

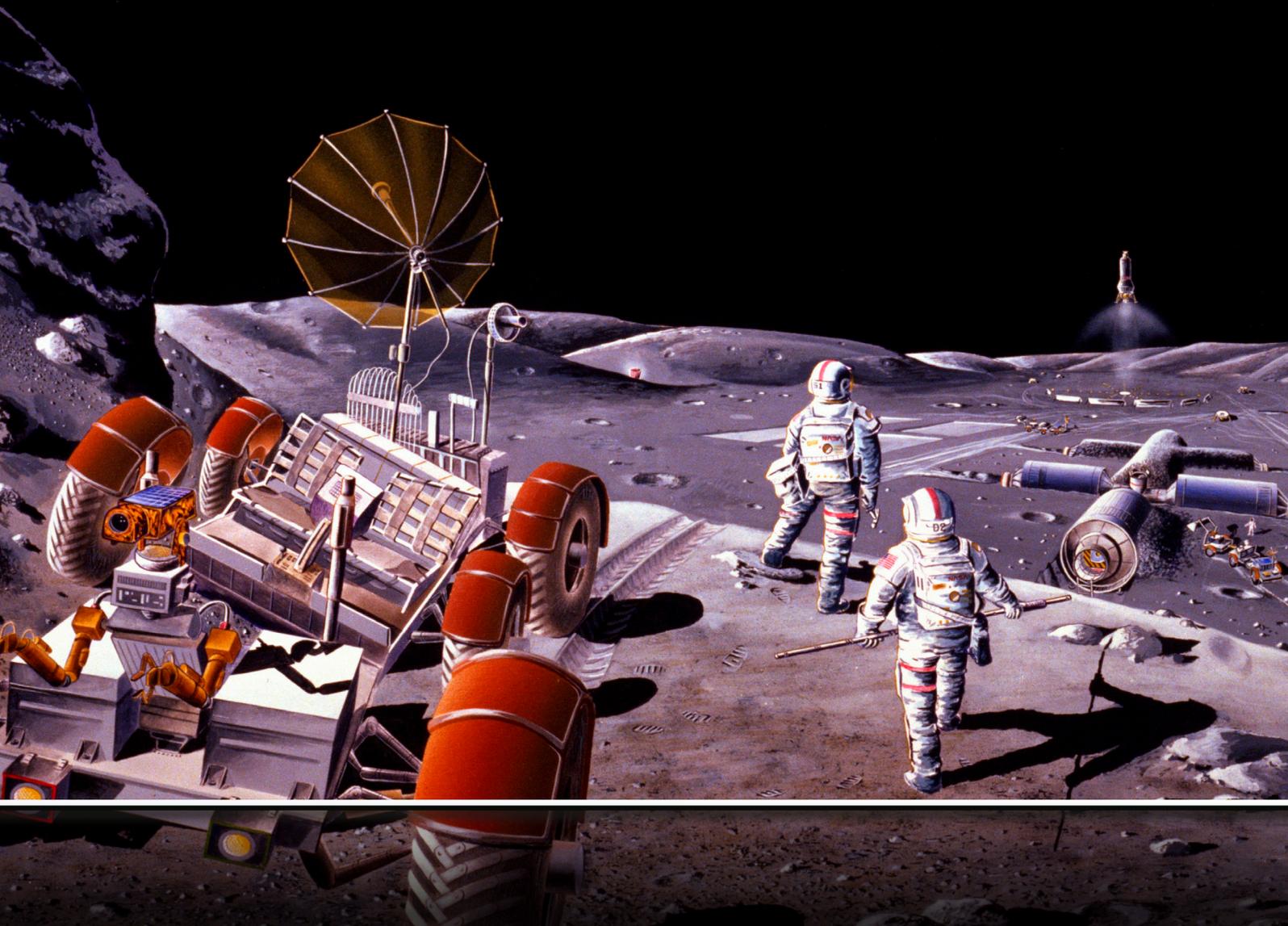


**INTERNATIONAL ASSOCIATION
FOR THE ADVANCEMENT OF
SPACE SAFETY**

INTERNATIONAL COOPERATION IN THE FIELD OF SPACE SAFETY STANDARDS



***MEMORANDUM OF UNDERSTANDING
(STUDY DRAFT)***



Background

The international space community has identified the rapid international commercialization of space, in particular in the field of telecommunication, navigation and launch services, as an important and positive step to the continual global and national economic growth. Recent interest and actions from the private sector in the field of commercial human spaceflight illustrates the widening range of financial commitments, and business risks the private sector is willing to make in space. Though there is great promise about the further commercial potentials of space for the world economy, safety and on-orbit environmental risks are very real and growing, but there is no international cooperative effort to balance the multiple commercial interests in space with internationally agreed and nationally enforceable safety regulations.

The space treaties provide generic principles for the use of space but no implementing rules. They were produced at the early time of space programs when two countries, U.S. and Soviet Union locked in the Cold-War atmosphere, had a governmental monopoly in space with no much presence of the private and commercial sector. The space treaties were therefore conceived for the purpose of defining the overall limits applicable to each nation space activities and not to facilitate and promote commercial and civil international cooperation

The International Standards Organization (ISO) is the only international body that has attempted so far to develop some space safety guidelines (i.e. voluntary standards) for global use, in particular in the field of space debris. They are in any case not endorsed by most of the national space regulatory bodies. To better focus the discussion on this point we need to clarify that in general the standards can be divided in policy standards (usually referred to as policy requirements, *doctrine*, or rules) and industrial or technical standards. The former are in the case of safety those defining the acceptable level of risk and mitigation strategies on the basis of technical as well as non-technical considerations of various kinds (including economic effectiveness). The latter instead define essentially the state of art and best technical practices (design solutions, engineering methods, etc.). The ISO institutional mission is to develop industrial standards, such to facilitate international commerce, and not to set up safety policies, which are a government responsibility.

However, some important national bodies (e.g., USAF, CNES, NASA, FAA) have developed a number of space safety standards which are the natural reference for any international harmonization effort.

It should be further noted that the awareness about the need for international coordination in the field of space safety is growing very fast. For example, there are two important passages in the NASA Authorization Act – 2008 (H.R. 6063), signed into law on October 15, 2008, in the sections related to space traffic management and crew rescue. In Sec. 1102, SPACE TRAFFIC MANAGEMENT, NASA is instructed to initiate an international coordination in that field. In fact it is stated that: *“(a) In General- As more nations acquire the capabilities for launching payloads into outer space, there is an increasing need for a framework under which information intended to promote safe access into outer space, operations in outer space, and return from outer space to Earth free from physical or radio-frequency interference can be shared among those nations. (b) Discussions- The Administrator, in consultation with other appropriate agencies of the Federal Government, shall initiate discussions with the appropriate representatives of other spacefaring nations with the goal of determining an appropriate framework under which information intended to promote safe access into outer space, operations in outer space, and return from outer space to Earth free from physical or radio-frequency interference can be shared among those nations.”*

In Sect. 406, EXPLORATION CREW RESCUE, it is further stated that: *“In order to maximize the ability to rescue astronauts whose space vehicles have become disabled, the Administrator shall enter into discussions with the appropriate representatives of spacefaring nations who have or plan to have crew transportation systems capable of orbital flight or flight beyond low Earth orbit for the purpose of agreeing on a common docking system standard”.*

The final aim of this MOU is to provide a mechanism for the international coordination of national space safety policies and rules pertaining to those space safety risk issues that are international in nature and that can be effectively mitigated only through international cooperation. The parties subscribing this MOU would adopt the resulting voluntary rules and commit to their use as the main/preferred reference for their own national regulations. Furthermore they would jointly review the adequacy of industrial standards, issued by specialized standardization bodies such as ISO, in view of recommending their use (recommended practices).

In addition, the scope of this MOU includes the development of “optional” space safety technical standards for some specific areas for which two or more subscribing parties have an interest to harmonize their standards (e.g., to remove unwanted barriers to space commerce, or in view of international programs).

Article 1

Purpose and Objectives

- 1.1 The purpose of this Memorandum of Understanding (MOU) is to establish arrangements between Subscribing Parties (SP) for a genuinely open and as wide as possible international partnership in developing civil and commercial space safety policy standards to: a) ensure safe access to, use of, and transit through outer space by all countries, and b) to safeguard the functional and physical integrity of any space object operating therein.
- 1.2 The objectives of this MOU are in line with international law, and are specifically to:
- a) provide the basis for cooperation between Subscribing Parties and establish roles and responsibilities.
 - b) establish the management structure and interfaces necessary to ensure effective planning, funding and coordination.
 - c) provide a general description of the civil and commercial standards within the scope of this MOU and the main groupings comprising it.

Article 2

Standards Groupings

Under this MOU five coordinated groupings of policy standards will be established and maintained:

I) Public Safety Risk of Space Missions. Standards dealing with public safety risk management, including launch and re-entry operations, safe use of NPS (Nuclear Power Sources), health hazard in proximity of launch sites, as well as interfaces between airspace and outer space bound traffic.

II) Ground Processing of Commercial Space Vehicles and Payloads. Standards establishing general design and operations safety requirements for ground processing of Commercial Space Vehicles and Payloads at

international spaceports, including certification of ground personnel.

III) On-orbit Space Traffic Management. Standards establishing exchange of space situational awareness data and operational traffic management rules to prevent on orbit physical and functional interferences between functional spacecraft, and to prevent collision with orbital debris.

IV) Space Debris. Standards establishing international standards for mitigation and remediation of space debris. [*Note: On-going voluntary standardisation efforts within ISO would be duly taken into consideration*].

V) On-Orbit Safe & Rescue and Servicing. Standards establishing international rendezvous and docking requirements and minimum systems interoperability requirements, for on-orbit safe & rescue and servicing operations. It includes also requirements for interoperability of EVA (extra-vehicular activity) suits.

Article 3 Organization

2.1 The top body for guiding and co-ordinating all aspects of this standardisation activity is a Steering Board, called **International Space Safety Board** (ISSB). Each Subscribing Party shall have one representative as member of the Steering Board. The Steering Board can invite qualified observers to attend their meetings.

The Steering Board is supported by sub-boards dealing with specific areas of standardisation:

- The **Public Space Safety Board** (PSSB), for standards dealing with public safety risk management of space missions.
- The **Ground Space Safety Board** (GSSB), for standards dealing with ground processing safety risk management of space systems.
- The **Space Traffic Management Board** (STMB), for standards dealing with space traffic management and space situational awareness.
- The **Space Debris Standardization Board** (SDSB) for standards dealing with space debris mitigation and remediation standards.

Note: no overlapping with the IADC (Inter-Agency Space Debris Coordination Committee) which in accordance with their Term of Reference has the primary purpose to exchange information on space debris research activities between member space agencies, to facilitate opportunities for cooperation in space debris research, to review the progress of ongoing cooperative activities and to identify debris mitigation options.

- The **Safe and Rescue Board (SRB)**, for standards dealing with interoperability of on-orbit safe & rescue systems and servicing systems.

Finally, the **Secretariat** under the lead of a Secretary shall provide the overall management function.

The Steering Board nominates members and chairs of the Sub-Boards on the basis of proven knowledge and experience in the specific field. Each Sub-Board nominates experts to be the members and chairs of each Working Group to which the development/review of one or more standards is assigned.

The Steering Board decisions are taken on the basis of unanimity. The decisions of the Sub-Boards and Working Groups can be either by unanimity or by a qualified 2/3 majority. In the latter case the Sub-Board and Working Groups decisions will need to be ratified by a decision of the Steering Board.

2.2 International Space Safety Steering Board – Terms of reference

The Steering Board is the international body responsible for the overall coordination of the space safety standardisation efforts. It is responsible for:

- establishing a four years strategic implementation plan, including funding profile and sources, and submitting it to the approval of the Head Representatives of the Subscribing Parties at dedicated meetings.
- approving the annual budget prepared by the Secretary
- deciding, on the basis of Sub-Board assessment and recommendation, when a standard has been approved by a Working Group with only a 2/3 majority decision.

- nominating members and chairs of the Sub- Boards

The Steering Board Chair and the Sub-Boards Chairs will be elected at unanimity by the Steering Board members for a period of four years, which can be renewed for two times.

2.3 Secretariat – Terms of reference

The Secretariat under the lead of the Secretary provides the overall management support function to the Steering Board and its subordinate Boards and Working Groups. It is responsible for:

- detailed annual planning of the standardisation activities;
- issuing of operating procedures;
- monitoring the progress of working groups activities;
- publishing the standards;
- maintaining the website of the organisation;
- issuing a detailed annual report to the Sub-Boards concerning the status of Working Group activities including updating of the annual planning and recommendations for future work;
- ensure performance of all administrative duties.

2.4 Sub-Boards – Terms of reference

The Sub-Board is responsible for the overall coordination of the standardisation efforts of the Working Groups for their assigned grouping. It is responsible for:

- providing to the Steering Board input for the four years strategic implementation plan;
- approving the detailed annual plan prepared by the Secretariat;
- providing assessment and recommendation to the Steering Board when a standard has been approved by a working group with only a 2/3 majority decision;

- nominating members and chairs of the Working Group (after confirmation of sponsorship availability by the relevant Subscribing Party (see article 4);
- issuing an annual summary report to the Steering Board concerning the status of activities and future direction.

Article 4 Funding

Funding is provided directly and indirectly by the Subscribing Parties.

The direct funds are those provided to the International Space Safety Standardization Organization to cover all costs of running the Secretariat, including staff, office rentals, etc. Such costs are evenly shared among the Subscribing Parties.

The indirect funds are those that the Subscribing Parties will internally allocate to sponsor the participation of their nationals (staff, contractors, consultants, etc.) to the standardisation activities, including travel costs.

Article 5 Transitional Rules

4.1 Initial Standards Baseline

Each Subscribing Party will propose an initial list of candidate international space safety standards among those already formally issued in the past by the Subscribing Party as national standards.

The Sub-Boards will determine if overlaps exist between Subscribing Parties standards lists and initiate working groups with the participation only of members and chairs sponsored by the Subscribing Parties of the overlapping standards. Observers from other Subscribing Parties can attend the meetings, but not vote. Each resulting standard will be baselined as international standard by the relevant Sub-Board.

If no overlap exists and only a single national standard exists, the national standard will be automatically adopted as international standards, save for text adaptations or reformulation necessary for the international use.

4.2 Initial Funding

The annual initial direct funds for operating the Secretariat are established to be (TBD).

4.3 Seat of the Secretariat

The Secretariat will be registered as non-profit organization with seat in (TBD).