

WORKPLAN OF INTERNATIONAL SPACE EXPLORATION COORDINATION GROUP

**Update following 4th ISECG Meeting,
held in Noordwijk, the Netherlands, 2–3 December 2009**

Issued March 2010

1 Introduction

The overall scope of the ISECG activities is defined in its term of reference as follows:

‘The scope of the ISECG activities will be broad and strategic. The ISECG will focus on developing non-binding findings, recommendations and other outputs as necessary for use by Participating Agencies. Areas for initial consideration for the ISECG activities include:

- Identification of architectures to promote standards and interoperability;
- Methods for sharing scientific data and related analysis;
- Identification of common services, allowing for the development of shared infrastructures;
- Mechanism(s) to allow the provision of payload opportunities;
- Ways and means to include broader future participation in the planning and coordination process;
- Assessment of the requirements for any relevant international legal agreements;
- The development of a common international exploration coordination tool to enhance the implementation of the coordination process.’

At the 1st ISECG meeting held in November 2007 in Berlin, the objectives of activities to be performed within 2008 were discussed and agreed. At the second ISECG meeting held in Montreal in July 2008, it was agreed that the workplan would be updated after each meeting. The updated version will then be the new baseline for ISECG activities up to the subsequent meeting. The agency chairing the meeting will be responsible to update the workplan as a deliverable to the new chair.

This document details the ISECG work objectives and defines an associated implementation plan as primarily addressed through the ISECG working groups. It was updated following the 4th meeting in Noordwijk, the Netherlands, on 2–3 December 2009. Specific deliverables to be produced for the 5th ISECG meeting scheduled for mid 2010 in the United States are identified.

The 2010 ISECG workplan responds to 3 overarching strategic objectives:

- Demonstrate the effectiveness and value of ISECG to senior management of participating agencies by developing and presenting products within 2010, building on work performed in 2009, which further the goals of ISECG and are of mutual benefit to the participating agencies in advancing their exploration policies and plans;
- Maintain and increase the engagement of all ISECG members in the advancement of the Global Exploration Strategy;

- Increase the visibility of ISECG by communicating its existence and purpose to relevant international groups, organizations and stakeholder communities through appropriate means.

In line with these objectives and in recognition of the ongoing review and preparation of exploration in many agencies throughout 2010 the following specific actions have been targeted for implementation in 2010:

- Engagement of agency senior managers (Head of Programme level) on ISECG role and forward activities.
- Development of the ISECG Reference Architecture for Human Lunar Exploration by the International Architecture Working Group (IAWG) by mid 2010.
- Evaluation of the ISECG Reference Architecture for Human Lunar Exploration against common goals by the International Objectives Working Group (IOWG) and the IAWG by mid 2010.
- Progress towards development of the Global Exploration Roadmap and an assessment of resultant technology development needs by the Exploration Roadmap Working Group (ERWG, former working group on “Mapping the Barriers to Human and Robotic Exploration”).
- Continuation of the development of the INTERNATIONAL Space Exploration Coordination Tool (INTERSECT) and its population with agencies provided data to support the ISECG working groups.
- An expansion of the Enhancement of Public Engagement Working Group to include the definition and preparation of coordinated public engagement activities and implementation of pilot activities; development of the 2010 Annual Report; update and maintenance of a standard ISECG overview presentation; and development of suggestions to enhance ISECG communication with relevant stakeholders, including opportunities to engage in international conferences and the use of the ISECG website.
- Conduct initial planning for a workshop to discuss international collaboration models for space exploration.
- Update the inventory of existing multilateral working groups with an eye toward ensuring proper synergies between ISECG and other related activities.
- Preparation of the 5th ISECG meeting planned in mid 2010 by NASA.

2 ISECG Working Groups

The tables below define the objectives, activities and implementation approach for the ISECG working groups established to implement the specific actions identified above.

INTERNATIONAL ARCHITECTURE WORKING GROUP (IAWG)	
Lead Agency: NASA	
Objective	<p>Serve as the ISECG working group assigned to lead multilateral architecture definition work, including the identification of interfaces that could benefit from standardization to enhance interoperability.</p> <p>The IAWG will also lead an evaluation process that will validate that the architecture enables, and is traceable to, a set of common ISECG objectives.</p>
Activities	<p>Near Term Objective (Through June 2010): Conduct Multilateral Lunar Architecture Study</p> <ol style="list-style-type: none"> 1. Expand on representative lunar exploration scenarios and characteristics <ul style="list-style-type: none"> • Explore innovative element concepts for providing desired functions • Define desired architecture elements and their key driving requirements • Understand how surface and communication elements influence transportation element requirements • Continue to pursue standardization of interfaces that will bring benefits to a global lunar exploration scenario 2. Continue dialog/recommendations on interfaces which benefit from standardization <ul style="list-style-type: none"> • Maintenance of the Interface Standards Matrix as a tool for guiding the work of appropriate interface standardization 3. Provide a forum for discussion of strategic questions that impact architectures 4. Inform policy/programmatic/partnership decisions from a technical perspective 5. Establish a team to conduct a Multilateral Evaluation of a set of common, ISECG exploration objectives (see International Objectives Working Group). To the extent possible, articulate shared and potentially emerging priorities for lunar exploration and determine which objectives are achieved in the scenarios outlined by the IAWG and how the scenarios enable their achievement
Implementation	Conduct series of workshops that include ISECG members, their experts and personnel, and if necessary additional experts as identified by ISECG members.
Potential Deliverables at 5 th ISECG Meeting	ISECG Reference Architecture for Human Lunar Exploration (by June 2010) to aid decision making by any individual agency

INTERNATIONAL OBJECTIVES WORKING GROUP (IOWG)	
Lead Agency: JAXA/NASA	
Objective	The IOWG collects agency objectives and distills these objectives into a destination-specific set of common goals. Assisting the IAWG, the IOWG will also lead an evaluation process that will validate that the architecture enables, and is traceable to, a set of common ISECG goals.
Activities	Near Term Objective (Through June 2010): <ol style="list-style-type: none"> 1. Establish a team to conduct a multilateral evaluation of a set of common ISECG exploration goals to the extent possible, articulate shared and potentially emerging priorities for lunar exploration and determine which goals are achieved in the scenarios outlined by the IAWG and how the scenarios enable their achievement. 2. Establish methods by which the IAWG campaigns are evaluated against common goals and present the results of this analysis to the ISECG.
Implementation	Continue to conduct a series of workshops, in coordination with IAWG, that include ISECG members, their experts and personnel, and if necessary additional experts as identified by ISECG members.
Potential Deliverables at 5 th ISECG Meeting	A set of common lunar goals to drive the ISECG Reference Architecture for Human Lunar Exploration (by June 2010) along with analysis to support responsiveness of the architecture to goals.

INTERSECT	
Lead Agency: CSA and ESA	
Objectives	Further develop INTERSECT capabilities and utilise tool in support of International Architecture Working Group and ISECG action to further develop the “Mapping of the Exploration Journey”.
Activities	<ul style="list-style-type: none"> ○ Launch “manual” INTERSECT operations ○ Maintain and further develop INTERSECT user requirements supported by consultation of relevant ISECG Working Groups (IAWG, Mapping the Exploration Journey) as well as the ILN Working Group and international terrestrial analog working group and relevant groups ○ Initiate development of web-based INTERSECT applications ○ Coordinate development of 2010 Annual Report
Implementation	<u>INTERSECT Working Group</u> : A virtual work team will be set-up and co-led by CSA and ESA. Interested ISECG participating Agencies will nominate participants to this work team. <u>INTERSECT Operations</u> : Intersect operations will be supported by the ISECG secretariat. Each Agency which intends to make use of INTERSECT will nominate a focal point of contact.
Potential Deliverables at 5 th ISECG Meeting	Consolidated Intersect User Requirements Document Status report on planned missions and capability development

Exploration Roadmap Working Group	
Lead Agency: ESA and NASA	
Objectives	Begin the process of developing a Global Exploration Roadmap which will inform Agency's near-term decisions on long-term R&D investments, risk mitigation activities, and highlight opportunities for complementary and synergetic investments as well as early opportunities for collaboration.
Activities	<ul style="list-style-type: none"> • Identify and characterise the significant technological, operational and programmatic challenges associated with international exploration mission scenarios and architectures defined by the IAWG and any other relevant architecture done by an individual agency and analyzed through comparative architecture assessments. • Identify and articulate the key exploration challenges associated with human exploration, by destination, including the ISS, the Moon and Mars. • Define, analyse and assess considerations for sequences of international mission scenarios. • Compare individual Agency's roadmap defined to prepare for the future implementation of these mission scenarios addressing terrestrial R&D development and risk mitigation activities utilising also analogue missions, space infrastructures such as ISS and robotic missions. • Build the Global Exploration Roadmap at mission and capability level integrating also planned missions utilising INTERSECT. • Develop a global exploration risk reduction strategy using the Global Exploration Roadmap as framework and based on the identification of gaps, overlaps and synergies between Agency's individual technology development plans and roadmaps.
Implementation	Organisation of working group meetings in combinations with the planned International Architecture Working Group (IAWG)
Potential Deliverables at 5 th ISECG Meeting	1 st draft of Global Exploration Roadmap 1 st draft of Global Risk Reduction Strategy

ENHANCEMENT OF PUBLIC ENGAGEMENT	
Lead Agency: DLR	
Objectives	Develop a common strategy for the enhancement of public engagement to promote exploration and implement coordinated actions.
Activities	<ul style="list-style-type: none"> • Provision of archive for sharing of educational material • Development of plan for touring exhibition • Establishment and maintenance of relations with other relevant groups (e.g. ISEB)/ • Preparation of follow-up workshop on public engagement with Agency experts • Contribute to development of ISECG website to ensure its relevance for public engagement
Implementation	<p>This WG will:</p> <ul style="list-style-type: none"> • conduct regular telecons regarding the WG progress and forward work. • Participate in upcoming meetings of existing relevant groups to build relations. <p>This WG plus experts will: conduct workshops dedicated to specific activities (e.g. the sharing of educational material) as appropriate.</p> <p>This WG together with all other ISECG WGs will work closely to:</p> <ul style="list-style-type: none"> • raise awareness among WG members themselves regarding ISECG information possibly relevant to the public (e.g. a member of this WG participates in meetings of the other WGs) • align activities accordingly (like at the last meeting: which kind of presentation would be appropriate for which conference)
Potential Deliverables at 5 th ISECG Meeting	Updated version of the ISECG Overview Presentation

International Collaboration Workshop	
Lead Agency : JAXA	
Objectives	Building and gathering information regarding large scale international collaborations, preparing for the future collaborations in space explorations.
Activities	<ul style="list-style-type: none"> • Map and survey of how the existing and past large scale international collaborations are/were built including lessons learned • Initial planning for a future WS (period TBD), including consideration of potential invited experts such as in the field of policy
Implementation	<p>Hosting discussion meetings venue periodically.</p> <p>Asking inclusively participations from the agencies who are interested in.</p> <p>Preparation for WS through telecons</p>
Potential Deliverables at 5 th ISECG Meeting	Developing schedule, organizing team to arrange WS,

Establish and Maintain WORKING RELATIONSHIPS WITH EXISTING INTERNATIONAL WORKING GROUPS	
Lead Agency: CSA	
Objectives	<p>Help ensure ISECG activities are complimentary with relevant existing multilateral working groups through</p> <ul style="list-style-type: none"> • Informing existing groups of the ISECG existence, its mandate and activities • Acquiring a better knowledge of the activities of existing groups and initiate collaborative activities, as appropriate.
Activities	<ol style="list-style-type: none"> 1. Map existing groups potentially dealing with space exploration or related matters, assess synergies between ToR of these groups and ISECG ToR and compile information on Membership of these groups. 2. Identify in liaison with these groups specific areas in which ISECG could benefit from ongoing activities and define the scope and approach for the establishment of a collaborative relationship. 3. When appropriate, invite participants from other groups to ISECG meetings to inform ISECG of their activities.
Implementation	<p>Working closely with the Public Engagement Working Group, set-up small working group for the development of the ISECG information package and mapping and analysis of existing working groups supported by ISECG secretariat. Share between all participating agencies the tasks of informing existing working groups according to an agreed process.</p> <p>The following milestones are planned:</p> <ul style="list-style-type: none"> • Development of ISECG information package by next ISECG • Review of synergies between ISECG and existing working groups at 5th ISECG meeting
Potential Deliverables at 5 th ISECG Meeting	Updated inventory of relevant existing working groups an assessment of synergies with ISECG activities.

3. Reporting Activities

(Annual Report)

ISECG will continue to produce an annual report to inform the wider community about the activities and outcomes of ISECG. Annual report will be distributed by the Secretariat. The fourth annual report for 2010 activities will be lead by the Public Engagement Working Group.

4.Resources

X: Lead Function x: Expressed Interest of Participation	ASI	BNSC	CNES	CNSA	CSA	CSIRO	DLR	ESA	JAXA	KARI	NASA	NSAU	ROSCOSMOS
WORKING GROUPS													
INTERSECT	x		x		X			X	x		x		
IAWG	x	x			x		x	x	x	x	X		
IOWG	x	x			x		x	x	X	x	x		
ERWG	x				x		x	X	x		X		
PUBLIC ENGAGEMENT		x			x		X	x	x		x		
RELATION WITH EXISTING WG'S	x	x	x		X			x	x		x		
ICWS		x			x			x	X		x		
ADMINISTRATIVE SUPPORT AND REPORTING													
ISECG SECRETARIAT								X					
ANNUAL REPORT	x	x	x	x	x	x	x	x	x	x	X	x	x

5. Meeting Plan of ISECG Working Groups and Planned ISECG Presentation at International Conferences

The following meetings have been planned by the ISECG Working Groups in 2010 (notional draft plan for review):

Date	Location	Key Meeting Objectives of Working Groups Present
23 – 29 January	Houston, US	IAWG: Select the preferred lunar exploration campaign IOWG: Further develop reference utilization activities and assess campaign options against common goals ERWG: Prepare future working meeting on analysis of exploration roadmaps and risk reduction roadmap
22 – 26 February	Langley, US	CIT: Consolidate preferred campaign and analyse critical functions
22 - 25 March	Montreal, Canada	IAWG: Review first draft of International Reference Architecture for Human Exploration IOWG: Assess selected campaign against reference utilisation activities ERWG: Develop the first outline of the Global Exploration Roadmap
TBD April	TBD	CIT: optional
11 – 14 May (TBD)	Japan	IAWG: Finalise International Reference Architecture for Human Exploration IOWG: Finalise products ERWG: Consolidate the Global Exploration Roadmap
TBD October	TBD	IAWG: Review lessons learned and determine destination products

ISECG representation at the following international conferences is planned:

Date	Location	Conference	Planned Activities
31 May – 3 June	Beijing, China	Global Lunar Exploration Conference	Plenary Session and invited paper on IAWG
18 – 25 July 2010	Bremen, Germany	38 th Scientific Assembly (COSPAR)	Invited paper on ERWF/ IAG highlighting opportunities for science
27 Sept. – 1 October	Prague, Czech Republic	61 st International Astronautical Conference	Proposal under elaboration, to include a Plenary Session