**CMC Draft Minutes**

**Spring 2020 Meetings**

**Remote Meeting**

**16-18 June 2020**

1. **Call to Order – Welcome/Opening Remarks**

S. Townes called the meeting to order and thanked the attendees for their participation. J.M. Soula introduced Mr. Sylvain Teodomante, who is expected to replace him as the CNES Head of Delegation following the fall 2020 CCSDS Meeting series. J.M. Soula noted that this was an excellent opportunity to introduce S. Teodomante to the CMC and procedures of CCSDS.

1. **Introduction of Delegates**

CMC Attendees were:

1. ESA – Nicholas Bobrinsky

2. DLR – Osvaldo Peinado

3. JAXA – Tsutomu Shigeta

4. NASA – Stephen Townes

5. INPE – Eduardo Bergamini

6. UKSA – Chris Perry

7. CNES – Jean-Marc Soula, Sylvain Teodomante

8. CSA – Siamak Tafazoli

9. ASI – Massimo Calabrese

10. CNSA – Yonghui Huang

11. ROSCOSMOS – Dmitry Barannikov, Vladimir Yanik

12. CESG - Margherita di Giulio, Wallace Tai, Jonathan Wilmot, Erik Barkley, Scott Burleigh, Gian Paolo Calzolari, Gilles Moury, Peter Shames, Colin Haddow, Mario Merri, Xiongwen He

12. Secretariat – Michael Blackwood

1. **Agenda Review and Approval** ([June\_2020\_CMC\_Agenda\_\_Draft\_20200615](https://cwe.ccsds.org/cmc/_layouts/15/WopiFrame.aspx?sourcedoc=/cmc/Private/CMC%20Meeting%20Minutes%20and%20Presentations/2020%20Spring%20-%20Remote%20Meeting/June_2020_CMC_Agenda__Draft_20200615.docx&action=default))

The CMC reviewed and approved the agenda for this, the first day of the CMC meeting. M. di Giulio noted that she and the CESG members would cover Area Reports today followed by the CESG summary and overview the following day.

1. **CESG and Area Reports** ([CESG-Report-to-CMC-Spring 2020](https://cwe.ccsds.org/cmc/_layouts/15/WopiFrame.aspx?sourcedoc=/cmc/Private/CMC%20Meeting%20Minutes%20and%20Presentations/2020%20Spring%20-%20Remote%20Meeting/CESG-Report-to-CMC-Spring%202020.pptx&action=default))

M. Di Giulio began by explaining that as the spring 2020 CCSDS Technical Meetings were held remotely rather than in person, a number of challenges were encountered including how each Working Group Chair would organize their meetings. She continued noting that she was most impressed by the response of the Area Directors to these challenges

* 1. CESG Chair Introduction (slides 1-4)

M. di Giulio noted that there had been no changes to the structure of the CESG since her previous report to the CMC. She also reported the review of active CCSDS publications and missions that have adopted CCSDS standards.

* 1. MOIMS Area (slides 5-29)

M. Merri presented the MOIMS Area report. M. Merri began observing that all four (4) Working Groups in the MOIMS Area met remotely and that from these experiences, the conclusion was drawn that virtual meetings cannot fully replace physical, in-person meetings. These remote meetings were less efficient and productive than previous in-person meetings and team building and networking were also negatively impacted.

M. Merri presented the Data Archive Interoperability Working Group Report. The DAI WG had been holding regular, weekly meetings and utilizing a Bugzilla-based website to help in document reviews. The WG had very good participation from CCSDS member agencies as well as outside organizations.

M. Merri presented the Mission Planning and Scheduling Working Group Summary. He noted that the MP&S WG is the youngest WG in the MOIMS Area and has very active participation including members of the Spacecraft Monitor and Control Working Group. At these meetings, ESA presented informal prototyping results of precursor services onboard OPSSAT. The MP&S WG too noted that efficiency at these meetings was reduced in comparison to past meetings and considered meeting for five (5) days at the fall Technical Meetings as essential.

M. Merri presented the Navigation Working Group Report. The Working Group had maintained a high level of momentum with individuals from nine (9) organizations attending these virtual meetings. Due to the limited time available for these meetings, the WG was unable to discuss all of the publications on their agenda. Due to this reduced timeframe and the WG decision for participants to remain muted unless speaking and not use video, there was no sense of group camaraderie except during a "Gathering Time" 20 minutes before the meetings for socialization. The WG suggested using video at future virtual meetings to help combat this.

M. Merri presented the Spacecraft Monitor and Control Working Group Slides. SM&C WG attendance was comprised of forty-one (41) unique individuals. The SM&C WG would like to work with the Artemis Program to identify areas in which SM&C products could eventually meet their needs, as there are currently no plans for Artemis to use MO services. The IOAG/MOSSG team presented their status and that of the ongoing Mission Interoperability Demonstration. The SM&C WG concluded that meeting remotely for any more than two (2) hours at a time was very difficult and overall productivity was lower than face-to-face meetings.

M. Merri also presented the CCSDS-OMG Liaison report. Like CCSDS, the OMG had decided that WGs would meet remotely. As most OMG participants are located in the United States, scheduling meetings would be simpler than for CCSDS meetings.

* 1. SLS Area (slides 30-73)

G.P. Calzolari presented the SLS Area Report. G.P. Calzolari reported that the RF and Modulation and Space Link Coding and Synchronization Working Groups elected to conduct their normal meetings activities by email, but the other SLS Area Working Groups held virtual meetings.

G.P. Calzolari presented the RF and Modulation Working Group Report. The WG had agreed to continue discussing with the DDOR WG the new draft recommendation for wide-band PN DDOR and aligning the representation of PN registers among several SLS (RFM, DDOR, C&S, SLP) books.

G.P. Calzolari presented the Space Link Coding and Synchronization Working Group Slides. The C&S WG made progress on a number of books during this meeting cycle despite all conversations being by email and agreed to consider standard representation of shift registers used in the C&S books. However, more progress would have been made had the WG been able to meet in person.

G.P. Calzolari presented the Space Link Protocols Working Group Summary. The SLP WG reported good progress resulting from their virtual meetings and reached agreement for several books to proceed through publication in the coming months.

G. Moury presented the Space Data Link Layer Security Working Group Slides. The WG reported good progress made during these virtual meetings with a review all contributions to SDLS Extended procedures green book being held and a review of draft pink sheets for revision of SDLS Core Protocol.

G. Moury presented the Multispectral Hyperspectral Data Compression Working Group Report. The MHDC WG resolved all of the RIDs resulting from Agency Review of the Lossless Data Compression blue book and made good progress on the other publications reviewed during these remote meetings.

G.P. Calzolari presented the Optical Communication Working Group Summary. The WG reported good progress during these meetings holding technical discussions and reviewing proposals from ESA, CNES, DLR, NASA, and JAXA. An issue resulting from the fall 2019 Technical Meetings was recorded. The WG had agreed on a resolution to start a new project for updating Optical Communications Coding and Synchronization Layer to add Generic Frame Procedure (GFP) for downlink of variable length frames and transmission of frames from commercial protocols. Other WGs considered the change proposed by the Optical Communications WG to affect wider architectural/stack aspects affecting at least the SLP and C&S Working Groups. At the Fall 2019 meeting it was agreed to discuss the issue in a joint Meeting(s) involving these three (3) Working groups. In spring 2020, the C&S WG were unable to support a joint meeting and the Optical Communications WG held an informal joint meeting with interested SLS Area members.

G.P. Calzolari concluded with the SLS Area summary including a summary of recent Working Group resolutions and resolutions expected in the next six (6) months. G.P. Calzolari also raised an issue noting that commonly, polls requested by the Area and Working Groups require a long period before they are initiated. He asked the Secretariat please try to be more responsive in creating polls and reduce the amount of time between requests and polls being initiated.

* 1. SOIS Area (slides 74-85)

J. Wilmot presented the SOIS Area reports. J. Wilmot presented the Application Support Services Working Group Summary and noted that work in the WG has been slow to progress due to resource constraints and that the WG remains focused on standard infusion. The WG has now migrated to a new GitHub repository that is accessible by NASA and non-NASA participants.

J. Wilmot presented the Onboard Wireless Working Group Report. The WG spent the majority of the week’s meetings discussing and evolving the Proximity Wireless Network Communications Book and made plans to forward to the SOIS Area Director in mid-to-late June for his review. The WG also discussed the process for establishing a CCSDS liaison with the Wi-Fi Alliance (WFA). The working group’s goal is to use WFA interoperability test suites for testing. The working group determined though discussions with WFA that a liaison agreement would be the optimal solution for continued collaboration. The Wireless WG holds regular, remote meetings throughout the year and were able to adapt to changing meeting conditions relatively well though in-person meetings are still preferred.

J. Wilmot presented the Subnetwork Services Working Group Slides. During these meetings, the WG initiated WG-level reviews for the Memory Access Service and Synchronization Service books and expect to coordinate with the Time Management Working Group.

* 1. CSS Area (slides 86-97)

E. Barkley presented the CSS Area Report. The Transfer Services Working Group reported concerns regarding personnel availability in the future. Some resources currently committed will expire shortly and two (2) new projects are being considered. Only ESA and NASA participants attended these remote meetings. It was also noted that some senior WG participants have indicated they will be retiring in the near future, but no replacements have bene identified. The WG has identified a number of books that require updating, but does not have the necessary resources to begin the process.

E. Barkley also presented the Service Management Working Group Summary. The WG made very good progress on the goals they established for these meetings and made progress on joint agenda items with the CSTS WG. The WG reported that population of values in the Service Sites and Apertures Registry were still lacking but appeared to be moving in the right direction.

* 1. SEA Area (slides 117-134)

P. Shames presented the SEA Area Reports briefly providing a high-level summary of Working Group achievements during this meeting cycle.

P. Shames continued with the Security Working Group Report. The WG reported good participation despite the virtual format of the meetings and held joint sessions with the Space Data Link Layer Security and Delay Tolerant Networking Working Groups. The WG planned to hold monthly remote meeting following the spring 2020 technical meetings.

P. Shames presented the Systems Architecture Working Group Summary. The WG had completed disposition of the PIDS and RIDS for the Support Layer Architecture Green Book and reported that dispositioning the 141 review items resulted in many edits scattered throughout the document. The Data Archive Interoperability WG had asked Systems Architecture Working Group to reconfirm the Reference Architecture for Space Information Management, which will be considered as a new work item.

P. Shames also presented the Delta-DOR Working Group Slides. The DDOR WG reviewed Input Papers on proposed recommendation 2.5.7B for new, higher resolution, PN DOR signals submitted by both NASA and ESA to the RF&M WG prior to meeting. The WG also reviewed results from interoperability tests with BepiColombo DDOR passes using existing D-DOR signals and two new Open Loop Receivers, NASA’s OLR and ESA’s TTCP.

P. Shames presented the Time Management Working Group Report. P. Shames noted that this is CCSDS’s newest WG and has been making very good progress thus far. The WG is currently focused on their Time Management Green Book.

P. Shames concluded with the SANA Steering Group Summary. All four of the SANA related Yellow Books were reviewed by CESG and updated. Issues with process description, workflow, and SANA registry updates were resolved and these books were added to the Chief Technical Editor’s queue for publication. The Service Site and Aperture (SSA) registry is only to be accessible to those with a CCSDS account. SANA now has the list of users with CWE credentials and funding has been allocated for SANA to develop a secure, remote access, update interfaces for Agency Representatives to take responsibility for their own Agency’s data.

**CMC-A-2020-06-01 - The CMC asks that member agencies consider potential candidates for the position of MOIMS Deputy Area Director. Formal proposal of candidates will be at a later date with the intent that the new Deputy Area Director assume responsibilities by the fall 2020 Technical Meetings.**

**Due Date: 18 July 2020**

* 1. SIS Area (slides 98-116)

S. Burleigh presented the SIS Area Reports. S. Burleigh noted that two (2) working groups, CFDP Revisions and Voice, did not hold remote meetings. The CFDP Revisions WG was awaiting resolution of Conditions on approval to publish their final revised Blue Book and would consider the future work for the WG once it was published. The Voice WG was currently dormant and will be reactivated in the near future to handle five (5) year reviews. The Voice WG plans to discuss voice issues with MIA about the new book, Audio and video over RTP and DTN.

S. Burleigh presented the Motion Imagery and Applications Working Group Report. The WG addressed RID disposition from the Red One review of RTP book in real time with the RID initiator and resolved all RIDS from the Red One Review of the RTP book and distributed the Red Two version to WG for final review. The WG also reported that Digital Motion Imagery Blue Book revisions should be ready for Agency Review by late May 2020.

S. Burleigh continued with the Delay Tolerant Networking Working Group Report. The WG held a Cross-Area meeting with the Security WG on concerns over resource expenditures on SBSP to be followed closely by BPSec. The WG plans to leave the Streamlined Bundle Security Protocol project in Red status and redirect all SBSP resources to development of the BPSec Blue Book. The WG also reported that no resources had been identified for First-Hop / Last-Hop service which has an IOAG Priority of three (3) and a need date of the end of calendar year 2020.

* 1. Summary

M. di Giulio concluded discussion for the day noting that the disagreement on the CESG poll, CESG-P-2019-12-002 Approval to release CCSDS 131.3-P-1.1, CCSDS Space Link Protocols over ETSI DVB-S2 Standard (Pink Sheets, Issue 1.1) for CCSDS Agency review, would be discussed the following day.

# Day 2

1. **Introduction of Delegates**

CMC Attendees were:

1. ESA – Nicholas Bobrinsky

2. DLR – Osvaldo Peinado

3. JAXA – Tsutomu Shigeta

4. NASA – Stephen Townes

5. INPE – Eduardo Bergamini

6. UKSA – Chris Perry

7. CNES – Jean-Marc Soula, Sylvain Teodomante

8. CSA – Siamak Tafazoli

9. ASI – Massimo Calabrese

10. CNSA – Yonghui Huang

11. ROSCOSMOS – Dmitry Barannikov

12. CESG - Margherita di Giulio, Wallace Tai, Jonathan Wilmot, Gian Paolo Calzolari, Gilles Moury, Peter Shames

12. Secretariat – Michael Blackwood

1. **Agenda Review and Approval** ([June\_2020\_CMC\_Agenda\_\_Draft\_20200615](https://cwe.ccsds.org/cmc/_layouts/15/WopiFrame.aspx?sourcedoc=/cmc/Private/CMC%20Meeting%20Minutes%20and%20Presentations/2020%20Spring%20-%20Remote%20Meeting/June_2020_CMC_Agenda__Draft_20200615.docx&action=default))

The CMC reviewed and approved the agenda for this, the second day of the CMC meeting

1. **CESG Report on Other Topics** ([CESG-Report-to-CMC-Extra Items-Spring 2020](https://cwe.ccsds.org/cmc/_layouts/15/WopiFrame.aspx?sourcedoc=/cmc/Private/CMC%20Meeting%20Minutes%20and%20Presentations/2020%20Spring%20-%20Remote%20Meeting/CESG-Report-to-CMC-Extra%20Items-Spring%202020.pptx&action=default), [131.3unresolvedPoll.SLSforCMC.v0.3](https://cwe.ccsds.org/cmc/_layouts/15/WopiFrame.aspx?sourcedoc=/cmc/Private/CMC%20Meeting%20Minutes%20and%20Presentations/2020%20Spring%20-%20Remote%20Meeting/131.3unresolvedPoll.SLSforCMC.v0.3.pptx&action=default), [NASA refined ALACAMAD approach 3Apr20](https://cwe.ccsds.org/cmc/_layouts/15/WopiFrame.aspx?sourcedoc=/cmc/Private/CMC%20Meeting%20Minutes%20and%20Presentations/2020%20Spring%20-%20Remote%20Meeting/NASA%20refined%20ALACAMAD%20approach%203Apr20.pptx&action=default))

M. di Giulio presented the CESG Report on Other Topics.

* 1. Poll statistics since last CMC Meeting and status of activities (slides 1-6)

M. Di Giulio noted that the previous six (6) months had been very active with many polls and quite a few books proceeding to Agency Review. M. di Giulio noted that the unresolved CESG poll, CESG-P-2019-12-002 Approval to release CCSDS 131.3-P-1.1, CCSDS Space Link Protocols over ETSI DVB-S2 Standard (Pink Sheets, Issue 1.1) for CCSDS Agency review, would be discussed later in this day’s agenda.

* 1. Report on resources status, prioritization of resources (slides 7-12, 14-17)

M. di Giulio presented the resource status graphic. S. Townes noted that this graphic represented some of the information present in the CCSDS Strategic Plan, but displayed this information in a manner that is quite valuable. S. Townes wondered if this graphic could be adapted and included in the Strategic Plan to provide additional insight for project resources.

M. Di Giulio continued that the MOIMS Deputy Area Director, Brigitte Behal, will be stepping down from this position later in 2020. B. Behal planned to attend the fall 2020 CCSDS Meeting Series and ideally would hand over responsibilities to her replacement at that time. M. di Giulio requested that CMC members consider potential candidates for this position. A formal request for candidates would follow later in 2020. J.M. Soula noted that CNES intended to submit a candidate for this position.

M. di Giulio noted that as utilization of SANA registries has increased, so has the need to maintain registry data. The CESG has agreed to conduct an assessment with the SANA Steering Group and other invited participants. The results of the analysis would be presented at the next CMC meeting. P. Shames added that the Functional Resources Registry has led to ongoing resource needs. P. Shames continued that the Reference Architecture for Space Data Systems (RASDS) would benefit from additional agency resources. M. di Giulio noted that RASDS is overdue for five (5) year review. P. Shames provided the background information that RASDDS was reconfirmed at the last five (5) year review as there were no resources available to for further development. P. Shames stated that he would like to return to RASDS and refresh the recommended practice.

M. di Giulio noted that she considered this a normal revision project with no need for a new resource type. S. Townes continued that from the CESG perspective, updating RASDS should follow the normal procedure and asked if the level of support required for the update would require outsized resources. P. Shames responded that most WGs having a standing workforce that can handle revision projects. In the Systems Engineering Area, all projects, except for the Security WG, have been treated as special projects and requests have had to be made to the CMC for resources. Existing resources in the System Architecture Working Group were on loan from the MOIMS and SOIS Areas and would be returned at the completion of existing projects.

M. di Giulio clarified that SANA’s position is that a new resource may be required simply to maintain existing registries. The CESG may conclude that the SANA Operator is responsible for some data and WG representatives for other data.

M. di Giulio asked that the minutes of previous CMC meetings that had not yet been distributed be provided as soon as possible. M. Blackwood apologized and responded that he would complete the minutes and provide them for review.

**CMC-A-2020-06-02 - The CMC directs the Secretariat to complete and distribute the minutes of meeting for the June 2019, October 2019 and March 2020 CMC Meetings.**

**Due Date: 25 July 2020**

M. di Giulio next raised the topic of a proposed GitHub repository for all of CCSDS. Many CCSDS Areas and Working Groups already utilize repositories which are independently organized and maintained. M. di Giulio suggested that the cost and any implications should be evaluated. S. Townes added that he did not expect the cost of a GitHub repository would be prohibitive but there may security restrictions resulting from existing NASA policies and regulations.

**CMC-A-2020-06-03 - The CMC directs the Secretariat to add an agenda item for the next midterm CMC Meeting to discuss the possibility of a GitHub repository for all of CCSDS.**

**Due Date: 1 August 2020**

M. di Giulio continued to the topic of SANA Yellow Books. All four SANA Yellow Books were updated by the SANA Steering Group and approved by the CESG. The updates include instructions for WGs creating new registries and maintaining existing registries. P. Shames provided some background information on SANA stating that it was created in 2004 and the four Yellow Books were drafted to bring some order to the existing chaos. Since SANA was created, CCSDS standards have evolved to include dynamic data sets. These dynamic data sets, and other static data sets, are contained in SANA.

M. di Giulio continued to the topic of the unresolved CESG poll, CESG-P-2019-12-002 Approval to release CCSDS 131.3-P-1.1, CCSDS Space Link Protocols over ETSI DVB-S2 Standard (Pink Sheets, Issue 1.1) for CCSDS Agency review. In the course of the poll, the Systems Engineering Area Director, P. Shames, placed a condition on approval of the poll as follows:

**“Facts:**

The mods to the DVB-S2 coding and synch document have the following effect:

1. Change the applicability of the coding and the synchronization schemes as defined in the DVB-S2 standard from telemetry / downlink only, to downlink, uplink, and cross link (plus, as implied, maybe proximity link and surface-to-surface link too)
2. Add support for USLP (and also, incidentally, AOS for uplink use)
3. Add support for Space Research Service (SRS) use, in addition to the current Earth Exploration Service (EESS) applications
4. Limit use of USLP to only the fixed length frame option

In essence, the use cases of the DVB-S2 would be extended from downlink only, to those that are neutral to link directionality and independent of link type.

**Statement:**

These changes to CCSDS 131.3-B-1 finally open up the possibility of using the AOS and USLP protocols in the forward and cross-link applications, as well as for downlink / telemetry, which is what these two protocols have always been designed to do. This allows them, as they were designed, to be deployed in modes that are neutral to directionality as well as to link types. As such this is a good thing and approval of this spec would mean that now these protocols and an underlying coding and synchronization (only DVB-S2 in this formulation, but potentially others) would be available to a wider range of missions and applications. This is a fundamental change and I wholeheartedly endorse it.

However, approving this change for only this DVB-S2 coding and synch standard leaves the users of these two powerful space data link standards (AOS and USLP) without the ability to choose the completely appropriate core CCSDS TM coding and synch standards as well. We already have missions, such as the Lunar and Gateway, that, in compliance with the International Communication System Interoperability Standards (ICSIS), are planning to use AOS/USLP for forward, proximity and cross-link USLP over the LDPC specs that are documented in the TM synch and channel coding book, CCSDS 131.0-B-3. A set of changes to that doc, which were first proposed in detail more than two years ago, have stalled and not moved forward. These changes are hardly any more complex than those in this document and it is past time to complete the work to get them approved and published as well.

Approval of this spec is therefore conditional on completion of the identical changes to the TM Synch and Channel Coding spec, CCSDS 131.0-B-3, thus allowing AOS and USLP to be used over these codes for forward, proximate, and cross link purposes.

In my opinion it would be wise to do likewise with the accommodation of USLP variable length frames over the TC synch and channel coding standard as well. There is really no technical reason why all of the CCSDS frame types and suitable codes should not be available to all missions. These limitations that tie us to 30+ year old distinctions are just holding CCSDS back, and our users are moving out on their own to use what we have provided in more functional ways than we have, as yet, approved.”

S. Townes asked M. di Giulio to describe the issue, how the CESG has addressed the issue, and what is there for the CMC to do. N. Bobrinsky seconded the request for a summary.

P. Shames stated that he believed the CESG had decided this was a technical issue to be settled at the technical level. M. di Giulio disagreed noting that the CESG could not reach consensus and the only possibility was to raise the issue to the CMC for resolution. S. Townes noted that he was unsure of how to proceed having never encountered an issue where the CESG could not reach consensus before.

G. Moury was asked to provide context. The Space Link Coding and Synchronization Working Group undertook three (3) projects to extend the use of downlink channel codes to uplink and space-to-space links. CNES produced pink sheets for the CCSDS Space Link Protocols over ETSI DVB-S2 Standard blue book. The WG reviewed the pink sheets and approved proceeding towards agency review. When the project reached the CESG, it was prevented from progressing by the SEA Area Director on the grounds that a similar extension should be provided for TM Synchronization and Channel Coding before either revision is published. The WG’s plan was to complete this extension at a later date. G. Moury alleged that as the condition was contingent upon the content of another book, it was not valid.

G. P. Calzolari noted that there was consensus within the SLS Area on the C&S WG’s plan to provide the updated extensions in series; the other books would follow as soon as they were completed. P. Shames interjected that consistency across the standards produced by CCSDS is specifically the responsibility of Area Directors and the CESG. S. Townes agreed that the issue appeared to be purely of a technical nature and asked how the CESG had attempted to resolve the situation. N. Bobrinsky agreed that the underlying issue appeared to be technical in nature.

G. P. Calzolari noted that agency review serves as a valuable opportunity for a Working Group to receive informative feedback about the content of a book for use in further development. J.M. Soula agreed that this is the case for reviews.

P. Shames reminded attendees that the prevailing CCSDS rule is that a document should cover only one layer of the communication stack. These coding schemas were granted an exception from this rule.

M. di Giulio asked G. Moury to present the SLS Area summary of the situation.

N. Bobrinsky stated that from ESA’s perspective, the question was whether to make an exception for the three coding schema books or to hold them to standard operating procedures. Clearly the contents of all three books are connected. N. Bobrinsky asked for a recommended course of action from the CESG. M. di Giulio replied that there was no consensus opinion and that she could not speak for the CESG in this case. M. di Giulio noted that her personal opinion was that the WG’s roadmap for updating all three books in parallel was appropriate, DVB-S2 was just the first book to be ready for review.

P. Shames stated that his point of view on the subject is that the CESG has been given responsibility for technical work across all areas of CCSDS. P. Shames stated his opinion was that as the CESG could not reach consensus, the responsible WG should be given the responsibility of reexamining their process based on feedback from the CESG.

S. Townes asked if other members of the CMC had an opinion on the subject. S. Tafazoli stated that N. Bobrinsky’ s summary was clarifying the issue and that he too was unprepared to make a decision. J.M Soula replied that he agreed on the role of the CESG in technical matters and that he deferred to the SLS Area leadership in this case. J.M Soula stated that he believed the review of DVB-S2 should proceed as all three books will be updated in turn. O. Peinado added that he agreed with J.M Soula and his proposed course of action.

P. Shames requested the opportunity to share his presentation as G. Moury had been given the opportunity to share his. N. Bobrinsky agreed that he would like to see P. Shames’ presentation.

P. Shames began, noting that after conclusion of the poll, the CESG discussed the issue over the course of several months. P. Shames stated that he had taken a step back to examine the questions of consistency. The individual standards being produced had potential to leave users confused. Not being an expert on Coding and Synchronization himself, P. Shames consulted NASA’s representatives to reexamine his point of view and objections and the best way to serve missions adopting CCSDS standards. His opinion did not change after these actions.

G. P. Calzolari noted that the Coding and Synchronization Working Group had reached consensus on these standards including NASA’s representation. G. Moury added that preventing the DVB-S2 standard from being published would not solve any issues. N. Bobrinsky stated that he still believed the underlying issue should be able to be solved at the Working Group or Area level with NASA’s representation there.

S. Townes summarized that it seemed there was an impasse and that he was not confident the CMC had been able to ingest all of the relevant information. S. Townes asked that the CESG make a formal proposal to the CMC with the two courses of action specifically stated. The CMC would review these positions and the supporting information and would then vote on the best course of action.

M. di Giulio noted that there seemed to be no agreement at that time among the CMC members on how to proceed and that she believed all of the relevant information had been presented. S. Townes replied that he wanted to establish a process for proceeding and that coming to a decision now for a complex problem could be problematic. He suggested that the Secretariat should create a poll to settle the issue which would give CMC members time to review both sides of the issue. N. Bobrinsky agreed with S. Townes’ proposal

M. di Giulio agreed to present the positions of the SLS and SEA Area Directors with one sentence from each and provide links to both positions’ supporting materials. S. Townes asked if the other CMC members agreed with this course of action. S. Tafazoli agreed with this approach. T. Shigeta agreed. C. Perry agreed. J.M. Soula agreed and noted that no other course of action appeared possible and that it was undesirable to delay a resolution until the fall meetings.

**CMC-A-2020-06-04 - The CMC directs the CESG Chair to provide the SLS and SEA Area Director’s presentations on the unresolved CESG poll to the Secretariat for distribution and inclusion in the meeting materials CWE folder.**

**Due Date: 2 July 2020**

**CMC-A-2020-06-05 - The CMC directs the CESG Chair to provide the two potential solutions to the unresolved CESG poll to the Secretariat for polling.**

**Due Date: 2 July 2020**

**CMC-A-2020-06-06 - The CMC directs the Secretariat to create a CMC poll for the two potential solutions to the unresolved CESG poll.**

**Due Date: 9 July 2020**

* 1. Status of ICPA including Service Catalogue #3 (slide 13)

M. di Giulio raised the topic of IOAG Service Catalogue #3 and the question of what CCSDS standards should be developed based on the services in the catalogue. As CESG Chair, she was waiting for SC#3 to be formally distributed by the CCSDS liaison to the IOAG. As CCSDS liaison to the IOAG, S. Townes responded that at this time, the IOAG had not requested any formal action of CCSDS, but that he would reconfirm that this was the case with IOAG Chair, Michael Schmidt.

M. di Giulio continued noting that even if no formal action had been requested by the IOAG, CCSDS should begin to determine which services are met by existing CCSDS projects and where new standards are required. J.M. Soula, CNES’s IOAG Head of Delegation, noted that the IOAG is not expecting any action from CCSDS at this time. The need dates for services in SC#3 had not yet been finalized. S. Townes agreed with J.M. Soula that no response from CCSDS was required, but also agreed to distribute SC#3 to the CESG for informal review and planning.

1. **CCSDS Strategic Plan**

S. Townes noted that though a discussion of the CCSDS Strategic Plan had been included on the agenda for the second day of the CMC meeting, the meeting had already run over time. The agenda for the third day of the meeting should be updated to include this discussion.

# Day 3

1. **Call to Order – Welcome/Opening Remarks**

S. Townes welcomed all attendees and noted that on this, the final day of the CMC’s meeting, he had missed seeing everyone in person.

1. **Introduction of Delegates**

CMC Attendees were:

1. ESA – Nicholas Bobrinsky

2. DLR – Osvaldo Peinado

3. JAXA – Tsutomu Shigeta

4. NASA – Stephen Townes

5. INPE – Eduardo Bergamini

6. UKSA – Chris Perry

7. CNES – Jean-Marc Soula

8. CSA – Siamak Tafazoli

9. ASI – Massimo Calabrese

10. CNSA – Yonghui Huang

11. ROSCOSMOS – Dmitry Barannikov

12. CESG - Margherita di Giulio, Wallace Tai

13. Secretariat – Michael Blackwood, Thomas Gannett, Brian Oliver

1. **Agenda Review and Approval** ([June\_2020\_CMC\_Agenda\_\_Draft\_20200615](https://cwe.ccsds.org/cmc/_layouts/15/WopiFrame.aspx?sourcedoc=/cmc/Private/CMC%20Meeting%20Minutes%20and%20Presentations/2020%20Spring%20-%20Remote%20Meeting/June_2020_CMC_Agenda__Draft_20200615.docx&action=default))

The CMC reviewed and approved the agenda for this, the third and final day of the CMC meeting

1. **CCSDS Strategic Plan**

S. Townes began discussion of the CCSDS Strategic plan. Previous discussions of the Strategic Plan had included the presentation Juan Miro had prepared and updated when he served as CESG Chair. S. Townes asked a couple questions of the CMC. Did the information presented in the strategic plan fulfill the needs of the CMC when making strategic decisions about resource allocation and how can the plan be developed to support CMC members in justifying the decisions to their superiors?

S. Townes stated he found the CCSDS Strategic Plan consistent with his expectations. CCSDS’s high-level goals and the Area goals are clearly presented and how ongoing projects support these goals is clearly presented. S. Townes noted that the visual representation of this information was somewhat lacking.

M. di Giulio stated that CCSDS’s high-level goals had not been updated for some time. The presentation Juan Miro created displayed this information in a different manner, but was very labor intensive to keep updated. This was one of the motivating factors for developing the online CCSDS Strategic Plan. CCSDS Area Directors update the Strategic Plan when it is appropriate. New projects are added to the plan regularly and these changes are immediately viewable. If a new Working Group project falls outside their charter, the charter and strategic plan can be updated to reflect the change. CCSDS Area Directors are familiar with this process and are quite disciplined in making updates as soon as they are required.

S. Townes added that a roadmap or schedule seemed to be missing. When a CCSDS standard is published, that is a step towards a goal, but how does CCSDS measure progress towards goals and when a goal is completed?

J.M. Soula agreed and stated that he thought Juan Miro’s presentation was a good way of displaying this and wondered if there was an automated way to produce the report.

N. Bobrinsky suggested updating both the online Strategic Plan and the Juan Miro style presentation in parallel for a period of time and to create a regular agenda item for the CMC to review the strategic plan. S. Townes agreed to the idea of the CESG manually updating the presentation while the Secretariat considered options for automating the process. S. Townes suggested the focus should be on producing material that makes CCSDS’s goals and how projects support them readily apparent to outside parties.

M. di Giulio noted that the Approved and Pending Projects pages on the CWE display information about planned completion and delivery dates for projects. This information is of great value to supplement the Strategic Plan. The Draft Projects page on the CWE shows future work planned by Working Groups including projects to support the ICPA.

S. Townes asked the CESG Chair to try updating Juan Miro’s presentation and for the Secretariat to look into options for automating the process. If the CESG or Secretariat comes upon a better format for the report they should present this to the CMC.

**CMC-A-2020-06-07 – The CMC asks that the CESG Chair and Secretariat investigate options for updating the CCSDS Strategic Plan Format created and formerly maintained by Juan Miro. Options to automate the process for generating the report and new formats for the report should be considered and results reported to the CMC.**

**Due Date: Spring 2021 CMC Meeting**

1. **CCSDS Target User Audience**

S. Townes started the conversation on CCSDS’s targeted user audience. S. Townes noted that he believed this agenda item originated from a request of the IOAG. The IOAG’s question was what are agencies doing to promote CCSDS’s standards to other audiences? Commercial organizations were mentioned as an example. Are CCSDS standards intended for use by a wide community or are they focused on interoperability between space agencies? S. Townes stated that from his perspective, CCSDS has been focused on agency interoperability in recent history.

N. Bobrinsky added that in ESA member states, CCSDS standards have a good reputation and was unsure of the nature of the question. CCSDS members need to promote standards to a wider audience, but many in that audience currently utilize CCSDS standards. N. Bobrinsky stated that he was interested in hearing of other members’ success in propagating CCSDS standards.

S. Townes noted that JAXA had been advocating CCSDS standards to Japanese entities and asked T. Shigeta if JAXA had experienced much success. T. Shigeta responded that SLS Area standards in particular are widely used in Japan, but infusion of other Areas had been limited. In the realm of Spectrum Management, the Space Frequency Coordination Group (SFCG) was also approaching the commercial community. T. Shigeta asked if CCSDS was doing the same and what the best way to approach potential users was.

S. Townes reported the situation in the United States was similar to Japan. Large companies utilize SLS Area standards and provide compatible services but their onboard avionics tend not to use CCSDS standards. Cross Support Transfer Services (CSTS) are not widely known for example. The IOAG was also beginning to address these concerns. The IOAG was preparing a booth at SpaceOps and would also be targeting commercial groups rather than only scientific organizations and space agencies. In the United States, problems often result from commercial groups moving ahead quickly using their own solutions. Frequently they are not aware of CCSDS standards. Some large companies, like Amazon, have been introduced to CCSDS standards, but some choose not to adopt these standards.

M. di Giulio noted that ESA was taking an open source approach for software applications supporting CCSDS standards first creating a license that allows users to take existing products and immediately use them. ESA was encouraging commercial groups to adopt CCSDS standards, but some opine that CCSDS standards primarily address operations safety and interoperability. They were not always ideal or convenient solutions for companies with business goals.

S. Townes agreed that CCSDS’s goal of interoperability is not always a goal for commercial groups when capturing customers is a major goal. N. Bobrinsky agreed M. di Giulio made a good point. ESA had been discussing distribution for some time and decided that open source distribution was usually the best approach.

T. Shigeta asked if it should still be CCSDS’s goal to find commercial adopters. Were the efforts taken successful enough to justify the approach. S. Townes responded that for now, CCSDS’s goal should remain broadening the pool of groups that have adopted CCSDS standards. Additional outreach at appropriate conferences for example could increase knowledge of CCSDS standards. T. Shigeta agreed that this approach aligned with JAXA’s intent and efforts and noted that JAXA would continue promoting CCSDS standards.

1. **Meeting Planning**
	1. Fall 2020 Tech Plenary & CMC (CNES)

J.M. Soula reported that the plans for the fall 2020 meetings had been confirmed. CNES was still discussing some security concerns internally; some attendee registration may have been required, but the goal was to be discreet. COVID-19 remained a concern for CNES with French borders remaining closed to travelers from many countries. At the time of the meetings, it was likely some restrictions would still exist. J.M. Soula asked if other delegates knew of any restrictions that would prevent participants from their countries attending the meetings. With no clear picture at the time, CNES would attempt to clarify the situation over the next two months. A final answer would be required in September 2020 for CNES to cancel or postpone reservations.

S. Townes noted that there were two questions. First, would CNES be able to host the meetings and what restrictions would be in place. S. Townes stated that he knew some regular meeting attendee’s had personal concerns about attending the meetings. S. Townes asked that each agency begin the discussion with their participants about individual willingness to attend the meetings should they be held in-person. T. Shigeta stated that JAXA had already begun these conversations. Many participants from JAXA consider FtF meeting was preferable and much productve, but at least one member had already indicated they would not be able to attend the meetings in person.

J.M. Soula asked if a page for the CCSDS public Website should be created. M. Blackwood responded that he was working on the information for a page and would ask J.M. Soula for input on local information for Toulouse, France.

N. Bobrinsky suggested a short meeting at the end of August 2020 would allow CMC members to share their agencies’ positions and provide time for discussion.

**CMC-A-2020-06-08 - The CMC directs the Secretariat to initiate a poll to determine the best date for holding a meeting at the end of August 2020 to discuss the fall 2020 CCSDS Meeting Series.**

**Due Date: 1 August 2020**

* 1. Spring 2021 Tech Plenary & CESG (NASA-MSFC)

S. Townes reported that plans for the spring 2021 Technical Plenary and CESG Meeting would largely be the same as plans had been for the same meetings in spring 2020. M. Blackwood stated that he would send an email to the CMC and CESG with proposed dates for the meetings so members could note any conflicts and suggests other dates if necessary.

* 1. Spring 2021 CMC (JAXA) ([CMC2021spring\_Tokyo.pdf](https://cwe.ccsds.org/cmc/Private/CMC%20Meeting%20Minutes%20and%20Presentations/2020%20Spring%20-%20Remote%20Meeting/CMC2021spring_Tokyo.pdf))

T. Shigeta. reported that JAXA’s plans for the spring 2021 CMC meeting would be much the same as for the spring 2020 meeting. The only outstanding issue was the dates for the meeting. With the CCSDS Technical Plenary in early May 2020, JAXA had first considered the week of 17 May and decided these dates were too close to the Technical Plenary. JAXA identified two options for the dates, 24-27 May 2020 or 1-4 June 2020. The second week in June was another option but not the preferred option due to concerns about Japan’s annual rainy season. T. Shigeta requested that the CMC consider these options and reach a decision. With the meetings closely following SpaceOps 2021, some conflicts were likely to exist.

**CMC-A-2020-06-09 - The CMC directs the Secretariat to initiate a poll to determine the best date for holding the June 2020 CMC meeting hosted by JAXA.**

**Due Date: 15 August 2020**

* 1. Fall 2021 Tech Plenary &CESG & CMC (ESA/ESTEC)

N. Bobrinsky stated that ESA intended to host the fall 2021 CCSDS meetings in Holland with ESTEC serving as the hosts. N. Bobrinsky expected further details to be presented at the next CMC meeting.

* 1. Spring 2022 Tech Plenary & CESG (NASA, center TBD)

S. Townes acknowledged that NASA had not yet selected a location to host the spring 2022 Technical Plenary and CESG Meeting. M. Blackwood continued that the two primary locations under consideration were Houston, Texas to be hosted by NASA Johnson Space Center or Titusville, Florida hosted by NASA Kennedy Space Center.

* 1. Spring 2022 CMC (INPE)

E. Bergamini confirmed that decision to postpone meeting hosting responsibilities by one year was accepted by INPE and the intent was to again host the CMC Meeting in São José dos Campos, Brazil. E. Bergamini asked the CMC if there was a preferred month to host the meetings. M. Blackwood responded that late May or early June were preferred, but the dates could be flexible dependent on the dates of the spring 2022 Technical Plenary and CESG Meeting. E. Bergamini asked if there were preferred days of the week to host the meetings. M. Blackwood responded that holding the CMC meetings Tuesday through Thursday was preferred as it allowed attendees to travel on Monday and Friday of the same week.

1. **Secretariat Report**
	1. Action Item Status (only open items) ([Open\_CMC\_Action\_Items\_20200617.pptx](https://cwe.ccsds.org/cmc/_layouts/15/WopiFrame.aspx?sourcedoc=/cmc/Private/CMC%20Meeting%20Minutes%20and%20Presentations/2020%20Spring%20-%20Remote%20Meeting/Open_CMC_Action_Items_20200617.pptx&action=default))
* CMC-A-2019-08-01
	+ M. Blackwood reported that SANA was currently working on creating the interface that would allow agency representatives edit their entries of the Service Sites and Apertures Registry with the intent of completing the task later in 2020.
* CMC-A-2019-10-01
	+ O. Peinado noted that this Action Item could not be completed until CMC-A-2019-08-01 had been completed and should remain open.
* CMC-A-2019-10-03
	+ M. di Giulio noted that ESA’s efforts from this Action Item were ongoing. Results from the exercise were being combined into a single report and would be provided to SANA in a few weeks’ time. J.M. Soula reported that CNES had completed this action in September 2019, but that he was unsure if SANA had made updates accordingly. T. Shigeta reported that JAXA had also provided with the review results while not checked yet whether JAXA review was reflected in the SANA.
* CMC-A-2019-10-06
	+ M. Blackwood reported that this action had been completed and the agenda item discussed earlier in this meeting.
	+ Action Item closed by decision of the CMC.
* CMC-A-2019-10-07
	+ S. Townes reported that NASA had completed this action. W. Tai and Mr. Dan Smith (NASA) had approached NASA’s Artemis program, but their success was not yet assured. W. Tai reported that NASA’s Deep Space Network (DSN) and Near Earth Network (NEN) had committed to adopting Simple Schedule Format and Communications Planning Information Format. N. Bobrinsky reported ESA was currently undertaking this action, but was far from completion. T. Shigeta reported that JAXA was doing the same and was not yet done with the action.
* CMC-A-2019-10-09
	+ M. Blackwood reported that this work had not yet been completed. The contents of the current brochure could be updated but a new format might be required in the near future.
* CMC-A-2019-10-10
	+ S. Townes reported that NASA had not yet completed this action. N. Bobrinsky reported that ESA had only partially completed this action. S. Townes pointed members to the [Implementations Section](https://public.ccsds.org/implementations/default.aspx) of the CCSDs website for the currently available list of products and software. S. Townes asked if the intent of this action was to update this list. M. Blackwood agreed that this was the intent of the action and that he would update the action to reflect this. CMC members should provide their updates to this list to the CCSDS Secretariat for implementation.
* CMC-A-2019-10-16
	+ M. di Giulio reported that the CESG had begun this action, but had been frustrated in that no individual had been recommended by the Navigation Working Group. There were no volunteers to serve in this role or interest in the project. Mr. David Berry had suggested that he could be the best option for this role, but that his current schedule and resources did not allow for him to accept this role.
	+ Action Item closed by decision of the CMC.
* CMC-A-2020-03-01
	+ M. Blackwood reported that due to the current implementation of the CCSDS Strategic Plan in SharePoint lists, the best viable option to distribute a file was in .pdf form, but there was no way to automate generation of this file.
	+ Action Item closed by decision of the CMC.
* CMC-A-2020-03-02
	+ M. Blackwood reported that this action had been completed and the agenda item discussed earlier in this meeting.
	+ Action Item closed by decision of the CMC.
* CMC-A-2020-03-03
	+ M. Blackwood reported that this action had been completed and the agenda item discussed earlier in this meeting.
	+ Action Item closed by decision of the CMC.
* CMC-A-2020-03-04
	+ M. Blackwood reported that this action had been completed and the agenda item discussed earlier in this meeting.
	+ Action Item closed by decision of the CMC.
* CMC-A-2020-03-05
	+ M. Blackwood reported that this action had not yet been created and suggested that a poll could be initiated to adopt the new code of conduct or retain CCSDS’s current code of conduct.
* CMC-A-2020-03-06
	+ M. Blackwood reported that this poll had bene created and the results reported to JAXA, but with the cancellation of the in-person CMC meeting in June 2020. The same would need to be completed for the following year.
	+ Action Item closed by decision of the CMC.
* CMC-A-2020-03-07
	+ M. Blackwood reported that this poll had been created and the meeting held in March 2020.
	+ Action Item closed by decision of the CMC.
* CMC-A-2020-03-08
	+ M. Blackwood reported that beginning with this meeting of the CMC, UTC was being included on every CMC meeting agenda.
	+ Action Item closed by decision of the CMC.
	1. Document Status Report ([CCSDS Document Status as of June 18, 2020.pdf](https://cwe.ccsds.org/cmc/Private/CMC%20Meeting%20Minutes%20and%20Presentations/2020%20Spring%20-%20Remote%20Meeting/CCSDS%20Document%20Status%20as%20of%20June%2018%2C%202020.pdf))

T. Gannett noted that he had provided an up to date document status report that was available in the meeting folder on the CWE and would allow attendees to review and asks questions at a later date due to time restrictions.

* 1. IT Project Status ([CCSDSPWRedeignPresentation.pptx](https://cwe.ccsds.org/cmc/_layouts/15/WopiFrame.aspx?sourcedoc=/cmc/Private/CMC%20Meeting%20Minutes%20and%20Presentations/2020%20Spring%20-%20Remote%20Meeting/CCSDSPWRedeignPresentation.pptx&action=default))

B. Oliver presented the status of IT Projects. B. Oliver noted that he would focus his report on the ongoing effort to redesign the CCSDS public website. B. Oliver noted that the plan was to deploy the redesigned website prior to the fall 2020 CCSDS meetings to allow the Secretariat to receive feedback on the website in person from CCSDS participants.

S. Tafazoli asked if the footer in the presentation showing the logos of CCSDS’s member agencies would be in full color or grey scale in the final version. B. Oliver responded that initially the logos were in full color, but this proved distracting. Taking inspiration from SANA’s approach, the grey scale version was implemented. T. Gannett noted that this approach would likely violate many agencies’ rules regarding the use of their logos. S. Tafazoli confirmed that this was the case for CSA. N. Bobrinsky added that this was the case for ESA too. B. Oliver noted this feedback and agreed to revert the footer to full color logos.

Following the presentation, the CMC members voiced their approval of the progress so far and appreciation for B. Oliver’s efforts.

1. **Schedule for Next CMC Mid-term Telecon**

S. Townes suggested a poll to select the best dates for all attendees to attend a CMC mid-term meeting. J.M. Soula reminded CMC members and the Secretariat that CNES required a decision about holding or postponing the fall 2020 CCSDS Meetings by 7 September 2020.

**CMC-A-2020-06-10 - The CMC directs the Secretariat to initiate a poll to determine the best date for holding the next CMC Mid-term Meeting.**

**Due Date: 2 July 2020**

1. **CMC Review of Resolutions and Action Items**

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**CMC-A-2020-06-01** - The CMC asks that member agencies consider potential candidates for the position of MOIMS Deputy Area Director. Formal proposal of candidates will be at a later date with the intent that the new Deputy Area Director assume responsibilities by the fall 2020 Technical Meetings.

Due Date: 18 July 2020

**CMC-A-2020-06-02** - The CMC directs the Secretariat to complete and distribute the minutes of meeting for the June 2019, October 2019 and March 2020 CMC Meetings.

Due Date: 25 July 2020

**CMC-A-2020-06-03** - The CMC directs the Secretariat to add an agenda item for the next midterm CMC Meeting to discuss the possibility of a GitHub repository for all of CCSDS.

Due Date: 1 August 2020

**CMC-A-2020-06-04** - The CMC directs the CESG Chair to provide the SLS and SEA Area Director’s presentations on the unresolved CESG poll to the Secretariat for distribution and inclusion in the meeting materials CWE folder.

Due Date: 2 July 2020

**CMC-A-2020-06-05** - The CMC directs the CESG Chair to provide the two potential solutions to the unresolved CESG poll to the Secretariat for polling.

Due Date: 2 July 2020

**CMC-A-2020-06-06** - The CMC directs the Secretariat to create a CMC poll for the two potential solutions to the unresolved CESG poll.

Due Date: 9 July 2020

**CMC-A-2020-06-07** – The CMC asks that the CESG Chair and Secretariat investigate options for updating the CCSDS Strategic Plan Format created and formerly maintained by Juan Miro. Options to automate the process for generating the report and new formats for the report should be considered and results reported to the CMC.

Due Date: Spring 2021 CMC Meeting

**CMC-A-2020-06-08** - The CMC directs the Secretariat to initiate a poll to determine the best date for holding a meeting at the end of August 2020 to discuss the fall 2020 CCSDS Meeting Series.

Due Date: 1 August 2020

**CMC-A-2020-06-09** - The CMC directs the Secretariat to initiate a poll to determine the best date for holding the June 2020 CMC meeting hosted by JAXA.

Due Date: 15 August 2020

**CMC-A-2020-06-10** - The CMC directs the Secretariat to initiate a poll to determine the best date for holding the next CMC Mid-term Meeting.

Due Date: 2 July 2020

1. **Available for additional topics**

No additional topics were raised.

1. **Adjournment**

S. Townes thanked all for their participation in the CMC’s meetings and expressed his hope that the group would be able to meet in person again later this year. S. Townes adjourned the meeting.