

**CMC Minutes**  
**INPE**  
**National Institute for Space Research**  
**Sao Jose dos Campos, Brazil**  
**26-28 April 2016**

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

James Afarin, CMC Chair, called the meeting to order at 0901h and welcomed everyone to Brazil. He thanked E. Bergamini and INPE for hosting the meeting and all those in attendance for joining together at INPE for the spring 2017 CCSDS Management Council (CMC) meeting. The attendance list for each of three days of this meeting can be found at the following location: ([Attendance Lists](#))

**2. Introduction of Delegates**

Introductions followed. CMC Attendees were:

1. ESA – Juan Miro, Nestor Peccia, Mario Merri (via WebEx)
2. DLR – Osvaldo Peinado, Martin Pilgram
3. JAXA – Tsutomu Shigeta
4. NASA - Wallace Tai, Dr. James Afarin (via WebEx), Erik Barkley (via WebEx), Richard Barton (via WebEx), Peter Shames (via WebEx), Keith Scott (via WebEx)
5. INPE - Eduardo Bergamini, Mauricio Ferreira
6. UKSA – Christopher Perry
7. CNES - Gilles Moury (via WebEx), Jean-Marc Soula
8. CSA - Siamak Tafazoli (via WebEx)
9. ASI – Not Present
10. CNSA – Rusheng Zhang, Yonghui Huang
11. ROSCOSMOS – Not Present
12. Secretariat - David Ross (via WebEx), Thomas Gannett (via WebEx), Brian Oliver (via WebEx)
13. Opening Remarks by INPE Directorship - Carlos Wuensche

**3. Agenda Review and Approval ([26-28 April 2016 CMC Draft Agenda Spring 2016 v5](#))**

The CMC agenda was reviewed and approved, with minor changes to the order of the CESG Area reports. Mr. Mario Merri, the Mission Operations and Information Management Services (MOIMS) Area Director's presentation was moved forward to accommodate conflicts in schedules.

**4. CESG Area Reports, Summary from Cleveland ([d02-CESG-Report-to-CMC-Spring16](#))**

**4.2 MOIMS Area Report (slides 8-24)**

Mr. Mario Merri provided his report and an overview of work for the MOIMS area. M. Merri noted that David Giaretta was nominated the new chair of the Data Archive Ingestion (DAI) Working Group (WG) and that there is strong activity in the DAI WG with active participation by its members. M. Merri also noted the Navigation working group has a new editor, Mr. Dale Force (NASA – GRC). M. Merri provided a discussion of missing prototype 2 resources in the Navigation WG; indicating that there are currently four books (Attitude Data Message, Pointing Request Message, spacecraft (S/C) Maneuver Message and Navigation Hardware Message) missing the required 2<sup>nd</sup> prototypes. In the Spacecraft Monitor and Control (SM&C) WG, the C++ MAL API magenta book, which was stuck in export control at Johnson Space Center (JSC), was released after a full year of delay as a result of intervention by NASA Headquarters. M. Merri added that Mr. Sam Cooper (ESA) was nominated the deputy chair for the SM&C WG. M. Merri also noted strong attendance for the SM&C working group at the spring technical meetings and that the WG made excellent progress on its current portfolio. M. Merri provided a discussion of the Telerobotics WG, which indicated that the WG is not active. David Mittman, the prior chair of this working group needed to step down due to constraints, and the Area Director is currently consulting with different agencies for a new chair. If there is agreement among JPL, ESA and DLR the Area Director will issue a resolution to publish the

current Green Book from the Telerobotics WG and then wait for a proposal for a chair to continue the work; if no chair is selected, then the WG will close.

i) Questions/Comments:

- (a) Mr. Thomas Gannett, prompted by a request for boilerplate security language for MOIMS publications, indicated that any boilerplate security language requested should be directed to the Security WG.
- (b) Juan Miro inquired about overlap between the Spacecraft Maneuver Message (SMM) and Orbit Data Message (ODM) books, and requested more information about whether the books will become one book. The response was that the working group will resolve the overlap internally.
- (c) James Afarin requested a response on how the group should move forward with books missing prototype 2 resources. The area indicated that the WG's are currently looking for partners to resolve these issues and the CESG chair added that some books were approved prior to the requirements for prototype 2 resources to be identified before project approval. As such, these books are functionally grandfathered into the process without resources to complete the projects. Mr. Mario Merri indicated that since resources are scarce, the books will be internally reviewed for the requirements for prototype 2, for example, the navigation data message specification may be able to have some content removed which would avoid prototype 2 requirements.

**4.3 SIS Area (slides 25-36)**

Mr. Keith Scott provided his report and an overview of work for the SIS area. K. Scott indicated the CCSDS File Delivery Protocol (CFDP) Working Group will determine the best path forward for interoperability testing by the fall 2016 meetings. The Motion Imagery WG has taken on the task of looking at the requirements and experience with streaming services over DTN based on interest in streaming video and audio over Bundled Protocol. The Voice and Audio Communications WG red book is slightly delayed but it is scheduled for review and making progress. Progress is also being made on the Voice green book, currently being edited. The DTN WG has tentatively identified resources for a second prototype of the security mechanisms. K. Scott noted that partial implementations of this prototype are already active. The group indicated it will not be able to get its books through Agency review by Rome.

i) Questions/Comments

The CMC requested the Document Summary Slide provided by the SIS area be completed in the future for all areas.

**4.4 SLS Area (slides 36-57)**

Mr. Gilles Moury provided the report and overview of work for the SLS area.

i) Radio Frequency and Modulation (RFM) Working Group

- (a) An overview of the RFM WG provided news that the green book on GMSK + PN Ranging is ready for publication at this time. Further there is a proposal for a new ranging scheme based on telemetry based ranging techniques suitable for simultaneous high rate telemetry and ranging and time correlation. Further, a discussion of the publication 2.4.18 on 8 GHz modulation for EESS will be delayed until SFCG deliberations on the topic have concluded.

ii) Coding and Synchronization (C&S) Working Group

- (a) An overview of the C&S WG indicated that LDPC was added to the existing Coding Blue Book, allowing spacecraft to use more powerful codes than the existing error-correcting codes. A yellow book documenting interoperability testing between ESA and NASA for LDPC was drafted and a joint Variable Coding and Modulation (VCM) magenta book currently has a resolution to begin Agency Review. The proximity-1 coding book has a proposal by NASA to update the book to make the prox-1 coding scheme compatible with unified space data link (USLP). The WG resolved to request from the CMC approval to add the new project to the CWE.

iii) Space Link Protocols (SLP) Working Group

- (a) An overview of the SLP WG was provided which discussed plans to review the USLP white book and to come to consensus on its contents. The white book currently has preliminary test plans with supporting agencies identified (NASA and DLR). A review of the USLP green book and the Communications Operation Procedure (COP)-1 reconfirmation was also provided. The WG indicated they have resolved to reconfirm COP-1, CCSDS 232.1-B-2 without modifications.

iv) Multispectral & Hyperspectral Data Compression (MHDC) Working Group

- (a) An overview of the MHDC WG provided information regarding WG resolutions requesting promotion to pink book towards Issue 2 of the Image Data Compression book and a resolution requesting related Draft CWE projects be converted to active projects for new project 122.1-B, expected to begin in May 2016.

v) Space Data Link Security (SDLS) Working Group:

- (a) The SDLS WG discussed the success of their Blue Book, SDLS core protocol, which already has several missions selected to use SDLS for TC/TM/AOS security. Space Data Link Security Green Book plans to transmit the Green Book to the CCSDS editor for publication resolution prior to September 2016. The WG will attempt to issue a red book for SDLS extended procedures before the fall 2016 meetings, prototypes are being developed by ESA, NASA and CNES. Interoperability testing is being completed on the same cloud service provider, which provides an encouraging use case for future interoperability testing.

vi) Optical Communications Working Group

- (a) The optical communications working group provided information that indicated potential problems with the path forward for the High Data Rate recommendation. Other books in this WG continue to make good progress, and the working group still plans the following blue books for completion:
  - i. Deep Space (High Photon Efficiency)
  - ii. Near Earth Scenario for Low Complexity (LC) systems (agreement amongst parties to postpone discussions at the Cleveland meetings)
  - iii. Green Book on Atmospheric Characterization for Optical Systems (Ready for SLS AD review)

vii) Questions/Comments

- (a) A discussion of the optical high data rate blue book was held amongst the CMC members regarding the Working Groups progress on the book. The consensus of the group was that if there are major issues within the working group those issues should be addressed with the CESG and the CMC will also be available to respond and provide guidance if it is requested. G. Moury added that he believed that the working group will be making progress again at the next face to face meetings.
- (b) The CMC is concerned with the progress being made by the SLS optical communications WG on the High Data Rate project and requests the CESG to encourage the WG to discuss a way forward at the fall meetings. Any advance report on the project should be provided via the CESG.

#### 4.4 SOIS Area (slides 59-70)

The Spacecraft Onboard Interface Services (SOIS) area report was provided by Richard Barton. R. Barton noted the Onboard Wireless WG expects to complete prototype testing for WWG RFID encoding blue book and LAN blue book, planned for final draft submissions to the CESG in spring 2017. The Application Support Services WG (APP) indicated the EDS and DoT red books are to be delivered to the CESG/CMC for 2nd agency review. The working group also will continue planning for the 5 year review of all SOIS APP books. R. Barton discussed the Subnetworking Working Group activities, indicating the WG was recently approved and as such, a review of the current charter goals, deliverables, schedule and proposed work plan is underway within the Area/WG.

i) Questions/Comments

- (a) The CMC discussed the need to determine a new SOIS Area Director and Deputy Area Director.

**AI – CMC-A-2016-05-01 – by Mid-Term Telecon (28 June 2016): CMC Member agencies to provide and discuss candidates for the new Area Director and Deputy Area Director for the SOIS area at the CMC Mid-Term Telecon.**

#### **4.5 SE Area (slides 71-90)**

Mr. Peter Shames, Systems Engineering Area Director, provided an overview of the Systems Engineering Area activities. An overview of planned resolutions by the SE Area Director was provided followed by a discussion of the Working Group technical activities. P. Shames discussed the value of the work produced by the SOIS area regarding electronic datasheets to document interfaces. The Systems Engineering area identified this as an area of high potential for producing documentation and in verification and validation of interfaces and in integration and testing. A discussion of the SANA Registry Management Policy noted that the policy would extend the existing SCID registry with the possibility to add allocated frequencies (by frequency bin, not operational frequencies). P. Shames indicated the SE area is also developing an additional 7 page cookbook document on how to use the SANA Registries and the cookbook will be provided to working group chairs for production of CCSDS publications.

##### i) Questions/Discussion

- (a) A discussion regarding coordination of spacecraft frequency identification amongst CMC members occurred. The question was in reference to coordination between networks and the responsible party for completing that coordination. The response was that whichever network is primarily responsible for communications with the spacecraft would handle coordination, for example, a DSN launch requiring NEN coverage would have its coordination efforts led by the DSN.
- (b) Per request of Jean-Marc Soula, the CMC Poll for SANA related documents was extended one week.
- (c) CESG chair Nestor Peccia, responded to a question regarding simulator SCID returns. N. Peccia indicated that agency representatives are working within their respective agencies to return SCID's used only for simulators.

#### **4.6 CSS Area (slides 91-106)**

Mr. Erik Barkley provided an overview of the Cross Support Services area. The Cross Support Services area indicated a number of publications which will be utilizing the updated SANA registries and other publications (SLE blue books) currently with the CCSDS editor awaiting revision for publication.

##### i) Questions/Discussion

- (1) None.

#### **4.1/4.8 CESG Chair Introduction and Meeting Statistics (slides 1-6 & 107-115)**

Nestor Peccia provided the CESG report and noted the status of various projects. N. Peccia also made note of the importance of CMC Polls, which, upon approval by the agencies infers the commitment of resources for Prototype 1, Prototype 2 and editorship resources by the agencies. An overview of meeting statistics showed strong participation at the Cleveland meetings, but it was noted that resources may be utilized more effectively through room schedule optimization.

#### **4.9 Items Brought to the Attention of the CMC (slides 116-120)**

N. Peccia provided a report from the Cleveland CESG meetings. The report provided insight on IT Support, indicating that all secretariat communications (IT, Logistics, and Editorial support) will now be provided through [secretariat@mailman.ccsds.org](mailto:secretariat@mailman.ccsds.org). An overview of the migration from BTAS to ASTS was also provided by N. Peccia. Successful cloud testing was highlighted as a valuable lesson learned for interoperability testing which required minimal use of resources to complete required interoperability tests.

## 5. Agency Report on Priorities

### 5.1 ASI

No report provided.

### 5.2 CNES ([CNES priorities April 2016](#))

J-M. Soula provided his report, and a discussion regarding the communication of priorities with the CMC yielded agreement that two-way communications occur which ensure awareness of Agency priorities within the Working Groups.

### 5.3 CNSA ([CNSA Priorities – Spring 2016](#))

R. Zhang provided a report on CNSA priorities.

### 5.4 CSA

S. Tafazoli provided an oral report and discussion of the CSA priorities. CSA indicated the importance of Telerobotics to the agency.

### 5.5 DLR ([CMC DLR Report-April 2016-priorities](#))

O. Peinado provided the report of DLR priorities. O. Peinado indicated the Telerobotics work was a high priority but the agency was unable to provide the resources to chair the working group. DLR has completed the current Telerobotics green book based on the current comments.

### 5.6 ESA ([ESA Priorities CMC Spring 2016](#))

J. Miro provided the ESA report on priorities and the drivers of priorities within the agency. The ESA report further provided an overview of traceability of the CCSDS strategic plan to the Areas then to the Working Groups, showing traceability of strategic technical plan to area goals and then to work conducted by the working groups.

### 5.7 Roscosmos

No report provided.

### 5.8 INPE ([INPE-Rep.to.CCSDS-CMC.Meet.S.J.Campos.BR.V.25.04.2016.1](#) slides 8-12)

E. Bergamini provided an oral report of priorities and discussed the INPE matrix of infusion of Standards by the agency.

### 5.9 JAXA ([JAXA input to INPE CMC April 2016](#))

T. Shigeta reviewed the JAXA priorities and noted a change to move navigation Attitude Data Message (ADM) from high priority to medium.

### 5.10 NASA ([NASA Priority](#))

J. Afarin provided the NASA report on priorities.

### 5.11 UKSA ([CMC UKSA priorities 2016 04](#))

C. Perry provided the UKSA report on priorities, noting the UKSA currently has limited resources for standards work, but that efforts are ongoing to consolidate agency activities in support of standardization.

## 6. Resources Topics

### 6.1 CESG report on resources status (projects with issues) ([d02-CESG-Report-to-CMC-Spring16 Extra Agenda Items 27042016](#))

N. Peccia provided an updated presentation on projects with missing resources, especially those with immediate needs for resources. The CMC discussed the desire of the group to review upcoming projects missing resources and this topic was added to the beginning of the day for 27 April 2016.

## 7. Secretariat Resources

The General Secretary led a brief discussion and presentation of the possibility of disaggregating Secretariat resources to limit the costs of maintaining the CCSDS Secretariat.

- i) J. Miro recommended another possibility for review by the CMC at a later date is an option for a fee to participate in the CCSDS.

**AI – The CMC instructed the General Secretary to review the applicable NASA policies for transferring the intellectual property of the Space Assigned Numbers Authority (SANA) registries task.**

**AI – The CMC instructed member agencies to review their ability to assume the responsibility of the SANA registries task.**

## 8. IOAG Presentation and ICPA Update ([d02-CESG-Report-to-CMC-Spring16 Extra Agenda Items 27042016 slides 9-12](#))

N. Peccia provided an IOAG and ICPA update. As a part of the discussion of the ICPA, a question regarding the ability to enter a third prototype was brought up as a potential area of future development for the Secretariat support team.

N. Peccia briefly discussed the coordination efforts with the IOAG and CCSDS regarding future Lunar/Mars missions. N. Peccia indicated that additional results from the coordination will be discussed with the IOAG during their September 2016 meeting, at which time, this information can then be relayed to the CCSDS at the fall 2016 meetings in Rome, Italy.

- i) J.M. Soula commented that there seems to be a mismatch of priorities between the CCSDS and IOAG.
- ii) J. Miro commented a clear process should be developed on handling of IOAG priorities and understanding if the requirements from IOAG are a requirement on the CCSDS.
- iii) N. Peccia commented that the IOAG has been asked for priority input on the IOAG projects that impact CCSDS work and priorities.
- iv) Once the IOAG approves catalogue 1 in relation to CCSDS the remaining ghost projects will be converted to draft projects. A similar action will also be completed when catalogue 2 will be updated.

Nestor Peccia explained that the IOAG is about to approve a revised version of their Cross Support Service Catalog # 1 and following this step new standards may show up in the ICPA that were not previously identified. N. Peccia also reported that such standards appear as “ghost standards” in the CCSDS Work Environment (CWE) as there is no corresponding development activity in the CCSDS working groups and that it is desirable to disposition the ghost projects. JM Soula responded that the principle of the ICPA is to allow coordination and exchanges on the standards to be written (TBW) as identified in the IOAG Cross Support Service Catalogs which in fact appear as the ghost standards in the CWE; in addition, he reminded the CMC that the ICPA is also used to keep an eye on the compatibility between the IOAG need dates and the CCSDS target production dates. JM Soula clarified that the IOAG will need time to assign priorities and need dates to the additional standards added in the revised Cross Support Service Catalog, as this will be initiated as a survey of the Member Agencies who will report on their potential needs and infusion plans. So far, the target date for an update of the ICPA by the IOAG is the end of the summer, assuming the Cross Support Service Catalog # 1 is approved in June. Nestor Peccia inquired when the same process would be completed for the Cross Support Service Catalog # 2 and JM Soula replied that this process had already been initiated by GP Calzolari on the IOAG side with the objective to conclude by the end of 2016. N. Peccia also asked for some potential future missions requiring cross support for the new proposed Catalogue 1 and 2 services. This will also help CCSDS to identify those Agencies keen to deploy resources for the forthcoming CCSDS standards

## 11. Resources Topics Continued

### 11.1 Schedule of projects as impacting resources (future work, etc.) ([d02-CESG-Report-to-CMC-Spring16 Extra Agenda Items 27042016 slide 7](#))

N. Peccia provided an overview of projects missing prototypes per CMC action item 11-2015-08.

- i) The CMC held a discussion of the missing prototypes within the navigation working group and indicated that if the WG cannot provide a prototype for its project it should work internally to determine the correct priority of its project(s).
- ii) A discussion of the Telerobotics Working Group by N. Peccia yielded an understanding that the Telerobotics Green Book would be published as is and the Area Director will attempt to determine if any other agencies would like to provide the leadership to continue this Working Group in light of its missing WG Chair. If no WG Chair is located by the fall meetings the working group will be disbanded.

## **11.2 Project Review/Approval – Schedule of projects impacting resources in 2016** ([d02-CESG-Report-to-CMC-Spring16 Extra Agenda Items 27042016 slide 13](#))

N. Peccia provided a review of the schedule of projects impacting resources in 2016.

- i) N. Peccia reviewed the schedule of projects as impacting resources (future work, etc.). A question regarding the Systems Engineering Area Magenta Book to NASA – should this book remain a high priority? Response from W. Tai was that this will remain a high priority but resources discussions must be held internally to the agency.

**AI – The CMC instructed the CESG to review the Area Director summaries and to provide a list of new work items that will require new resources in the next six months for the next CMC meeting.**

## **12. Technical Meetings Duration** ([d02-CESG-Report-to-CMC-Spring16](#)) (slides 106-115)

N. Peccia provided an overview of the statistics from the spring 2016 meetings showing the peak days of meeting room usage on Tuesday, Wednesday and Thursday and lower usage on Monday and Friday. N. Peccia noted the expense that is taken on by most hosts to book these meeting rooms and pointed out the need to efficiently utilize resources to constrain costs.

## **13 IOAG and CMC action item to coordinate Lunar and Mars Missions** ([CMC-to-IOAG AI on Lunar-Mars working group 4-27-2016](#))

W. Tai provided a presentation of the Lunar/Mars mission action item from the IOAG and CCSDS.

J. Miro commented on the fidelity of planning for cislunar missions in the 2020's. W. Tai responded that mission planning is still at a high level and that dates are not definitive at this time.

The CMC discussed the specific coordination areas which included:

- i) Cross support and interoperability between missions.
- ii) Infusion of new standards, CCSDS or industry.
- iii) Identification of missing standards required by the missions.
- iv) Identification of capability gaps.

W. Tai identified the next steps which included plans to review the following:

- i) Scope
- ii) Problem space/trade space
- iii) Recommendations on activities moving forward

A discussion amongst CMC members occurred regarding coordination efforts for identifying standards, issues related to IOAG participation and methods for CCSDS to provide their input to the ISECG.

## **14 Secretariat Report**

### **14.1 Action Item Status (Only open items)** ([CMC Action Item List](#))

D. Ross provided a status of the current open action items and a discussion was held amongst CMC members regarding action items to close/those to remain open.

- i) Action Items CMC-A-2015-11-15, CMC-A-2015-11-09, CMC-A-2015-11-08, CMC-A-2015-11-06 were all closed.

#### **14.2 Document Status Report ([CCSDS Document Status](#))**

T. Gannett discussed the current status of projects with the CCSDS editor and led a discussion of the current poll statuses.

#### **14.3 Resolution Report ([Summary of CMC Polls since May 2015 Meeting in Nagano, Japan](#))**

See notes from 14.2.

#### **14.4 IT Project Status ([CCSDS Secretariat IT Update 04272016](#))**

B. Oliver provided a presentation and discussion of the current IT project status. Specifically B. Oliver addressed the transition of infrastructure from BTAS to ASTS as the new contractor for the CCSDS Secretariat.

**AI – The CMC instructed the Secretariat to change the size of the font for the content of the CCSDS Operating Procedures page to improve the legibility of the page upon printing.**

#### **15 SANA Registries Report ([20160408\\_SANA\\_Report](#))**

Marc Blanchet provided a presentation on the current activities associated with the SANA registries and updates.

#### **18 Meeting Planning**

##### **18.1 Fall 2016 Technical Plenary & CMC (ASI/Italy - Rome)**

- i) The CMC discussed the fall 2016 meeting planning and indicated that the dates are confirmed from 17 to 21 October 2016. The Secretariat reported that meeting planning with ASI is under way to ensure logistics are appropriately supported for the October meeting. I believe we have confirmed the dates.
- ii) The CESG meeting will be held on 24 October 2016 in Rome.
- iii) The Joint CESG/CMC meeting will be held from 25 to 27 October 2016 in Rome.
- iv) Comments regarding transportation from Rome to ASI indicated the following agency's interest in ride share opportunities:
  - i. CSA
  - ii. NASA

##### **18.2 Spring of 2017 – Southwest Research Institute (SwRI/USA – San Antonio) ([CCSDS Spring 2017](#))**

- i) M. Epperly provided a presentation of logistics and meeting information for the spring 2017 Technical Plenary meeting to be held at the Southwest Research Institute, San Antonio, TX, USA.

#### **Resolution 2016-04-01:**

***CMC agrees that the spring 2017 Technical Meetings will be May 8th through May 12th for the technical meetings and 15th of May for the CESG Meeting.***

##### **18.3 Spring 2017 CMC Meeting (Roscosmos/Russia)**

- i) Not discussed.
- ii) On 24 May 2016, the CMC received an official invitation from Roscosmos to host the Spring 2017 CMC meeting in Moscow, Russia.

##### **18.3 Fall 2017 Tech Plenary & CMC (ESA/ Noordwijk)**

The CMC briefly discussed the fall 2017 Technical Plenary meetings in Noordwijk.

**AI – The CMC Instructed the CESG chair to report to the CMC at the next CMC meeting the best dates for the fall 2017 Technical Plenary Meetings, to be held at ESA/Noordwijk).**

##### **18.5 Schedule for next CMC mid-term telecon**

The CMC discussed and agreed that the next CMC mid-term telecon will be held on the 28th June 2016 0800 EST.



## 19 Agency Report on Other Activities

The CMC agreed to report agency news only during the spring meetings.

*The CMC member agencies submit their collective appreciation and thanks to INPE for hosting the spring 2017 CMC meeting in Sao Jose dos Campos, Brazil and to NASA-GRC for hosting the spring 2016 CCSDS Technical Plenary meetings in Cleveland, OH, US.*

### 19.1 ASI

No report provided.

### 19.2 CNES ([CNES report to the CMC Sao Jose April 2016](#))

J.M. Soula provided the CNES report on agency activities.

### 19.3 CNSA ([CNSA report to CMC April 2016](#))

R. Zhang provided a report of agency activities by CNSA.

### 19.4 CSA ([CMC CSA Report Spring 2016](#))

S. Tafazoli presented the CSA report of agency activities. S. Tafazoli discussed the possibility of supporting additional communications and participation with ISRO based upon current ongoing work between CSA and ISRO.

### 19.5 DLR ([CMC DLR Report-April 2016](#))

O. Peinado provided the report of agency activities by DLR.

### 19.6 ESA ([ESA Agency Report CMC Spring 2016](#))

J. Miro provided the ESA report of agency activities.

### 19.7 Roscosmos

No report provided.

### 19.8 INPE ([INPE-Rep.to.CCSDS-CMC.Meet.S.J.Campos.BR.V.25.04.2016.1](#))

E. Bergamini provided the INPE report of agency activities.

### 19.9 JAXA ([JAXA input to INPE CMC April 2016](#))

T. Shigeta provided the JAXA report of agency activities.

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### 19.10 NASA ([NASA News – CMC Agency Report April 2016](#))

J. Afarin provided the NASA report of Agency activities.

### 19.11 UK Space Agency ([CMC UKSA Agency Report Spring 2016](#))

C. Perry provided the UKSA report of Agency activities

C. Perry answered a question regarding satellite size in lunar orbit, and the response indicated the satellite will be small, approximately 100-150 kg providing communications to earth.

## 20. Overflow Topics

### 20.1 **Review of the Projects with the largest changes in months** ([Project Change Report Sorted by Largest Change](#)) ([Project Change Report Sorted by WG](#))

The CMC held a discussion of the report of projects with largest changes (in duration to completion/variance from completion dates). The CMC discussed opportunities to continue to develop/complete projects with long delays that were approved prior to procedural changes that required the identification of resources before the approval of a project to be undertaken by a Working Group.

**AI – The CMC instructed the CESG Chair to review projects with significant delays to confirm the ability of the working groups to complete the identified projects and/or to work with the working groups to determine if the identified projects should be closed or remain open.**

AI – The CMC instructed the Secretariat to provide to the CMC the estimated completion date report two weeks prior to the next CMC meeting and to add an agenda item to review the report for the next CMC meeting.

**Resolution 2016-04-02:**

*The CMC agrees with the initial phase of the CCSDS Application and Support Layer Reference Architecture Project including resources and then for the second phase, the CMC requests that the area director breaks down the second phase activities that must be completed, including the identification of resources, and with this information, the CMC must vote on a second poll for the project which will be considered the agency's vote of their allocation of resources and that poll will be released to initiate a second phase. CMC-P-2015-12-002 this poll was giving the go ahead for the initial phase. CMC-P-2016-04-001 is considered invalid and must be reopened, because it contained phase 2 resources that cannot be confirmed at the current stage. To be completed by Peter Shames by 15 May 2016.*

**21. CMC Review of Resolutions and Action Items ([Brazil Spring16 Actions and Resolutions](#))**

The CMC reviewed the resolutions and action items and approved them with revisions.

**22. Adjourn**

There being no other business, the meeting was adjourned at 15:45h on 28 April 2016.