



## Part A

# Payloads of a size less than 1U: Operational Policy

## 1.1 Purpose of this document

This is the New Zealand Space Agency (**NZSA**) policy relating to the consideration of applications for payload permits made under the Outer Space and High-altitude Activities Act 2017 (**the Act**) and in accordance with the Outer Space and High-altitude Activities (Licences and Permits) Regulations 2017 (**the Regulations**), where the proposed payload is of a size less than 1U (a unit of satellite volume equivalent to a 10cm cube).

It sets out the approach that will be taken by the NZSA when assessing applications under the Act.

## 1.2 When to apply this policy

This policy will be applied when assessing applications for:

- + Payload permits
- + Overseas payload permits

## 1.3 Relevant sections in the Act and Regulations

The Act requires the Minister to be satisfied that the applicant has taken and will continue to take all reasonable steps to safely manage the operation of a payload and through an orbital debris mitigation plan (**ODMP**) that the applicant has taken measures to minimise the risk of collision with debris. The relevant sections in the Act and the Regulations are:

- + [16\(2\)](#): *Application for payload permit*
- + [17\(1\)\(b\)](#): *When payload permit may be granted*
- + [33\(1\)\(b\)](#): *When overseas payload permit may be granted*
- + [Regulation 13](#): *Requirements for orbital debris mitigation plan*

## 1.4 Policy intent

New Zealand has established a permitting process for payloads. From time to time we receive payload permit applications for payloads smaller than 1U. The small size of these payloads means that they are more difficult to track using current space situational awareness (**SSA**) systems. Tracking of objects smaller than 1U is possible but is dependent on a number of factors such as altitude, design features or radar cross section. The ability to detect and track objects in orbit is increasingly necessary for effective SSA and Space Traffic Management (**STM**) as the number of payloads (and population of orbital debris) continues to grow.

New Zealand has a strong interest in managing the SSA risks associated with payloads less than 1U. Encouraging trackability through our permitting regime demonstrates New Zealand's commitment to the responsible use of space and reflects the UN Committee on the Peaceful Uses of Outer Space's (**COPUOS**) Guidelines on the Long Term Sustainability of Space (**LTS Guidelines**). These encourage regulators to promote the trackability of space objects, regardless of their size or mission type.

The application of this policy is intended to evolve to reflect the development of new technologies, changes in the satellite and broader space industry, and the orbital debris environment.

## **1.5 Information to be taken into account when applying this policy**

Relevant sections of the Act must be complied with. Other information that is to be taken into account in the application of this policy includes:

- + the applicant's submitted orbital debris mitigation plan;
- + any applicable technical advice, reports or assessments provided by other space agencies, regulators or experts;
- + any overseas licence, permit or other authorisation relevant to the proposed activities.

Note that [Section 51](#) of the Act allows the Minister to treat an overseas licence, permit or other authorisation as satisfying some or all of the criteria for the granting of a payload permit or overseas payload permit.

## **1.6 Payload permits may not be granted for objects smaller than 1U unless they can demonstrate trackability or have a limited orbital lifetime**

**1.6.1 Payloads that can suitably demonstrate trackability equivalent to a 1U object may be permitted if they mitigate trackability concerns related to their small size:**

- + These concerns are mitigated, for example, through the deployment of antenna, solar panels, or other components that increase the radar cross section of the object to the equivalent of a 1U object, or the use of reflectors or beacons that transmit location data.
- + Applicants should demonstrate the reliability and performance of the mechanism used through testing, analysis or by other means. Assurance will be verified through the NZSA's own assessment process.

**1.6.2 Payloads that cannot demonstrate trackability equivalent to a 1U object may be permitted in some circumstances if they operate below the orbits of crewed spacecraft (typically 400km)**

- + This will also ensure the payloads have a very limited life (1 – 2 years) which further reduces the probability of collision, and that any risk to, or interference with, the operations of crewed spacecraft is eliminated.

## 1.7 Conditions

If a payload permit is granted [section 18](#) of the Act provides that the Minister may impose conditions on the payload permit or overseas payload permit as necessary. There may be cases where imposing specific permit conditions can mitigate the concerns around payloads that are unable to be tracked and/or that propose to operate at altitudes above crewed spacecraft. Such conditions may include (but not limited to):

- + requirements to install a device or beacon that transmits location data;
- + requirements to collaborate with other spacecraft operators for the purposes of collision avoidance; and
- + requirements to notify the NZSA of any incident or accident involving the permitted spacecraft.