

SALT SPRING RECOMMENDATIONS ON SPACE DEBRIS

The following recommendations were adopted at an international workshop on ‘Space Debris and National Security’ on Salt Spring Island, Canada, on January 10 and 11, 2020. They reflect a consensus view, and should not be attributed to the individual participants. The workshop was convened by the Outer Space Institute and the University of British Columbia with financial support from the Canadian Department of National Defence and the Salt Spring Forum.

I. Reducing Space Debris Collision Risk

Accurate information on the location of objects in orbit enables more reliable conjunction assessments, a more efficient carrying capacity of orbits, and better accountability. For these reasons, we recommend:

1. The use of a single international referencing index for identifying space objects that is open-access, reliably and independently maintained, and associated with International Telecommunications Union (ITU) filings.
2. The development of an accessible and reliable directory of operators, with standard modes of contact.
3. An increased effort to collect accurate data and make it publicly available and readily useable, and thus improve predictions about the locations of objects in orbit.
4. The integration of astrodynamics into all stages of mission planning, including the use of dynamical resonances, which offer underappreciated potential for identifying optimal safe orbits as well as paths toward natural debris removal and disposal.
5. The development of a publicly available space traffic “ecological footprint” for quantifying the impact of every object on the orbital environment.

II. Sustainable Space Operations

We also recommend:

1. The avoidance of anti-satellite (ASAT) weapon tests, especially those that generate debris, and the negotiation of an international treaty prohibiting such tests.
2. That all satellite systems be made as resilient as possible to the effects of severe solar storms that could otherwise disable or significantly damage them.
3. That launch components such as stages and fairings be re-entered during launch sequences whenever feasible.
4. That the low-cost model of production used in the consumer electronics industry be avoided by the space industry, or its negative consequences mitigated, through the use of:
 - a. Redundant systems and quality-control measures that provide high reliability rates.
 - b. Rapid end-of-life de-orbiting capabilities.

- c. Incentives such as the scaling of insurance premiums according to redundancy, reliability, and rapid de-orbiting capability.

III. Governance

Finally, we recommend:

1. That the planning and licensing of satellite constellations and other new technologies take into account the carrying capacity (and therefore sustainability) of the orbital environment.
2. That a state's responsibilities for space operations do not end with launch-licensing. Regular audits of a system during operations and after its end-of-life should be conducted, with success being made a condition for maintaining a license.
3. That closer cooperation and common standards be pursued by states with launch facilities and ground stations, since such facilities can serve as regulatory gateways.
4. That a move from non-binding guidelines to binding international and domestic law be pursued.
5. That a planning and policy body be created to which the Inter-Agency Space Debris Coordination Committee (IADC) can report, as is the case with regard planetary defence (i.e. International Asteroid Warning Network (IAWN) reporting to Space Mission Planning Advisory Group (SMPAG)).
6. That the spacefaring states along with industry and other stakeholders work towards the creation of an International Space Organization similar to the International Civil Aviation Organization (ICAO) or International Maritime Organization (IMO), or to the expansion of the responsibilities of an existing international organization such as the ITU.
7. That space companies cooperate in establishing international 'best practices' and supporting government action, with the understanding that unsustainable behaviour can have negative economic, political, or reputational consequences for them.
8. That the Space Sustainability Rating and Space Safety Coalition be supported by governments and industry, as promising mechanisms for incentivizing sustainable space operations.
9. That the UN Committee on the Peaceful Uses of Outer Space (COPUOS) Space Sustainability Guidelines be widely implemented, including in domestic legal systems.
10. That Space objects be de-orbited as soon as practicable. For this reason, the IADC 25-year guideline for end-of-life deorbiting should be replaced with shorter timeframes, with the actual timeframe depending on the type of orbit and mission.
11. That responsible active debris removal be encouraged and that governments support its use.
12. That the challenge of space debris and possible solutions be communicated in ways that actively promote public engagement and highlights the potential for cooperation among space actors.