



INTERAGENCY OPERATIONS ADVISORY GROUP

2011 Annual Report

Document Number: IOAG.A.AR.2011.001

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Date: 22 February, 2012



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This 2011 Annual Report of the Interagency Operations Advisory Group (IOAG) provides an overview of the activities conducted over the past year, with reference to the objectives defined in the IOAG 2011 Work Plan. It is intended to keep all stakeholders and partners informed of the IOAG's work and achievements in the domain of space communications, in line with the mandate given by the second Interoperability Plenary (IOP-2) held in Geneva end of 2008.

In 2011, the IOAG held four teleconferences and one plenary session, IOAG-15, in Toulouse, in December. These meetings gave the IOAG the opportunity to continue the exchanges between the member Agencies and to update the IOAG reference tables that are or will soon be displayed on the web site: Communication Assets, Mission Model, Cross Support Mission Model and Standard Infusion Plans (in preparation). The IOAG continued to improve its processes so as to provide a forum for space agencies to share their cross support experiences and plans with the view to working collectively towards the further development and implementation of standardized interfaces. The central role of the IOAG, to harmonize requirements and to establish common objectives and plans, was enhanced through strengthened coordination with, on the one hand the projects and the international user communities (for instance the International Space Exploration Strategy Group [ISECG]) and, on the other hand, the standardization organizations (including the Consultative Committee for Space Data Systems [CCSDS], the Space Frequency Coordination Group [SFCG] and more recently the International Committee on Global Navigation Satellite Systems [ICG]).

One of the key objectives the IOP-2 assigned to IOAG as initiated in 2009-2010 came to a conclusion in 2011: the production and endorsement in February 2011 of a multipoint Cross Support Service Catalogue, called IOAG "IOAG Service Catalogue #2," that provides the platform of standardization for extending cross support into space.

This catalogue, together with the 2010 ground-based Cross Support Service Catalogue, called "IOAG Service Catalogue #1", identify the services required to operate missions in various cross support scenarios and the standards to support the data exchanges and their management, as elected by IOAG or as needed to support these services, when not yet available. Throughout the year and finally at the IOAG-15 meeting, significant progress was made in the utilization of the catalogues, both to:

- monitor and report on the infusion of the existing services and existing standards throughout the member agencies;
- serve as a reference between the CCSDS and the IOAG and to develop a Product Agreement on missing standards with the ideas of collectively agreed prioritization of these developments and of reporting on the development schedules.

To fulfill another of the objectives given by the IOP-2, the IOAG has monitored the progress made by the CCSDS in the development of a Solar System Internetworking (SSI) candidate architecture and its suite of supporting standards (e.g.: DTN). It is expected that this will come to a conclusion in the 2012 timeframe. In the meantime, the IOAG's Space Internetworking Strategy Group (SISG) which had produced a first version of the "Operations

Concept for the SSI” was put in dormant mode, but can be re-activated, if necessary. This activity on the SSI definition will be one of the drivers for the scheduling of the next IOP-3, currently planned not earlier than Q1 2013.

Year 2011 was also the occasion for the IOAG to initiate new activities that are part of the Work Plan and are still at work. This includes:

- The “Optical Links Study Group” (OLSG) which was formed in late 2010, with the objectives first to collect information from the member agencies on their plans and views, and later to assess the need for cross support in various mission scenarios and the technical aspects to be standardized to enable the interoperability of optical assets. The study was conducted during 2011 and an intermediate report was submitted at the IOAG-15 meeting. Several mission scenarios have already been studied and significant findings were presented. It was agreed that the study will continue in 2012, to provide complements on some scenarios (e.g.: LEO satellites), to elaborate on site selections and to refine cost estimates. Then, a final report will be approved by IOAG and will be the basis of a presentation to the IOP-3 aiming at pointing out the interest of optical communications, the possibilities for demo flights and the opportunity to establish very soon the standards that will be the early basis of a true interoperability in the future.
- The “Mission Operations Services Coordination Group” (MOSCG) which was also formed after IOAG-14, was suspended in mid-2011. Its objectives were to investigate the status of the activities related to the Mission Operations domain of CCSDS and to propose strategic guidance to IOAG on the way forward. Considering the significant efforts to be made in developing a third IOAG service catalog in this domain and the difficulty to efficiently address the subject in the current organization of the IOAG, the conclusion of this first phase was that the IOAG should seek guidance from the next IOP. At IOAG-15, it was agreed that the MOSCG will be revived some 5 to 6 months before the IOP-3, then possibly before the end of 2012, in order to prepare for a presentation to the IOP delegates on the interest of the subject, the challenges and the implications on IOAG to elaborate a strategy and plans for interoperability in this domain.
- The analysis made by several agencies and reported at IOAG-15, on the utilization of Ka-band in different scenarios. This evidenced some obvious progress on technologies and applications, for instance for Deep Space missions, but also some hesitation on the investment on Ka-band for other domains like the Earth Observation. This topic should come back on the agenda of future IOAG meetings, to monitor the new developments and the evolution of the plans with the IOAG members.
- The task, initiated in 2011, of establishing the collective IOAG top priorities on activities to be developed in the upcoming decade was extensively discussed at the IOAG-15 meeting. A special report will be developed before mid-2012 to reflect the consensus reached by the member agencies on the priority standards and technologies that will lead to significant benefits (operational and/or financial) and standards for capabilities or services that will be committed to flight operations or tracking networks in the short term. This will cover domains such as the coordination on space debris, the anticipated need for higher data rates, the link security, the technologies for the exploration of the solar system and the management of cross support configurations.

- Following the analysis of the first version of the ISECG roadmap that contains preliminary information on the communication requirements for some Exploration scenarios, it was agreed that the IOAG should support the ISECG, jointly with the CCSDS, in defining the candidate architectures and concepts that may answer their needs and that should be identified in the next version of their roadmap. A coordination plan was initiated and proposed to the ISECG Architecture Working Group in this regard.
- The format of the new liaison with the ICG was agreed in 2011 and cross attendance to each other's meetings may be anticipated starting from the second half of 2012, to exchange information on the user requirements and mission models in the domain of Positioning, Navigation and Timing (PNT), in particular for the GNSS Space Service volume.

In addition to the follow-up of the already engaged activities, on the agenda of the IOAG meetings for 2012 are the preparation of the IOP-3 and the continuous promotion of the services and their supporting standards as elected by the IOAG.

Tentatively, five meetings are scheduled in 2012 to iterate on these subjects:

- IOAG-15a : tele-videoconference on 27 February
- IOAG-15b : "mini-IOAG" during the SpaceOps 2012 in Stockholm, TBD in the week of 11~15 June
- IOAG-15c : tele-videoconference in early September
- IOAG-15d : tele-videoconference, one month prior to IOAG-16
- IOAG-16 : plenary meeting hosted by NASA in the November - December timeframe

Involvement of all members and contributions to the actions in progress are the condition for a successful preparation of the IOP-3. This is being reminded to some members who were deficient in the last year.

For any further information please consult the IOAG web site (www.IOAG.org) or contact the IOAG Secretariat (Barbara.Adde@nasa.gov).