

**Satellite Telemetry Interagency Working Group
122nd STIWG Meeting Minutes
March 21, 2018
Miami, FL**

0: Introduction / Roll Call – LySanias Broyles

LySanias Broyles opened the 122nd STIWG with a welcome to all attendees. He noted that due to disruptions beyond the STIWG's control, a virtual meeting was held in the fall hosted by NOAA in College Park, MD and this set of meetings was planned at that time. A round of self-introductions followed and instructions were given to identify yourself when speaking and to mute your phone when not speaking.

LySanias Broyles noted that the minutes from the previous meeting are available at the STIWG web site at: <http://acwi.gov/hydrology/stiwg/Meetings/index.html>. He asked if the members noted anything in the minutes that needs correction or expansion. Since there were no suggestions, the minutes from the 121st STIWG meeting were accepted.

1.0: Review Action Items from 02-Nov-2017 Meeting

1.1: HRIT File Format Comparison – LySanias Broyles

LySanias briefly reviewed the options presented by Microcom Design for an update to the HRIT file format. He noted that Option 2 goes further, adds quality information and shortens the header. He questioned the audience on whether they had reviewed the options and being that there were no comments or objections, it was decided to pursue this update.

There is an extensive description of this effort and a slide presentation from Microcom Design, "10. New HRIT File Format Proposal.pptx," at: <http://www.noaasis.noaa.gov/DCS/twg.html> after the Technical Working Group minutes and presentations are posted.

1.2: DCS on Small-Sat Project – Beau Backus

Beau provided a summary of the Small-Sat Project. He stated that this is a use of DCS in a new way. Since the Small-Sat industry is an existing system, there may be specific rules that apply to using this for space-to-space communications. Agency General Counsel will have to navigate how we proceed to modify the existing rules.

He also described how the Small-Sats life-span can run for a matter of weeks and some of their licenses specify that they must de-orbit within 5 years. An average mission would be approximately 2 years. We need to remember that we are talking about constellations or blocks

of satellites that continuously replace the older satellites. Beau then presented some examples of small-sat projects. LySanias stated that the small-sat project could replace iridium if that is also impacted by frequency sharing.

The question was posed by the Chair whether there is any objection to pursuing this Project and since there were no objections, it was decided to move forward.

There is a description of this effort in the TWG minutes and a slide presentation from Beau Backus, “8. Small-Sat Project Update.pptx,” at: <http://www.noaasis.noaa.gov/DCS/twg.html> after the Technical Working Group minutes and presentations are posted.

Action 122-1 Respond as soon as possible to Beau Backus (beau.backus@noaa.gov) on whether and how users might use small-sats within the DCS community.

1.3: Iridium data on HRIT – Scott Rogerson

Scott Rogerson opened a discussion on adding Iridium messages on HRIT/EMWIN. He noted that there is a difference between putting iridium data on LRGS and putting it on a NOAA system using the GOES system. He said that was a non-starter unless programmatic and technical issues can be overcome, if we choose to even pursue this effort.

Phillip Whaley stated that he does not think NOAA should apply filters to determine which messages are broadcast. It was stated that technically if the observations got into the NESDIS Product Dissemination and Access system (PDA) they are made available to HRIT/EMWIN.

It was stated that DCS use of GOES is probably safe for the 15-20 years as we move through the deployment of the GOES-R Series satellites but after that we may be directed toward commercial providers as there are government directives to do so, although, they may be impacted by spectrum issues also.

Dave Lubar stated a plan would have to be submitted detailing the cost to change the receive equipment and to change all the DCPs etc. The federal laws states that if the cost to migrate systems costs a lot more than what is being spent now, the sharing may not happen. Beau Backus clarified the language that states that the expectation is that if viable commercial systems exist, it may not be necessary for NOAA to operate GOES-DCS.

Action 122-2: The STIWG should develop a paper that captures the expected cost for the STIWG community to transition to commercial providers if GOES-DCS were unavailable in the future.

1.4: Updates to the STIWG DCS Reliance Whitepaper – LySanias Broyles

As an introduction, Scott Rogerson detailed how Argos works which uses polar orbiting satellites. They use the SATCOMFORUM (WMO) to bring the industry together with the users. Scott and Kay attended the first meeting in Paris and Rich and Letecia will go to the next meeting in Amsterdam. EUMETSAT is looking to NOAA to chair a forum on DCS.

Scott asked the question of who would spearhead the effort to work the umbrella agreement between NOAA and the Corps of Engineers to develop a memorandum and take it to completion so that development costs could be shared across agencies. The suggestion is to work this through the NOAA International Affairs Office. The STIWG can help explain to NOAA management what the effort entails.

Action 122-3: STIWG members are asked to provide detailed summaries of recent events (including pictures, charts, statistics, impact statements, etc.) for inclusion in the DCS Reliance Whitepaper to illustrate the impact of DCS on operations and the public (similar to the hurricane event detailed in 2017). The purpose of the DCS Reliance Whitepaper is to provide information for the public to let them know what GOES DCS is and why it is important. It has gotten wider circulation that anticipated so it needs to be kept fresh.

2.0: EDDN and Configuration Repository – Dan Schwitalla

Dan stated that they are a backup to WCDAS. They try to keep approximately the same architecture as WCDAS. EDDN is currently receiving LRIT from GOES-West (GOES-15) but is ready to go with HRIT/EMWIN when GOES-17 becomes GOES-West.

Dan went over the EDDN public website at URL is <http://eddn.usgs.gov>. He showed various capabilities that exist on the site including:

- Status of the public data servers
- Access to a system monitoring page
- Web pages that
 - describe the EDDN,
 - describe message format of DCP data,
 - provide message access services, and
 - make available relevant documentation.

How also showed the LRGS status page which was similar to what was shown earlier by WCDAS. EDDN has also added a change to show the address to the Iridium stations EDDN is receiving. He also stated that EDDN has the DECODES configurations for the USGS in all states and they are added to the web sites. It was pointed out that, if you want to go forward with DCP monitoring you need to have the decodes for all the stations.

Also briefed were the web services for technical users including:

- <http://eddn.usgs.gov/msgaccess.html>
 - Users can access GOES DCS messages based upon time, address, and channel criteria. (Does not decode the data)
- <http://eddn.usgs.gov/fieldtest.html>
 - Provides a low-bandwidth means of publicly accessing messages from a specific DCP. Designed for the access from a cell phone or PDA

Recent architectural changes to the EDDN system include:

- Replaced the blade servers with new hardware.
- Added a new rack and two more 40 channel cages for expanding channels on GOES East and West
- Converted the LRIT receiver to an HRIT receiver.
- Updated the DAMS-NT software to the latest version to be congruent to the NOAA Wallops' systems
- Swapped out the EDDN website server

Dan also briefed that they are working on several projects related to USGS Telecommunications.

- Cellular Virtual Private Network testing
- New decoding software
- Server centralization
- Iridium rollout
 - He stated that one thing to remember is you need personnel to administrate the Iridium services.
 - The iridium data is on LRGSEDDN2 on the EDDN site.

3.0: OpenDCS Standardization and Interagency Support Agreements - LySanias Broyles

It was briefed that it took about a year to figure out how to re-establish a method to use existing agreements to allow collaboration on OpenDCS development.

The CORPS and NOAA now have a draft agreement as of 2017. It will be done soon and then it will be used as a template for other agreements. When all agreements are in place, we will all be able to implement new enhancements as they are added to the Open DCS. This might mitigate the risk of industry not supporting OpenDCS by allowing us to fund further development.

Action 122-8: As a supplement to the DCS Reliance White Paper, develop a concise, cohesive, slide deck for agencies to use for briefing management.

4.0: OpenDCS Appliance - Ruth Abney/Ari Powers

Ari Powers stated that the Portland District has maintained a line-of-sight radio system which is currently failing and difficult to maintain. The line-of-sight radio system is being replaced by GOES and Iridium telemetry. The OpenDCS software is the enterprise solution for acquiring and decoding data from these telemetry methods. She further briefed that Portland District has a requirement to get data to remote sites (dam control rooms), independent of the internet. Thus, HRIT/EMWIN dishes and receivers have been purchased for each manned control room. The OpenDCS appliance prototype is being developed for use at remote locations to decode and display streamflow data from GOES telemetry. These will be single-purpose units that run the LRGS and DECODS portions of the Open DCS software. The appliance will be connected to HRIT receivers.

Technical questions should be directed to Arthur Armour at athur.armour@usace.army.mil.

5.0: Spectrum Regulatory Issues – Dave Lubar

David Lubar reviewed a 23-page draft document regarding DCS uses with the STIWG members, soliciting additions and corrections from the assembled users. Specific examples gathered from NWS Hydrologists or NIFC wildfire management experts were presented. NWS HADS personnel, USFS and several regional offices of USACE, provided additional DCS usage information or corrections to the information presented. Thoughts on spectrum considerations as it relates to future GOES DCS systems were discussed, as well as potential topics associated with alternative systems such as Iridium. Several recent public articles regarding spectrum were presented to the assembled STIWG members.

Action 122-4: Respond to NOAA SPRES Subcontractor, Alion Sciences, by completing the DCS User Survey for All Users
<https://docs.google.com/forms/d/e/1FAIpQLSfbcfa2APQHW6okffTJOfxFW8coIak81jk6jWxBDOm6n-8Dtg/viewform>. This is very time critical to support the contractor schedule under the NOAA Spectrum Pipeline Reallocation Engineering Study (SPRES) which will study if the 1675-1680 MHz spectrum can be shared. Please complete this survey in next 30-60 days.

Action 122-5: Provide the location, exact latitude and longitude for all Federal and non-Federal stations (including foreign) for DRGS, LRIT, HRIT/EMWIN to the NOAA SPRES Contractor Shared Spectrum Company so that they have a correct and comprehensive list of receiving stations. Send to Dr. Todd Martin at tmartin@sharedspectrum.com and please

copy beau.backus@noaa.gov. Please provide within next 30-60 days along with a point of contact with email and phone for your organization.

Action 122-9: Review the Alion survey to see if there are any fields that that would be valuable to capture as the survey is still in draft at the time of this meeting.

6.0: Progress Report: 2-Way DCP Project – Scott Rogerson

Scott opened by stating that the 2-way DCS Project is currently funded through the sustainment contract. The DCS Program will have to compete for funds to continue the project. He then asked if there was a STIWG consensus on whether it was important to continue this project.

Warren Krug from the NOS COOPs program stated that they can do this with Iridium and use this as a backup. Canada would like to have it to remotely trigger a camera at the DCP. The USGS would say to proceed and would use it. The Army CORP has been interested from the beginning and would use it.

There is an extensive description of this effort in the TWG minutes and a slide presentation by Microsoft Design, “9. Two-Way Prototype Update.pptx” at: <http://www.noaasis.noaa.gov/DCS/twg.html> after the Technical Working Group minutes and presentations are posted.

7.0: Future of GOES in 10-15 years (NOAA)

Scott began the discussion by showing the NESDIS GOES Flyout Chart to illustrate the projected life of the GOES-R Series of satellites. A current flyout chart can always be found at https://www.nesdis.noaa.gov/sites/default/files/asset/document/GOES_Flyout_Jan_2018_Signed_Linked.pdf.

Scott Rogerson briefed that spectrum challenges aside, he foresees the following:

- DCS is a part of GOES-R/S/T/U; thus, we expect the system to be available (at least) until 2035
- We are renewing DADDS (servers & software) this year
 - Acquisition is already being pursued
- We plan to start evaluating "DADDS-Next" (2025+) options soon
- We are evaluating next steps for 2-Way (DCPC) development (per TWG)

But that said, there are federal government policies that could affect what happens to DCS on NOAA geostationary satellites in the following Series (V) including:

- 15 CFR Part 911 – Policies and Procedures Concerning Use of the NOAA Space-Based Data Collection System
- Part 911.4 – Use of the NOAA Data Collection Systems
- Part 911.7 – Continuation of the NOAA Data Collection Systems

There was a discussion of the Part 911.4 - Use of DCS will only be authorized where there is no commercial service available as there are lots of conditions to consider including:

- What would the cost be to replace or modifying all DCPs?
- What is the viability for such services to continue if the industry changes?
- What about redundancy of redundancy or Return to Service?
- It was also stated that the 2013 presidential resolution on wireless spectrum indicates that the transfer of the spectrum will not result in loss of cost, services and benefits to the public.

See Action 122-2 on page 02 or in the actions summary on page 10.

8.0: Secondary Processors of GOES DCS Data: Problems Encountered - Brian Jackson

Brian Jackson provided the STIWG an overview of HADS so STIWG members could gain an understanding of the program that has been operational since 1992. HADS does not own or maintain any DCPs. We are secondary processors of the data. We process more than 17,000 DCPs and push that data to the NWS field offices so they can execute their mission to save life and property. Brian mentioned HADS being a NOAA Mission Essential Function. Late in the presentation he went on to express the difficulties of decoding data because PDTs and other metadata sources are often not available, not updated, not complete, etc. We will be reaching out to owners to request PDT updates. At the end of the presentation, Brian introduced the idea of having "Best Practices" for the programming of DCP's where perhaps we introduce some standard or multiple standards that owners could use and try to encourage owners to use. Additionally, he introduced the idea of having a header at the very beginning of the raw data that would provide an indication of:

1. Order of the data (newest to oldest OR oldest to newest)
2. Order of the sensors (time ordered, or sensor ordered), and
3. How many sensors there may be.

Perhaps other information could be added to this header to help secondary processors of data. Another suggestion is to host metadata on a central site.

Brian also listed some of the important stakeholders for the HADS system including:

- 122 Weather Forecast Offices
- 13 River Forecast Centers
- National Centers for Environmental Prediction (NCEP)
- National Operational Hydrologic Remote Sensing Center (NOHRSC)
- National Centers for Environmental Information (NCEI)
- Multi-Radar/Multi-Sensor System (MRMS)
- Advanced Hydrologic Prediction System (AHPS)
- Other agencies via HADS Public Website

Action 122-6: Consider required fields for update to DCS Metadata.

Action 122-7: Develop suggestions to provide lookup tables for DCP parameters.

9.0: Full spectrum L/HRIT message processing - LySanias Broyles

There was also a discussion on whether the STIWG felt it important to have software that decoded all the products on HRIT/EMWIN. Some manufacturers decode the DCS and others have a software package that does it all. What is being suggested is pursuing the processing of the rest of the products that are on HRIT. Is this something that sounds interesting to the users? Is this this microcosm?

Some users have this capability if they have an HRIT/EMWIN system that includes Dartcom software. There was limited interest by those that do not.

10.0 Action Items

The action items were read and accepted. NOAA and the STIWG will coordinate the correct wording of the action items for the minutes and include them into the minutes.

11.0 Other Business - LySanias Broyles

No other business was discussed. Scheduling for the next meeting is TBD and will be addressed in the future.

Adjourn – LySanias Broyles

The meeting was adjourned at 14:30.

Appendix I:

- Action 122-1 Respond as soon as possible to Beau Backus (beau.backus@noaa.gov) on whether and how users might use small-sats within the DCS community. See Page 02.
- Action 122-2: The STIWG should develop a paper that captures the expected cost for the STIWG community to transition to commercial providers if GOES-DCS were unavailable in the future. See Page 02.
- Action:122-3: STIWG members are asked to provide detailed summaries of recent events (including pictures, charts, statistics, impact statements, etc.) for inclusion in the DCS Reliance Whitepaper to illustrate the impact of DCS on operations and the public (similar to the hurricane event detailed in 2017). The purpose of the DCS Reliance Whitepaper is to provide information for the public to let them know what GOES DCS is and why it is important. It has gotten wider circulation that anticipated so it needs to be kept fresh. See Page 03.
- Action 122-4: Respond to NOAA SPRES Subcontractor, Alion Sciences, by completing the DCS User Survey for All Users <https://docs.google.com/forms/d/e/1FAIpQLSfbcfa2APQHW6okfftJOfxFW8coIak81jk6jWxBDOm6n-8Dtg/viewform>. This is very time critical to support the contractor schedule under the NOAA Spectrum Pipeline Reallocation Engineering Study (SPRES) which will study if the 1675-1680 MHz spectrum can be shared. Please complete this survey in next 30-60 days. See Page 05.
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- Action 122-8: As a supplement to the DCS Reliance White Paper, develop a cohesive slide deck for agencies to use for briefing management. See Page 05.
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