SPACE DEBRIS

Lead: Enrico Palermo, Head of the Australian Space Agency

- Space debris, or space junk, refers to non-functional human-made objects in orbit around the Earth, including parts of satellites, rocket bodies and other fragments. It is a problem due to the potential for collision in space or through uncontrolled re-entry in the Earth's atmosphere.

- Management of space debris is a developing area of global cooperation.

- The amount of space debris and expected re-entries to Earth is growing due to the rapid increase in use of space, increasing the potential for space debris re-entry events over Australia.

    - There are over 27,000 uniquely tracked space objects in Earth orbit, including 11,600 satellites (41 Australian); 13,700 debris; and over 2,000 used rocket bodies.

- The risk to people and infrastructure from uncontrolled re-entry of space debris remains very low. Hazards of return of space debris are mitigated somewhat through spacecraft or satellite design, usually resulting in burn up through the atmosphere, or where possible the return of debris to uninhabited locations on Earth.

- Applications for Overseas Payload Permits and Australian Launch Permits under the *Space (Launches and Returns) Act 2018* must contain a debris mitigation strategy (based on an internationally recognised guideline or standard) which includes measures to limit the release of debris and the long term presence of space-craft and launch vehicle orbital stages in orbit.

- In a statement on 20 October 2022 the Australian Government committed to never conduct destructive, direct-ascent anti-satellite missile testing, consistent with our role as a responsible actor in space.

- **Liability:** Under the *Convention on International Liability for Damage Caused by Space Objects*, a launching state is liable to pay compensation for damage caused by its space object. Most launching states including Australia have ratified this convention.

- **Recovery and return** of space debris is addressed in the *Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects*

Launched into Outer Space (Rescue Agreement). The international obligations it covers around notifications, retrieval and cost recovery are reflected in Australian Government crisis management plans.

- **Recent re-entry events:** The Agency has been involved in five space debris events over the past three years:

Date	Where	What
19 Jan 24	Pacific Ocean, South of Fiji	Re-entry of Peregrine lunar lander which re-entered Earth's atmosphere following failed mission to the moon. The Agency led communication with US counterparts to ascertain and mitigate potential risks to Australia and Pacific neighbours.
8 Aug 23	Southeast VIC. Debris impacted the ocean off the SE coast of TAS.	Remnants of a Russian Soyuz-2 rocket, launched earlier in the evening, re-entered the Earth's atmosphere. The Russian airspace authority provided prior notification to their Australian counterpart in accordance with global airspace norms on or about 25 July 2023. The Agency provided technical advice.
15 Jul 23	Washed ashore at Jurien Bay, WA. First impacted Indian Ocean well off the WA coast.	The third stage of an Indian Polar Satellite Launch Vehicle (PSLV). Launch date unknown. WA authorities recovered the debris. The Agency provided technical advice, liaised with the Indian government and coordinated UN notification obligations.
9 Jul 22	Near Dalgety, NSW.	Debris from the Space Exploration Corporation (SpaceX) NASA Crew-1 mission launched from the United States on 16 Nov 20. The Agency recovered the debris, liaised with SpaceX and coordinated UN notification obligations.
Sep 21	Washed ashore at Yambuk beach, VIC. First impacted Indian Ocean well off WA.	Debris from a United Launch Alliance (ULA) rocket, which most likely re-entered the atmosphere immediately following the Orbital Flight Test mission to the International Space Station in December 2019. The Agency provided technical advice, liaised with ULA and coordinated UN notification obligations.

- The Australian Government response to space debris re-entry is set out in the *Australian Government Debris Re-Entry Plan 2017* (AUSSPREDPLAN), a crisis management plan under the *Australian Government Crisis Management Framework*.
    - The Agency is developing internal operational protocols based on lessons learned from recent debris events to improve debris monitoring, response, recovery, and provide advice to Government.

- The Agency is also working with the National Emergency Management Agency to revise operational procedures under AUSSPREDPLAN and update Australian Government agencies' respective roles and responsibilities.

Space Monitoring

- Space debris is a global problem due to the potential for collisions in space or through uncontrolled re-entry in the Earth's atmosphere.
    - Space debris, or space junk, refers to non-functional human-made objects in orbit around the Earth, including parts of satellites, rocket bodies and other fragments.
    - The Australian Space Agency monitors Australian objects and events in space to provide situational awareness to the Agency's National Space Safety Office and other government stakeholders.
- The amount of space debris and expected re-entries to Earth is growing due to the rapid increase in use of space:
    - As of 24 April 2026, more than 16,000 satellites (49 Australian) and 2,000 used rocket bodies are in orbit,
    - The European Space Agency Space Environment Report of 2025 estimates orbital space debris object populations as follows:
        - more than 50,000 objects larger than 10 cm,
        - approximately than 1.2 million objects between 1 and 10cm, and
        - more than 100 million objects smaller than 1 cm.

Australian Position

- Management of space debris is a developing area of global cooperation.
- Forecast and prediction of space debris events globally is immature and highly imprecise.
- The likelihood of adverse impact to people and infrastructure on the ground from uncontrolled re-entry of space debris remains low.
    - Hazards of return of space debris are mitigated somewhat through spacecraft or satellite design, usually resulting in burn up through the atmosphere, or where possible the return of debris to uninhabited locations on Earth.
- In Australia, applications for Overseas Payload Permits and Australian Launch Permits under the *Space (Launches and Returns) Act 2018* must contain a debris mitigation strategy (based on an internationally recognised guideline or standard) which includes measures to limit the release of debris and the long-term presence of spacecraft and launch vehicle orbital stages in orbit.

- In a statement on 20 October 2022 the Australian Government committed to never conduct destructive, direct-ascent anti-satellite missile testing, consistent with our role as a responsible actor in space.

International

- **Liability:** Under the *Convention on International Liability for Damage Caused by Space Objects*, a launching state is liable to pay compensation for damage caused by its space object. Most launching states including Australia have ratified this convention.

- **Recovery and return** of space debris is addressed in the *Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space* (Rescue Agreement). The international obligations it covers around notifications, retrieval and cost recovery are reflected in Australian Government crisis management plans.

Response to events

- The Australian Government response to space debris re-entry is set out in the *Australian Government Debris Re-Entry Plan 2025* (AUSSPREDPLAN), a plan under the Australian Government Crisis Management Framework.
    - The Agency is developing internal operational protocols based on lessons learned from recent debris events to improve debris monitoring, response, recovery, and provide advice to Government.
    - The Agency is also working with the National Emergency Management Agency to revise operational procedures under AUSSPREDPLAN and update Australian Government agencies' respective roles and responsibilities.