INTERAGENCY OPERATIONS ADVISORY GROUP

IOAG-19a Meeting

Document Number: IOAG19a.A.MN.2015

Prepared by: Stephanie Wan, IOAG Secretariat

Date: 11 September 2015

IOAG-19a Teleconference
11 September 2015
Minutes

Attendance:

Chair: Michael Schmidt/ESA
Secretariat: Stephanie Wan/NASA

Members:
ASI: Fabio D'Amico
CNES: Jean-Marc Soula
CSA: Ken Lord
DLR: Martin Pilgram, Rolf Kozlowski
ESA: Ricard Abello, Enrico Vassallo, Josep Rosello
JAXA: Tsutomu Shigeta
NASA: Phil Liebrecht, Dan Smith, Frank Bauer, James Miller, Wallace Tai, AJ Oria, Rebecca Zia, Les Deutsch, James Afarin, Mike Fossum, Dave Israel

Observers:
SANSA: Tiaan Strydom

All charts are available on the www.ioag.org website.

1. Opening/ Introduction of IOAG participants

The Chairman opened the meeting and thanked everyone for their participation. After asking whether IOAG delegates had any further items to add on to the agenda, and hearing none, the agenda was approved.

2. Secretariat's Report

The Secretariat noted further markup had been received to the draft minutes for the IOAG-18d since IOAG-19 and requested approval by the members. The IOAG-18d minutes were then approved.

For the IOAG-19 minutes, additional input has been received in the past days and the Secretariat had resent the updated version yesterday. NASA asked for an additional week to review, which the other IOAG delegates agreed.

AI 19a-01: All IOAG members to take a final review of the IOAG-19 minutes and if no further comments are provided, it will be approved.

The Secretariat then noted that there are no additional action items for review at this moment, as they should be reported during today's discussion.

3. CCSDS Report

Mr. Nestor Peccia summarized the books, noting that five books have been published since the IOAG-19 Daejeon meeting. He noted that the Cross Support Architecture working group is also now completed. In CESG, he commented that there were additional activities in the CESG poll, but some are not issued yet. He then provided status of the online strategic plan, noting that the goal is to release the package to the management counsel to review on 1 October. Ideally at the CESG and CMC, there would be an agreement on aligning the strategic plan for future projects.

Mr. Peccia concluded with the final chart with the list of the ICPA approval, with the LTP Blue book and CSA Req. Magenta book published. On the approved projects in CCSDS, the remaining 15 approved projects belonging to the ICPA have their schedules compliant with the IOAG need dates, except for the Space Data Link Security (SDLS) Protocol, Optical Communications Physical Layer, Optical Communications Coding & Synchronization, Bundle Security Protocol, and CSS MD blue book. However, this has been presented last time. As for the SDLS protocol, it may be published next month, though the required date may be closer to 2018. The Chair then asked about the wavelength of optical and if CCSDS would be reviewing it in the fall; Mr. Peccia responded hopefully at the next IOAG a proposal can be developed. The CCSDS need date is December 2017, but the estimated date may be a year later in 2018. Additionally, CNES commented that they have now committed resources for CSTS Transfer file service.

4. ICG Liaison Update

Mr. JJ Miller introduced Mr. Frank Bauer to present. Under the leadership of the former Chair, Mr. Soula, he noted that IOAG now has a seat at the table. The next ICG meeting will be held in

November 2015 and in the United States. The Positioning, Navigation, and Timing Advisory Board will also be held in the same place.

He commented that the current goal is to have the IOAG GNSS mission model reference table be updated for the ICG-10 meeting. While there is a dissatisfaction with the current pace of work at the United Nations ICG, he would like to report NASA's amazing results over the summer on the GPS antenna characterization. The bottom line is that NASA always took a conservative approach with four satellites in view at GEO. Each GPS satellite can be independent if they use side lobes and main lobes; this is a "game changer." As a result, interoperability becomes redundancy.

Mr. Liebrecht noted that at the last IOAG meeting, the action item was assigned to identify what other nations can do to enhance their participation at ICG. Mr. Miller responded that the easiest approach was continued representation at ICG. He will continue to work and map additional opportunities. Mr. Liebrecht asked for other examples, such as IOAG working with GNSS experts in their countries to get an accepted SSV requirement for their GNSS provider systems, in a similar way that NASA is doing for GPS in the US. Mr. Miller noted they want to host monitor sites with Galileo by looking at signals at GEO for low performance; for example, running a Galileo signal on ISS using software defined radio.

Mr. Bauer noted that bottom line is that when they first specified the Space Service Volume last in 2006, there was not a lot of information on side lobe data. They wanted to make sure that the main lobe signal was protected for the space service volume. They learned that from antenna patterns, etc. on orbit data on the MMS spacecraft on performance improvement. He points out that user community in GEO and LEO environment is vulnerable of design changes of the signal if not protected. They were looking at this concept strongly with the GPS directorate.

The SSV specifications are crucial space users, providing real time GPS navigation solutions in high orbit. There are two areas to note: the side lobes exceed main lobe specification and there is better performance from GPS than planned. If we can make sure it is protected, it will give a green light for project managers to consider the use.

The Chair asked what Mr. Bauer expects from IOAG for the side lobes? Mr. Bauer responded that the protection of the signal in the SSV in each provider area. He asked the IOAG delegates to make sure they recognize the side lobe as also an aggregate signal capability. Mr. Miller noted that when it was first considered it was a "junk energy" until it had actual practical use. Mr. Miller noted the he was sure that will see benefits and can help Galileo and the other GNSS providers do the same.

Mr. Liebrecht reminded everyone that this discussion came from an action item from ASI and believed action item can be closed.

The Chair asked if Mr. Miller was interested in maintaining database and he responded yes.

Mr. Josep Rosello noted that any knowledge of antenna patterns is also interesting for Earth science. Mr. Miller plans to represent IOAG at the next ICG meeting. The Chair thanked him for the help.

5. Harmonized Practice for 26 GHz

Mr. Richard Abello highlighted the IOAG-19 meeting action items and reported on the action completions.

- IOAG AI 19-07: Mr. Abello commented that 26 GHz is not harmonized, in particular for Modulation and Coding. He responds to some suggestions from Mr. Soula's email that was sent on 4 August 2015 regarding AI 19-07 suggesting the best starting point is the LEO26GHz report dated June 2013 and to enlarge the scope of the study group. He noted there were some possible scenarios that can be developed. The report in June 2013 already agreed on those issues.

- IOAG AI 19-08: He noted the action item asked LEO26SG and SFCG to develop charter for harmonized practices for 26 GHz cross support. He suggested that the current LEO26SG team be reactivated with the current expertise and will focus on the areas for which it was created (i.e. RF, modulation and coding). Furthermore the group should add an Annex to the charter with the scenario on Medium & High Speed scenarios. There is no need for new experts in the LEO26SG.

The Chair asked to have offline progress to pick up the discussion. It was agreed to get a small team of interested participants together (Dr. Deutsch, Mr. Abello, Mr. Soula, Mr. Kozlowski, Mr. D'Amico, and Mr. Shigeta showed interest) to further discuss the topic and come back to IOAG with their discussions.

6. IOAG Priorities/Tables & IOAG Management of the ICPA & IOAG Registry of RF Assets

Mr. Soula reported on the action items from IOAG-19.

- AI 19-05 on the creation of Service Catalogue revision: this was circulated and feedback on the Charter was received. All the replies have been taken into account. The action item is now closed.
- AI 19-06 on Top Priorities establishment process documentation: it was reviewed that a procedure was produced. Mr. Soula asked for clarification from NASA. Mr. Liebrecht noted that NASA had no issues with the procedure; however, NSA felt that it was too detailed for the IOAG to decide on priorities for such low level standards. CNES commented that there must be a confusion with the procedure for management of the ICPA and recommended in the future ICPA and Top Priorities topics are separated in IOAG meeting agendas. NASA noted that "prioritizing standards" was interpreted at a lower level. CNES asked Mr. Tai to share wording that requires clarification. Assuming only minor comments are to be expected, the procedure was approved.
- AI 19-09 on writing a 1-2 page summary of the various IOAG Top Priorities: Mr. Calzolari and Mr. Soula updated that in the document made available on the website as part of IOAG-19a documents to close this action; each box identified as a top priority at

IOAG-18 (Rome meeting) has an explanation of the items. It was suggested that all IOAG delegates review and provide comments to the action 19-09 document regarding the formulation of top priorities prior to the next IOAG meeting.

AI 19a-02: Service Catalogue Working Group (SCWG) to review whether the Forward Encoded Frame Service can be removed from the ICPA.

AI 19a-03: Delegates to comment on the Top Priority explanatory document prepared in answer to AI 19-09 and intended to formulate top priorities.

- Action 19-11 on creating a draft IOAG internal reference document for ICPA Documentation. Mr. Soula noted that it is available on the website as part of IOAG-19a documents and needs to be reviewed and commented on to be approved for IOAG-19b.

AI 19a-08: Delegates to comment on the ICPA management document, prepared in answer to AI 19-11. [Due Date: 10 December 2015].

- Action 19-12 on IOAG members to revisit their priorities and need dates and inform the IOAG concerning the two standards discussed: Bundle Security Protocol and Bundle Protocol Network Management is completed.
- Action 19-16 on all delegates to check SANA Communications Database to make sure it is up to date. IOAG needs to review again since DLR commented that their inputs were missing.

Mr. Soula then changed to the topic of the Service Catalogue Working Group (SCWG) and proposed a modification of infusion table. He noted the definition of services in the service catalogue has discrepancies that needs to be identified, for instance in Delta Dor. There are new terms that needs to be fixed. He then provided a slide to add [DDRXF] CCSDS 506.1-B Delta-DOR Raw Data Exchange Format – Blue Book to the Delta Dor Service (slide 4).

The Chair asked if there is any urgency/advantage to close the action earlier. Mr. Soula noted the next step would be if IOAG approved the proposed modification of the Service Catalogues If yes, then the Agencies should update their information reporting whether they support or not [DDRXF] (i.e. CCSDS 506.1-B Delta-DOR Raw Data Exchange Format – Blue Book). Mr. Soula noted that there is no urgency from their side, but asked other agencies for their inputs. NASA noted they can agree to take change effective now and can concur. ESA as well agreed.

AI 19a-04: Calzolari and Soula to generate new format template for the infusion table.

IOAG Registry of RF Assets

Relative to AI 19-16, Mr. Soula then commented that the topic of the IOAG Registry of RF Assets does not fall under the ICPA coordination or the work on the service catalogues. It was then noted that there were some errors in the SANA communications that DLR marked up. The

IOAG delegates were asked to review the markups in order for SANA to make the appropriate updates

AI 19a-05: IOAG to confirm DLR inputs to CCSDS, and CCSDS liaison to send instructions to SANA to make appropriate updates. [Due Date: 10 December 2015].

7. MOSSG

Mr. Dan Smith noted the revised plan to complete the MOSSG activity and to present the results at the next meeting. He provided background on the work and noted the team felt it was not possible to meet the deliverables in time. As a result, the group was re-scoped so it would fit the schedule despite working with limited resources. By the Spring CCSDS meeting, their work should be completed and will be disbanded.

He then noted the Catalogue 3 status, where they found the ISS group's earlier works have been useful. He showed a slide on Service Suitability Factor. He commented that MOSSG recommends a very high bar for determining that an international standard should be developed for a particular functional area as a way to promote interoperability needs across missions and Agencies. Based upon Catalogue 3, it is based upon functional need – not design need, and should support multi-mission and multi-Agency needs.

He then stated the ten key finding where the group hoped to provide some suggestions for a documented set of clear objectives, service approaches, and priorities. This included: Scope; Roadmap; Awareness of levels of interoperability; OpsCon for small and large mission; Long-term innovation; Providing a cohesive approach across all of CCSDS; Moving away from being software centric; Promoting infusion and use; Interoperability that is more important than code sharing; and Guiding Principles.

Chair noted the report is coming along well and believes the working group activities are speeding up again. NASA agreed and noted the positive direction.

Mr. Ken Lord noted that after the Daejeon meeting, Mr. Allard made a presentation on MOSSG at the control board GSCB. Two Russian delegates were interested in IOAG and participation at the MOSSG level. Information on IOAG was passed to their colleagues, which then became silent until 3-4 weeks ago. They wrote to back to Francois and noted they were interested, but only to be involved in MOSSG and not participate in IOAG. The Chair would like to have confirmation of their representative, but there has been no response. He suggested they move ahead on Russian MOSSG participation in parallel he continues to try and reach the Russian IOAG head of delegation.

8. Spacecraft Emergency Cross-Support Working Group (SECSWG): W. Tai

Mr. Tai answered action items from the last meeting:

- AI 19-20: Mr. Tai noted the working group action to submit the SpaceOps abstract has been completed. He received inputs from member agencies and incorporated them when submitting the final abstract.

- AI 19-04 on the proposed position statement for cubesat in SECS; a response was posted on 31 August.. He recommended that cubesats be broadened to nanosat and cubesats. Since these nanosatellites are low cost missions, they are more risk tolerant. Furthermore, though each is a reduced reliability, as a whole they provide additional support so if one is lost, it will not make the whole system at risk. He recommended that IOAG member agencies should provide spacecraft emergency cross support to these missions, but at the level that won't incur significant impact on agency resources. The members have to recognize that there will be an overflow of requests, and the cross support will be on a case by case basis. They should have a few items in place, such as changing to safe mode when Earth pointing. Nanosatellites can have ability to be in a controlled orbit and this should be CCSDS compliant. The Chair noted the recommendation looks great and that he has already passed it to some colleagues working on small satellites. Mr. Tai noted that for interplanetary missions that IOAG asks them to follow those guidance. He noted that the final study report will be done.

- AI 19-03: SECSWG received input from CNES and verbal input from NASA; this will be reviewed at a later time due to meeting time constraints.

Mr. Tai then wanted to highlight the key work items is to look at the overall study report, and realized that SECS operation concepts included but loosely covered and loosely addressed.

- Timely availability of RF licenses: How to achieve this?
- Participating communications assets of the IOAG member agencies: What are they?
- Standard operations process/procedures (SOP) for the SECS interfaces: This is the rubber-meets-the-road stuff, but is it even feasible?
- The definition of the SOP for the SECS interfaces

Mr. Tai stated that investigating further into the SOP has led the group to consider a few more fundamental questions. All communication assets need a license of RF. As a result, it was a drawback and required further consideration. Considering the number of satellites and the lifetime of a satellite, that can be at a high cost. Perhaps for NASA they don't have that issue, but it is a point for further investigation. Furthermore, it was still necessary to identify optical communications assets owned by the IOAG member agencies to provide the SECS services.

As a result, the asset contribution from each agency is important. The question was raisedregarding what is the standard timeframe to put this ECS in place.

The Chair noted that overall this was progressing quite well. Mr. Tai answered that it is difficult doing it over teleconference, and so it is in the exploration stage and have yet to look into the detail.

AI 19a-06: All IOAG delegates to review the SECSWG questions and provide a response by the end of October.

It was commented that the technical issues identified during the meeting will need to be resolved before the paper to the SpaceOps is written.

9. Status of SCWG

The Chair noted that the points are covered in agenda item 6.

10. IOAG paper to SpaceOps 2016

The IOAG paper was discussed in agenda item 8, during the SECSWG discussions.

11. Next IOAG Meetings

The Chair noted that since there are too many topics to discuss, he suggested having the meetings a bit more frequently.

For the face to face meeting, CSA noted they are happy to host IOAG-20 at the CSA HQ at the end of Sept/early October timeframe in Montreal. The Chair also suggested a short face to face meeting during SpaceOps 2016.

It was agreed that IOAG would have one more teleconference before the end of the year, on 10 December, 2015.

12. Any Other Business:

IOAG Mission model and the IOAG Cross Support Mission Model & future needs

Mr. Soula noted that during the CCSDS Nagano meeting, it was noted the moon missions are increasing in the coming years. However, there are only a few lunar missions listed in the IOAG mission models. He questioned if the mission model reflects what IOAG wants to do in the future. At the last CMC meeting, they are doing their own models and it may highlight difficulties for common standards for cross support. Mr. Tai noted that the ISECG subset of ISS are doing a study about collaborative lunar exploration. ESA is playing a key role on mission models for the moon. There are some interactions with the ISECG ISS working group and CMC needs further communication. Furthermore, ISECG is a closed group and there are difficulties opening up to IOAG. To ensure there is no disconnect, it was agreed that IOAG members review their current mission models to ensure they are up to date.

AI 19a-07: All delegates (and Observers) to take a look at the current mission model, especially the lunar missions, and ensure they are up to date. (Due Date: before next IOAG meeting).

The Chair thanked everyone for their time, and adjourned the meeting.

Action Items

AI 19a-01: All IOAG members to take a final review of the IOAG-19 minutes and if no further comments are provided, it will be approved. [Due Date: 22 September 2015]

AI 19a-02: Service Catalogue Working Group (SCWG) to review whether the forward encoded frame service can be removed from the ICPA. [Due Date: 10 December 2015]

AI 19a-03: Delegates to comment on the Top Priority explanatory document prepared in answer to AI 19-11 intended to formulate top priorities. [Due Date: 10 December 2015].. [Due Date: 10 December 2015]

AI 19a-04: SCWG to generate new format template for the infusion table. [10 December 2015]

AI 19a-05: IOAG to confirm DLR inputs to CCSDS, and CCSDS liaison to send instructions to SANA to make appropriate updates. [Due Date: 10 December 2015]

AI 19a-06: All IOAG delegates to review the SECSWG question and provide a response by the end of October. [Due Date: 10 December 2015]

AI 19a-07: All delegates (and Observers) to take a look at the current mission model, especially the lunar missions, and ensure they are up to date. [Due Date: 10 December 2015].