

**Satellite Telemetry Interagency Working Group  
Meeting Minutes  
8 November 2017**

**I. Welcome, Opening Remarks and Administrative Issues – LySanias Broyles –STIWG Chairperson**

LySanias Broyles opened the 121<sup>st</sup> STIWG with a welcome to all attendees. He noted that the meeting is normally held in the Spring but due to events of this year it made sense to do a STIWG in the Fall and to do a virtual meeting format. A round of self-introductions followed and instructions were given to identify yourself when speaking, especially if an action is being proposed and also to mute your phone when not speaking. The agenda was reviewed and accepted with a note that there were several items presented in the Technical Working Group’s last meeting in September that merit further discussion in this forum; the small-sat topic being of especial interest.

After the introduction a special event occurred where Kay Metcalf, previous GOES DCS Program Manager, joined the telecon. She said she misses everyone and regrets her sudden retirement but notes that the DCS user have been left in good hands. She very much enjoyed the 19 years she worked with everyone. Before she dropped off the call, she thanked everyone for their cards and letters.

**II. 2016 STIWG Meeting Minutes – LySanias Broyles – STIWG Chairperson**

LySanias Broyles noted that the minutes from the previous meeting are available at the STIWG web site at: <http://acwi.gov/hydrology/stiwig/Meetings/index.html>. He asked if the members noted anything saw in the minutes that needs correction or expansion. Since there were no suggestions, the minutes from the 120<sup>th</sup> STIWG meeting were accepted.

**III. Subcommittee Reports - LySanias Broyles – STIWG Chairperson**

LySanias noted that there were two standing committees formed in the past to address two technically challenging issues that required a dedicated group of people to address: DCS Preservation and OpenDCS Standardization.

**DCS Preservation**

The DCS Preservation committee was specifically tasked to address issues relating to spectrum loss and sharing with the telecommunication industry. It was noted that a White Paper was generated to inform people of the importance of the HydroMet info sent and received every day over the GOES DCS satellite system. The White Paper, “STIWG Perspective on DCS Reliance and Preservation” of 23 September 2015, was published and can be access at: [https://acwi.gov/hydrology/stiwig/stiwig\\_dcs\\_reliance\\_and\\_preservation.pdf](https://acwi.gov/hydrology/stiwig/stiwig_dcs_reliance_and_preservation.pdf). It was proposed that due to the extreme disaster events that occurred this year, the White Paper should be updated and that it should be made into a “living document.” Agencies are encouraged to remain engaged

with their IRAC member so the IRAC is informed of the DCS spectrum issues and the DCS system is accurately portrayed.

Dave Lubar, NOAA/NESDIS/GOES-R Program Office Spectrum Management, noted that the National Telecommunications and Information Administration (NTIA) has a new administrator who was confirmed recently on November 11<sup>th</sup> and that he has not been aware of recent rule making activities. He also noted that the American Meteorological Society (AMS) will add a session on “Radio Spectrum Role in Meteorology and Hydrology” at their January 2018 meeting. Dave noted that he has some examples of flood data but could use some other examples (e.g. fire data; hurricane damage) to add to a presentation he is preparing at-this-time. It was decided that interested members will hold a side session in the coming days to discuss what is available.

LySanias noted that this is the type of information that we need to communicate to a wider public and to decision makers. We need to show how the information that people see on TV and internet is made available using the DCS system. Our tools are in jeopardy to the point where data might be delayed or lost when they are needed the most. The industry has proposed a replacement for the direct readout that uses terrestrial infrastructure. Under this architecture, the GOES DCS information might be available to users outside an affected area but not when or where it is needed the most.

In summary, we should take every opportunity to do outreach with the information we have. Dave Lubar provided his email and LySanias will forward to the entire STIWG group.

**Action 121-1: Update the White Paper “STIWG Perspective on DCS Reliance and Preservation” with new information from the previous year and make this a living document.**

### **OpenDCS Standardization**

The OpenDCS Standardization Committee was tasked with combining the Cove and Sutron software packages so that all members can benefit from enhancements and improvements to the software. In the past, improvements were sometimes made on one and not on the other.

In the past, we wanted to meet periodically so that enhancements could be coordinated before the work began so both packages had equal functionality. This sometimes involves the budget and acquisition process of each agency. It would be better if agencies could contribute to the process so that upgrades could be coordinated. It was noted that the older STIWG process of exchanging funds is no longer available, so a new solution had to be found.

The STIWG, through USACE, looked at which MOAs or MOUs that already exist and could be utilized. As it happens, the Corps has an agreement with either an agency or parent organization that covers the entire STIWG. The Corps is now working with their contracting office on the first iteration of support agreements based on the existing agreements. These will be shared with the

members for approval and then signing. Then funds can be moved to the Corps, so they can fund either their own contracts or Cove Software for updates to the “STIWG Software.” Since a majority of the members use Cove software, it will become the basis for the STIWG software. Since NOS uses the Sutron version of the software, NOS will need to incorporate their unique features in-order-to transition to the Cove Software. Sutron was also contacted and will also sign on with RMA, who supports the Corps so they can support this process as well.

### **Support Agreements Status**

The process will be to first get the mechanisms in place so that one or more agencies can transfer funds so that the work can be accomplished. One goal is to get everyone using the “STIWG Software,” then see if improvements and enhancements can be funded.

Bonnie Wyatt asked whether the Corps can share the agreements, so agencies can analyze what they would have to do to share funds in advance. Chan Modini at Hydrological Engineering Center at the Corps said that sharing was not an issue as they are public. Some agreements can be bilateral, and some are broader. One is the IRIS MOU which has a scope that should work for the STIWG needs. Standard Statement of Work information needs to be passed to Corps along with POCs so that the agreements can be generated and reviewed.

**Action 121-2: Standard Statement of Work information needs to be passed to Corps along with POCs so that the agreements can be generated and reviewed.**

### **IV. TWG Action Item Summary – Scott Rogerson / Leticia Reeves**

Scott Rogerson introduced himself and explained his position and relationship to DCS. He gave us a reminder of where the 120<sup>th</sup> GOES DCS Technical Working Group TWG minutes and presentations are located on the NOAASIS web site: <http://noaasis.noaa.gov/DCS/twg.html>. It was also noted that the minutes contain the actions and recommendations.

Scott went over the status of the 121<sup>st</sup> TWG actions and recommendations. There are page numbers that relate to the place in the TWG minutes so that they can be read in context. He noted that the “Assessment and Outreach Survey that resulted from the 121<sup>st</sup> TWG Action 121-2 can be accessed at the following link:

<https://docs.google.com/forms/d/e/1FAIpQLScQvMcxRRK330AqmyighlF29R6MBmlqBOWfE7SESZvWFhQf3w/viewform>. The deadline for responding is November 10<sup>th</sup>, 2017. Highlighted results are that when asked what their primary data retrieval system is currently the response was that “LRGS & DADDS account for ~65% of 48 responses.” Of these 48, 5 of the 48 users indicated DOMSAT as primary. The 5 primary users represent 1,383 platforms. Another result was that when asked what their secondary data retrieval system is currently, the response was that “LRGS & DADDS account for ~55% of 48 responses.” Of these, 2 of the 48 users indicated DOMSAT as secondary. This was surprising. Also of note is that there are 541 platforms for the 2 users that have DOMSAT as secondary. Scott encouraged members to send him examples of

the importance of their programs and of DCS. Scott will prepare an input to NESDIS management in cooperation with the STIWG.

TWG recommendation 121-4 stated that the GOES DCS community should monitor the next step related to the 1675 to 1680 MHz bands which would be a “notice for proposed rule-making” is still open for discussion. Dave Lubar stated that the FCC has not made any proposals for rule changes recently. He also noted that is invited to speak to the GPS meeting next week. He asked if anyone sees interference with the uplink frequencies at-this-time. We can probably not attempt an evaluation until after the GOES-East transition. We need to be aware of this issue going forward. LySanias stated that the first he had heard of this was at the September TWG and repeated here.

Another subject for discussion from the recommendations was the issue of whether we could use the small satellites or small-sats as platforms for DCS; making an intentional signal with system use agreements with the operators.

The short version of what is going on is that we are in partnership with NASA for the concept for 1-2 projects to see if existing small-sats could host a DCS receiver. There is a possibility of having up to 10,000 of these platforms go into space in the future. There are a lot of problems with this including GPS issues, being underneath the GOES satellites and other regulatory issues. The first project could be accomplished over the next year. Success could help to alleviate the risk of interference. Wallops stated that one goal is to try and see whether the DCS band could be utilized with certified transmitters to make use of the band. After that, what would it take for them to utilize this capability? It was also stated that very often the satellites are built for short duration projects, although this is not always the case. Some are constellations that are replenished. Some small-sats are software defined and can shift frequencies. How all this affects our frequency issues remains to be seen. It was also noted that part of these projects is to show we are willing to work with the spectrum users and be cooperative as all agencies are tasked with working with the sharing of the spectrum.

**Action 121-3: Provide feedback on the small-sat projects over the next month.**

### **GOES-16 Update**

NOAA briefed that GOES-16 is expected to become GOES-East at approximately 1545Z on 14 December. The instruments will be turned on at approximately 1532Z. Outreach has been extensive. We will update the information on or about the week of November 27 and into December. Also noted was that there are challenges to the uplink equipment for HRIT. The vendor is working on signal output modulations with NOAA. Evaluation is ongoing.

### **New HRIT File Format**

Scott Rogerson gave an update on the proposal by Microcom Design to update the DCS file format. Two options were presented to the STIWG. The current LRIT format comes from the old

format from the DCS DAPS inception. Microcom is trying to add information that is now available. Option 1 changes the ASCII to binary and gives you a character for the data quality e.g. G for good. Proposal 2 would provide all the extra bits of information that the DEMODS provide but currently throw away. Option 2 also provides more granularity. The new formats could also give you the path that the data took to get to the user.

Depending on which proposal is selected, it may be possible to transmit both the old and new format after GOES-16 is declared the operational East satellite since the HRIT product suite does not completely fill the broadcast thus there is capacity on the broadcast; if NOAA can authorize this test. NOAA and Microcom are looking for inputs from manufactures and STIWG members, either as individual comments or a STIWG recommendation. This could be a good opportunity during the LRIT/HRIT transition to align both DADDS and the broadcasts and add value to the users.

NOAA would like feedback and then have the in-depth meeting. This is a unique opportunity since the product stream has enough capacity to handle both formats at the same time or staggered on a diurnal basis taking advantage of lesser data at night. LySanias stated the he also would like an opportunity for Microcom to have an in-depth meeting with the STIWG in order to understand the proposals more completely.

**Action 121-4: The STIWG to set up a meeting between Microcom Design on the new file format.**

**Action 121-5: The STIWG to provide input over the next month on the file format.**

### **2-Way DCP Status**

The key update since the TWG is that NOAA has given direction for Microcom to continue work to do two tasks: 1) Complete the DEMOD prototype and 2) Complete bit-rate error testing. Microcom should report out progress at next TWG. This is a significant investment for a significant improvement.

### **Narrow Band Channels**

Narrow band transition will enable NOAA to double our channel capacity. There are some channels that contain on CS2 transmitters already. This project is in progress.

### **HDR and CS2 Transition Progress**

Out of 38,000 transmitters in the system, there are only 16 of the older 100 baud transmitters. Some of these are international users. A few of them have no POC information or the contact information is out of date. NOAA is trying to contact the organizations. There are 10,500 assignments that are CS2 transmitters. There are many channels that have only CS2 transmitters. Once we have two adjacent channels only containing CS2 transmitters, we will be able to create a new channel.

## **V. DCS Preservation: Congressional Briefing Presentation**

Steve Fitzgerald briefed that a presentation was given to congressional staffers. It was estimated that there were 40-50 attendees which may be a record. It was highlighted how important NOAA and USGS are to the warning and relief efforts in the United States. USGS instruments are critical to the efforts and spectrum is vital for the ability of the instruments to connect with the people that need the information. There are consequences to doing away with this spectrum both before, during and after events. The bottom line is NOAA and USGS are critical to protecting lives, property and the environment.

## **VI. Agencies' DCS (DRGS, L/HRIT) Interference Monitoring Plans (Open Discussion)**

LySanias opened this discussion noting that the USGS is well aware of the frequency sharing proposals. What they would like is to track instances where interference was detected and attempt to localize the source. They have a contract to develop a system to deploy at their DRGS and LRIT/HRIT sites and find out what interference exists. These would be able to be relocated between sites. They are also working on the front end of the antennas to filter out unwanted frequency. It was also stated that NOAA will do a study on the 1775 to 1680 MHz band and that this will be a 2-year project. It was noted that NIFC is also documenting interference on their DRGS system. The NIFC is looking for long-term solutions that can be affordably monitored into the future. One issue is that whatever mitigations and solutions are presented will have budget ramifications for all the DRGS users. Dave Lubar stated that filters may help if the frequency is out of band. If it is coming in band, there is no way to filter out the undesired signal. NOAA is working on a monitoring system, but no details are available at-this-time. It was suggested that the members contact their vendors on what filters may help.

## **VII. 15-Minute 300 baud transmissions; A Way Forward (Letecia Reeves/Open Discussion)**

Letecia stated that eligibility for 15-minute transmissions is restricted to critical programs (e.g. flash floods, fires, tsunamis, etc.). If you request permission to use 15-minute transmissions, you are asked to only use CS2 transmitters. They must be deployed within 9 months of receiving the assignments. Currently, there are more options on GOES-West. On GOES-East, there is only 1 empty channel for this. As we transition to CS2, there will be more channels opening which may open up use to other than critical users.

There was a discussion on what the minimum transmission windows requirements would be for users with 15-minute requirements. There was a mixed response, but some users stated they could live with 5 second windows. It was also noted that random reporting worked for some users, but one Corps activity stated it was not working well for them. Another user reported that they currently use redundant reporting which they could possible trade for 5 second windows on 15-minute assignments. Letecia stated that if you need more 15-minute assignments, please contact her and she will work with you.

### **VIII. HRIT Preparedness: Hardware/Firmware compatibility - (Open Discussion)**

Many of the LRIT receivers purchased in the past need an upgrade to be able to receive the HRIT signal from GOES-16 (GOES-R Series). NOAA will continue to provide information on the GOES-East transition to GROES-16. Some agencies that have the Microcom Design solution have been able to have their receivers updated at the Microcom facility and others have had the work done onsite. There was general agreement that the upgrade was done quickly.

### **IX. Hypothetical: Costs to convert GOES DCS to Iridium - (Open Discussion)**

The question of the cost to transition from GOES to Iridium was discussed. There are two components to this effort; hardware and service contract. It was noted that DoD is paying as low as \$10 - \$15 per month, per MODEM. Others noted that this may be a subsidized cost and may not continue into the future. It was also noted that one strategy is to have both Iridium and GOES capabilities available at remote sites as they are the only viable options for these locations. The question was posed as to whether the Iridium data could be added to the LRIT broadcast.

#### **Action 121-6: Determine if Iridium data can be added to the LRIT broadcast?**

### **X. GOES Performance During Natural Disasters - Nathan Holcomb (Open Discussion)**

Nathan Holcomb began by explaining the NOS/CO-OPS ingest and telecommunications system. There are two main methods of retrieval, Iridium and GOES. Iridium has started and will expand. They use IP modems or direct telephone lines. They also use the GOES system. He went through statistics on GOES messages received. They are working up upgrade their reporting system to format new data status reports as the increase or decrease in observations are those used and not those received.

The general conclusion of the analysis was that there was a large decrease in the observations used from stations with terrestrial connections and a large increase in those using GOES immediately before, during and after the hurricanes. The result is that GOES transmissions continued when the IP modems failed; especially during the peak of the storms. CO-OPS hopes to use the data for future public outreach to further stress the need for this essential data collection system. It was noted that it would also be important to estimate what the impact would have been had there been no data.

### **XI. Migration from DOMSAT: User Impact, mitigate loss, etc. - Open Discussion**

NOAA briefed that the current DOMSAT service will continue to May of 2019, when it will go dark, depending on Management approval. It was noted that the service provider only has to provide continental U.S. support whereas if your platform can see GOES, you can transmit to GOES. Also, DOMSAT has recurring costs whereas GOES does not. OSPO is now supporting the cost of the DOMSAT service. Wallops also stated that the DOMSAT system is failing and needs to be replaced.

## **XII. 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.

## **XIII. Other Business - LySanias Broyles – U.S. Army Corps of Engineers**

Scheduling for the next meeting was discussed. The original concept would be to hold a TWG, STIWG and Training in Miami, Florida in the Spring. Further outreach was done with international users to see if they would attend in person, if it was held in Miami. Letecia has 16 replies so far. It was stated that travel into Miami would be more economical than it was to New York for the NOAA Satellite Conference which may have limited participation there. 13 of the 16 would still come even without funding. We should continue the plan for Miami. It was proposed that probable dates would be the first through the third week of March (before Easter) and would again contain remote access.

- **Action 121-7: NOAA to assess best dates for next meetings (for Training + TWG/STIWG).**

## **XIV. Adjourn – LySanias Broyles – U.S. Army Corps of Engineers**

The meeting was adjourned at 15:25 PM.

### **Appendix I:**

- **Action 121-1: Update the White Paper “STIWG Perspective on DCS Reliance and Preservation” with new information from the previous year (STIWG DCS Preservation Committee) See Page 2**
- **Action 121-2: Standard Statement of Work information needs to be passed to Corps along with POCs so that the agreements can be generated and reviewed. (STIWG) See Page 3**
- **Action 121-3: Provide feedback on the small-sat projects over the next month. (STIWG) See Page 4**
- **Action 121-4: The STIWG to set up a meeting between Microcom Design on the new file format. (STIWG) See Page 5**
- **Action 121-5: The STIWG to provide input over the next month on the file format. (STIWG) See Page 5**
- **Action 121-6: Determine if Iridium data can be added to the LRIT broadcast? (NOAA) See Page 7**
- **Action 121-7: NOAA to assess best dates for next meetings (for Training + TWG/STIWG). (L. Reeves) See Page 8**