Active Debris Removal and On-Orbit Servicing Missions: Operational Policy

Issue/Version Control

Version	Date	Amendments
V1	10th May 2023	Initial Issue

1.1 Purpose of this document

This is the New Zealand Space Agency (**NZSA**) policy relating to applications for Active Debris Removal or On-Orbit Servicing missions 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**). It sets out the approach that will be taken by the NZSA when assessing applications under the Act.

1.2 This operational policy should be read alongside the operational policy on orbital debris mitigation plans. When to apply this policy

This policy will be applied when assessing applications for active debris removal (ADR) and/or on-orbit servicing (OOS) missions (including demonstrations):

+ Payload permit
+ Overseas payload permit.

1.3 Relevant sections in the Act

The Act allows the Minister to impose conditions on payload operators in relation to (among other things):

- managing New Zealand's liability under international law
- protecting New Zealand's national security and other national interests
- avoiding potentially harmful interference with the activities of others in the peaceful exploration and use of outer space.

The relevant sections in the Act are:

Payload

+ **16(2):** *Application for payload permit*
+ **17(1)(b):** *When payload permit may be granted*
+ 18: *Conditions, indemnity, and insurance relating to payload permit*

Overseas Authorisation

+ **51:** *Minister may take into account authorisation granted in country other than New Zealand*
+ **33(1)(b):** *When overseas payload permit may be granted*
+ 34: *Conditions, indemnity, and insurance relating to overseas payload permit*

The Regulations prescribe the requirements for an Orbital Debris Mitigation Plan. The relevant regulation is:

+ **Regulation 13**: *Requirements for orbital debris mitigation plan*

1.4 Policy intent

New Zealand has established a policy position and process on how to assess applications for payload permits for operations involving ADR and OOS. This policy considers mitigations for the following risk areas:

- Orbital debris mitigation
- Security and stability
- Liability and insurance.

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

Information to be taken into account in the application of this policy includes:

For payloads that intend to carry out or demonstrate active debris removal or on-orbit servicing activities, the ODMP should include specific considerations for the activity being carried out. In addition to the requirements in the Operational Policy on Orbital Debris Mitigation Plans, these missions will be required to comply with the Consortium for Execution of Rendezvous and Servicing Operations (CONFERS) “Guiding Principles for Commercial Rendezvous and Proximity Operations (RPO) and On-Orbit Servicing (OOS)”.

Other standards and relevant documents for ADR and OOS missions recommended by NZSA include:

+ CONFERS Recommended Design and Operational Practices
+ CONFERS On-Orbit Servicing (OOS) Mission Phases
+ JERG-2-026 - JAXA Safety standards for OOS.

Risk and Hazard Management Plan

To mitigate the unique risks related to the safety and security of these operations a risk and hazard management plan is required as part of the ODMP, which contains:

+ Detailed analysis of risks and hazards at each stage of mission
+ Steps taken to address hazards and minimise or avoid risks
+ Consideration of the characteristics of, and hazards associated with, the client object part.

Communication Plans

ADR and OOS payload permit applications should also contain a communications plan. Communication and transparency around planned ADR and OOS operations are important in mitigating the risk of third-party operators and states misinterpreting the behaviour of ADR and OOS satellites and intent of their operators. NZSA expects the communication plan therefore contains details on:

+ How the operator plans to provide information on the planned activity and in the event of an anomaly to:
    - the regulator (MBIE)
    - third-party operators
    - the general public.
+ Provision for communication and coordination between entities that could be affected by the servicing operation to avoid misinterpretation of behaviours or harmful interference.
+ Provision for consultation with other states in the event of potential accidental harmful interference.

Insurance and Liability

Requirements for liability insurance for ADR and OOS payloads are assessed on a case-by-case basis, based on the risks associated with each mission. The applicant may be required to hold liability insurance that would indemnify the Crown against claims (up to a set value) made against New Zealand under the Liability Convention.

Jurisdiction and Ownership of Space Objects

Active debris removal and on-orbit servicing payload permit applicants will require an agreement with the debris object owner establishing consent for the proposed servicing operation.

Payload permit applicants may be required to present an agreement with the state that has registered the client space object and the entity which holds the proprietary right to the object. This agreement should stipulate that the permit applicant has the necessary consent to execute and deliver the service, the service complies with relevant regulations of the client object registration state and that, where necessary, any changes to the client object appear in an update to the object's registration with the United Nations Office for Outer Space Affairs (UNOOSA).

Applicants should also provide NZSA with contact information for the client object owner and operator.

1.6 Verifying compliance

NZSA will consider:

- the alignment of the ODMP with the CONFERS "Guiding Principles for Commercial Rendezvous and Proximity Operations (RPO) and On-Orbit Servicing (OOS)"
- whether the risk and hazard analysis has considered all likely risks, and sensible mitigations are in place
- the planned communication methods and frequency
- how information will be communicated to potentially affected parties in the event of an anomaly including provisions for consultation with other states in the event of potential accidental harmful interference.

Further information

Where an application is incomplete, contains deficiencies or inconsistencies, or in any other way fails to satisfy the requirements of the Act and Regulations, further information will be requested from the applicant. This may occur at any point during the application and assessment process.

1.6 Conditions

The Minister may impose conditions on the licence or permit in relation to ADR/OOS missions. Such conditions may include, but not be limited to:

- Requirement that payloads launched from New Zealand comply with relevant regulations of the state that has jurisdiction over the object being serviced or removed
- Prohibition of any remote sensing capabilities of these payloads from being used to collect data on third-party satellites
- Notification of any change, expiry or revocation to a licence, permit or authorisation treated by the Minister as satisfying New Zealand's orbital debris mitigation requirements
- Notification of deviations from the planned orbital trajectory
- Notification of any incident or accident (eg a conjunction, near miss or collision), or notification of debris associated with the object, including details of that incident or accident
- Notification of initiation of re-entry or other end-of-life processes[1].

[1] End-of-life processes include passivation and any disposal manoeuvres