

INDIA

National mechanism:

India is in the process of formally adopting a national mechanism on space debris mitigation. ISRO Space Debris Mitigation Requirements, in line with the IADC and United Nations guidelines, are being firmed up to evolve more effective implementation mechanisms to promote adherence by Indian entities.

Description:

Being an active member of Inter-Agency Space Debris Coordination Committee (IADC) since 1996, Indian Space Research Organization (ISRO) follows the guidelines recommended by IADC and UN for space debris mitigation limit creation of space debris, on-orbit collision avoidance and post-mission disposal.

Historically, except for payload adapters, launch vehicle upper stages, and injected payload, no other object is left in Earth orbit by Indian launch vehicles. No mission related orbital debris is released during ascent phase, satellite orbital injection phase or satellite commissioning phase.

Over the years, India has built the capability for Collision Avoidance (COLA) analysis and Space Object Proximity Analysis (SOPA) for safeguarding of its space assets. ISRO carries out COLA analysis for launch vehicles as a mandatory activity for lift-off clearance. Any collision risks during ascent phase of launch vehicles and post-injection initial orbital phase of the injected payloads are mitigated by adjusting the lift-off time within the launch window. SOPA is carried out for all operational satellites on a regular basis to predict any close conjunction between catalogued objects and the operational satellites. Collision avoidance maneuvers are performed for Indian satellites to mitigate collision risk in case of critically close conjunctions.

In all Indian launch vehicle missions, the last stages are passivated by venting out the fuel after payload injection. All operational Indian GEO satellites have Post Mission Disposal capability. After completion of mission life, the GEO satellites are re-orbited to super-synchronous orbits, followed by electrical passivation. Recently, initiatives have been undertaken to deliberately de-orbit ISRO's LEO satellites at the end of their mission to limit their post-mission orbital lifetime and deplete the residual fuel on-board to minimize accidental break-up risk.

Applicability:

Applicable to all Indian operational space objects and launch vehicle upper stages launched from India.

Relation to international mechanisms:

India is committed to promote sustainability of outer space through non-proliferation of space debris during the course of space activities, and adheres to internationally accepted space debris mitigation guidelines. ISRO, as a member of IADC has been an active contributor towards

the formulation of recommendations for IADC Space Debris Mitigation Guidelines. India also participates in IAA Space Debris Working Group and IAF STM working group contributing to international efforts. In addition, India has regularly participated in the United Nations Committee on the Peaceful Uses of Outer Space and its Subcommittees for the evolution of Space Debris Mitigation Guidelines in the United Nations.

Link to other national mechanisms:

None.

References:

None.