

## Proposal for Forming an IAA Study Group

**Title of Study:**

Establishing “Rules of the Road” for Satellite Collision Avoidance Maneuver Planning

**Proposer(s):**

*(Must be member(s) of the Academy M or CM)*

David B. Spencer (M)

**Primary IAA Commission Preference:**

*(From Commission 1 to Commission 6) Commission 4*

*Commissions: 1 Space Physical Sciences, 2 Space Life Sciences, 3 Space Technology & Systems Development, 4 Space Systems Operations & Utilization, 5 Space Policy, Law & Economics, 6 Space and Society: Culture and Education*

**Secondary IAA Commission Interests:**

*(From Commission 1 to Commission 6) Commission 3*

**Members of Study Team****Chair(s):**

*(Must be member(s) of the Academy, M or CM)*

David B. Spencer (M)

**Secretary:**

Marlon E. Sorge

**Other Members:**

*(Open to members and non- members of the Academy)*

Christophé Bonnal (M)

Juan-Carlos Dolado-Perez (CM)

Other members TBD

**Short Description of Scope of Study**

Several commercial companies, as well as other nations, have proposed to deploy or are deploying many satellites in Low Earth Orbit (LEO). These large constellations will greatly increase the number of satellites operating in relatively narrow regions of space. The added space traffic in these regions will create many close approaches between the member of the large constellations and other space operators. These close approach situations can necessitate a collision avoidance maneuver to avoid a potential collision. Should both satellites have maneuvering capability, the question of how the overall collision avoidance procedures should be executed is raised. The large constellations can employ automated collision avoidance systems which interact differently than conventional

human-in-the-loop systems. Interactions between an automated system and another operational satellite or between two automated systems presents new challenges for executing effective collision avoidance

**Overall Goal:**

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

This proposed study will examine the issues and strategies of establishing a set of “Rules of the Road” in collision avoidance maneuvering. In this study, we will examine current strategies for satellite systems, detailing their strengths and shortcomings, to identify collision avoidance maneuver planning and execution best practices that both increase the level of safety and maintain equity particularly in the context of new space operations techniques and situations.

**Intermediate Goals:**

While the study is underway, we will be evaluating feedback from industry on preliminary ideas and strategies that arise. This feedback will be used to help guide the study to conclusion.

**Methodology:**

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

Committee contributions, industry surveys, virtual workshops, potential special sessions at future IAC meetings, interim publications.

**Time Line:**

*(Cannot exceed three years)*

This study is expected to last two years.

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

We anticipate a final report with an IAC paper or two along the way. Recommendations on operational practices will also be developed and shared with the operations community.

**Target Community:**

The communities most interested will be the spacecraft operations community and organizations involved in space traffic management, autonomous spacecraft maneuvering, and satellite tracking and data reduction.

**Support Needed:**

Minor support from IAA (meeting logistics, access to member and corporate member contact information).

**Potential Sponsors:**

The Aerospace Corporation

*To be returned to the IAA Secretary General Paris*

*by fax: 33 1 47 23 82 16 or*

*by email: sgeneral@jaamail.org*

**Date:**

**Name:**

*(No Signature required if document authenticated).*