



## **INTERAGENCY OPERATIONS ADVISORY GROUP**

### **IOAG-22b Meeting Minutes**

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**Prepared by: Madeleine Bronstein**

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**IOAG-22b Meeting Minutes**  
**Teleconference**  
**09 October 2018**

**Attendance:**

Chair: Michael Schmidt

Secretariat: Barbara Adde, Madeleine Bronstein

Members:

CNES: Jean-Marc Soula

CSA: François Alain

DLR: Rolf Kozlowski

ESA: Gian Paolo Calzolari, Klaus-Juergen Schulz

JAXA: Hirokazu Hoshino, Tsutomu Shigeta

NASA: Bernard Edwards, Catherine Barclay, Dan Smith, Dave Israel, Jim Schier, Phil Liebrecht, Wallace Tai

Observers:

KARI: Sangil Ahn

UKSA: Matthew Cosby

Liaisons:

CCSDS: James Afarin

SFCG: Enrico Vassallo

Presentations are available at: [www.IOAG.org](http://www.IOAG.org).

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**Introduction: Michael Schmidt**

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The Chairman thanked the participants for attending and began by noting that he received confirmation from Roscosmos and CNSA that they intend to participate in IOP-4. The only agency not participating in IOP-4 will be SANSa and he is unsure whether CSA plans to participate. Mr. Alain responded that as of that moment, he will be the only participant from CSA at IOP-4, because it coincides with the launch of the next Canadian astronaut to the Space Station, so senior leadership will be in Russia. He will follow up with the Chairman about whether he will attend virtually or in person within the next week.

**Review of Draft Communiqué**

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The reviewed documents can be found on [www.ioag.org](http://www.ioag.org).

The latest draft Communiqué, including the draft resolutions can be found at:

[https://www.ioag.org/\\_layouts/15/WopiFrame.aspx?sourcedoc=/IOP4%20Documents/Draft%20Communique%20IOP%204%20081118.doc&action=default](https://www.ioag.org/_layouts/15/WopiFrame.aspx?sourcedoc=/IOP4%20Documents/Draft%20Communique%20IOP%204%20081118.doc&action=default)

General Edits

The delegates agreed to introduce separate sections for liaisons and working groups and reorder the resolutions according to topic area.

CCSDS

Mr. Afarin noted that the IOP is endorsing CCSDS and the strategic direction is for the IOP to encourage the IOAG and CCSDS to work together. It is very similar to earlier resolutions, except that the budget request was removed. There were no further comments.

ICG

No comments.

ISECG

The delegates discussed the need to include a recommendation concerning the future and forward work. The Chairman noted that he will flip the order of bullets #3 and #4. Mr. Schier recommended rephrasing #3 to include a mention of Mars architecture. He will send a recommendation to the Chairman for how this should be worded. Mr. Schulz recommended replacing “policy” with

“architecture” in the first recommendation and spelling out acronyms. The delegates accepted these changes.

#### SFCG

Mr. Vassallo commented that he will change the phrasing of the first resolution to be more generic: the IOP recognizes that important accomplishments have been achieved by SFCG and there has been cooperation between organizations. The phrasing of Resolution 2 will be changed to “*try to ensure* that the position of their national frequency management authority...” Mr. Vassallo added that he will spell the acronyms and send any additional edits to the Chairman.

#### C&MWG

Recommendation #2 was suggested to be changed to “implementation of preferred set of coding & modulation standards.” Eventually, it was agreed to follow Mr. Soula’s suggestion for removing the C&MWG and SCWG resolutions in the communique and therefore, the above mentioned changes were dropped.

#### LCAWG

Mr. Schulz asked whether the final version of the lunar communications architecture document would be available by the IOP. Mr. Cosby responded yes. The Chairman and Mr. Cosby discussed removing #2 because it was too specific, but Mr. Tai suggested making it more generic, such as rephrasing it to “communication capabilities/standards.” Mr. Cosby and Mr. Tai agreed to think about this further and send updated language to the Chairman. The delegates also discussed the appropriate usage of “endorse.” Mr. Cosby will review the phrasing and send an updated version to the Chairman.

#### LEO26SG

Mr. Vassallo suggested changing X-band to 8 GHz to maintain consistency with the other resolutions. The delegates agreed to this change. The delegates also agreed to rephrase “C” to prioritize VCM, followed by ACM. Mr. Soula asked why there is no recommendation to expand the group in the future to explore user missions in all orbit regimes, which was previously discussed. The Chairman responded that he will reach out to Mr. Baldwin (chair of WG) to discuss this.

#### LMWG

The delegates agreed to remove this section.

#### MOSSG

Mr. Smith noted that on #2 he will remove “enforce” and rephrase “cross-support” to “mission operations interoperability.” Mr. Schulz asked if Mr. Smith wanted to include stronger language in relation to infusion for mission operations service into LOP-G. Mr. Smith responded that if the working group would like to be more specific, he is open to that, but when the MOSSG was developed, they did not have sufficient detail to do a detailed vetting of LOP-G requirements. Mr. Smith recommended that this be worked internally to IOAG and not raised with the IOP yet as a

topic of discussion. He added that #4 covers it generically. The Chairman agreed to leave it out of the IOP.

### OLSG

Mr. Schier pointed out that the sections are not inconsistent, but slightly redundant, because the LCAWG recommendation addressed this, but this working group is mentioning optical more specifically. The delegates agreed to move the LCAWG section to the end of the document because it incorporates technology mentioned in the other working groups. Mr. Shigeta asked whether there is consensus on the resolutions within the OLSG. Mr. Edwards responded yes.

### SCWG

Mr. Smith recommended changing “two Service Catalogues” to “Service Catalogues 1 & 2” on bullet #1. Mr. Calzolari accepted this change. Mr. Calzolari also accepted changing “services” to “core services” on bullet #2.

Mr. Soula advocated for removing the C&MWG and SCWG resolutions in the communique and instead adding a note at the end of communique on the work being done. Mr. Schier proposed adding high-level bullets that suggest the IOAG continue work in areas such as coordinating services and emergency cross support – places where the effort is underway, but there are no specific IOP-level recommendations. The Chairman agreed with this approach.

Since the delegates agreed to follow Mr. Soula’s suggestion for removing the C&MWG and SCWG resolutions in the communique, the changes to the SCWG section mentioned above were dropped.

### SECSWG

The Chairman suggested removing “as warranted” from #4. Ms. Barclay agreed with this change. Mr. Shigeta proposed including future work in #3 and expanding the scope of the group to include exploration missions. Ms. Barclay will reword the resolutions, because two are challenges and engaging commercial and human spaceflight are new undertakings. Ms. Barclay will send the updated version to the Chairman.

### SISG

Mr. Cosby noted that #4 needs to be changed after the comma to expand on link layer architecture to network architecture – the same format as #3. Mr. Soula proposed updating #4 to avoid ambiguity and asked if all the agencies want to generalize relays or be more specific. The Chairman suggested emphasizing planetary relay functions. Mr. Israel said he will reword #4 based on the comments received.

In reference to #1, Mr. Tai commented that the resolutions are too DTN-focused and it is important to state that the IOP recognizes the importance of internetworking for future scenarios. Replacing DTN with space internetworking will make the resolutions broader. Mr. Israel agreed with this. Mr. Soula noted that LEO satellites also have ground internetworking. DTN covers disruption, but

for some missions IP is okay and relay isn't an issue. Mr. Schulz added that he is only thinking about DTN for now, but the group is labeled as being broader. Mr. Afarin also noted that he agreed that DTN is the solution for space internet.

### Evolution of the IOAG

The following proposals were made in reference to #1.

- Mr. Schier proposed removing “exploration program” in order to expand the scope. The Chairman concurred.
- Mr. Schier proposed adding a sub-bullet for science missions.
- Mr. Afarin proposed adding a sub-bullet on optical communication, because optical was mentioned in IOP-3 guidance. The Chairman responded that accomplishments from IOP-3 will be addressed elsewhere in the IOAG presentation. Mr. Afarin then proposed adding optical to the first sub-bullet.
- Mr. Schier proposed adding a sub-bullet on IOP acknowledgement of what the IOAG has achieved and encouraging continued work. The basic premise would be to provide support to the IOAG to continue these activities in the future. The Chairman agreed and asked Mr. Schier to provide him with wording for this.

The following proposals were made in reference to #2.

- The delegates agreed to add “to be written” under the “Interaction with Commercial Providers” topic until the IOP.

Lastly, Mr. Soula suggested adding another item in the communique related to membership of the IOAG. The Chairman concluded by noting that he will put in placeholders for the topics and finalize them after the IOP.

### **Review of Leadership Forum Kickoff Presentation**

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The Chairman noted that the moderator for the forum is still undecided and asked the delegates to send him input on proposed topics and trigger questions. He added that the leadership forum isn't limited to the IOAG, so if there are any different topics, provide them to him in the next couple of weeks. The following input was given:

- Mr. Schier proposed a trigger question of “whether the IOP recommends that the IOAG encourages development of a new space economy in communications?”
- Mr. Schulz referenced the first question on the Future Role of Agencies Trigger Questions chart and asked whether this referred to tracking service providers or equipment providers. The Chairman clarified that this refers to the tracking service providers.
- Regarding the Future Trends and Evolution of Agencies topic, Mr. Schier suggested a discussion on evolving towards greater independence as further exploration is pursued and tying autonomy to technology development. Mr. Soula responded unfavorably, because this is not a shared vision between agencies.

Mr. Soula concluded the discussion by adding that the “Key Consideration for the Future IOAG” presentation proposed by himself and Mr. Liebrecht was intended to set the stage for the meeting.

## **IOAG Presentation Review**

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### IOAG Context

Mr. Afarin noted that CCSDS is bidirectional, similar to SFCG and ICG. He will provide input to the Chairman on how to change the chart.

### IOAG WGs

The delegates suggested removing the subtitles to the WG slides and moving SISG to come before MOSSG. The Chairman agreed to the changes.

### IOAG Priorities Overview

Mr. Schulz noted that Earth Observation missions are missing. The Chairman responded that he will add EO in. Mr. Soula proposed removing the fourth point on “enabling commercial space endeavors” because there is no distinction between existing and future.

### IOAG Specific Priority Items

The delegates agreed that “multilateral” should be removed from “Facilitate S/C Emergency Cross-Support.” Mr. Hoshino asked whether the Priorities Overview should be linked to the Priority Items. The Chairman responded that this is not necessary, because they are not directly linked.

### IOAG Achievements since IOP-3 (International Bodies)

Mr. Vassallo noted that he gave the Chairman bullets on the achievements of SFCG.

### IOAG Future Evolution/IOP Guidance

The Chairman asked the delegates whether to include the topics from the leadership forum? Mr. Soula responded that out of the management meeting, the IOP delegates will give guidance on whether it is the domain of the IOAG to address or give guidance for future work on the topic. The Chairman will take into account the expected outcomes of the management meeting on the potential topics as a placeholder.

## **Next Steps & Conclusion of Meeting**

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### IOP-4 Document Overview

The Chairman reviewed the Document Overview and noted that working group and liaison presentations should be finalized one week before the IOP and the communique and resolutions will not be distributed before the IOP, since they will be updated during it.

The Chairman asked the Secretariat to make distinct sections for previous and current versions of IOP documents within the IOP-4 folder on [www.ioag.org](http://www.ioag.org).

### Closing Remarks

The Chairman noted that it will be decided after IOAG-22c in November whether another telecon or in person meeting will be needed before the IOP. A meeting in Darmstadt in November is a possibility.

The meeting was adjourned.

### **Appendix A: Actions**

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AI 22b-01: Liaisons and working group chairs to review the input given on their resolutions and provide updated resolutions to the Chairman. [Assigned to: Liaisons and Working Group Chairs. Due date: 8 November 2018]

AI 22b-02: Delegates to provide input on moderator, proposed topics, and discussion questions for Leadership Forum. [Assigned to: All Agencies. Due date: 8 November 2018]

AI 22b-03: Jim Schier to provide wording on IOP support for IOAG activities to “Evolution of IOAG” section of communique. [Assigned to: Jim Schier. Due date: 8 November 2018]

AI 22b-04: CCSDS liaison to provide edited IOAG context chart to the Chairman. [Assigned to: CCSDS. Due date: 17 October 2018]

AI 22b-05: IOAG Secretariat to create “Current Version” and “Previous Version” sections on IOP-4 documents folder. [Assigned to: Secretariat. Due date: 17 October 2018]

### **Appendix B: Acronyms**

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ACM	Adaptive Coding and Modulation
ASI	Italian Space Agency
CCSDS	Consultative Committee for Space Data Systems
CMWG	Coding & Modulation Working Group
CNES	Centre National d’Etudes Spatiales
CNSA	China National Space Administration
CSA	Canadian Space Agency

DLR	German Space Agency
DTN	Disruption Tolerant Networking
EO	Earth Observation
ESA	European Space Agency
GEO	Geosynchronous Orbit
ICG	International Committee on GNSS
IOAG	Interagency Operations Advisory Group
IOP	Interoperability Plenary
IP	Internet Protocol
ISECG	International Space Exploration Coordination Group
JAXA	Japan Aerospace Exploration Agency
KARI	Korean Aerospace Research Institute
LCAWG	Lunar Communication Architecture Working Group
LEO	Low Earth Orbit
LEO26SG	Low Earth Orbit 26 GHz Study Group
LMWG	Lunar Mars Working Group
LOP-G	Lunar Orbital Platform-Gateway
MOSSG	Mission Operations Systems Strategy Group
NASA	National Aeronautics and Space Administration
OLSG	Optical Link Study Group
S/C	Spacecraft
SANSA	South African National Space Agency
SCWG	Service Catalogs Working Group
SECSWG	Spacecraft Emergency Cross Support Working Group
SFCG	Space Frequency Coordination Group

SISG	Space Internetworking Strategy Group
UKSA	United Kingdom Space Agency
VCM	Variable Coding and Modulation
WG	Working Group