

**CGMS-52-WGI-WP-15**  
**8 April 2024**

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*Agenda Item 7.2*  
*Discussed at WG-I*

<b>Subject</b>	<b>Strengths, Weaknesses, Opportunities and Threats (SWOT) Analysis of DCS</b>
<b>In response to CGMS action/recommendation</b>	<b>Action A51.10</b>
<b>HLPP reference</b>	
<b>Executive Summary</b>	<p>At CGMS-49 the Task Group on Data Collection Services (DCS) was given the action of performing a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis on the DCS. The group has been addressing the SWOT analysis during the regular intersessional meetings. Many aspects were considered during the discussions and the output of the SWOT analysis and discussions is covered in this report. The focus of this paper is on the five proposals, which address areas for further work as an outcome of the SWOT analysis. The five proposals for further work are in the areas of:</p> <ul style="list-style-type: none"> <li>• Discussion of approaches and mechanisms for identifying and mitigating RFI to DCS with the WGI task group on RFI detection, monitoring, and mapping;</li> <li>• Production of joint DCS Promotional materials presenting the global view of DCS;</li> <li>• Production of a DCS introduction video for improved outreach;</li> <li>• Hold a joint workshop between the DCP transmitter manufacturers and DCS agencies, to discuss future technologies / functionality and the evolution of international DCP standard;</li> <li>• Improvements to DCS information made available to users across agencies, CGMS and WMO.</li> </ul>
<b>Action/Recommendation proposed</b>	CGMS WG-I is invited to take note of the status of the Data Collection Services SWOT analysis.



## **1 INTRODUCTION**

This paper presents a report on the progress of the implementation for SWOT analysis performed by the DCS Task Group. The SWOT analysis has been considered by the members of the group and discussed during the regular intersessional meetings. The output of the SWOT analysis can be found in Section 3 as a reference. The focus of this paper is on presenting five proposals, which address the opportunities and threats identified through the SWOT analysis. This is tracked under action A51.10.

## **2 SWOT ANALYSIS PROPOSALS**

### **2.1 RFI Mitigation**

Radio Frequency interference (RFI) has been and continues to be a concern to the users and operators of the DCS. With the significant increase in numbers of small satellites, it is expected that RFI problems will increase in quantity and duration. To assist in mitigating RFI incidents, DCS providers can collaborate on these incidents, provide best practice solutions, and assist in resolving incidents that span multiple DCP receivers. The Group are working towards releasing an RFI register, although the document is not mature enough to present at this time. The Group aim to provide more information in CGMS 53.

### **2.2 Joint DCS PR Materials**

Following on from the DCS handbook and to present the DCS in a global way, it is proposed to produce some joint PR materials. This would be in the form of posters and flyers. These would be available to all agencies and distributed at any workshop, conference or exhibition as appropriate. The focus and priority of the Group has been on the Enhanced DCP. Once the Enhanced DCP standard is available then there will be a follow up on this topic.

### **2.3 DCS Introduction Video**

In order to improve outreach, it is proposed to produce a video that introduces the DCS to prospective users. This could be described as a video version of the DCS handbook. The Group would outline a proposal for the video during the intersessional and discuss how this would be funded. There was also some contact with the world bank about producing a video podcast, however, this proved unsuccessful.

## **2.4 Manufacturers Workshop**

The manufacturers are better placed than the CGMS DCS organisations to identify new technologies. They also interact directly with users, who express their desires for the functionality of the transmitters / platforms. Also, with the view to developing a new DCP standard the manufacturers could provide the group with clear indication of what is possible. This would still be based on the original study performed by ESA.

The group has successfully involved the manufacturers into the process of defining the Enhanced DCP standard. A DCS workshop was held in the MET Expo in Paris in Autumn 2022. The manufacturers have attended the Task Group intersessional virtual meetings. More details on that can be found in the:

- CGMS-52 - WG-I - EDCP Transmitter Standard Proposal
- EUM/CGMS/DOC/24/1403759
- A49.03

## **2.5 Discoverable information**

Having discoverable information would entail ensuring that information on the DCS is easily available and discoverable. The group can see that there is some scope within each agency, CGMS and WMO to make considerable improvements. The group should also look at aspects such as common terminology for references to DCS. During the intersessional the group has discussed the best way to improve this aspect. The intention would be to produce a combined resource under the CGMS when the E-DCP becomes operational.

## **3 SWOT ANALYSIS REFERENCE**

The following table served as a reference for analysing the SWOT and developing proposals for further work. EUMETSAT, JMA and NOAA each provided inputs to the SWOT analysis. The agencies discussed those inputs and identified proposals to address common opportunities and threats based on the SWOT analysis.

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S Strengths	W Weaknesses	O Opportunities	T Threats
<p>EUMETSAT inputs:</p> <ul style="list-style-type: none"> <li>• Low operating cost for the users</li> <li>• Established global coverage</li> <li>• Long-term commitment</li> <li>• Robust proven transport mechanism</li> <li>• High availability &gt;99%</li> <li>• 24/7 monitoring</li> <li>• Low maintenance overhead</li> <li>• Non reliance on terrestrial infrastructure</li> </ul> <p>JMA inputs:</p> <ul style="list-style-type: none"> <li>• Effective way to disseminate observation data in remote areas where communication environment is poor</li> <li>• Communication fee is free for users</li> <li>• More disaster-resistant than landline</li> <li>• Low-directivity</li> </ul> <p>NOAA inputs:</p> <ul style="list-style-type: none"> <li>• Large deployment of platforms and users</li> <li>• Real-time raw data relay from field to users</li> <li>• Mitigates interference</li> <li>• Multiple ways to access data (broadcast, internet service)</li> </ul>	<p>EUMETSAT inputs:</p> <ul style="list-style-type: none"> <li>• Low data rate capability</li> <li>• Complicated concept</li> <li>• Restrictive data policy</li> <li>• High setup costs</li> <li>• Uncertainty of MTG for IODC (EUMETSAT-specific)</li> <li>• No polar coverage</li> <li>• Documentation</li> <li>• TDMA Weakness or Strength</li> <li>• Not all agencies part of global DCS</li> </ul> <p>JMA inputs:</p> <ul style="list-style-type: none"> <li>• DCP transmitter is more expensive than transmitter using communications satellites</li> <li>• Non-interactive comms</li> <li>• Weaker than landline in terms of rainfall attenuation, transmission delay, and error control</li> <li>• Operational and maintenance costs for DCS operators</li> <li>• Installation cost for users due to complicated concept</li> <li>• Radio license renewal cost for users (at least in Japan)</li> </ul> <p>NOAA inputs:</p> <ul style="list-style-type: none"> <li>• Spectrum sharing / interference</li> </ul>	<p>EUMETSAT inputs:</p> <ul style="list-style-type: none"> <li>• Expansion of operations</li> <li>• Re-introduction of international support</li> <li>• Introduction of interagency standards</li> </ul> <p>JMA inputs:</p> <ul style="list-style-type: none"> <li>• Growing needs to improve availability of observation data in data-sparse area (WMO is conducting GBON.)</li> </ul> <p>NOAA inputs:</p> <ul style="list-style-type: none"> <li>• Iridium</li> <li>• Simplify current DCS ground system (i.e., DADDS is over complicated – needs vendor support)</li> <li>• More ops training for DCS personnel</li> <li>• More User training</li> <li>• User access points (how users access training, get help on problems, knowing who to talk to)</li> <li>• Develop a plan to mitigate RFI once it is identified</li> <li>• RFI management plan</li> <li>• Temporary channel parking space</li> <li>• Identify benefits our foreign partners get from our DCS system</li> <li>• Consider DCS Standard Baud Rate. Should it be 300 BPS?</li> </ul>	<p>EUMETSAT inputs:</p> <ul style="list-style-type: none"> <li>• RF Interference</li> <li>• Misuse of 400 MHz band</li> <li>• Increase in terrestrial technology taking users away - Alternative technologies being developed</li> <li>• Satellite transponder problems</li> <li>• Misinformation on DCS use.</li> </ul> <p>JMA inputs:</p> <ul style="list-style-type: none"> <li>• Possibility of improving Internet environment in the future (Small sat constellation Internet by Space X, Amazon, etc.)</li> <li>• To reduce cost and to utilise modern technologies and infrastructures provided by private sectors, Public-private-engagement (utilizing private-sector resources, instead of developing and maintaining infrastructures on government's own) is required.</li> </ul> <p>NOAA inputs:</p> <ul style="list-style-type: none"> <li>• Understanding of differences in DCS business construct between agencies</li> <li>• Iridium data cost to users or to NOAA?</li> </ul>

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<p>S</p> <p>Strengths</p>	<p>W</p> <p>Weaknesses</p>	<p>O</p> <p>Opportunities</p>	<p>T</p> <p>Threats</p>
<ul style="list-style-type: none"> <li>• Applications (water level, fire weather, Tsunami, etc)</li> <li>• Permanent or temporary deployment (flexible)</li> <li>• Data sharing capability</li> <li>• Rapid deployment of DCPs vs. weather events</li> <li>• Diversity of access supports COOP plans of various agencies</li> <li>• Basic requirements do not change or do not change often</li> <li>• DCS used to verify that NWS weather radar system is correct</li> <li>• Saves lives and property</li> </ul>	<ul style="list-style-type: none"> <li>• No common data format</li> <li>• Regulatory restrictions on use</li> <li>• Underutilised globally / Channels are underutilised</li> <li>• Limited data rate</li> <li>• Dependent on GPS access</li> <li>• Difficult to navigate current DADDS interface (NOAA-specific)</li> <li>• Archive is 30 days (limited time). Need? LRGS? (NOAA-specific) Could be no full archive</li> <li>• Long lead time for system upgrades/ DCS &amp; DCPs (pro &amp; con) – impacted heavily by users</li> <li>• No senior leader visibility of DCS needs/ challenges/ funding (not the squeaking wheel)</li> <li>• Certification process as impacted by senior leadership (change in how its funded?)</li> <li>• Potential change in Rebroadcast capability</li> <li>• Interrogate/ command function not matured (NOAA-specific)</li> <li>• Visibility of who the customers or data users are (for example, who uses NWSTG)</li> </ul>	<ul style="list-style-type: none"> <li>• Improve modulations standards</li> <li>• Greater data sharing</li> <li>• Common metadata</li> <li>• Take full advantage of CS2. What more can be done with CS2 than currently planned?</li> <li>• Users want more transmission times or frequency</li> <li>• Consider if DCS should move to another part of spectrum</li> <li>• Advertise benefits of DCS to users and potential users</li> <li>• User page describing use or number of DCPs used on a monthly or quarterly basis</li> <li>• Visual representation of prominent users and how many DCPs in use</li> <li>• Routine usage survey or display of customer usage of DCS system</li> </ul>	<ul style="list-style-type: none"> <li>• Pilot interference can have very adverse impact on RF system</li> <li>• Spectrum auctioning</li> <li>• GEO-XO plans for DCS downlink method</li> <li>• Lack of Public support or awareness of the critical role that DCS plays in weather &amp; environmental information, indications &amp; warnings</li> <li>• Commercialisation</li> <li>• Free data access to a pay for access model</li> <li>• User information is not up to date; i.e. PDT data</li> <li>• Not known how many DRGS are in use with DCS system (NOAA-specific)</li> <li>• Lack of awareness where User DCPs or other equipment is located</li> <li>• DCS service being moved fully from Government to Commercial</li> </ul>

S Strengths	W Weaknesses	O Opportunities	T Threats
	<ul style="list-style-type: none"><li>• Hard to know where DCPs are located</li><li>• DCPs are remote and hard to reach for installation and maintenance</li><li>• SHEF codes</li><li>• Lack of personnel to support DCS (hiring/ retiring/ loss of historical SME knowledge). Need to ID personnel needed (NOAA-specific)</li><li>• Continuous user education needed. More than every 2 or 3-year training. More online training.</li><li>• Website maintenance</li></ul>		





#### **4 ACTIONS AND/OR RECOMMENDATIONS FOR CONSIDERATION BY CGMS WG-I**

WGI is invited to take note and comment on:

- The outcome of the SWOT analysis as a reference;
- The five proposals, which address proposed areas for further work as an outcome of the SWOT analysis and the work carried out so far.

An action proposed for CGMS-52 is to:

- Work on the five proposal coming out of the SWOT analysis on DCS. Report on the implementation progress and effectiveness of these proposals in CGMS-53 A51.10.