



Interagency Operations Advisory Group

Work Plan 2009

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1 Introduction

The overall scope of the Interagency Operations Advisory Group (IOAG) is to undertake activities to establish a multi-agency coordination related to space cross support and space communications. A specific IOAG goal is the achievement of full interoperability among member space agencies.

To achieve these goals, some permanent objectives are defined in the IOAG Terms of Reference; the InterOperability Plenary (IOP) has also assigned some specific ones, as described in Section 2.

This Work Plan details the IOAG work objectives for 2009 and defines an associated implementation plan. The work objectives for the next several years are also identified in a less detailed format, so as to highlight the need for continuity in some tasks or the objective to initiate new activities. However, it is anticipated that the IOAG work plan will be updated on an annual basis; in particular to be more accurate on medium term objectives and on the implementation schedule.

The IOAG work for 2009 has been classified into four activity lines: (i) core tasks (section 3), (ii) tasks performed in collaborations with other existing international groups/organizations (section 4), (iii) improvement of IOAG internal processes (section 5) and (iv) reporting activities (section 6 = TBC).

The IOAG work plan 2009 responds to 3 overarching strategic objectives:

- Establish all elements of the IOAG organization required to make it fully operational, in particular in its role of international focal point for matters related to cross supports in the space communication and navigation domain.
- Demonstrate the effectiveness and value of IOAG within 2009 with achievements which further the goals of IOAG and are of mutual benefit to the participating Agencies and to the organizations in interface
- Increase the visibility of IOAG by communicating its existence and purpose to relevant international groups and organizations.

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2 Objectives

According to its Terms of Reference, areas for consideration for the IOAG objectives and activities include:

- ToR (a) Identifying the space and ground networks support capabilities needed by potential cooperative programs and projects to achieve their scientific objectives.
- ToR (b) Maintaining a list of interoperable facilities and services operated by the space agencies.
- ToR (c) Promoting the use of internationally recognized standards in the design and implementation of cooperative flight programs including: spacecraft, ground and space networks.
- ToR (d) Monitoring the work of relevant standards organizations and assisting in the agreement, adoption and implementation of new standards by space agencies.
- ToR (e) Identifying inconsistencies in the data transmission, capture, handling, and processing systems used by agencies. The IOAG should inform relevant standards organizations (such as the Consultative Committee for Space Data Systems [CCSDS] or the Space Frequency Coordination Group [SFCG]) of these inconsistencies, using methods described in the IOAG Procedures Manuals, as well as the IOP Members, inviting them to undertake the development of new international standards.
- ToR (f) Establishing priorities for the implementation of systems and services needed to achieve full interoperability and enunciating policies furthering interoperability. Such priorities should be passed to relevant organizations and to the IOP Delegations.
- ToR (g) Assessing the resources needed to implement these requirements and urging IOP Delegations to make these resources available within their agencies.
- ToR (h) Defining and maintaining a reference architecture that will enable interoperability and cross support across space agencies., this could be the SISG Operations Concept and Architecture document)
- ToR (i) Encouraging the distribution of communication and navigation techniques to accelerate the deployment of interoperable solutions

At the 2nd InterOperability Plenary meeting (IOP-2) which was held on 8 to 10 December 2008 in Geneva, the objectives of the IOAG for the upcoming years were established. As the parent organization of the IOAG, the IOP-2 then adopted the following resolutions that task the IOAG on some additional and specific objectives:

- IOP 2 (1). The IOP charges the IOAG to continue as the international focal point for fostering and leading interoperable space communications and navigation matters for cross-support of spaceflight missions, and approves the amended IOAG Terms of Reference dated June 2007. IOAG

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participating Agencies should strive to comply with the IOAG's strategic guidance.

- IOP 2 (2). The IOP considers it as strongly beneficial for the IOAG to admit Membership of those Agencies having significant and relevant missions and assets respectively requiring and providing space communications and navigation cross-support. The IOAG is encouraged to invite observers from other Agencies to participate in IOAG meetings as deemed necessary.
- IOP 2 (3). Furthermore, IOAG organizational processes should be adapted to collect and process in a timely manner all the space communications and navigation requirements of other international space coordination groups (e.g., the International Space Exploration Coordination Group [ISECG], International Lunar Network [ILN], and international Mars exploration, inter alia), and to provide strategic guidance to the relevant standardization organizations (i.e., the Consultative Committee for Space Data Systems [CCSDS] and the Space Frequency Coordination Group [SFCG]).
- IOP 2 (4). The IOAG's ground-based Cross Support Service Catalog should be completed and agreed by all IOAG participants in order to establish a common basis across the Agencies for the consolidation of ground-based cross support by 2011. Agencies should agree to implement IOAG recommendations for missions which may benefit from cross-support and/or international cooperation. It is an IOAG goal to have a plurality of the participating Agencies capable of providing ground-based cross support of an agreed common IOAG Service catalog by the end of calendar year 2015.
- IOP 2 (5). In order to achieve an enhanced end-to-end cross support service catalog that will provide the platform of standardization for extending cross support into space, the IOAG should prioritize the requirements relevant to space communications interoperability and cross-support and should urge the CCSDS to adjust their work accordingly. In this regard, the IOP-2 endorses IOAG Resolution 12.9.1. IOP-2 recognizes the authority of the IOAG to prioritize future work as necessary.
- IOP 2 (6). The IOAG's Space Internetworking Strategy Group (SISG) should formalize a draft Solar System Internetwork (SSI) Operations Concept and candidate architectural definition in time for IOAG-13 and should prepare a mature architectural proposal for review and endorsement at the third Inter-Operability Plenary meeting (IOP-3). At that time, the IOAG is requested to present an enhanced service catalog for endorsement. The IOP Agencies should ensure representation from their programs and projects to work with SISG to identify potential missions which may benefit from adoption of the SSI-related standards, leading to a gradual build up of in-space and ground-based space internetworking infrastructure.
- IOP 2 (7). In the course of its deliberations, the IOP-2 was encouraged by the progress made to date, and stressed the importance of safeguarding the achievements made throughout the past years in cross-support and interoperability, in particular, maintaining compatibility with prior recommendations.

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3 Core Tasks 2009

IOAG tasks are classified as core tasks if their implementation is primarily performed by IOAG (and not other unrelated working groups) and if they lead within 2009 to clearly identified and concrete outcomes.

Five core tasks have been identified for 2009:

- Revision of IOAG Terms of Reference and Operating Procedures
- Improvement of presentation and visibility of the IOAG Mission model, Communication Assets and Recommended Standards
- Elaboration of a draft point-to-point Cross Support Service Catalog
- Initial definition of a multipoint Cross Support Service Catalog
- Draft definition of a Solar System Internetwork Operations Concept and candidate Architecture

The tables below define the tasks, identify the activities, the implementation approach and the expected outcomes for the core tasks of the year 2009 and their continuation in the following ones, as applicable. The connection between the core tasks and both the objectives assigned by the IOP-2 or the ones in the terms of reference of IOAG are also identified.

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WP-Core-1 : Revision of IOAG Terms of Reference and Operating Procedures

Definition	<p>While the scope of the IOAG remains unchanged, following the IOP-2, there is a need to clarify its organization and processes (e.g.: membership or decision process) so as to improve the continuity and reactivity of the IOAG. Moreover, the objectives of the IOAG for the next year(s) are to be established in the form of a work plan that will realize these objectives.</p>
Related Objectives	<p>IOP2 (1), (2) & (3)</p>
Activities	<ol style="list-style-type: none">1. Develop and approve new ToR's.2. Develop and approve IOAG Operating Procedures.3. Develop and approve 2009 IOAG Work Plan.4. Iterate with organizations in interface to adapt the Work Plan to commonly agreed objectives and implementation steps.
Implementation	<p>The documents (1), (2) and (3) will be drafted by the IOAG Chairman, with the help of the Secretariat, and will then be circulated for review and comments.</p> <p>If required, according to the nature and number of the comments received, one videoconference (or more) may be called at the end of the review cycle, in order to finalize the documents and have them approved.</p> <p>In parallel, the 2009 membership of the IOAG will be completed according to the IOAG action items AI-12-11 (CNSA) and AI-12-12 (BNSC). The Secretariat is in charge of this activity.</p> <p>In the establishment of each liaison with another organization, it will be one initial activity of the liaison to review and adjust the IOAG Work Plan, in order to phase the planning and to take into account what is really achievable in the periods of activities.</p>
Expected Outcomes	<ul style="list-style-type: none">- Issue 3.0 of the IOAG ToR's- Issue 1.0 of the IOAG Operating Procedures- Issue 1.0 of the 2009 IOAG Work Plan
Next steps	<p>The ToR's and Operating Procedures are assumed to be quite stable in the next years; modifications may be accommodated as defined in the procedures.</p> <p>The Work Plan may be revised in 2009, in particular following the feedback expected from the organizations in interface. More likely, these modifications will come with the 2010 Work Plan.</p>

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WP-Core-2: Improvement of presentation and visibility of the IOAG Mission model, Communication Assets and Recommended Standards

Definition	<p>The mission model established and maintained by the IOAG is to be adapted to provide sufficient information to identify the major parameters and services that these missions require.</p> <p>The communication assets list established and maintained by the IOAG is to be adapted to provide sufficient information to identify the major parameters and services that these assets may provide. Such assets may include tracking stations but also other cross support points, as they become involved with the mission model, for instance, relay satellites of the Earth or orbiting other planets.</p> <p>There is a need to clearly point out the standards agreed upon and deployed by the IOAG member agencies. Such standards must be clearly known and their infusion status must be provided.</p>
Related Objectives	<p>ToR – (a), (b), (c)</p> <p>IOP2 (1), (3), (7)</p>
Activities	<ol style="list-style-type: none">1. Define a new template for the mission model that highlights the services required and provided.2. Define a new template for the communication assets (ground based and space based) that takes into account the agreement with SFCG (IOAG AI 12-2) and that highlights the available cross support capabilities.3. Collect the inputs from the IOAG members to fill these two above tables with information pertaining to their agencies.4. Identify the previous agreements reached in IOAG, on the recommended standards and cross support services, and establish a new table that points out those recommended by the IOAG community.5. Collect the inputs from the IOAG members to fill a table showing the infusion status of the recommended standards in their agency.6. Display the above elements in the public pages of the IOAG web site, for information of the agencies, the standard organizations or the user communities.7. Keep the above elements up to date on the website.
Implementation	<p>The IOAG secretariat is responsible for proposing the new templates and of collecting the inputs from the agencies. The secretariat is also in charge of managing these elements and their subsequent updates on the website. This will be coordinated via email with the objective to have all information available on the website at IOAG-13.</p> <p>The Heads of Delegations will ensure that the information</p>

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required to fill these tables is provided in due time by their agency. They will provide updates as required so that the information on the web pages is always current.

Expected Outcomes

- New IOAG mission model table on the website
- New IOAG communication assets table on the website
- New IOAG recommended cross support standards and services table on the website
- New IOAG standard infusion status table on the website

Next steps

It is likely that in the initial definition of the new tables, the cross support services realization are limited to those required by the current point to point and initial multipoint internetworking cross support scenarios, which will be enhanced with the elaboration of the Solar System Internetwork (SSI) Operations Concept and Architecture.

Based on the individual recommended cross support services (which themselves reference the appropriate CCSDS standards) in the point-to-point Cross Support Service Catalog IOAG will have to define a new template for a table of the realization of cross support capabilities of each agency (cross support services realization table) .

Based on the draft individual recommended cross support services (which themselves reference the appropriate CCSDS standards) in the multipoint internetworking Cross Support Service Catalog IOAG will have to define a new template for a table of the realization of cross support capabilities of each agency (cross support services realization table).

Such tables should then replace the current standards infusion table.

To keep the tables up to date is a collective permanent action of the IOAG delegates, under the coordination by the secretariat. It will be a pre-requisite for the new members to provide the information related to their agency before they are formally admitted to IOAG (TBC).

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WP-Core-3: Elaboration of a draft ground-based Cross Support Service Catalog

Definition	<p>The ground-based Cross Support Service Catalog defines the cross support services for a communication scenario of a point-to-point Spacelink between ground station and satellite. The overall cross support scenario involves a connection between agency A control center and agency A satellite via an agency B ground station, short ABA scenario, with two cross support interfaces:</p> <ol style="list-style-type: none">1. agency A control center to agency B ground station (Space Link Extension Interface)2. agency B ground station to agency A satellite (Space Link Interface) <p>The catalog will list the services and protocols over the above interfaces to be used for a cross support.</p> <p>This is clearly a step towards a more complete catalog, to be called “point-to point Cross Support Service Catalog” that may also address those services required to extend the above configuration to an orbiter and a lander but still with no internetworking features.</p>
Related Objectives	<p>ToR (e), (f.), (h) IOP2 (4)</p>
Activities	<ol style="list-style-type: none">1. Review the list of ground-based Cross Support services submitted at the IOAG-12 (W. Hell presentation). This list will serve as a basis for the service catalog.2. Elaborate the catalog taking into account the related outcomes of the SISG activities.3. Review this document at IOAG level.4. Submit the document to CCSDS for information with an associated recommendation in case existing standards have to be modified or new standards have to be developed.
Implementation	<p>(Agency TBD) will take the lead to establish the ground-based Cross Support Service document. Agencies (Agency 1 TBD), (Agency 2 TBD), (Agency 3 TBD) ... will support this activity in the editorial phase.</p> <p>The document is expected for presentation to the members at the IOAG-13.</p>
Expected Outcomes	<p>- Draft ground-based Cross Support Service Catalog, for adoption as a resolution at IOAG-13.</p>
Next steps	<p>An iterative process is possible with CCSDS as the working group in charge of Cross Support Service Architecture may need some inputs or validations from IOAG.</p>

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WP-Core-4: Initial definition of a multipoint Cross Support Service Catalog

Definition	<p>The multipoint internetworking Cross Support Service Catalog defines the cross support services for a communication scenario involving two or more spacecraft, still in a point to point configuration for the end to end communications.</p> <p>The two spacecraft scenario, also called relay scenario, involves typically a relay Orbiter and a Lander spacecraft. The agency A Lander control center communicates to the agency B Orbiter control center, which communicates to agency B Orbiter, which communicates to agency A Lander, short ABBA scenario. This scenario exposes two cross support interfaces:</p> <ol style="list-style-type: none">1. agency A Lander control center to agency B Orbiter control center interface2. agency B Orbiter to agency A Lander (Relay Link Interface) <p>The catalog will list the services and protocols over the above interfaces to be used for a cross support.</p> <p>This is clearly a step towards a more complete catalog, to be called “multipoint internetworking Cross Support Service Catalog” that will also address those services required to extend the above configuration to several orbiters and landers with internetworking features.</p>
Related Objectives	<p>ToR (e), (f), (h). IOP2 (5)</p>
Activities	<ol style="list-style-type: none">1. Review, complement and revisit as required the list and priorities for the development of new or improved multipoint Cross Support services as established at the IOAG-12 (refer to IOAG – Resolution 12-9-1).2. Elaborate the draft catalog, taking into account the related outcomes of SISG activities.3. Review this document at IOAG level.4. Submit the document to CCSDS for information with an associated recommendation in case existing standards have to be modified or new standards have to be developed.
Implementation	<p>The above activities (1) and (2) are to be conducted in a videoconference (or an IOAG opportunity meeting), taking into account the related inputs and proposals from the SISG.</p> <p>Status of activities (3) and (4) will be reviewed at IOAG-13 to check the consistency with the SISG presentation.</p>
Expected Outcomes	<p>Draft service catalog, covering the multipoint Cross Support scenario.</p>

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Next steps

The IOAG will identify candidate missions that could implement multipoint cross support and make sure that the IOAG inputs are available in due time for those.

The scope of work of the CCSDS Cross Support Service Architecture has to be defined after delivery of the final SISG SSI Architecture in 2011.

Other services will be added to the catalog at a later stage, as their definition becomes available and as prioritized by the IOAG in the next years.

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WP-Core-5: Initial definition of the architectural elements of a Solar System Internetwork (SSI)

Definition	<p>The IOP-2 has established the objective of an advanced proposal for a Solar System Internetwork (SSI) at the IOP-3 (in 2011-2012); this includes a mature architecture and an enhanced service catalog. As a first step in that direction, a draft SSI Operations Concept and a candidate Architecture definition are expected at IOAG-13.</p> <p>IOAG-12 had already initiated this task with the confirmation of the Space Internetworking Strategy Group (SISG) as a working group of the IOAG. The IOP-2 has assigned some priorities to the works of this group in the upcoming years.</p> <p>This is clearly the step towards a final and complete IOAG catalog of services, to be called “multipoint internetworking Cross Support Service Catalog” that will extend the previously defined catalogs (two previous tasks) to cover missions requiring internetworking services.</p>
Related Objectives	ToR (e), (f), (h). IOP2 (6)
Activities	<ol style="list-style-type: none">1. Augment the participation to the SISG and call for contributions of more IOAG agencies. Also agencies representatives in the SISG are required to represent the agency future projects.2. Establish the liaisons to the ISECG and ILN so as to convey the requirements of these user communities as inputs to the SISG works (refer to the tasks WP-Liaison-1 & 2 for the implementation of this activity).3. Document the draft SSI Operations concept and candidate architecture and present the results to the IOAG-13.4. Elaborate on the next steps in terms of roadmap towards the IOP-3 and beyond.5. Review and validate this document at IOAG level.6. Identify potential missions that may serve as demonstrators for the SSI-related standards.
Implementation	<p>The above activity (1) is to be conducted by the Heads of Delegation. The Secretariat will send reminders according to the updated status.</p> <p>The SISG is tasked to conduct the activities (3) and (4) as the in Space Cross Support scenario is the first one on the way to a more complete internetworked scenario.</p> <p>The activity (5) is expected to be conducted at IOAG-13 as a result of the presentation of the intermediate report of the SISG</p> <p>The activity (6) may be initiated in 2009, taking into account the</p>

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opportunities reported by the IOAG Members ; nevertheless, it is likely that such opportunities need be continuously explored in the next years.

Expected
Outcomes

Draft SSI Operations concept and candidate architecture

Next steps

After the IOAG-13 and pending the resolutions and actions to be decided then, the following activities may be anticipated:

- continue the definition of a SSI architecture to be reviewed at the next IOAG meetings before the IOP-3.

- submit the draft documents to CCSDS as an input to their works.

The IOAG will continue to seek demonstrator opportunities but will also make sure that the lessons learned from the implementations will be injected in the process of definition of the services and architecture.

For the longer term but as much in advance as possible, the IOAG will also identify potential missions that may benefit from adoption of SSI-related standards, in order to build up an internetworking architecture.

The final product will be an enhanced service catalog, relying on a global operations concept, a mature architecture and a governance concept for the SSI.

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4 Tasks in collaboration with other organizations

The role of IOAG with existing groups, as directed by the IOP-2, will be primarily to coordinate the aspects to space communications and navigation, for ensuring the consistency of the tasks conducted by the different communities.

Four strategic tasks have been identified for 2009:

- Definition and implementation of a liaison with the ISECG to collect their requirements in the domain of Space Communications and Navigation
- Definition and implementation of a liaison with the ILN to collect their requirements in the domain of Space Communications and Navigation.
- Continuation and improvement of the existing liaison with the CCSDS to better convey the requirements from the IOAG and the users' communities in a timely manner relative to the domain of the Standards for the Space Communications and Navigation.
- Continuation and improvement of the existing liaison with the SFCG to better convey the requirements from the IOAG and the users' communities in a timely manner relative to the domain of the Frequencies and Spectrum for the Space Communications and Navigation.

The tables below are constructed the same way as those for the core tasks. As a first activity for all of the tasks listed below, the identified organizations and working groups need to be approached for consolidating the tasks objectives and work to be performed. It has to be verified what can be achieved within 2009.

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WP-Liaison-1: Definition and implementation of a liaison with the ISECG

Definition	<p>The IOP-2 has identified the International Space Exploration Coordination Group (ISECG) as a crucial organization to interface with the IOAG and to represent the user community of the Space Exploration missions. The requirements from this community, in the domain of the Space Communications and Navigation, should be collected by the IOAG and aggregated to the general context of the requirements the IOAG manages with its mission model.</p> <p>The associated scenarii, operations concept and elements of architecture will be of value for the works of the IOAG in the definition of its future cross support contexts.</p> <p>The IOAG-12 had already been the occasion of a first contact with a representative of the ISECG. This relationship is to be formalized in terms of organization and the workflow is to be defined into more details.</p>
Related Objectives	<p>ToR (a), (b). IOP2 (1), (3).</p>
Activities	<ol style="list-style-type: none">1. Contact the ISECG and propose a permanent liaison with the IOAG (IOAG AI 12-7); identify initial points of contact to document the understanding, including the operational interfaces and the procedures that will enable the two organizations to exchange the information needed on both sides.2. Draft a joint communiqué or equivalent.3. Start the exchanges of information as required, according to the schedule constraints identified on either side in their on-going activities. A list of the issues to be addressed in the short, medium or long term, under this liaison, should be established and later be updated, to be used as support for the reporting on both sides.4. Validate the communiqué and identify the points of contact on each side who will be the permanent liaison officers.5. Apply the communiqué and contribute to each other's activities with liaison statements, documents, presentations in meetings, as appropriate.
Implementation	<p>The IOAG secretariat will initiate the activity (1).</p> <p>The activities (2) and (3) are to be conducted by the initial points of contact, with the support of the two secretariats. The exchanges of information should initially focus on the short term needs of the organizations, such as the IOAG activities conducted in the SISG.</p> <p>The activity (4) should be completed on the occasion of IOAG-13</p>

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	or of an ISECG meeting before the end of 2009.
Expected Outcomes	A joint communiqué defining the ISECG – IOAG relationship. An initial exchange of information on the activities of each organization that may be of short term interest for the other organization.
Next steps	The liaison with ISECG being permanent, the activity (5) is expected to be continuous and the exchanges will be as frequent as required and the reporting to either organization will be made, at least once a year, on the occasion of an ISECG or an IOAG meeting (or videoconference).

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WP-Liaison-2: Definition and implementation of a liaison with the ILN

Definition	<p>The IOP-2 has identified the International Lunar Network (ILN) as a crucial organization to interface with the IOAG and to represent a user community for the missions to the Moon. The requirements from this community, in the domain of the Space Communications and Navigation, should be collected by the IOAG and aggregated to the general context of the requirements the IOAG manages with its mission model.</p> <p>The associated scenarios, operations concept and elements of architecture will be of value for the works of the IOAG in the definition of its future cross support contexts.</p> <p>The ILN has a Communications working group (WG 2) who addresses these particular domains of interest of the IOAG (and its SISG).</p> <p>This relationship is to be formalized in terms of organization and the workflow is to be defined into more details.</p>
Related Objectives	<p>ToR (a), (b). IOP2 (1), (3).</p>
Activities	<ol style="list-style-type: none">1. Contact the ILN and propose a permanent liaison with the IOAG; identify initial points of contact to document a joint communiqué (or equivalent), including the operational interfaces and the procedures that will enable the two organizations to exchange the information needed on both sides.2. Draft the communiqué; this may be with the WG 2 of the ILN and not with the whole ILN.3. Start the exchanges of information as required, according to the schedule constraints identified on either side in their ongoing activities. A list of the issues to be addressed in the short, medium or long term, under this liaison, should be established and later be updated, to be used as support for the reporting on both sides.4. Validate the communiqué and identify the points of contact on each side who will be the permanent liaison officers.5. Apply the communiqué and contribute to each other's activities with liaison statements, documents, presentations in meetings, as appropriate.
Implementation	<p>The IOAG Chairman with the support of the secretariat will initiate the activity (1).</p> <p>The activities (2) and (3) are to be conducted by the initial points of contact, with the support of the two secretariats. The exchanges of information should initially focus on the short term needs of the organizations, such as the IOAG activities conducted in the</p>

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SISG.

The activity (4) should be completed on the occasion of IOAG-13 or of an ILN regular meeting before the end of 2009 (or latest, early 2010).

Expected
Outcomes

A joint communiqué defining the ILN – IOAG relationship.

An initial exchange of information on the activities of each organization that may be of short term interest for the other organization. This should include the ILN reports from their WG2 on Communications.

Next steps

The liaison with ILN being permanent, the activity (5) is expected to be continuous and the exchanges will be as frequent as required and the reporting to either organization will be made, at least once a year, on the occasion of an ILN or an IOAG meeting (or videoconference).

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WP-Liaison-3: Continuation and improvement of the existing liaison with the CCSDS

Definition	<p>The IOAG has established since 2004 a permanent liaison with the CCSDS. From early 2006, the CCSDS CESG co-chairs serve as liaison agents between the two organizations. In turn or depending on opportunities, they attend the IOAG meetings and report on the statements that they collect on the CCSDS side, during the CCSDS Management Council meetings.</p> <p>A drawback that has to be addressed in the interface is the rhythm of the meetings between the two organizations</p>
Related Objectives	<p>ToR (c), (d), (e), (f), (g). IOP2 (1), (3).</p>
Activities	<ol style="list-style-type: none">1. Continue to use the existing liaison as the main support for the exchanges between the two organizations. Adrian Hooke (NASA) and Nestor Peccia (ESA) act as liaison officers between IOAG and CCSDS. In the short term, this activity will concentrate on the cross support services and the internetworking, as discussed on both sides. A list of the issues to be addressed in the short, medium or long term, under this liaison, should be established and later be updated, to be used as support for the reporting on both sides.2. Collect the suggestions of the CCSDS for future improvements of the interface, in particular on the expectations of the CCSDS on inputs to the works of their working groups.3. Establish processes within IOAG that enables the reception and processing of special requests from the CCSDS, in between the IOAG meetings. A template for such requests is to be agreed by the two organizations.4. Draft a joint communiqué (or equivalent) that refers to the previous definition of the liaison, but that also takes into account the improved process.5. Validate and apply the communiqué and contribute to each other's activities with liaison statements, documents, presentations in meetings, as appropriate.
Implementation	<p>The activity (1) is under the responsibility of the nominated liaison officers.</p> <p>The next activities (2), (3) and (4) will be conducted by the IOAG Chairman, together with the liaison officers and the CMC Chairman. The Secretariats on both sides will support, in particular for the drafting of the communiqué.</p> <p>The activity (4) on the internal side will initially rely on the IOAG Chairman, as a point of contact and as the organizer of intermediate IOAG meetings (videoconferences), as required to process urgent matters.</p>

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	<p>The activity (5) is expected to be completed at the IOAG-13 or the next CMC meeting in 2009 (or early 2010).</p>
Expected Outcomes	<p>Improved processes formalized in a joint communiqué defining the CCSDS – IOAG relationship.</p>
Next steps	<p>The liaison with CCSDS being permanent, the activity (5) is expected to be continuous and the exchanges will be as frequent as required and the reporting to either organization will be made, at least once a year, on the occasion of a CCSDS or an IOAG meeting (or videoconference).</p> <p>The need and the opportunity of a joint meeting in 2010 will be discussed in the course of 2009. Depending upon the scope of such meeting, it could be a full joint session or a special interest session on a set of specific subjects. Decisions should be made at IOAG-13.</p>

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WP-Liaison-4: Continuation and improvement of the existing liaison with the SFCG	
Definition	<p>The IOAG has established since 2005 a permanent liaison with the Space Frequency Coordination Group (SFCG). From then, a member of each organization serves as liaison officer between them. The IOAG person in charge of this liaison or, depending on opportunities, both officers attend the IOAG or SFCG meetings and report on the statements that they collect on the other side.</p> <p>A drawback that has to be addressed in the interface is the rhythm of the meetings between the two organizations</p>
Related Objectives	<p>ToR (c), (d), (e), (f), (g).</p> <p>IOP2 (1), (3).</p>
Activities	<ol style="list-style-type: none"> 1. Continue to use the existing liaison as the main support for the exchanges between the two organizations. In the short term, this activity will concentrate on the frequency and spectrum utilization for inter satellite links, for the Earth, Moon and Mars missions. A list of the issues to be addressed in the short, medium or long term, under this liaison, should be established and later be updated, to be used as support for the reporting on both sides. 2. Collect the suggestions of the SFCG for future improvements of the interface, in particular on the expectations of the SFCG on inputs to their works. 3. Establish processes within IOAG that enables the reception and processing of special requests from the SFCG, in between the IOAG meetings. A template for such requests is to be agreed by the two organizations. 4. Draft a joint communiqué (or equivalent) that refers to the previous definition of the liaison, but that also takes into account the improved process. 5. Validate and apply the communiqué and contribute to each other's activities with liaison statements, documents, presentations in meetings, as appropriate.
Implementation	<p>The activity (1,2,3,4) is under the responsibility of the nominated liaison officers: Enrico Vassallo (ESA).</p> <p>The activities (2), (3) and (4) will be conducted with the support of the IOAG Chairman.</p> <p>The activity (5) is expected to be completed at the IOAG-13 or the next SFCG meeting in 2009 (or early 2010).</p>
Expected Outcomes	<p>Improved processes formalized in a joint communiqué defining the SFCG – IOAG relationship.</p>
Next steps	<p>The liaison with SFCG being permanent, the activity (5) is expected to be continuous and the exchanges will be as frequent</p>

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as required and the reporting to either organization will be made, at least once a year, on the occasion of a SFCG or an IOAG meeting (or videoconference).

The need and the opportunity of a joint meeting in 2010 will be discussed in the course of 2009. Depending upon the scope of such meeting, it could be a full joint session or a special interest session on a set of specific subjects. Decisions should be made at IOAG-13.

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5 Initiatives for improvement of IOAG internal processes

In many areas of IOAG activities the flow of information within the IOAG, with external organizations of interest and with the agencies or their partners is critical with respect to the overall efficiency of the organization. The table below summarizes the special tasks assigned to the Secretariat for an improvement of the tools and methods used in the various procedures of the IOAG.

WP-Processes-1: Improvement of the IOAG internal processes	
Definition	<p>The IOAG Secretariat supports the organization in many of its areas of activities and plays a central role in the flow of information within the IOAG, with external organizations of interest and with the agencies or their partners.</p> <p>The tools utilized by IOAG and managed by the secretariat need be kept as efficient as possible so as to facilitate the activities of all.</p>
Related Objectives	IOP2 (3).
Activities	<ol style="list-style-type: none">1. Continue to improve the IOAG website, in particular on the public side, to reflect the role, membership, activities and achievements of the IOAG. The final outcomes of the IOAG core tasks in the present Work Plan should be displayed on the public website of IOAG.2. Continue to improve the IOAG website, in particular on the secure side, to provide tools for the members to access the documentation related to each meeting (archives or in preparation) or to contact members or liaisons. Special areas of interest are the action items (lists, elements of progress or closure), the resolutions submitted for discussion, the documents submitted for review and comments, the schedules for next IOAG videoconferences or meetings.3. Identify how the website could be used as a support to exchange information with the organizations having liaisons with IOAG : initially, ISECG, ILN, CCSDS and SFCG. Also, the schedules of the meetings of such organizations could be integrated into a global IOAG schedule (2 years horizon).4. Evaluate improved methods for registration to next meetings and videoconferences.5. Develop a new permanent logo that reflects the IOAG main area of interest while it no longer shows the individual logos of the member agencies.6. Identify and validate a compatible and reliable system that enables to hold videoconferences or teleconferences with all members.

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7. Set up tools to make sure to distribute announcements, reminders, answers, etc... in a timely manner with reference to the assigned due dates.

Implementation	The secretariat is in charge of all activities. The schedule of implementation of the different tasks is made by the agency funding the secretariat. The achievements may need an acceptance by the IOAG Chairman only or by the members, depending upon the cases.
Expected Outcomes	Improved website. New IOAG logo. Reliable tools and processes.
Next steps	New objectives will be established every year so as to improve the outreach of IOAG and its internal efficiency.

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6 Reporting Activities (TBC)

IOAG will develop a synthetic annual report to inform the participating Agencies about the activities and achievements of IOAG. The IOAG Chairman will develop the 1st annual report, with the support of the Secretariat, utilizing inputs from all participating Agencies and reporting in particular on the execution of the 2009 activities as described in the present work plan.

The Annual Report will be deposited on the public web site of IOAG in the first quarter of 2010.

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7 Implementation Schedule

The figure below shows the overall IOAG activity schedule for 2009

(To be later established and be distributed before IOAG-13 as an update to the work plan)

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8 Resources

X: Lead Function x: Participation	Secretariat	Chairman	ASI	CNES	DLR	ESA	ISRO	JAXA	NASA	RFSA	BNSC	CNSA
CORE TASKS												
Terms of Reference and Operating Procedures	x	X										
Mission model, Communication Assets and Recommended Standards	X		x	x	x	x	x	x	x	x		
Point-to-point Cross Support Service Catalog				x	x	x		x	x			
Multipoint Cross Support Service Catalog				x	x	x		x	x			
Solar System Internetwork (SISG)				x	x	X		x	X		x	

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X: Lead Function x: Expressed Interest of Participation	Secretariat	Chairman	ASI	CNES	DLR	ESA	ISRO	JAXA	NASA	RFSA	BNSC	CNSA
COLLABORATIONS WITH OTHER ORGANIZATIONS												
Liaison with ISECG	x	x										
Liaison with ILN	x	x										
Liaison with CCSDS	x	x				X			X			
Liaison with SFCG	x	x				X						
IMPROVEMENT OF IOAG TOOLS AND METHODS												
Improvement of tools and methods	X	x							x			
REPORTING												
Annual report	x	X	x	x	x	x	x	x	x	x		