Proposal for Forming an IAA Study Group SG 3.22

Title of Study:

Next-Generation Space System Development Basing on On-Orbit-Servicing Concept

Proposer(s):

Yury N. Razoumny, Prof. Dr., IAA Member, Research Centre for Space Utilization Problems, Russia

Primary IAA Commission Preference:

Commission 3: Space Technology & Systems Development

Secondary IAA Commission Interests:

Commission 5: Space Policy, Law & Economics

Members of Study Team

Chair:
Yury N. Razoumny, Prof. Dr., IAA Member, Research Centre for Space Utilization Problems, Russia

Co-Chair:
Brij N. Agrawal, Prof. Dr., IAA Member, Spacecraft Research and Design Center, USA

Secretary:
Ji Simei, Dr., Harbin Institute for Technology, China

Other Members:

Tetsuo Yasaka, Prof. Dr., IAA Member, QPS Institute, Fukuoka, Japan
Giuseppe Reibaldi, Dr., IAA Member, ESA
Filippo Graziani, Prof. Dr., IAA Member, University of Rome, Italy
Marcello Coradini, Dr., IAA Member, ESA
Erick Lansard, Dr., IAA Member, Thales Alenia Space, France
Arthur Dula, IAA Member, Attorney at Law, USA
Fan Ruixiang, Dr., IAA Member, China Academy of Launch Vehicle Technology (CALT), China

Short Description of Scope of Study

Overall Goal:

(Expected scientific or practical benefit of the study group's efforts)

Over the last years many organizations in different countries have been involved in development of various technical aspects of on-orbit satellite servicing, which to a great extent predetermines the characteristics of next-generation space systems. The problem of developing next-generation space systems basing on on-orbit-servicing concept is considered as technical challenge in two main directions: making serviced satellites and space systems suitable for servicing; developing servicing satellites and space systems for the performance of the on-orbit-servicing operations. Implementation of the first direction includes a wide range of developments: unified detachable and installable satellite blocks and modules, maximal complexation of missions on-board a single satellite, internationally standardized hardware and connectors, providing the docking with the serviced satellite, selection of the satellite's period of use with regard to servicing, etc. Implementation of the second direction varies from the development of servicing methods and servicing systems to the gradual development of the space complexes for providing on-board-servicing operations. The overall goal of the study is to unite the efforts of the specialists, which have been undertaken in different countries and organizations, for discovering the most effective approaches to solving the problem.

Intermediate Goals:

A near-term objective of the study is to coordinate the efforts of the specialists in developing on-orbit-servicing technologies for performing the current and short-term tasks for maintenance – as the first stage for creation of next-generation space systems – of the existent orbital space segment, in particular, in the areas of satellite refueling, replenishing expendables for long-term space stations, etc.

Methodology:

(Email works, workshops, stand alone conferences, interim publications, etc.)

Hold regular electronic meetings of the group. Agree to specific assignments and deadlines once the work outline has been finalized. Being a volunteer effort, the cosmic study will be performed basing on contributions of all the members of the group as well as management of the chair(s) and secretary according to the roles and responsibilities accepted by all the members. The current results of the work will be reported at the IAA conferences during the period of cosmic study performance.

Time Line:

(Cannot exceed three years)

- Preliminary Materials of the Sections of the Study, March 2015
- Preparatory Study, November 2016.
- Final Study, March 2017.

Final Product (Report, Publication, etc.):

- Study Report on Next-Generation Space System Development Basing on On-Orbit-Servicing Concept – to be published by IAA or other sponsor.
- Publication(s) of report information in appropriate journals.

Instructions and application form: see: "Scientific Activity" section at http://iaaweb.org/content/view/256/393/

Target Community:

- Scientific, technical and engineering space community.
- Commercial space and business communities.
- Space policy makers and officials responsible for next-generation space system developing.

Support Needed:

None identified at this time.

Potential Sponsors:

TBD

To be returned to the IAA Secretary General Paris *by fax: 33 1 47 23 82 16 or*
by email: sgeneral@iaamail.org

Date: August 6, 2014

Name: Yury N. Razoumny

(No Signature required if document authenticated).

Instructions and application form: see: "Scientific Activity" section at http://iaaweb.org/content/view/256/393/

Follow-up Section for IAA use only

Initial Phase

Application received:

Commission Approved:

SAC Approved:

Web Site Section opened:

Members Formally Appointed by IAA:

Final Phase

Peer Review by Commission Completed:

Recommended by the Commission:

Final Report Received:

SAC Approved:

BOT Accepted:

Publisher Selected:

Study Published: