GSOA
GLOBAL SATELLITE OPERATORS ASSOCIATION

GSOA Code of Conduct on Space Sustainability

www.gsoasatellite.com

I. Purpose

The purpose of the GSOA Code of Conduct is to identify and endorse industry space sustainability practices that will enable the world to maximize the use of, access to, and benefits from, space resources.

II. Goals and Scope

The goal is to recognise that space provides significant benefits to people and our planet and that preserving those benefits in the face of greater utilization of orbits for valuable services requires timely action.

III. Practices

In addition to endorsing the space sustainability measures and practices set forth below, GSOA acknowledges that there are matters relating to space sustainability not addressed in this Code of Conduct. This includes whether other measures and/or regulation not reflected here are necessary. Some other matters also include, but are not limited to: the collective impact of entire satellite systems, and multiple satellite systems, on collision risk, orbital debris, satellite reflectivity, continued availability of spectrum and orbital resources, impact on the Earth's atmosphere, and potential infrared interference into astronomy observations. GSOA will continue to gather, analyse and share relevant studies, reports and information regarding space sustainability among its members to ensure they are fully informed, while continuing efforts to establish a consensus position on these matters.

The Global Satellite Operator Association endorses, and recommends that operators comply with, the following practices:

Mitigating the risk of in-orbit collision

Objective: Implementing measures to minimize the threat of collision between spacecraft.

Rationale: As the number of spacecraft continue to increase in the orbits around the earth, it is necessary to take action to minimize the risk of collision among space objects and the generation of orbital debris.

Recommended practices:

1. Spacecraft Design:
    i. Risk-Mitigation: Design/procure spacecraft in a manner that embeds relevant risk-mitigation approaches that will be used during its operations, based on the specific mission of the spacecraft and the characteristics of the orbit(s) to which the spacecraft will be deployed, among other things;
    ii. Trackability: Design and operate each spacecraft in such a way that appropriate technologies and operational means are used to ensure that it is trackable by Space Situational Awareness (SSA) systems from deployment until atmospheric re-entry or after it is disposed of into a graveyard orbit, as applicable;
2. Coordinate Before and During Operations and When De-Orbiting: Before deploying, while operating a spacecraft and during de-orbit, coordinate in good-faith and on a timely basis safety-of-flight operations with both existing and future spacecraft, to the extent possible;
3. International "Rules of the Road": Actively contribute to the development of rules of the road to ensure the physical coexistence of operators' spacecraft.

Objective: Track operational spacecraft, monitor orbital debris and promote situational awareness of the space environment through information sharing and transparency.

Rationale: Operators should take all reasonable steps to share information with other operators about trackable debris that they may have or may not have generated through the operation of their spacecraft.

Recommended practices:

1. **Standard Interface:** Use standard interface(s), cooperating with relevant national and international bodies, as needed, with which SSA data is shared among operators;
2. **Data Sharing:** Share data on a real-time basis with other operators (whether they are part of GSOA or not) and relevant government agencies, as appropriate.

GSOA further recognizes

The important role of the global SSA industry, as well as the potential benefits of constituting an appropriate and trustworthy international body for information sharing: this body would facilitate the sharing (e.g., through a data bank) among spacecraft operators and relevant government agencies of data (including accurate ephemeris and planned maneuvers, if applicable) related to spacecraft and trackable debris and any fees that operators may incur for services above those deemed essential would be cost-based.

Minimize the Threat of Non-Trackable Debris

Rationale: Operators should take steps in the design, launch, orbit raising, operational and de-orbit phases of the spacecraft mission – to ensure that their satellites (or portions thereof) do not become a source of debris.

Recommended practices:

1. **Design Spacecraft to Minimise All Debris:** Design their satellites using relevant state-of-the-art techniques to mitigate the risk of generation of space debris during nominal and degraded modes for all phases of a satellite's lifetime, including in the event of a collision, accidental explosion or destruction;
2. **Minimise Incidents:** Ensure that the risk of accidental destruction of space systems due to any stored energy elements (e.g., propulsion, pressurized parts, batteries) is assessed and mitigated; operators should use any valid method available to passivate spacecraft;
3. **Appropriate Post-Mission Disposal:** Ensure that spacecraft and suborbital space objects (e.g., launch vehicle stage, adaptation structures for a launch of multiple payloads) are adequately disposed of (e.g., through re-entry in the atmosphere or by transferring a spacecraft to a disposal orbit, as applicable) in the shortest time possible, while maximising the probability of successful disposal.

Preserving human life in space

Objective: Ensure that spacecraft do not endanger human life in space.

Rationale: Human life should be protected.

Recommended practices:

Operators should take steps in the design, launch, orbit raising, operational and de-orbit phases of the spacecraft mission to ensure that their satellites (or portions thereof) and their missions minimise the risk to space structures aimed at supporting human missions in space.

Limiting satellite reflectivity and the related impact on optical astronomy

Objective: Minimise negative impacts on ground-based optical astronomy while allowing observation at optical wavelengths and ensuring the delivery of satellite services.

Rationale: Operators of artificial satellites and astronomers should work together to achieve a mutually acceptable agreement to enable co-existence and the undoubtful benefits that these bring to humankind.

Recommended practices:

1. Design low-Earth orbiting spacecraft and their constellations in compliance, to the extent possible, with recommendations and best practices to date, including by selecting materials and operations in a manner that reduces expected brightness to recommended levels;
2. Take all reasonable steps to minimise specular reflection from the spacecraft in the direction of observatories;
3. Cooperate with the astronomers' community to develop tools, resources and practices aimed at reducing the impact on optical astronomy.

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