INTERAGENCY OPERATIONS ADVISORY GROUP

IOAG-18a Meeting

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Prepared by: Stephanie Wan, IOAG Secretariat

Date: 12 May 2014

IOAG-18a Meeting Minutes
Mini-Meeting/Teleconference
6 May 2014
12:00 – 15:00 UTC

Attendance:
Chair: Michael Schmidt
Secretariat: Stephanie Wan

Members:
ASI: Giovanni Valentini, Claudio Canu
CNES: Jean-Marc Soula
DLR: Martin Pilgram
ESA: Nestor Peccia, Gian-Paolo Calzolari, Richard Abello (telecon), Marco Lanucara
NASA: Phil Liebrecht, Les Deutsch, Mike Kearney, Wallace Tai, Madeline Butler, James Afarin, Dave Israel, Barbara Adde (telecon), Greg Mann (telecon), JJ Miller (telecon)
JAXA: Takanori Iwata, Tsutomu Shigeta (telecon)

Observers:
UKSA: Peter Allan
CNSA: He Shanbao (Telecon and webex)
KARI: Eunsup Sim (VP of KARI), Durk-Jong Park

1) **Opening/ Introduction of IOAG participants:**
The Chair introduced himself and noted that there were new IOAG participants at the meeting and requested all to introduce themselves.

He provided an update on the member status. RFSA was unable to attend the meeting but would continue to follow IOAG activities. He then commented that SANSA was interested in joining IOAG and he had sent them an invitation to join the IOAG meeting; the IOAG members agreed that having SANSA as a potential observer would be valued and accepted SANSA as an observer.

The Chair then provided an overview of the IOAG-18a agenda. He highlighted that the topics would include discussions on CCSDS from Mr. Peccia and other topics, including small reports on the working groups.

2) **Secretariat's Report:**

The Secretariat presented an overview of the IOAG documentation and action item status. She highlighted that the IOAG-18 minutes have been reviewed by most delegates and the latest version was on the IOAG website. The IOAG-18 minutes were then approved. She then provided a brief list of actions and noted all will be addressed and hopefully closed out by the end of the IOAG-18a meeting.

3) CCSDS Updated Report:
Mr. Peccia provided an update of the CCSDS activities and a number of questions for IOAG as per presentation (CESG Report to CMC June 2008)

The SSI Green Book has been distributed to the IOAG, and CCSDS requested comments. It will continue with the CCSDS approval process. The SISG chairs have reviewed the book and it has been re-distributed for further comments by end of this month.

AI 18a-01: All IOAG delegates to send comments on the SSI Green Book by the end of the month (31 May 2014).CCSDS presentation also included a number of questions for IOAG on e.g. Forward File Service and Return File Service. The issue here is the closure of the protocol at the Ground Station or the MOC because this can have a significant impact on the required bandwidth.

AI 18a-02: IOAG delegates to provide proposed responses to CCSDS questions to allow IOAG Chair to provide coordinated reply to CCSDS. Due Date: 20 June 2014

Mr. Peccia underlined the need to consider scenarios regarding the forward and return file service when CFDP is used and the closure of the protocol is not at the Ground Station but rather at the MOC.

The presentation "IOAG Service Catalog #1 Clarifications (as per CCSDS Request)" provided some initial replies to CCSDS questions and included two questions to IOAG delegates. Another question to IOAG delegates - risen from CCSDS input - was addressed in the presentation "IOAG analysis of the ICPA (reference version of April 30, 2014)". Therefore 3 actions are generated accordingly to allow IOAG to provide CCSDS with a coordinated reply.

AI 18a-03: IOAG Delegates to
a) confirm or not whether the Forward File Service [CFFS] shall be able to request three types of processing to Agency B depending on file contents, and
b) if they would have relative priority.
The 3 types of processing are:

1. Being the file a collection of Space Packets, Agency B would extract those SP's and transmit them over TC or AOS frames;

2. Being the file a collection of Encapsulation Packets, Agency B would extract those EP's and transmit them over TC or AOS frames;

3. Being the file to be processed with CFDP, Agency B would generate the CFDP PDUS to be embedded either in SP's or EP's and transmit them over TC or AOS frames.

Due Date: 20 June 2014

AI 18a-04: IOAG Delegates to
a) confirm or not whether the shall be able to request three types of processing to Agency B depending on file contents, and
b) if they would have relative priority.
The 3 types of processing are:

1. Build a file being a collection of Space Packets extracted from TM or AOS frames;

2. Build a file being a collection of Encapsulation Packets extracted from TM or AOS frames;

3. Build a file reconstructed from CFDP PDUS previously embedded either in SP's or EP's and transmitted over TM or AOS frames.

Due Date: 20 June 2014

AI 18a-05 IOAG Delegates to confirm their priorities and need dates for Return Unframed Telemetry and Validated Radiometric services. Due Date: 20 June 2014

4) Status of Dormant Working Groups
26GHz Working Group:

Mr. Ricard Abello provided an update to the dormant working group. He noted that NASA and ESA have been trying to follow the recommendations of IOP-3, recognizing the band will be used in several missions for communications. In order to achieve the recommendations, the group identified the following issues:

- Expand the propagation knowledge of the 26 GHz band by performing experimental campaigns to validate the propagation models
- Finalize the VCM/ACM (coding/modulation) protocols to guarantee interoperability.

ESA plans to fulfill the recommendations on studying a cubesat and piggy-back feasibility, 26GHz downlink experiment from LEO, four pre-developments for the downlink experiment,

multiple propagation for LEO & measurements from GEO activities, system analysis for ACM techniques for 26GHz downlink.

NASA added that there is a new antenna in Alaska that is Ka-band capable. NASA asked about ESA's arctic environment, and if it is being done in conjunction with what NASA is doing. Abello said that it concerns Svalbard.

The Chair asked who is still involved in the working group; and Mr. Abello answered it was mainly ESA and NASA, with support of EUMETSAT.

SISG:
Mr. Dave Israel spoke on behalf of SISG and noted there was nothing new to report. There is an architecture report with CCSDS. It was already reviewed, comments were provided, and the changes just need to be accepted. IOAG asked Mr. Peccia if any foreseeable work needs to be done with SISG and he responded no.

OLSG:
There was no additional input for the OLSG. Mr. Peccia noted there were new actors in CCSDS mainly due to new interested participants and resources. Agencies with "optical" interests have influenced the budget. Mr. Liebrecht noted that optical communications is currently a popular topic in the aerospace community. The Chair noted that this could be a topic for the SpaceOps workshop next year as well.

5) SECSWG Update
Ms. Madeline Butler provided a brief update to the working group's activities and listed the names of the new SECSWG members. KARI noted that due to limited resources, it will prevent them from participating. Ms. Butler noted that the charter was reviewed and the next telecon will be on 3 June 2014; she would be able to provide an update at the next IOAG meeting.

Following up on AI 18-11 on the policy issue of IOAG member agency support in case of a spacecraft emergency, the IOAG raised the issue on whether SECSWG's outcome would establish a formal or casual relationship with responding to spacecraft emergency cross support if missions have problems. ESA noted that this topic will be discussed internally within the agency next week. NASA noted their internal discussions resulted in suggesting an addition to the IOAG charter that has a minimalist approach. There will be another meeting on the topic to work out which mechanisms can be agreed upon. Upon reviewing the NASA inputs, UKSA asked about 'legally sufficient means'; NASA responded that it was within the U.S. government constraints to do a cross support. Some other IOAG members may require a more formal relationship for SECSWG activities.

The Chair asked about the frequency of the SECSWG meetings, and Ms. Butler responded that meetings will occur at least once a month.

AI 18a-06: IOAG delegates to follow up on AI 18-11 after further internal discussion and to report back at IOAG-18b.

6) MOSSG Update

Mr. Kearney presented an update to the MOSSG activities, noting that the group holds bi-weekly telecons. Currently the group has been looking at 2 missions (the ISS and potentially JASON-2) for a "core drill" in-depth analysis of the interoperability available today. The goal is to look at the most complex interfaces and also do a re-assessment of the MOSCG survey.

He then asked the IOAG on the fidelity of priorities for CCSDS. CCSDS asked for priorities by the Nov 2014 CCSDS meeting. Mr. Kearney provided two potential options for the response and then requested IOAG input. NASA asked about the driver for the CCSDS need-date; Mr. Kearney responded that the SM&C WG runs out of tasks to work on by the end of the year, and they are seeking guidance on the next set of tasks they will apply their resources to. Of the two options discussed, the IOAG agreed that the second option (see MOSSG input) was best, as providing preliminary priorities are better than no priorities at all.

Mr. Kearney noted that during the IOP approval of the MOSSG effort, the need to apply additional resources was acknowledged. Those additional resources have not been applied yet. In the MOSSG the resources are limited, cannot meet the originally proposed report date of 18 months, and may take quite a few more years to complete with reduced scope at this pace. The Chair asked for the CCSDS point of view if it will cause a problem; Mr. Peccia responded it will not because the preliminary list of priorities is in line with work that is already defined. Mr. Kearney proposed that the MOSSG task is technically not standardization work. However, ESA noted their budget used for this activity comes from standardization causing complications in providing the necessary resources to support it. ESA mentioned that in the past when missions have been selected to adopt a standard this pushes the activities. It should be checked whether this is also feasible for the MOSSG.

Mr. Kearney drew comparisons to similar work, noting that SISG required many more participants to accomplish the strategy group tasks than were available to the MOSSG; however ESA responded that the SISG had a driver and a goal (Mars Missions), which is not the case for MOSSG. While the MOSSG is a useful and interesting activity, it is hard to justify the actual needs based on currently formulated missions. It was clarified that the budget handling is different at ESA compared to NASA.

Mr. Kearney then highlighted discussions on the various models from the CMU System of Systems Interoperability (SOSI) Report. The report described a hierarchy of levels of interoperability, in which higher levels of interoperability provide more integration and more benefits for the organizations. The MOSSG adapted that approach with a simplified interoperability model (see slide 6). Mr. Tai asked about the "common application" level of the model, and Mr. Kearney responded that an example would be the ISS antenna management application, where the NASA implementation software was deployed to the external organizations. In general the point being made by the MOSSG was that there were other approaches to interoperability than the CCSDS Service Interface approaches, and the MOSSG planned to consider those other approaches as well.

7) Coding and Modulation Task

Mr. Les Deutsch and Mr. Calzolari provided a quick update to the task. They noted that they have corresponded with the team members; however due to many members being out on holiday, there has been limited communication so far. A telecom will be scheduled for June 2014.

8) Priority Process Update

Mr. Soula presented the ICPA priority process action item that was assigned to himself and Mr. Calzolari. He provided the current ICPA process chart, and highlighted that IOAG has not provided new items to be added into the ICPA. As a result, CCSDS has raised questions to IOAG regarding their needs for some of the projects that have yet to be started in the ICPA, such as the Forward File, Return File, Return Unframed Telemetry, and Validated Radiometric. Furthermore, following the decisions made at IOP-3, CCSDS has initiated new projects on which the IOAG has to assign priorities and need dates, namely:

- Blue: Optical Communications Physical Layer (141.0)
- Blue: Optical Communications Coding & Synchronization (142.0)
- Green: Optical Communications Concepts and Technologies (140.0)
- Green: Real-Time Weather and Atmospheric Characterization Data (140.1)

He requested that IOAG Members assign their individual Agency Priority and due date for availability of the Optical Comms standards, by June 30, 2014.

The answers from the IOAG delegates will be consolidated by Mr. Calzolari and Mr. Soula, first for IOAG approval and then, for communication to the CCSDS liaison by the end July 2014.

AI 18a-07: IOAG Members assign their individual Agency Priority and due date for availability of the Four Optical Communications books mentioned above. Due Date: June 30, 2014

AI 18a-08: Calzolari and Soula to consolidate the Agency Priority inputs and prepare them for communication to CCSDS liaison. Due Date: July 2014.

9) ICG/IOAG Interface & GNSS Table for ICG

Michael Schmidt noted that the GNSS tables have been updated and shared with the ICG. UKSA is looking to provide inputs, but their missions are actually ESA missions. NASA noted that the IOAG should consider how to engage commercial space companies as more plan to use GNSS for their space vehicles.

As for ICG/IOAG interface, DLR commented that there are no delegates from Germany for ICG participation; usually only EU and Italy have delegates. He has not contacted the Germans in the European Union delegation. DLR recommended that it was best to still use IOAG as the interface mechanism. CNES and ESA also agreed that it was important to be connected to ICG, and that the continued ICG/IOAG interface will be at the IOAG level rather than individual agencies.

10) Mission Model Database

Mr. Kearney provided an update to the Mission Model Database action item. He noted that he looked at several Comm Assets Database approaches and requested more time to analyze them. He suggested that he plan to report at IOAG-18b. There are 3 databases he is investigating: CCSDS, SANA, and SFCG. NASA noted it would be value added in mission planning and the new capability may provide interesting outputs.

11) Other Items

11.1: IOAG Member Status:

The Chair provided an update on IOAG Membership Status. He updated the IOAG members that CSA joined as full member to IOAG at the IOAG-18 meeting. While CSA could not participate in IOAG-18a, they continue to have active interest. He noted that Mr. He Shanbao from CNSA is currently participating in this telecon as an observer. As for Russia, Mr. Valiliev in RFSA, noted the organization's interest in the group, but is having difficulty identifying who would be in charge of the interface. ISRO has not communicated back to IOAG after a letter was sent informing them of their observer member status. The Chair then noted that SANSA are interested to become and observer to the organization.

Mr. Liebrecht noted that SANSA asked to become SpaceOps members, during which the members looked into the organization. He noted that was worthwhile to consider SANSA, as they have tracking assets. It was agreed amongst all IOAG members that SANSA received observer member status.

NASA asked about SANSA's participation in CCSDS. Mr. Peccia responded that while SANSA has observer status, they have not attended meetings.

<u>11.2: Next IOAG Meetings:</u>
KARI confirmed their plans to host IOAG-19 at the KARI Daejeon facility around May 12-14, 2015. The goal was to fit the meeting around the same time as the SpaceOps meeting (May 15-19th), and the CCSDS CMC meeting in Tokyo to reduce travel costs. NASA noted there is SpaceOps Committee meeting on Friday and this can be discussed.

Post-Meeting Remark:
At the SpaceOps Committee meeting it was discussed to accommodate the IOAG and the Spaceops meeting in one week. The proposal is to execute IOAG from 11 to 13 May 2014.

The Chair confirmed with all the IOAG delegates that the next IOAG telecon is scheduled for 16 September 2014.

<u>11.3: SpaceOps Paper</u>
NASA/Mr. Liebrecht thanked all the IOAG delegates for their support and contributions on the SpaceOps paper. The presentation will occur tomorrow, 7 May, at 4PM.

12) Any Other Business
Mr. Kearney presented an award to Mr. Pilgram for his 28 years of dedication to CCSDS, and wished him the best in retirement.

NASA/Mr. Liebrecht then presented a montage to Mr. Pilgram, thanking him for his decade of service to the IOAG.

13) Conclusion:
The meeting was adjourned.

ACTION ITEMS

<u>AI 18a-01</u>: All IOAG delegates to send comments on the SSI Green Book by the end of the month (31 May 2014)

<u>AI 18a-02</u>: IOAG delegates to provide proposed responses to CCSDS questions to allow IOAG Chair to provide coordinated reply to CCSDS. Due Date: 20 June 2014

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AI 18a-07: IOAG Members assign their individual Agency Priority and due date for availability of the Four Optical Communications books mentioned above. [Due Date: 30 June 30 2014]

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