

Knowledge Management Study Group 4.1 Report

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

Website Study Information up to date?

- No, will work with Fabrice Dennemont to upload past meeting notes, draft paper, and link to new web site

Issues requiring resolution?

- None

Progress and Product Deliveries on Schedule?

- **Plan:** Support a better understanding among member and aerospace organizations of the ways in which they can share knowledge
 - **Action (ongoing):** Planning underway for third *International Conference on Knowledge Management for Aerospace*, likely date is May/June 2010 hosted by ESA. Will build on previous two conferences that focused on case studies and best practices from across the globe. This conference will additionally have a workshop related to augmentation and validation of the taxonomy and ontology that is the recommendation of the group's white paper. This year's conference was cancelled due to the economic downturn and difficulty in attendees obtaining travel funds.
 - **Action (ongoing):** Continue to co-lead a consortium of US aerospace industry, academia, and government space organization meetings on knowledge management. Team meets face-to-face 4-6 times a year.

Participants include Northrop Grumman, The Aerospace Corporation, Boeing, Pratt Whitney Rocketdyne, Lockheed Martin, Raytheon, Computer Sciences Corporation, University of California at Irvine, Pepperdine University, California State University at Northridge, and NASA.

- **Plan:** Ensure that after this Study Group concludes, there is an ongoing entity to coordinate the KM track.
 - **Action:** IAF application for partner KM for Space Organizations Technical Committee was approved.

- **Plan:** Ensure that there is a set of related papers from workshop participants at the 2009 IAC that exemplifies excellent knowledge management practices at aerospace organizations.
 - **Action:** Continue to have combined Knowledge Management and Quality Management tracks.
 - **Action:** 13 papers were submitted for the KM track for Daejeon and 12 were accepted, 11 papers have been confirmed for presentation at the session this week, and one was withdrawn.

Confirmed

1. *Status of the IAA Knowledge Management Working Group*
 - Jeanne Holm, NASA/Jet Propulsion Laboratory
 - Roberta Mugellesi-Dow, European Space Operations Centre
2. *Apollo: Learning From the Past, For the Future*
 - Michael Grabois, United Space Alliance, LLC
3. *Capturing Tacit Knowledge for Spacecraft Operations in ESOC*
 - Roberta Mugellesi-Dow, European Space Operations Centre
4. *Multi-Generational Knowledge Sharing for NASA Engineers*
 - Daria Topousis, Jet Propulsion Laboratory
5. *Taxonomy for Space: Knowledge Sharing Amongst Countries*
 - Jeanne Holm, NASA/Jet Propulsion Laboratory
6. *Knowledge Management Architecture for Japan Aerospace Exploration Agency*
 - Hiroaki Tateshita, JAXA
7. *Understanding and Implementing Knowledge Management Applied to the ESA Rosetta Mission*
 - V. Dhiri, G. Schwehm, and J. Brinkmann, ESA-ESAC, Spain
8. *Importance of Knowledge Management Within Space Data Systems*
 - Gert Villemos, Logica
9. *SWIFTER - Space Weather Informatics, Forecasting, and Technology through Enabling Research and Virtual Organizations*
 - Larry Paxton, Applied Physics Laboratory
 - Jeanne Holm, NASA/Jet Propulsion Laboratory

10. Learning from Space Operations: Lessons Learned as Drivers for Improvement

- Stefano Scaglioni, European Space Agency (ESA)

11. The Implementation of Risk Management into the Concurrent Engineering Process

- Andre Weiss, German Aerospace Center (DLR)

Withdrawn

12. Development and evaluation of a prototype cross-search system for aerospace technical data management

- Yoshikazu Miyano, Japan Aerospace Exploration Agency (JAXA)

- **Plan:** Ensure that there is a set of related papers from workshop participants at the 2010 IAC that exemplifies excellent knowledge management practices at aerospace organizations.
 - **Action:** Continue to combine Quality and Knowledge Management Track for track to be submitted for Daejeon.
- **Plan:** Information is posted on a web site for each of communication and status reference.
 - **Action:** Group has an online collaboration workspace and discussion forums, which we are in the process of moving this year to have as a more generally available capability.
 - **Action:** Expanded online community to ~140 members.
- **Plan:** Coordination with other key working groups to understand issues and share lessons learned.
 - **Action:** Coordination continues with a variety of government and industry standards bodies as documented in previous notes.
 - **Action:** Seeking to find joint effort with the IAA Integrated Applications Working Group, perhaps in the area of utilizing space-related assets and knowledge for health. One-day workshop may be planned for this winter, either in Washington DC or Amsterdam.
- **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:** A draft paper will be distributed on Wednesday at the working group meeting for comment and review. Based on recommendations from the Commission in March, the paper was expanded to include recommendations for development of the

international taxonomy and ontology for space, perhaps under an IAF Technical Group.

Study Team Member Changes?

- New members
 - Dr. Panagiotis Bamidis (Greece)
 - Dr. Roger Launius (US)
 - Dr. Sorosh Sorooshian, (US)
 - Mr. Stephan Ulamec (Germany)
- Online community to supplement working group—~135 members.

Name of Persons Providing Study Group Status

- Jeanne Holm, Chief Knowledge Architect, NASA, Jet Propulsion Laboratory
- Roberta Mugellesi-Dow, ESOC

Status Report Date

- 11 October 2009