

## **International Academy of Astronautics**

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### **Minutes of Meeting IAA Commission IV**

#### **Space Systems Operations and Utilization**

March 20, 2007

Location : IAA, Paris

## **1. Welcome and Introduction**

The list of participants is given in Attachment 1.

The minutes of last meeting, October 1, 2006 in Valencia, are approved.

Status of pending actions from this meeting are reported by R. Sandau :

- Study group Hitch-hiking to the Moon : R. Sandau organized on October 3, 2006 a meeting between L. Alkalai, B. Foing and J.S. Chern, in order to agree on the delivery of a first outline of the report. Status is discussed in §2.2.
- R. Sandau proposed to the Scientific Activities Committee (SAC) in Valencia a new Study Group on "Quality considerations for space programmes", based on the outline given by M. Hernandez. Status is discussed in §2.3.
- R. Sandau provided the SAC with the proposals for change of scope of Commission 4, to be incorporated in the Bylaws (see §4).

## **2. Study Groups activities**

Commission 4 has 2 on-going Study Groups : Knowledge Management, Hitch-hiking to the Moon. The approval process for Study Group on Quality considerations for space programmes is going on, and a proposal for a new Study Group has been submitted to Commission 4.

### **2.1 SG 4.1 - Knowledge Management**

The Study Group status report is given in Attachment 2

The main points are :

- A consortium of US aerospace industry (Northrop Grumman, Aerospace Corporation, Boeing, Pratt Whitney Rocketdyne, Lockheed), universities (University of California at Irvine, California State University) and NASA is having meetings on knowledge management 4-6 times a year in California.
- A workspace has been created on Internet, allowing an active online collaboration with 85 participants (discussion forums, documents, action items)
- The first *International Conference on Managing Knowledge for Space Missions* will take place at JPL on June 26-28, 2007.

- The best papers from IAC 2005 and other discussions were featured in the March-April publication of the *Journal of Knowledge Management, Special Issue: Knowledge Management In the Space Industry*. This special edition was edited by Philip Olla and Jeanne Holm.
- Discussions have begun concerning the position paper on the recommended approaches for an aerospace organization to follow in knowledge management. The paper outline is expected to be developed soon. Writing will continue between now and September 1. A draft position paper will be routed and reviewed at the Hyderabad conference.

## **2.2 SG 4.5 - Hitch-hiking to the Moon**

The Study Group is behind the schedule. The first outline of the report has not been delivered. J.S. Chern has proposed a first draft (Attachment 3), which is still waiting comments from the participants including the co-chairs.

The next decisive step shall be the Small Satellites Symposium in Berlin : there should be a meeting of the Study Group, where the outline shall be hopefully drafted, and the key contributors concretely identified. An updated schedule is also expected from this meeting.

It will be proposed to B. Foing to act as additional co-chairman.

## **2.3 Quality considerations for space programmes (4.6)**

The first reaction of the SAC when the proposed outline was presented at Valencia, was that addressing both programmatic and technical issues was too ambitious.

Based on this feedback, M. Hernandez has submitted a formal Study Group Proposal to the Secretary General of the IAA (Attachment 4).

R. Sandau will ask for the approval of this proposal by the SAC during the March 20, 2007 meeting.

## **2.4 New proposal : Integrated Applications Services (4.7)**

A. Ginati is proposing a new Study Group on "Integrated Applications Services". It should address the new trends towards higher integration of space based means with other means (airborne, ground, ...), in order to deliver global services to end-users.

The topic fits pretty well with the scope of Commission 4. The scope and organisation of the Study Group shall be prepared for formal presentation to the SAC in Hyderabad.

M. Grimard expressed his interest for the topic, and proposed to support A. Ginati in the process for Study Group proposal submission.

# **3. Program Committee Activities**

## **3.1 D.5 Safety & Quality**

The status of the Safety and Quality symposium for Hyderabad is the following :

- D5.1 Quality and Knowledge management : 7 abstracts,
- D5.2 Assessing the Space environment and its effects : 5 abstracts

For Glasgow IAC2008, 2 or 3 sessions will be proposed : one dealing with Safety issues for Space Tourism, one focused on Space environment, and maybe one on Knowledge Management.

### **3.2 B.4 Small Satellite Missions**

The Small Satellite Missions Symposium has received approximately 80 abstracts for Hyderabad to be distributed over seven sessions (approximate number as of March 19). The abstract review process has been chaotic and challenging due to the two mechanisms for viewing abstracts, which do not contain the same information. IAF Secretariat is aware of this and promises to have it corrected for the Glasgow IAC.

Nevertheless, after review and deliberation among the session chairs, there will be quality abstracts for all seven sessions.

For Glasgow IAC2008 7 sessions shall be proposed again.

One of the sessions might accommodate the topic Integrated Applications Services (see §2.4).

### **3.3 Stand Alone Symposium Berlin**

This symposium on Small satellites will be held on 23-26 April 2007. Details on content and organisation are given in Attachment 5.

### **3.4 First IAA Regional Conference in Africa**

Commission 4 was approached by IAA Secretary General to act as the umbrella for the first IAA regional conference "Space Science for Africa and Knowledge for Development" in Africa, Nigeria, Abuja, December 3-5, 2007.

Commission 4 agreed to act in this capacity, the details to be elaborated with IAA Secretary General and the conference organizers.

## **4. Organizational Issues**

The new Bylaws are correctly reflecting the new scope for Commission 4.

## **5. Report to the Scientific Activities Committee and to the Board of Trustees**

A report will be given about the positive status of the Safety & Quality, and Small Satellites Missions Symposia for Hyderabad.

The proposal for Glasgow will be 2 to "sessions for Safety & Quality (one being focused on Space Tourism) and 7 sessions for Small Satellites Missions (changes to be discussed regarding the focus of each session).

The approval of the Study Group "Quality considerations for space programmes" will be requested, on the basis of the formal proposal sent to Secretary General by M. Hernandez.

The principle of the new Study Group "Integrated Applications Services" will be presented, for first discussion. Formal approval is planned for SAC in Hyderabad.

## **6. Next Meeting & Action Items**

An informal meeting is planned next March 22<sup>nd</sup>, 11:00, with L. Paxton, J. Holm and R. Hornstein, to complement this meeting.

The next formal meeting of Commission 4 is planned during the Academy Day in Hyderabad, on September 23<sup>rd</sup>, 2007.

## Attachment 1 : Participants list

Name	Mail Address	Email
Rainer Sandau	DLR Rutherford Str 2 12489 Berlin Germany	<a href="mailto:rainer.sandau@dlr.de">rainer.sandau@dlr.de</a>
Max Grimard	EADS Astrium 6 Rue Laurent Pichat 75016 Paris France	<a href="mailto:max.grimard@astrium.eads.net">max.grimard@astrium.eads.net</a>
Jeng Shing Chern	National Space Organisation Remote Sensing Program 8F 9 Prosperity 1 <sup>st</sup> Road Hsinchu, Taiwan 30078	<a href="mailto:ischern@nspo.org.tw">ischern@nspo.org.tw</a>
Manola Romero	ONERA Toulouse BP 4025 2 Avenue Edouard Belin 31055 Toulouse Cedex 4 France	<a href="mailto:manola.romero@onera.fr">manola.romero@onera.fr</a>
Pierre Molette		<a href="mailto:pierre.molette@centraliens.fr">pierre.molette@centraliens.fr</a>

## Attachment 2 : SG 4.1 – Knowledge Management

### IAA Study Group Status Report

#### Responsible Commission:

- IAA Commission 4: Space Systems Operations and Utilization

#### Study Number and Title:

- S.4.1. Knowledge Management of Space Systems

#### Short Study Description:

- Define the organizational and inter-organizational issues that support or inhibit knowledge sharing amongst aerospace organizations (including capturing knowledge of our key experts and aging workforce)
- Identify and recommend standards for knowledge management activities and initiatives to promote interoperability of key systems (such as lessons learned or publications)
- Create, through consensus, a position on the recommended approaches for an aerospace organization to investigate to excel at knowledge management

#### Progress in past six months:

- See below in Progress Section.

#### Website Study Information up to date? (Study Group Membership, Study Plan and Schedule):

- Information has been updated on group collaboration site, but not the IAA site.

#### Issues requiring resolution? (recommend approach):

- Status of finalization of charter renewal by Commission.

#### Product Deliveries on Schedule?

- **Plan:** Support a better understanding among member and aerospace organizations of the ways in which they can share knowledge
  - **Action:** Hosted a one-day workshop “Collaboration and Knowledge Management in a Global Space Environment” at the *Space Mission Challenges for Information Technology Conference* on July 18, 2006, in Pasadena, California (see attached).
  - **Action:** Continue to co-lead a consortium of US aerospace industry and NASA meetings on knowledge management. Team meets face-to-face 4-6 times a year in California. Participants include Northrop Grumman, Aerospace Corporation, Boeing, Pratt Whitney Rocketdyne, Lockheed, University of California at Irvine, California State University, and NASA.
  - **Action:** Planning underway for first *International Conference on Managing Knowledge for Space Missions* to be held at JPL on June 26-28, 2007. Builds off successful conference last year in Houston for US participants (125 people). Track chairs will represent various countries and tracks focus on capturing knowledge of humans and organizations, latest research trends and technologies, applied knowledge capture and reuse, creating synergistic systems, collaboration in a global world, legal and competitive issues for international missions, and architectural challenges and solutions.
- **Plan:** Ensure that there is a set of papers from workshop participants at the 2007 IAF conference that exemplifies excellent knowledge management and quality management practices at aerospace organizations

- **Action:** Held meeting at Valencia with new and previous Working Group members to discuss possible courses of action for the group.
  - **Action:** Track was held at Valencia with seven papers presented.
  - **Action:** Merged Knowledge Management and Quality Management tracks for Hyderabad.
  - **Action:** 10 papers have been submitted for the KM and QM track for the Valencia conference. Noted that the remoteness of the location from traditional authors seems to have contributed to a decrease in the number of papers.
  - **Action:** Best papers from IAC 2005 and other discussions were featured in the March-April publication of the *Journal of Knowledge Management, Special Issue: Knowledge Management In the Space Industry*. This special edition was edited by Philip Olla and Jeanne Holm.
- **Plan:** Meetings outside of the conference would be held virtually to minimize travel and increase participation. Information will be posted on a web site for each of communication and status reference
    - **Action:** Group has an active online collaboration workspace with 85 participants (discussion forums, documents, action items) and has held face-to-face meetings at Valencia, with the Southern California KM Aerospace Group six times a year, and at the SMC-IT Conference in July.
  - **Plan:** Coordination with other key working groups such as the OMG standards committee for knowledge-based engineering and the W3C committees for interoperability
    - **Action:** Task with Sir Tim Berners-Lee (MIT and W3C) to look at standards and technologies for sharing mission data. Work (funded by JPL) focuses on mining inter-agency lunar data with expected publishing of results in July 2007.
  - **Plan:** A position paper on the recommended approaches for an aerospace organization to follow in knowledge management that would promote knowledge sharing and interoperability with other organizations
    - **Action:** Discussions have begun, paper outline expected to be developed this week. Writing will continue between now and September 1. A draft position paper will be routed and reviewed at the Hyderabad conference.

**Study Team Member Changes?**

- Core study team remains the same, expecting to incorporate a member from China this year. Currently have members from France, Germany, Hungary, Italy, Japan, India, USA, and Canada (from space agencies, academia, and industry).
- A community of practice has been developed to support the study team with a broader understanding of the issues related to industry and agency knowledge sharing, with 85 members.

**Name of person providing Study Group Status:**

- Jeanne Holm, Chief Knowledge Architect, NASA, Jet Propulsion Laboratory

**Status Report Date:**

- 20 March 2007



## Attachment 3 : SG 4.5 – Hitch Hiking to the Moon

*SG4.5, Commission IV, IAA*

### **International Study on Hitchhiking to the Moon and Beyond: Access and Opportunities for Small Satellite Missions**

Preface

SG4.5, Commission IV, IAA

Position Paper Contributors

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3.1.2 Other Studies (if any)

3.2 Organizations and Programs

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3.2.1.1 Introduction to UN/Conferences on Peaceful Use of Outer  
Space (COPUOS)

3.2.1.2 Background to UN/COPUOS

3.2.1.3 UN/COPUOS Activities

3.2.1.4 UNISPACE I, II and III

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3.2.1.5 Recommendations of UNISPACE III

3.2.1.6 Conclusions

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- 3.2.6 NASA
- 3.2.7 ESA
- 3.2.8 JAXA
- 3.2.9 ISRO
- 3.2.10 China
- 3.2.11 Operational Agencies (?)

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#### 4 Motivations for Return to the Moon

- 4.1 Science Research
- 4.2 Habitation Research
- 4.3 Steppingstone to Other Planets
- 4.4 Steppingstone to Outer Space
- 4.5 Outreach Education
- 4.6 Tourism, etc.

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#### 5 Scientific Aspects for Lunar Exploration

- 5.1 Birth of Moon
- 5.2 Water Resources
- 5.3 Chemical Resources
- 5.4 Other Resources
- 5.5 Seismography
- 5.5 Mineralogy
- 5.6 Mapping
- 5.7 Moon Motion
- 5.8 Habitation Environment
- 5.9 Outreach Education

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#### 6 Technology Aspects for Return to the Moon

- 6.1 Launch Vehicle, Chemical
- 6.2 Launch Vehicle, Solar Power, Ion
- 6.3 Launch Vehicle, Solar Power, Solar Sail
- 6.4 Launch Vehicle, Others
- 6.5 Lunar Orbiter
- 6.6 Lunar Module
- 6.7 Lunar Lander

- 6.8 Return to Lunar Orbit
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## **Attachment 4 : Proposal for Study Group “Quality Considerations for Space Programmes”**

### **Title of Study:**

Quality Considerations for Space Programmes

### **Proposer(s):**

Miguel A. Hernandez Jr  
Arnoldo Valenzuela

### **Primary IAA Commission Preference:**

**Commission 4**

### **Secondary IAA Commission Interests:**

*(From Commission 1 to Commission 6)*

## **Members of Study Team**

### **Chairs:**

**Miguel A. Hernandez Jr. - USA**

**Luigi Bussolino - Italy**

**Secretary: TBD**

### **Other Members:**

Hideo Hasegawa – Japan

Michael Ovechinnikov – Russia

Alex Melo – Brasil

Earl McNeil – USA

Rolf P. de Groot – The Netherlands

U. R. Rao (or his representative) – India

Lance Wu (or his representative) - Taiwan

Others to be identified

## Short Description of Scope of Study

### Overall Goal:

.To generate a comprehensive report addressing “quality” elements, and their implementation into space programs, that can safeguard against historic issues that have resulted in mission failures. (“Quality “ in this content encompasses the disciplines of Safety, Reliability, Risk, and Quality as well as other elements that affect the probabilities of accomplishing mission success.)

### Secondary Objective:

To establish a subject platform that will stimulate the generation/presentation of papers at future International Aeronautical Congresses sharing specific Program/Project experiences as they relate to causes of failures and successes.

### Intermediate Goals:

To deliver a report about the most frequent issues which have been encountered during past space activities, acting as a “warning” for the generation of young engineers entering the space business.

### Methodology:

To follow the classical phasing of a space project from pre-phase A up to phase E, as a guideline to review past weaknesses or failures, to analyze common root causes, to identify methods of avoidance, and to make recommendations for future projects.

### Time Line:

- Introduction of Position Paper request at the IAA Commission IV meeting in October 2006.
- Presentation of Official Proposal to form a Study Group for IAA approval.
- Study group membership organization and agreement on development approach by mid 2007.
- Status report at 2007 IAC Commission IV meeting.
- Draft report presented for review and discussion during 2008 IAC.

### Final Product (Report, Publication, etc.):

Final report for approval following the 2008 IAC

**Target Community:**

Technical and managerial personnel involved in Space Projects

**Support Needed:**

None

**Potential Sponsors:**

N/A

*To be returned to IAA Secretariat Paris fax: 33 1 47 23 82 16 email: sgeneral@iaaweb.org*

**Date: March 9, 2007**

**Signature:**  
Miguel A. Hernandez Jr.

***For IAA Use Only:***

## **Attachment 5 : 6<sup>th</sup> IAA Symposium on Small Satellites for Earth Observation**

### **6th IAA Symposium on Small Satellites for Earth Observation** in preparation

Berlin, April 23 – 26, 2007

Chairmen: Rainer Sandau, Hans-Peter Röser, Arnaldo Valenzuela

Keynote Speaker: Sir Martin Sweeting

11 Oral Sessions (54 oral contributions)

1 Panel Discussion

„Development and promotion of integrated applications (space and non-space)“

1 Poster Session (49 poster presentations)

Student Prize Paper Competition

Authors out of 26 countries

Final Announcement published on-line January, 2007

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### **6th IAA Symposium on Small Satellites for Earth Observation** in preparation (cont.)

- Reception in the German Museum of Technology Berlin (Deutsches Technikmuseum Berlin)
- Excursion to the museum of early-space technology in Peenemuende and to the Otto Lilienthal Museum in Anklam

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**6th IAA Symposium on Small Satellites for Earth  
Observation** in preparation (cont.)

**Students Conference**

- 12 abstracts submitted  
(2 Danmark, 5 Germany, 1 Russia, 1 UK, 2  
USA)
- 6 finalists selected (3 Germany, 1 UK, 2 USA)