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Space Sustainability and Downstream Industry Legal considerations

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Space Law and Legal Reflections

- I. UN Space Treaties
- II. ITU law
- III. Space debris mitigation guidelines and standards
- IV. Recent developments

I. UN space treaties

- Binding international treaty law: 1967 Outer Space Treaty, 1968 Rescue Agreement, 1972 Liability Convention, 1975 Registration Convention, 1979 Moon Agreement
- UN space treaties say little on environmental issues
- Article IX Outer Space Treaty:
„States Parties to the Treaty shall pursue studies of outer space, including the moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose.”
- other provisions can have an indirect effect on environmental protection

II. ITU law

- International Telecommunication Union (ITU) strives to guarantee undisturbed global telecommunications,
- legally binding instruments that have relevance also from an environmental perspective
- Article 44.2 of the ITU Constitution:
„In using frequency bands for radio services, Member States shall bear in mind that radio frequencies and any associated orbits, including the geostationary-satellite orbit, are limited natural resources and that they must be used rationally, efficiently and economically, in conformity with the provisions of the Radio Regulations, so that countries or groups of countries may have equitable access to those orbits and frequencies, taking into account the special needs of the developing countries and the geographical situation of particular countries.”
- Recommendation ITU-R S.1003 Environmental protection of the geostationary orbit from 1993, superseded by latest version from 2010

III. Space debris – guidelines and standards

- Despite general awareness of the problem, insufficient legal regulation : no binding international law regarding space debris
- Development of non-binding guidelines and standards:
 - 1993: establishment of the Inter-Agency Space Debris Coordination Committee (IADC),
2002: IADC Space Debris Mitigation Guidelines
 - since 1994: recurringly on the agenda of the Scientific and Technical Subcommittee of UNCOPUOS,
2007: adoption of the UN Space Debris Mitigation Guidelines
 - since 2010: space debris mitigation standards by the International Standards Organisation (ISO)
- **may become legally binding when States adopt them into national law or when treaties refer to them**

III. Space debris – guidelines and standards

IADC Space Debris Mitigation Guidelines

- first version published in 2002, currently third version from 2021
- describe existing practices suitable for reducing the creation of space debris
- main points:
 - limitation of space debris released during normal operation (section 5.1)
 - minimizing the potential for break-offs in Earth's orbit (section 5.2)
 - disposal of space debris after the mission (section 5.3)
 - collision avoidance in orbit (section 5.4)

III. Space debris – guidelines and standards

UN Space Debris Mitigation Guidelines

- based on IADC Space Debris Mitigation Guidelines
- drafted by the Scientific and Technical Subcommittee of UNCOPUOS, adopted by the UN General Assembly on 22.12.2007
- UNCOPUOS urged the member States to consider the guidelines
- seven recommendations aiming at the prevention of space debris to be considered during mission planning, design and production of space objects and execution of the mission

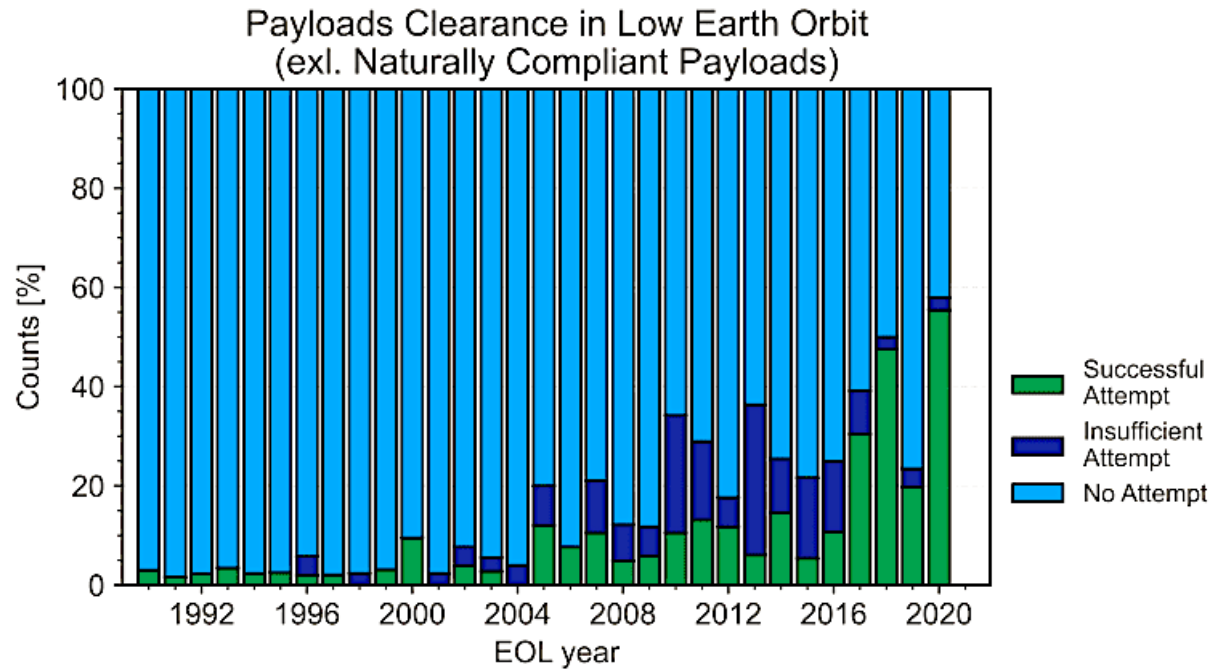
III. Space debris – guidelines and standards

ISO 24113

- 2010 first version ISO 24113 Space systems – Space debris mitigation requirements (ISO 24113:2010), currently third version from 2019 (ISO 24113:2019), fourth version in development
- adopted by the European Committee for Standardization (CEN)
- strong influence on economic practice
- applies to all unmanned spacecraft placed in LEO
- main points:
 - limitation of space debris released during normal operation
 - minimizing break-offs
 - disposal of space debris after end of mission
- collision avoidance regulated separately in ISO TR 16158

IV. Current developments

- in 40% of the cases of satellites in LEO that should have been deorbited in 2020 there was no deorbiting attempt (ESA Space Environment Report 2022)



source: ESA Space Environment Report 2022

IV. Current developments

Space Sustainability Rating (SSR)

- concept developed at the World Economic Forum in 2019, leaded and operated by EPFL Space Center (e-Space) in Lausanne
- expected to go live in June 2022
- goal: improving sustainability of space activities by providing a score to space operators after a transparent and data-based assessment
- space operators can participate on a voluntary basis
- score will be based on different factors like data sharing, choice of launch provider, choice of orbit, collision avoidance measures, de-orbit plans, adherence to international guidelines etc.
- rating is supposed to create a system of incentives (by having an impact on e. g. insurance costs, funding conditions and regulatory authorizations)
- partners: inter alia Airbus Defence and Space, Boeing, BryceTech, ESA

IV. Current developments

Net Zero Space initiative

- launched at the 2021 Paris Peace Forum
- goal: *„achieving sustainable use of outer space for the benefit of all humankind by 2030 by taking concrete actions so as to tackle the pressing challenge of reducing debris orbiting Earth“*
- recommends urgent measures from 2021 onwards to rapidly contain and then reduce the ongoing pollution of Earth’s orbital environment by:
 - avoiding further generation of space debris and
 - remediating existing space debris
- supported by different stakeholders (e. g. Arianespace, Astrocass, Astroscale, CGSTL/Chang Guang Satellite, CNES, EUSST, Eutelsat, Hispasat IAASS, International Institute of Air and Space Law)

V. Relevance of Space Sustainability for the EO Downstream Activities

- The legal framework on the sustainable use of outer space is not directly applicable to EO downstream activities.
- However, EO downstream companies should also promote space sustainability.
- The ability to provide EO downstream services based on data generated in outer space is threatened by the increasing density of debris in orbit.
- Some experts predict the debris population will reach a level at which it becomes self-sustaining.
- In other words, the availability of EO data is threatened.

V. Relevance of Space Sustainability for the EO Downstream Activities

- The EO downstream sector can promote space sustainability through measures that ensure the sustainable use of outer space by the EO upstream sector.
- Measures could include
 - Internal procurement policies requiring that data have been generated through systems which adhere to a certain set of rules on space sustainability.
 - Make use of future sustainability ratings when assessing the procurement of data generated by space systems..
 - Raising awareness of space sustainability towards operators, data providers, own team, customers etc.



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