers the different modes.

2026

Certify the EDCP transmitters from the manufacturers.
Modify the reception systems of all agencies.
Test the reception for all agencies and satellites.

2027

Declare EDCP operational.
This would give us the common standard which would once again allow international use of DCPs.

Interference Register

During the DCS workshop NOAA gave a presentation on some DCS interference problems they had observed. Their investigation revealed that the interference was produced by hand held two way radios. A presentation from Microcom can be found on the Satcom web site.
https://filecloud.wmo.int/share/s/7DPe2FXJRQes_ZVjf4NB7Q

EUMETSAT has also in the past suffered from some external interference which was suspected to come from ground based Radars.

This led the group to the idea to produce an interference register. This would be in the form of a CGMS document that would be populated with the history of known interference. It would be added to for any new incidents. This would be shared with the Task group on radio interference. Although we wanted to present this document during this CGMS round it was not possible. We are proposing that we would do this for the next round and would ask for endorsement for this approach.

SWOT Progress

During the 50th CGMS the group had proposed the following SWOT opportunities. Below is a recap of the status of these.

RFI Mitigation

Covered under previous slide on the interference register.

Joint DCS PR Materials

Although we have some ideas that came from the group there is no actual output yet. One of the items that will be worked on is the new IDCS (Blue Book) which would describe the international use of DCS. This can only be populated when we have finalised the Enhanced DCP standard.

DCS Introduction Video

Nick Coyne was in communication with the world bank with a prospect of making a promotional video. This idea is still ongoing but the arm of the world bank was not quite as it seemed and it has been necessary to check that there was not a hiden agenda with this offer and not to promote a particular commercial vendor.

Manufacturers Workshop

Covered in the DCS workshop.

Terms of Reference

Responsibilities

- To identify the needs for new international capable DCP standards taking into account the outcome of the ATRE 5.2 study commissioned by ESA.
- To propose to CGMS the new international standard.
- To facilitate the development towards on operational international standard
- Develop and maintain a DCS handbook
- The development of DCS best practices
- Develop and maintain the content for a CGMS DCS webpage
- Organisation of regular DCS workshops in co-ordination with the Satcom Forum
- Co-ordination of International DCS between the organisations
- Maintain an RFI DCS register
- Suggest improvements to the DCS especially based on the output of the SWOT analysis

Interactions

The Task Group will meet as part of the WG I Intersessional meetings with a goal of somewhere between 6 and 12 meetings per year. The majority of these meetings will be virtual but also some face-to-face meetings could be realised in the context of other already scheduled DCS-related meetings or meetings were a majority of the members would be present.

In addition to the regular intersessional meetings the Task Group will plan to convene a DCS workshop every 2 years. This will be arranged in co-ordination with the Satcom Forum, which is traditionally hosted during the Met Tech Expo. The goal of this workshop is to facilitate interactions between the operators, users and manufacturers.

ACTIONS/RECOMMENDATIONS FOR CONSIDERATION BY CGMS-50 WGI

CGMS is invited to take note of the Task Group on DCS activities and progress since CGMS-49, along with the proposed updated actions.

Action: A49.03: Updated

Analyse existing DCP standards taking into account user feedback, and propose a common standard that could be used as a future IDCS standard. This would be an evolution of an existing standard. There would also be workshops with the manufacturers to understand the best way to identify and implement this standard taking into account the SWOT analysis and the results of the survey commissioned by ESA.

The section 3.2 of the supporting document ***CGMS-51-WGI-WP-08*** details the progress we have made on this action.

CONCLUSION

Since the creation of the WGI Task Group on DCS, progress has been made in several areas including standardisation of data access and DCP certification. The group has identified the need for a usable IDCS standard (Enhanced DCP) as the current standard as described is only supported by EUMETSAT and JMA. Once identified the IDCS Guide would need to be updated including a specification for DCS formats. This international standard would also be important for any applications that may be possible after the proof of concept on the small sat activities.

A clear process is needed for the funding of the EDCP project. The group has not been able to identify this process.