

GOVERNMENT OF INDIA  
DEPARTMENT OF SPACE

**RAJYA SABHA**

**UNSTARRED QUESTION NO. 1257**

TO BE ANSWERED ON THURSDAY, AUGUST 01, 2024

**SPACE DEBRIS MANAGMENT**

1257. DR. FAUZIA KHAN:

Will the PRIME MINISTER be pleased to state:

- (a) the details on the current status of Government's efforts to mitigate space debris, including any technological advancements or international collaborations in this regard;
- (b) whether any strategies and technologies have been developed or planned to be developed by Government for the active removal or clean-up of space debris; and
- (c) if so, the details of such programme along with the contribution of the programme to global initiatives in this area?

**ANSWER**

MINISTER OF STATE IN THE MINISTRY OF PERSONNEL, PUBLIC GRIEVANCES &  
PENSIONS AND IN THE PRIME MINISTER'S OFFICE

(DR. JITENDRA SINGH):

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- (a) At present, internationally accepted space debris mitigation guidelines recommended by UN-COPOUS and Inter-Agency Space Debris Coordination Committee (IADC) are followed to the maximum possible extent in all space activities by ISRO. The currently adopted mitigation practices include limiting release of mission related objects (such payload cover etc.), preventing on-orbit explosions through robust design measures and end-of-life "passivation" (venting of excess fuel and discharging batteries etc.), removal of satellites and rocket bodies at their end-of-life away from densely populated regions of active satellites.

Close approach analysis is performed for all operational space assets to detect any potential collision risk in near future. To mitigate any such risks, Collision avoidance maneuvers are designed and executed as and when required. The lift-off time of the

launch vehicle is suitably adjusted well in advance to avoid any potential collision during ascent phase of launch vehicle missions and during the first orbital phase of satellite.

More proactive efforts are being undertaken such as de-orbiting of Low-Earth Orbit satellites at their end-of-life as well as de-orbiting of PSLV upper stages after payload injection to very low altitudes (below 350 km) so that they are naturally removed from orbits within few years.

As a notable example, in 2023, Meghatropiques satellite was de-orbited through a series of manoeuvres at end of mission and was successfully made to re-enter the atmosphere with a targeted impact point over the Deep Pacific Ocean on March 7, 2023. The satellite would have otherwise orbited the Earth as a debris object for more than a few 100 years.

ISRO has been a member of the IADC (Inter-Agency Space Debris Coordination Committee), since 1996. With the membership of 13 leading space-faring agencies, IADC is the most widely recognised entity on space debris related matters and brought out the foundational guidelines on space debris mitigation. ISRO has made substantial contribution in shaping the subsequent revisions of these guidelines. ISRO has also been an active participant in the activities of IAA Space Debris Working Group, IAF space traffic management committee and ISO working group for space debris. Indian delegation contribute very significantly to the activities of UNCOPUOS Long Term Sustainability Working Group.

Recently, in the opening plenary session of the 42nd annual meet of IADC, ISRO has declared the India's intent to achieve debris free space missions by all Indian space actors, governmental and non-governmental by 2030.

- (b) Yes, ISRO has plans to develop technology for Active Debris Removal. Many activities towards this are initiated and are at study level.
- (c) At present, several futuristic technology developments in the area of rendezvous and docking, space robotics, on-orbit servicing, related sensor, guidance and navigational algorithm development is being pursued within ISRO. Such technologies will be utilised for debris removal. Specific initiatives are in progress through concerted efforts among ISRO centres to conceptualize and demonstrate a debris removal mission.

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