

Inter-Agency Space Debris Coordination Committee



IADC Statement on Active Debris Removal

Issued by IADC Steering Group

Since 2005 modeling studies of the population of objects in Earth orbit, conducted by members of the Inter-Agency Space Debris Coordination Committee (IADC), have concluded that the space debris environment in certain regions below 2000 km altitude is currently unstable. In other words, the number of new debris created in these regions due to future accidental collisions among resident space objects is predicted to exceed the number of objects leaving the regions due to the atmospheric decay [1].

The IADC Space Debris Mitigation Guidelines, as well as similar guidelines of the United Nations Committee on the Peaceful Uses of Outer Space and other organizations, are meant only to curtail the growth of the space debris population in Earth orbit, not to reverse it [2-3]. IADC studies show that space debris mitigation measures will remain necessary and would need to be supported by additional measures to further limit debris growth in the long term.

Collisions involving non-maneuverable upper stages and spacecraft are predicted to become the dominant source of new debris. Currently, the mean time interval between catastrophic collisions of cataloged objects in low Earth orbit is approximately 5 to 9 years [1]. The associated frequency of collisions will increase as time progresses if no active measures are undertaken to counteract this trend.

Remediation of the near-Earth space environment involves the direct removal of space debris, also known as active debris removal or ADR. Several IADC member agencies, as well as other organizations, are investigating techniques and technologies that have the potential to support debris removal, or are developing pioneering missions, although routine debris removal operations are unlikely to commence in the near future.

Debris removal activities must be conducted in accordance with both, national and international law, and in a manner that does not unduly impose hazards to space systems in orbit or to people and property on Earth from reentering debris.

Low compliance with existing orbital debris mitigation best practices, such as the 25-year rule, only adds more potential targets for future ADR operations which leads to greater technical and economic challenges. Prioritizing and properly balancing mitigation and remediation will be key to manage the long-term orbital debris problem in a cost-effective manner.

To satisfy the intent of this statement the IADC encourages:

- operators to follow existing orbital debris mitigation guidelines with a post mission disposal reliability as high as practicable but no less than 90%,
- further research and cost-risk-benefit analysis on active debris removal and to identify and demonstrate concepts and enabling technologies which can satisfy technical, economic and safety considerations with the goal of stabilizing the debris population,
- newly launched spacecraft and upper stages to be ADR ready in case of PMD failure.

References

- [1] Stability of the Future LEO Environment Study Report, Inter-Agency Space Debris Coordination Committee, IADC-12-08, 2012.
- [2] IADC Space Debris Mitigation Guidelines, Inter-Agency Space Debris Coordination Committee, IADC -02-01, 2002 (Revision 1, 2007).
- [3] Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space, the United Nations, 2007.