INTERAGENCY OPERATIONS ADVISORY GROUP

IOAG-18c Meeting

Document Number: IOAG18c.A.MN.2014

Prepared by: Barbara Adde, IOAG Secretariat

Date: 9 December 2014

IOAG-18c Meeting Minutes
Teleconference
9 December 2014
12:00 – 15:00 UTC

Attendance:
Chair: Michael Schmidt
Secretariat: Barbara Adde**,** Stephanie Wan

Members:
ASI: Fabio D'Amico
CNES: Jean-Marc Soula
CSA: Ken Lord
DLR: Rolf Kozlowski, Martin Pilgram
ESA: Gian-Paolo Calzolari, Nestor Peccia, Eric Soerensen, Klaus-Juergen Schulz
JAXA: Tsutomu Shigeta
NASA: Phil Liebrecht, Les Deutsch, Mike Kearney, Wallace Tai, Madeline Butler, James Afarin
Don Cornwell, Kim Cashin

Observers:
UKSA: Peter Allan

Charts for all presentations are available online (www.ioag.org).

1) **Opening/ Introduction of IOAG participants:**
The Chairman opened the teleconference and the members introduced themselves.

2) **Optical Link Update Report:**
   NASA Optical Communications (D. Cornwell)
Dr. Cornwell provided a presentation on NASA's optical communications program, including
the Lunar Laser Communication Demonstration (LLCD) in September – November 2013. It was
a successful international collaboration, utilizing ground terminals in Tenerife, Spain; Table
Mountain, California; and White Sands, New Mexico, and included a Delay Tolerant Network
(DTN) demonstration with high definition video to the Moon and back. Leveraging LLCD's
success, NASA's next demonstration is for near Earth applications. The Laser Communication
Relay Demonstration (LCRD) will be a secondary payload on a commercial spacecraft. This
optical module is the same design as LLCD, with a high technology readiness level (TRL). It

1

will include high speed switching electronics to interconnect two optical communication ground stations. The mission is planned for the 2018-2019 timeframe, pending budget approval. One year after that, NASA will demonstrate an optical downlink from the International Space Station (ISS) to a relay to Earth. It will be placed on the ISS Japanese Experiment Module (JEM) platform. NASA is also working on a deep space optical system (DSOC), with a goal of 250 MBPS from Mars to a large aperture telescope on the ground. DSOC is planned to fly on a NASA DISCOVR mission. Mr. Cornwell closed with NASA's optical communication roadmap, with a goal of commercializing a network of ground terminals with 12-meter integrated telescopes.

Dr. Allan asked if the ground telescope is under construction. Dr. Cornwell said that South Africa has a similar aperture telescope; they will need all of them mounted and pointed together.

The Chairman invited Mr. Soula to present the CNES optical communication program.

CNES Optical Communications (J-M. Soula)
Mr. Soula presented the CNES mission model based on lower orbit satellites using X-band and possibly Ka-band in the medium term, with a goal of achieving an optical link by 2025. CNES is targeting an in-flight demonstration in 2020. The CNES optical telemetry demonstrator is called DOMINO, with a goal in 2015 of collecting more data on propagation channels. CNES does not have a concrete target mission for optical communication yet; it is for the longer term.

Mr. Kozlowski noted that DLR is working on optical communication as well. The Chairman requested that this agenda item remain on the agenda for the upcoming IOAG-19 so that CNSA and other agencies can present their activities.

3) Status of Coding/Modulation Schemes (G-P. Calzolari, L. Deutsch)
The working group presented their next steps on the coding/modulation schemes:

1. Create matrix that combines information from the various agencies;
2. Discuss matrix at Working Group meeting (15/1/2015) at ESOC to start building consensus for potential recommendations

They requested the assistance of the Secretariat in soliciting input from agencies missing from today's teleconference (AI 18b-05). Dr. Allan and Mr. D'Amico both noted that their respective agencies are working on gathering input. ASI input should be available in two weeks. Mr. Shigeta said that JAXA's input should be available by the end of the month. Dr. Deutsch said that an update to NASA's input is in final review and will be available soon. He requested input from all agencies by the end of the calendar year in order to give the working group time to assemble the material for discussion at their 15 January meeting.

4) Secretariat's Report (S. Wan)

The Secretariat noted that the final review of the IOAG-18b minutes had not been completed. A final version will be sent for email approval and then posted on the IOAG website. After reviewing the open actions, the following changes were made:

AI 13-11: Cancel. Chairman to discuss with Roscosmos at IOAG-19
AI 17-05: Close
AI 18-09/18b-01: Closed with today's meeting
AI 18-12: Cancel and send another reminder to Roscosmos
AI 18a-06: Closed; presented at last meeting and at today's meeting.
AI 18a-08: Closed with today's meeting
AI 18b-01: Closed
AI 18b-03: Closed
AI 18b-04: Closed
AI 18b-05: Closing date moved to 9 January 2015

5) CCSDS Update (N. Peccia)

Mr. Peccia presented the status of CCSDS activities for 2014, including 139 active publications, downloadable for free from their website (www.ccsds.org). CCSDS has published approximately 285 documents since its founding in 1982. This year they averaged approximately two books per month for a very active year. The Fall 2014 conference had the second highest attendance of all its meetings, with about 200 participants. The optical communication session on Thursday had increased attendance. The Chairman asked if there was anything that the IOAG needed to discuss, Mr. Peccia said that anything than came from the upcoming CCSDS Management Meeting (CMC) would be brought to IOAG-19 for discussion. The Optical Working Group would follow the normal process and will now be under NASA/ESA leadership. Regarding the issue stated of a lack of resources during 2015-2016, the Chairman noted that this was an ongoing issue for all agencies. Mr. Soula stated that the CSTS offline radio metric service working group is not approved or chartered, but is in the ICPA with a 31/12/15 need date. Mr. Peccia said that he would take an action to ask the CMC to identify an agency to lead this activity since it is a high priority. The agencies who classified it as a high priority should provide the necessary resources. Mr. Calzolari suggested that the point is further discussed with the next agenda item on the ICPA as some proposals will be made there. Mr. Peccia said that the CCSDS had resolved their second issue regarding an overlap between the CSS/ MOIM and SM&C working groups.

6) ICPA and Catalogues (G-P. Calzolari, J-M. Soula)

Mr. Calzolari said that several agencies had provided input (ASI, CSA, CNES, DLR, ESA, NASA) on AI 18a-05, which is closed. As a follow up to this action, the proposals made on the revision of the ICPA need an endorsement by the IOAG and the following actions were assigned:

AI 18c-01: Return Unframed Telemetry: Delegates to confirm their agreement on the proposal to remove RUFT from IOAG Service Catalogue and therefore also from ICPA. [Assigned to: IOAG agencies; Due date: 31 March 2015].

AI 18c-02: Validated Radiometric Service: Delegates to confirm their agreement on the proposal to adapt IOAG need dates to:
- CSTS Transfer File Service [CFXS]: Priority 1 & 12/31/2016
- CSTS Offline Radiometric Service [CORS]: Priority 1 & 12/31/2016
[Assigned to: IOAG agencies; Due date: 31 March 2015].

He noted that AI 18a-08 is closed and a statement on optical links was passed to CCSDS.

Delegates were also asked to confirm the state of work and to confirm/appoint members to the Catalogues working group. They noted that these should not be just CCSDS members, in order to have a clear IOAG focus.

AI 18c-03: IOAG delegates are asked to approve start of work for updating Service Catalog 1 (and maybe Service Catalog #2) for which there are some pending corrections and to confirm/appoint Catalogs WG Members. [Assigned to: IOAG agencies; Due date: 25 February 2015].

7) Status of Emergency Cross-Support Working Group (E. Soerensen, M. Butler)
The WG requested IOAG guidance on next steps because the progress is limited until the issues in the preliminary report that he introduced are resolved by the SECSWG. The Chairman asked for feedback on the preliminary report and for suggestions on how to resume the discussion without causing a delay by waiting until IOAG-19. It was decided that the working group will provide specific questions for the IOAG to address at the IOAG-18d teleconference. Mr. Soerensen agreed, stating they expect to finish their report in March, a few months before IOAG-19. Mr. Wallace Tai was named as the acting co-chair after Ms. Butler's 2 January 2015 retirement.

8) Status of MOSSG (M. Kearney)
Mr. Kearney noted that the MOSSG continues to have the same resource issues as previously, stating that the resources are sufficient depending on how quickly a final report is expected. He said that they can provide input to CCSDS at a later stage. The MOSSG discussion is on the systems that need to be brought to interoperability. MOSSG will continue to work this at a slow pace unless/until additional resources are provided. The Chairman agreed, stating that all the IOAG heads of delegation can do is continue to keep their management informed. [A few weeks after this meeting, Mr. Kearney announced his retirement from NASA on 2 January 2015. Mr. Dan Smith of NASA/Goddard Space Flight Center will serve as NASA's co-chair for the MOSSG.]

9) Interface to ISECG (P. Liebrecht, M. Schmidt)
Mr. Liebrecht said that he and the Chairman have held discussions with ISECG/K. Laurini regarding communication standards and conops for Rendezvous and Docking (R&D) of space vehicles in sislunar space. Ms. Laurini wants to run this activity out of ISECG with R&D experts with ISS experience. It was discussed whether this new group would be a hybrid between ISECG

and IOAG, or if a working group will need to be formed within the IOAG. The current plan is that ISECG will set up a working group and it will report to IOAG periodically so that we are aware of ISECG planning and they are aware of IOAG standards and plans for navigation and data messaging, which may enable R&D. The Chairman noted that he will not pursue this group within the IOAG anymore. IOAG will be consulted if any group is established and begins working.

10) Next IOAG Meeting: IOAG-19 in South Korea (S. Wan)
In Dr. Ahn's absence, Ms. Wan presented KARI's briefing regarding logistics for IOAG-19. The Chairman requested another discussion with Dr. Ahn before the 11-13 May meeting. SpaceOps will hold its meeting the afternoon of 13 May through 15 May. He asked that everyone arrive on Sunday so that the IOAG meeting can start promptly on the morning of 11 May. All agencies acknowledged that they will be attending. The Chairman will confirm Roscosmos and SANSA attendance.

Due to time constraints, the presentation from the ICG liaison was postponed to the next teleconference, scheduled for 25 February 2015. Other topics will include SECSWG final report, Communication Assets final report, and preparation for IOAG-19.

The Chairman and members congratulated Ms. Butler on her pending retirement and thanked her for her years of contribution. The Chairman thanked everyone for their participation and closed the meeting.

IOAG-18c ACTIONS

AI 18c-01: Return Unframed Telemetry: Delegates to confirm their agreement on the proposal to remove RUFT from IOAG Service Catalogue and therefore also from ICPA. [Assigned to: IOAG agencies; Due date: 31 March 2015].

AI 18c-02: Validated Radiometric Service: Delegates to confirm their agreement on the proposal to adapt IOAG need dates to:
- CSTS Transfer File Service [CFXS]: Priority 1 & 12/31/2016
- CSTS Offline Radiometric Service [CORS]: Priority 1 & 12/31/2016

[Assigned to: IOAG agencies; Due date: 31 March 2015].

AI 18c-03: IOAG delegates are asked to approve start of work for updating Service Catalog 1 (and maybe Service Catalog #2) for which there are some pending corrections and to confirm/appoint Catalogs WG Members. [Assigned to: IOAG agencies; Due date: 25 February 2015].