Australian Government
Civil Aviation Safety Authority

DISCUSSION PAPER
DP 2521US

Uncrewed aircraft operations - Research and development pathways

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Acknowledgement of Country

The Civil Aviation Safety Authority (CASA) respectfully acknowledges the Traditional Custodians of the lands on which our offices are located and their continuing connection to land, water and community, and pays respect to Elders past, present and emerging.

Artwork: James Baban.

1 Overview

This discussion paper (DP) invites industry feedback on how CASA's safety regulatory framework for uncrewed aircraft operations can be improved to better support research and development (R&D) operations. We want to ensure that our framework remains flexible and efficient, that regulatory requirements are risk proportionate and that they do not impose an undue burden on industry participants.

In this DP, we discuss how CASA's safety regulatory framework currently enables uncrewed aircraft R&D operations, and we outline our efforts to improve flexibility and efficiency across various regulatory areas that intersect with uncrewed aircraft R&D operations.

We welcome your feedback on these initiatives, and other matters, through a short survey and open text commentary via CASA's Consultation Hub.

Key elements of the DP include:

- an outline of key elements of CASA's safety regulatory framework that enable uncrewed aircraft R&D operations
- discussion of work in progress that is aimed at improving the flexibility of the framework and improving R&D pathways for industry
- a preliminary proposal for potential further amendments to improve the flexibility of the framework
- a consideration of how 'sandboxes' and flight testing are supported under the framework.

Our regulatory relief work follows a 2021 regulatory post-implementation review (PIR) of Part 101 of the *Civil Aviation Safety Regulations* 1998 and its Manual of Standards (MOS). Following the PIR review, Policy Proposal 2107US was released for public consultation, which included recommendations related to R&D operations. A Summary of Consultation can be found here.

CASA's RPAS and AAM Strategic Regulatory Roadmap was initially published in June 2022 and was reviewed and refreshed in 2024. It outlines regulatory activities or outcomes for CASA across 4 time horizons.

1.1 Summary of the DP and proposal to change the excluded category

The DP sets out the regulatory structure that broadly supports uncrewed aircraft operations, and how R&D operations may also be supported within this framework. The DP outlines the regulatory framework, highlights where it supports R&D operations, and through the survey, seeks feedback on how improvement can be made for R&D areas that are having trouble progressing innovation and other interests.

To provide immediate alleviation for R&D operations, CASA is proposing to amend the excluded category that would permit a person to operate a small RPA (weighing more than 2 kg but not more than 25 kg) under the standard RPA operating conditions (SOC), over their own land, for any purpose.

This change would align small RPA operations to the same conditions for micro RPA (weighing not more than 250 g) and very small RPA (weighing more than 250 g but not more than 2 kg) when operated under the SOC, for any purpose, but would require the remote pilot to hold a remote pilot licence or RPA operator accreditation. Please see section 5.3 Amending the small RPA excluded category.

The DP also discusses R&D considerations within the following contexts:

- medium and large RPA matters
- registration considerations
- ReOC requirements
- model aircraft
- area approvals

- industry guidance
- regulatory sandboxes
- flight test areas.

1.2 Why are we seeking your feedback

We would like to test our understanding of the regulatory constraints on uncrewed aircraft R&D operations and explore pathways to improve our processes across regulatory services, guidance material, communication and operator enablement while maintaining aviation safety.

We invite your feedback, and any additional input related to these matters. Your feedback will play a crucial role in shaping our next steps to engage with industry on the development of policy supporting R&D activities and informing future regulatory changes.

Please submit your responses through the online response form by 9 December 2025.

Contents

2 Reference material

2.1 Acronyms

The acronyms and abbreviations used in this DP are listed in the table below.

Table 1: Acronyms

Acronym	Description
AC	advisory circular
AOC	Air Operator's Certificate
AAM	Advanced Air Mobility
A-VLOS	assisted visual line of sight
BVLOS	beyond visual line of sight
CAA	*Civil Aviation Act 1988*
CAR	*Civil Aviation Regulations 1988*
CASA	*Civil Aviation Safety Authority*
CASR	*Civil Aviation Safety Regulations 1998*
DP	discussion paper
DPP	documented practices and procedures
DSA	drone safety apps
EVLOS	extended visual line of sight
JARUS	Joint Authorities for Rulemaking on Unmanned Systems
LAME	licensed aircraft maintenance engineer
MOS	Manual of Standards
NM	nautical miles
OPC	Office of Parliamentary Counsel
OONP	operations over or near people
RA	restricted areas
RePL	remote pilot licence
ReOC	Remotely Piloted Aircraft Operator's Certificate
RPA	remotely piloted aircraft
RPAS	remotely piloted aircraft system
SAIL	specific assurance integrity level
SOC	standard RPA operating conditions

Acronym	Description
SORA	Specific Operation Risk Assessment
TMI	Temporary Management Instruction
THA	test hazard analysis
VLOS	visual line of sight

2.2 Definitions

Terms that have specific meaning within this DP are defined in the table below. Where definitions from the civil aviation legislation have been reproduced for ease of reference, these are identified by 'grey shading'. Should there be a discrepancy between a definition given in this DP and the civil aviation legislation, the definition in the legislation prevails.

Table 2: Definitions

Term	Definition
authorisation	An authorisation under the CASR to undertake a particular activity (whether the authorisation is called an approval, permission, authority, licence, certificate, rating or endorsement or is known by some other name).
commercial	For hire or reward.
excluded category	'Excluded RPA' within the meaning of regulation 101.237 of CASR. The terms are used interchangeably in the DP.
model aircraft	As defined in regulation 101.023 of CASR.
regulations	CASR.
research and development	R&D is not defined. The principles of R&D may be considered to mean: 'Research' includes both basic and applied aviation research, such as studies aimed at understanding fundamental principles with the goal of benefiting future aviation-related activities or research that focuses on practical implementation to improve safety, technologies, and real-world solutions for aviation operations. 'Development' includes the translation of research findings into practical, usable solutions, systems, or products connected to aviation. This may involve prototyping, testing, and refining new technologies that are intended to be integrated into aviation infrastructure or operations. Flight testing is included within the reference to research and development.
uncrewed aircraft	Aircraft operated with no human pilot on board and no passengers and/or crew on board. The term 'uncrewed' is used in preference to 'unmanned' which is the term adopted in the CASR.

2.3 References

Legislation

Legislation is available on the Federal Register of Legislation website https://www.legislation.gov.au/

Table 3: Legislation references

Document	Title
Airspace Act 2007	
Airspace Regulations 2007	
Australian Education Act 2013	
Civil Aviation Act 1988	
Higher Education Support Act 2003	
Regulation 42 CB of the CAR	Maintenance - experimental aircraft
Part 11 of CASR	Part 11 - Regulatory administrative procedures
Part 21 of CASR	Part 21 - Certification and airworthiness requirements for aircraft and parts
Part 101 of CASR	Part 101 - Unmanned aircraft and rockets
Part 101 MOS	Part 101 - Manual of Standards
CASA 01/17	CASA 01/17 - Approval — operation of RPA at night
CASA 66/24	CASA 66/24 — Operation of RPA Within 3 Nautical Miles of a Controlled Aerodrome (CASA-Verified Drone Safety App) Instrument 2024
CASA 67/24	CASA 67/24 — Operation of RPA in Sydney Harbour Restricted Areas, R405A and R405B (CASA-Verified Drone Safety App) Instrument 2024
CASA 20/25	CASA 20/25 – Operation of Certain Unmanned Aircraft and Rockets – Directions Instrument 2025
CASA EX87/25	CASA EX87/25 – Obtaining Experience (Grant of RePL for Medium RPA and RePL Upgrade to Different Category of Small or Medium RPA) Exemption 2025
CASA EX92/25	CASA EX92/25 — Operation of Remotely Piloted Aircraft Over Populous Area Exemption 2025
CASA EX51/24	CASA EX51/24 Remotely Piloted Aircraft Operations Beyond Visual Line of Sight Exemption 2024

Advisory material and temporary management instructions

CASA's advisory materials are available at https://www.casa.gov.au/publications-and-resources/guidance-materials

Table 4: Advisory material and temporary management instruction references

Document	Title
	Part 101 Micro and Excluded RPA Plain English Guide
	Experimental certificates (COA.02) - protocol suite
	Temporary Management Instruction (TMI) – RPA operations over or near people (OONP TMI)
	TMI SORA 2.0 ground risk assessment – requirements and alternate criteria – 2024-03
AC 101-01	Remotely piloted aircraft systems – licensing and operations v6.0
AC 101-03	Flying a model aircraft or drone for recreation or education v2.0

Forms

CASA's forms are available at http://www.casa.gov.au/forms

Table 5: Forms

Form number	Title
Form 101-02	Application RPA Operator's Certificate (ReOC) Initial issue/variation/renewal
	Application Beyond visual line-of-sight (BVLOS) Approval Initial issue/variation/renewal
	Application Remotely Piloted Aircraft (RPA) Flight Authorisation Initial issue/variation/renewal

3 Introduction

CASA's primary function is to conduct the safety regulation of civil air operations in Australia and the operation of Australian aircraft overseas. As technologies, operational practices, and safety considerations continue to evolve, it is CASA's role to ensure that current levels of aviation safety are maintained within Australia's aviation system.

We recognise that research and development (R&D) is crucial to innovation in the Remotely Piloted Aircraft Systems (RPAS) and the Advanced Air Mobility (AAM) sectors. Potential flow on benefits from R&D operations include improved safety and efficiency of operations, and the safe deployment of new technologies and systems that bring economic and social benefits to the wider community. We recognise that CASA's safety regulatory framework is a key enabler of such innovation.

The RPAS and AAM Strategic Regulatory Roadmap (Roadmap) is a key guiding document that sets out CASA's strategy and planning to safely integrate RPAS and AAM technologies into Australia's airspace and future regulatory system, alongside traditional aviation. The Roadmap identifies the review and development of pathways to support R&D operations for RPAS and AAM as an action or outcome for CASA.[1]

In practical terms, to achieve this outcome we work in consultation with industry to understand the regulatory challenges that industry is experiencing in relation to R&D operations, we review policy and regulatory settings and update policy and legislation to reduce barriers to safe R&D operations, and we develop and publish guidance for industry on regulatory pathways for R&D operations. We are committed to ensuring that our safety regulatory framework remains flexible and risk proportionate and does not impose undue regulatory burden[2] on industry participants who are seeking to conduct safe R&D operations.

CASA's regulatory framework for uncrewed aircraft is primarily consolidated in Part 101 of CASR and its associated MOS and instruments.[3] In this DP we focus on R&D operations that are within the scope of the CASR Part 101 framework[4] and discusses how these operations are enabled under the current framework.

The purpose of the DP is to seek your feedback on how the CASR Part 101 framework (including operational aspects) can be further improved to support R&D operations while ensuring we maintain safety for other airspace users and people on the ground.

To enable informed feedback, we discuss the progress we've made in improving rules and regulatory services as well as the regulatory relief proposals we are prioritising to continue this progress. Many of these initiatives intersect with R&D operations. By improving the flexibility of the safety regulatory framework, the initiatives that we are progressing provide broad alleviation to industry and streamline pathways for R&D operations.

Through this DP we aim to improve industry understanding of available pathways under the CASR Part 101 framework, while we continue to work with industry to reduce regulatory and administrative barriers to safe R&D operations. Our goal is to make it easier for industry to conduct safe R&D and flight-testing operations.

[1] RPAS-AAM Strategic Regulatory Roadmap at Operations | Civil Aviation Safety Authority.

[2] In regulatory costs and delays.

[3] The framework also draws on other CASR Parts (for example Parts 11 and 21) and the Civil Aviation Regulations 1988 (for example Part 4A). CASA has issued a Manual of Standards under regulation101.028 of CASR implementing certain standards in relation to the safety and oversight of RPA. The CASR empowers CASA to make instruments in forms that include approvals, authorisations, designations, directions, exemptions, revocation notices. Some instruments are 'legislative instruments'.

[4] Crewed AAM aircraft flight testing and R&D will fall within the scope of the broader CASR framework beyond Part 101 of CASR.

4 Part 101 of CASR – key elements

The CASR Part 101 framework provides the underlying regulatory structure and creates the environment to enable safe uncrewed aircraft operations, including for R&D purposes.

The key safety risks of uncrewed aircraft operations are the risk to people onboard other aircraft in the event of a midair collision and the risk to people and property on the ground in the event of termination of a flight.

The key risk factors are the air risk (density of crewed and uncrewed aircraft in an area), ground risk (density of people in the area) and characteristics of an aircraft (dimensions and speed that impact lethal area if there is loss of control). These risk factors are considered by CASA in assessing the safety risks of all uncrewed aircraft operations that fall within the scope of Part 101 of CASR, irrespective of the purpose of the operation.

4.1 Remotely piloted aircraft

4.1.1 Micro and excluded RPA

The CASR defines types of RPA based on size/weight.[5]

Table 6: Types of RPA

Size	Gross weight
Micro	Not more than 250 g.
Very small	More than 250 g but not more than 2 kg.
Small	More than 2 kg but not more than 25 kg.
Medium	More than 25 kg but not more than 150 kg.
Large	More than 150 kg.

The CASR also creates a group of ‘excluded’ remotely piloted aircraft (RPA) operational profiles.[6]

An RPA is an excluded RPA if operation of the RPA is within an excluded operational profile i.e., within certain operational limitations and conditions as set out in regulations for that type of RPA. For example, small RPA are excluded RPA only if flown within standard RPA operating conditions (SOC), over land owned or occupied by the owner of the RPA, for certain purposes and provided there is no payment for services.[7]

The RPA using these profiles are described as 'excluded RPA' because these RPA do not require any further authorisation for an operation from CASA (but are subject to the rules applying to the relevant excluded operational profile). Certain excluded operations are excluded from either or both the requirement to hold a Remote Pilot Licence (RePL) and to operate under a Remotely Piloted Aircraft Operator's Certificate (ReOC).

Air and ground risk for operation of excluded RPA are controlled through the SOC and operational limitations that define characteristics for the RPA, the activity and the location where it is carried out, and qualifications, accreditations and certifications required to conduct the activity.

[5] Regulation 101.022 of CASR.

[6] Regulation 101.237 of CASR.

[7] Subregulation 101.237(4) of CASR.

Excluded RPA operations generally present a low level of risk to other airspace users, other people, and property and hence require no further approval from CASA.

The SOC require that:

- the RPA is operated:
  - only in Australian territory (including within 12 NM or 22 km of coastline)
  - within the visual line of sight (VLOS) of the person operating the RPA
  - no higher than 400 ft (120 m) above ground level during the daytime only.
- the RPA is not operated:
  - closer than 30 m from people not associated with the flight
  - in a prohibited area
  - in a restricted area that is classified as RA3
  - in a restricted area that is classified as RA2 or RA1, otherwise than in accordance with regulation 101.065
  - over populous areas
  - within 3 NM (5.5 km) of the movement area of a controlled aerodrome – one with an operating control tower
  - in the area of a public safety operation without the approval of a person in charge of the operation.
- only 1 RPA flown or operated by a person at any one time.[8]

Micro RPA (i.e. RPA weighing 250 g or less) are not within the excluded RPA profiles.[9] They are subject to the general rules regarding RPA operations and operational limitations equivalent to the SOC.[10]

Table 7 below is a summary of the framework for micro and excluded RPA operations.[11]

Table 7: Summary of the framework for micro and excluded RPA operations

	Micro RPA	Very small excluded RPA	Small excluded RPA	Medium excluded RPA
RPA requires registration.	Yes.	Yes.	Yes.	Yes.
Limited to operations on land owned or occupied by the RPA owner.	No.	No.	Yes.	Yes.
RPA must be operated by or on behalf of the owner of the RPA.	No.	No.	Yes.	Yes.
Must be operated as per SOC	Yes.[12]	Yes.	Yes.	Yes.

[8] Regulation 101.238 of CASR.

[9] Subpart 101.F of CASR does not apply to micro RPA. See regulation 101.235 of CASR.

[10] As set out in CASR Subparts 101.A to C, Part 101 MOS chapter 4 and 9, CASA 20/25.

[11] Table 1 does not include excluded category small and medium RPA operations for purposes of gaining practical experience and competency in the operation of an RPA as those arrangements are of limited relevance to the R&D focus of this paper. See subregulation 101.237 (6) of CASR, regulation 101.237 (8) of CASR and CASA EX87/25.

[12] As set out in CASR subparts 101.A to C, Part 101 MOS chapter 4 and 9, CASA 20/25.

	Micro RPA	Very small excluded RPA	Small excluded RPA	Medium excluded RPA
Limited to specified purposes	No.	No.	Yes.[13]	Yes.[14]
Requires RPA operator accreditation/RePL	RPA operator accreditation.	RPA operator accreditation.	RPA operator accreditation.	RePL.
Requires a ReOC	No.	No.	No.	No.

4.1.2 RPA operations that are not within the excluded category

A range of very small, small and medium RPA operations that fall outside the limitations of the excluded RPA profiles, or outside the SOCs (for example BVLOS operations, flying by night, operating multiple drones at the same time), are enabled by CASA authorisations and/or exemptions from compliance with certain provisions in the CASR.[15]

The assessment and outcome of an application for a flight authorisation depends on the type of RPA to be operated, the operational area in which the flight will take place including the airspace and altitude, the associated ground and air-risk and the quality of the required documentation. A person or organisation applying for an authorisation may be required to submit flight plans, risk assessments, practices and procedures to CASA for assessment, depending on the level of risk associated with the operation.

A ReOC is required for businesses wanting to operate RPA beyond the excluded category. ReOCs allow entities to:

- conduct RPA operations for hire or reward
- employ remote pilots to operate RPA
- apply for authorisations for complex RPA operations that are not available to non ReOC holders.

> **Note:** RPA weighing more than 150 kg require additional certification.

The ReOC framework is similar to the air operator's certificate (AOC) for crewed aviation, ensuring a safe, standardised, and professional environment for RPA operations. This is achieved through a robust governance structure within the organisation, ensuring key personnel are properly trained and qualified, and follow approved procedures for safe RPA operation.

Individuals who fly RPA for an individual or business that holds a ReOC, or who fly an RPA that weighs more than 25 kg but less than 150 kg over their own land, require a RePL.

> **Note:** The remote pilot licensing requirements for R&D operations by RPA over 150 kg is discussed further at paragraph 4.1.4.

[13] Subregulations 101.237 (4) and (6) of CASR.
[14] Subregulation 101.237 (7) of CASR.
[15] See for example, CASA EX92/25 — Operation of Remotely Piloted Aircraft Over Populous Area Exemption 2025 or CASA 01/17 – Approval – operation of RPA at night.

4.1.3 R&D pathways – micro, very small, small and medium RPA

The arrangements described at paragraphs 4.1.1 and 4.1.2 do not create bespoke arrangements for R&D operations but nonetheless support operations by RPA that may be for R&D purposes.

R&D operations may be conducted within the excluded RPA profiles. The arrangements for micro RPA and very small excluded category RPA appear to present minimal barriers to R&D operations.

There are some limitations with the arrangements for small and medium excluded category RPA that could potentially be improved to further support R&D operations. We discuss this in greater detail in Chapter 5.

For operations outside the excluded category, once an operator holds a ReOC and RePL that authorises operation of the RPA, there are no restrictions on them performing R&D operations, including flight testing, within the conditions on the ReOC.

Persons seeking to obtain a ReOC can apply using form 101-02.[16]

If the operator is not authorised on the ReOC to operate the RPA that they wish to conduct R&D with, they can apply using form 101-02 for a standard variation. The ReOC holder would need to comply with normal record keeping requirements that apply to the ReOC and adhere to the privileges of the ReOC.[17] ReOC holders have the option of applying for operations in addition to the privileges of a ReOC such as BVLOS, operations above 400 ft.[18]

Presently, micro RPA cannot be operated under a ReOC.[19] However, individuals who intend to operate micro RPA may apply to CASA for a flight authorisation, outside the scope of a ReOC such as for BVLOS operations. There are no R&D-specific restrictions for persons using micro RPA.

4.1.3.1 ReOC for R&D operations - very small, small and medium RPA

The current framework has flexibility to support a range of R&D operations under the privileges of a ReOC.

It is a condition on certification that each ReOC holder has suitable documented practices and procedures (DPP).[20] Most operators include the DPP in a document called an 'operations manual', with sections covering management, record keeping, training, checking, maintenance, normal operations, and emergency response.

For ReOC holders that are primarily interested in R&D operations, the ReOC holder's operations manual developed to support these operations would be assessed by CASA keeping in mind the R&D purpose of the operation. CASA could assess the air and ground risk of the proposed operations within a defined operational area and include safety risk mitigations as conditions of the authorisation.

In any case, a ReOC holder can conduct R&D operations within the stated privileges of the ReOC.

4.1.3.2 Feedback

We are interested in your feedback on the challenges that industry participants conducting R&D operations with micro, very small, small and medium RPA have experienced with the ReOC framework, including, what you have observed or experienced to be overly burdensome requirements that may be viewed to add minimal safety benefits.

At Chapter 5, we discuss proposed improvements that are aimed at streamlining administrative requirements that affect R&D operations.

[16] Form 101-02 is the approved application form for initial issue, variation or renewal of a ReOC. Applications may be made by individuals and corporate entities.
[17] Part 101 MOS, Chapter 10, Division 10.2.
[18] Using the RPA Flight Authorisation form or the BVLOS Approval form.
[19] Regulation 101.235 of CASR.
[20] Paragraph 101.340 (1) (e) of CASR.

4.1.4 R&D pathways for large RPA

The pathway for R&D operations using large RPA is supported under current arrangements.

Experimental certificates are used to authorise R&D operations for large RPA.[21] The issuance of an experimental certificate is underpinned by a test hazard analysis (THA) and other related risk assessments, typically informed by the application of relevant aspects of the Specific Operations Risk Assessment (SORA) methodology.[22]

Depending on the complexity and unique or unusual design characteristics of these innovative systems, CASA may issue an exemption for the requirement to hold a RePL based on the remote pilot's prior experience.[23] Standards and policy for the licensing of remote pilots to operate complex large RPA systems are limited and are still in development. There are no opportunities for a person to complete a training course as an alternative to completing a CASA flight test for large RPA.

To obtain a first of type rating on the RePL, a flight test conducted by CASA is the only mechanism to licence a person on a system. However, a flight test may present some safety concerns, including to CASA personnel conducting the flight test. Conducting a flight test on a specific system, especially one that is still under development and is to be operated for R&D purposes carries significant risk with uncertain safety benefit. CASA generally supports the use of RePL exemptions for R&D operations involving large RPA until such time as appropriate standards and procedures can be established.[24]The SORA risk assessment for the experimental certificate would continue to be used to assess and determine appropriate risk controls for these operations.

While large RPA R&D operations can be conducted under a ReOC, exemptions may be granted from the requirement to hold a ReOC where the applicant supplies a development flight test plan.[25] This approach is similar to the approach taken to conventionally piloted R&D operations conducted but without an AOC.

When operating an RPA under an experimental certificate, the operator need only comply with the conditions listed on the experimental certificate.[26] Exemptions from the maintenance requirements for large RPA are generally not required when conducting R&D operations if the maintenance requirements are adequately detailed in the experimental certificate. Where an applicant organisation does not employ a Licensed Aircraft Maintenance Engineer (LAME), a maintenance exemption may be issued.[27]

Typically, enquiries to operate large RPA for R&D purposes are received through CASA's Advanced RPAS operations enquiries and assistance pathway.[28] On receipt of an enquiry CASA will organise a pre-application meeting to discuss relevant authorisations and exemptions that would be needed to enable the concept. A concept of operations for the proposed large RPA R&D operation is required to support discussions at the meeting.

[21] Experimental certificates (COA.02) - protocol suite. See CASR 21.191 (experimental certificates) and CASR 21.185 (Certificates of airworthiness for restricted category aircraft).

[22] SORA (Specific Operations Risk Assessment) is a risk-based methodology developed by the Joint Authorities for Rulemaking on Unmanned Systems (JARUS)

[23] Due to similar safety concerns, a similar approach is taken in relation to medium RPA. CASA EX87/25 – Obtaining Experience (Grant of RePL for Medium RPA and RePL Upgrade to Different Category of Small or Medium RPA) Exemption 2025 provides an exemption from the requirements of CASR 101.252 to support pilots in gaining experience for an upgrade from a small to medium category RPA and for obtaining experience for an upgrade from a small or medium RPA to a different category of small to medium RPA.

[24] See for example CASA EX56/25. https://www.casa.gov.au/non-legislative-instrument/flight-testing-vertiia-v1000-rpa-amsl-aero.

[25] Regulation 101.275 of CASR.

[26] Regulation 101.260 of CASR and Civil Aviation Regulations 1988 (CAR) 42CB.

[27] Regulation 101.265 of CASR.

[28] Advanced Operations.

4.2 Autonomous aircraft

An autonomous aircraft is one that prevents pilot intervention during any stage of the flight.[29] Operations of autonomous aircraft are approved on case-by-case basis after an assessment by CASA of the safety case for the proposed operation.[30] This includes operations for R&D purposes.

4.3 Model aircraft

Under the CASR Part 101 framework, model aircraft are not RPA.[31] However, the definition is based on use - the same aircraft can therefore be deemed a model aircraft or an RPA under the regulations, depending on the operation.

Broadly, model aircraft are:

- uncrewed aircraft that weigh 150 kg or less that are operated for the purpose of sport or recreation

  or

- aircraft with a gross weight of not more than 7 kg operated in connection with educational, training or research purposes by schools and higher education providers defined in Australian Education legislation.

Operations conducted by educational institutions on a contracted basis are not considered model aircraft operations and must meet the requirements of excluded RPA operations or operate under a ReOC.

Uncrewed aircraft weighing more than 7 kg operated for training, educational or research purposes by a school or higher education provider are subject to the normal rules and requirements for the relevant RPA.

Regulatory requirements for model aircraft are linked to the weight of the aircraft. Model aircraft weighing 25 kg or less are subject to general rules and relevant CASA directions.[32] Giant model aircraft (weighing more than 25 kg but not more than 150 kg) can only be operated under the rules and procedures of a model aircraft organisation that holds a CASA approval for this purpose, or with CASA approval.

4.4 Area approvals

Anyone may apply to CASA for an area approval to conduct R&D operations.

On application from a person, CASA will assess the application and decide whether to approve an area as an area for the operation of uncrewed aircraft generally or a particular class of operations.[33]

In considering an application for an area approval, CASA must consider the likely effect of the proposed operation/s on the safety of air navigation in the area.[34] CASA may grant the approval only if the operation would not be likely to have an adverse effect on the safety of air navigation.[35]

The assessment and outcome of an application for an area approval depends on the type of uncrewed aircraft to be operated, the operational area in which the flights will take place including the airspace and altitude and the associated ground and air-risk. The regulatory framework may impose further requirements depending on the type of operations proposed. If the uncrewed aircraft is an RPA other than a micro RPA, a ReOC and RePL would be part of the requirements.

[29] Regulation 101.097 of CASR.
[30] Under Subregulation 101.097 (3) of CASR.
[31] Regulation 101.023 of CASR. Operation must be by a school in relation to which there is an approved authority under the *Australian Education Act 2013* or a higher education provider within the meaning of the *Higher Education Support Act 2003*.
[32] Subpart 101.C and 101.G of CASR and CASA 20/25.
[33] Regulation 101.030 of CASR.
[34] Subregulation 101.030(3) of CASR.
[35] Paragraph 11.055(1A)(e) of CASR.

The SORA risk methodology is the primary risk methodology utilised by CASA to establish a sufficient level of confidence that complex uncrewed aircraft operations can be conducted safely. Within the SORA, there are 6 Specific Assurance and Integrity Levels (SAIL), which are calculated according to the intended concept of operation. The SAIL is a consideration of both the air risk classification (ARC) and ground risk classification (GRC) of the operation.[36] In determining the required risk mitigators for RPA operations (relating to operator competence, manufacture and maintenance of the RPA, personnel competence, system capabilities and operational procedures), the requirements that apply increase the required integrity (how good) and assurance (how trusted) as the SAIL increases.

Where an area approval is sought to conduct novel and advanced uncrewed operations, CASA will generally provide feedback on suitability of the operational areas that are proposed and work with applicants to ensure appropriate mitigations are applied so that an acceptable level of safety is achieved.

4.4.1 Feedback

We welcome your feedback on any barriers to R&D operations posed by the authorisation arrangements described at paragraphs 4.1 to 4.4.

4.5 Registration

All RPA must be registered with CASA.[37] There are some exclusions for RPA weighing under 150 kg that are operated for test flights that are discussed below.

As discussed at paragraph 4.3, model aircraft are not RPA and are not required to be registered.[38]

Large RPA are registered in accordance with Division 47.C.1 of CASR. The registration requirements apply to both experimental and restricted category certificated large RPA. On registration on the Australian Civil Aircraft Register, large RPA are issued with a VH registration mark that must be attached to the aircraft.

Micro, very small, small and medium RPA are registered in accordance with Division 47.C.2 of CASR. The registration requirement does not apply to RPA under 150 kg that are operated for the purposes of a test flight.

Provided the operation is relevant to the development, manufacture, repair or maintenance of the relevant aircraft or its aircraft system (the relevant system), or of equipment associated with the relevant aircraft or its aircraft system (relevant equipment), RPA under 150 kg may be operated for the following purposes without registration:

a. a test flight conducted by, or at the request of, the manufacturer developing the relevant aircraft, system or equipment, and for the purpose of such development
b. a test flight, following the manufacture of the relevant aircraft, system or equipment, that is conducted:
    i. by, or at the request of, the manufacturer of the relevant aircraft, system or equipment
    ii. before it is provided to the initial purchaser of the relevant aircraft, system or equipment.
c. a test flight following the fitting of relevant equipment to a relevant aircraft or system, that is conducted by, or at the request of, the person who fitted the equipment
d. a test flight before or after repair or maintenance of the relevant aircraft, system or equipment, that is conducted by, or at the request of, the person who carried out, or will carry out, the maintenance or repair.[39]

[36] CASA's ground risk assessment methodology is set out in TMI SORA 2.0 ground risk assessment – requirements and alternate criteria – 2024-03. CASA's air risk assessment methodology is as set out in JARUS Guidelines on SORA, Annex C Strategic Mitigation - Collision Risk Assessment.

[37] Subregulation 47.105(1) of CASR.

[38] Paragraph 47,105(1)(f) of CASR.

[39] Paragraph 47.105(1)(n) of CASR, Division 47.105(B) and Division 101.099(B) of CASR and Chapter 11 of the Part 101 MOS.

To some extent, the regulations permit the original registration to continue even when an RPA is modified. This is to allow development of the RPA without requiring the RPA to be re-registered. The registration may continue, provided the modifications do not:

- change the category of the RPA (aeroplane, multi-rotor, powered lift etc.)
- increase the weight classification of the RPA into a higher weight classification (i.e., very small RPA to small RPA)
- increase the gross weight on take-off of the RPA by more than 20% (take-off weight includes payload)
- involve removal of parts and components that are critical to the flight of the RPA
- alter any of the following for the RPA: – the manufacturer's serial number – the CASA registration number allocated in substitution for a manufacturer's serial number – any electronic identification of the RPA.[40]

4.5.1 Feedback

The registration requirements described at paragraph 4.5 were developed to enable R&D test flights by RPA under 150 kg. We welcome your feedback on any barriers posed by these arrangements to R&D operations.

4.6 Information and guidance

While not specific to R&D, there is information available on CASA's website on the CASR Part 101 framework including guidance on application and authorisation processes.[41]

4.6.1 Feedback

We welcome your feedback on whether there is sufficient industry awareness of how R&D operations are enabled, and may be conducted, under the current CASR Part 101 framework.

[40] See the definition of 'unacceptable modifications' in Section 1.04 and Chapter 14 of the Part 101 MOS.
[41] See for instance the information available on the CASA website and AC 101-01 Remotely piloted aircraft systems – licensing and operations and AC 101-03 Flying a model aircraft or drone for recreation or education. Specific guidance material relevant to micro and excluded RPA operations is contained in the Part 101 Micro and Excluded RPA Plain English Guide.

5 Further enabling research and development

CASA's safety regulatory framework is a key enabler of innovation. CASA is committed to timely policy and regulatory development and implementation to ensure that its regulatory framework keeps up with the pace of change within industry and remains fit for purpose, effective and efficient. A flexible and adaptive regulatory framework would benefit industry participants more broadly as well as enable and support R&D operations.

CASA also recognises that regulatory requirements and processes may need to consider certain characteristics of R&D operations so that the requirements that are imposed are not disproportionate to the safety risk of these operations, and do not pose a barrier to these operations.

5.1 Timely legislative change

The CASR are made by the Governor General following Ministerial approval.[42] All regulation instruments, including amendments, must be drafted by the Office of Parliamentary Counsel (OPC), a separate Australian Government agency. CASA's access to the mechanisms supporting amendment to Government regulations are subject to whole of government priorities. CASA is aware that delays in regulation changes can prolong barriers to participation in the aviation sector and continues to advocate for critical changes as appropriate.

At the same time, the CASR empowers CASA to make a wide variety of instruments including approvals, authorisations, designations, directions, exemptions, revocation notices and MOS.[43] CASA uses these legislative mechanisms where available to adjust the CASR Part 101 framework to enable a greater range of operations with reduced regulatory/administrative requirement for industry.[44]

5.2 Streamlined regulatory requirements for a greater range of operations

CASA is aware that as technologies mature and use cases and applications evolve, there is growing interest in operations beyond the SOC (for instance, BVLOS that are over and near people or operations above 400 ft). CASA is responsible for carefully considering any adjustments to the framework to expand the range of operations that can be conducted without a specific authorisation from CASA, or with reduced regulatory requirements, to ensure that all safety risks are adequately managed and the risk controls applied are appropriate to manage the safety risks posed by the activity.

CASA now has better knowledge of the associated risks of the uncrewed aircraft operations that fall within the scope of Part 101, and insights gained through its regulatory activities over several years. These insights have informed initiatives to improve the responsiveness of the CASR Part 101 regulatory framework, including for R&D operations.

For example, previously, ReOC holders that applied for an approval to fly over or near people had to also apply for an exemption to fly in a populated area. The exemption process was time consuming and costly for industry. In January 2024, CASA released the *Temporary Management Instruction – RPA operations over or near people* (OONP TMI) in response to increasing applications to conduct RPA operations over or near people.[45] The TMI specifies CASA's policy to support processing applications for the approval of RPA

[42] Section 98 of the *Civil Aviation Act 1988*.
[43] See for instance Subparts 11.F and 11.G of CASR.
[44] See for example CASA EX51/24 Remotely Piloted Aircraft Operations Beyond Visual Line of Sight Exemption 2024 that allows for RPA operations beyond visual line of sight (BVLOS) under specific conditions. This exemption streamlines the process for obtaining BVLOS approvals, particularly for operations in remote Australian airspace or shielded operations.
[45] Temporary Management Instruction (TMI) – RPA operations over or near people (OONP TMI).

operations over or near people.[46] In August 2024, we introduced a general exemption that provides ReOC holders with CASA approval to fly over or near people permission to fly in populous areas as well.[47]

CASA is developing policy to enable a greater range of operations that can be conducted without impacting existing aviation safety levels whilst reducing regulatory and administrative requirements for industry, and that can be progressed without amendment to the CASR. Some of the areas that we are focussing on include:

- **Operations over and near people:** We are considering how we can improve application and assessment pathways for ReOC holders that wish to conduct operations over and near people, including by introducing additional approval pathways and requirements.
- **Lower risk BVLOS enablement:** Following the results from the BVLOS drone operations in regional Australia survey,[48] we have been working to identify safe and accessible pathways for ReOC holders to conduct BVLOS operations in lower risk, low altitude areas Australia wide.
- **Assisted visual line of sight (A-VLOS) trial:** CASA is intending to trial a roll out for low risk and low altitude operations that are conducted using an observer via an exemption instrument. The trial is intended to inform the development of amendments to the definition of visual line of sight (VLOS) via an instrument, The initial phase will likely be rolled out to RePL holders. This proposal may achieve alleviation for operators from applying to CASA for certain low risk extended visual line of sight (EVLOS) operations and enable such operations for excluded RPA operators who hold a RePL, for the first time.
- **Operations above 400 ft:** CASA is considering, under certain conditions, how RPA operations can be conducted above 400 ft may be enabled for ReOC holders without CASA approval.

We intend to release further information about these initiatives in 2025-2026.

5.2.1 Feedback

We welcome your feedback on whether the initiatives described at paragraph 5.2 would improve avenues for R&D operations.

5.3 Amending the small RPA excluded category

In 2021 we conducted a regulatory post-implementation review (PIR) of Part 101 and its MOS. Following the PIR review, Policy Proposal 2107US was released for public consultation that included a proposal to create a new excluded category operational profile for micro, very small, and small RPA operated for R&D purposes under the SOC.

The PIR proposed definition of the excluded RPA profile was:

A micro RPA, very small RPA or a small RPA is an excluded RPA if it is being operated:

a. by a person solely for the purpose of research and development of the RPA involving testing of the RPAS for the manufacturer of the RPAS

b. in accordance with the manufacturer's documented procedures

c. after having conducted a risk assessment

d. in the standard RPA operating conditions.

This proposal was intended to allow a person, organisation, or business to operate a micro, very small, or small RPA under the SOC for the purposes of R&D of the RPA.

CASA has now reconsidered this proposal.

[46] For the purposes of regulations 101.245 and 101.280 of CASR.
[47] CASA EX92/25 — Operation of Remotely Piloted Aircraft Over Populous Area Exemption 2025.
[48] See BVLOS drone operations in regional Australia.

It does not appear the creation of the proposed excluded profile would appreciably improve the regulatory environment for R&D over and above what is possible under the current arrangements for micro and very small excluded RPA. Operations by micro RPA under the SOC,[49] and very small RPA in accordance with the limitations of the very small RPA excluded profile, are not limited to specific use cases such as not for remuneration; nor are they restricted to operations over land that is owned or occupied by the RPA owner.

For instance, a very small RPA is an excluded RPA if it is operated in accordance with the SOC.[50] Registration and operator accreditation requirements apply. Like all uncrewed aircraft, operation of a very small RPA within the excluded profile is subject to the general prohibitions on unsafe operations in Part 101 of CASR, including the prohibition against creating a hazard to another aircraft, person or property.[51]

5.3.1 Small RPA excluded profile

The small RPA excluded profile limits operations within the profile to operations over land that is owned or occupied by the RPA owner, and for one or more of the following purposes:

a. aerial spotting
b. aerial photography
c. agricultural operations
d. aerial communications retransmission
e. the carriage of cargo
f. any other activity that is similar to an activity mentioned in the subparagraphs above
g. for which no remuneration is received by the operator or the owner of the RPA, the owner or occupier of the land or any person on whose behalf the activity is being conducted.[52]

R&D is not specifically mentioned nor is it a similar activity to the activities within the permitted purposes.

5.3.2 Proposal – small RPA excluded profile

CASA has considered the air and ground risk of small RPA operating within the SOC and the risk mitigators that are applied to these operations and is considering:

- Rather than inserting R&D as a purpose within this excluded profile, the purpose requirements could be removed. The retention of requirements to operate within the SOC and over land that is owned or occupied by the RPA owner is considered sufficient to mitigate the air and ground risk of operations within this excluded profile, irrespective of the purpose of operation (including R&D purposes) or the commerciality of the operation.
- Further, the excluded profile could be expanded to enable small RPA operations within the SOC outside land owned or occupied by the RPA owner. To mitigate the increased safety risks of these operations to third parties (for operations that are not over land owned or occupied by the RPA owner), the remote pilot would be required to hold a RePL to operate the RPA.

This would mean that, provided operations are within the SOC, RPA that weigh more than 2 kg but not more than 25 kg could be flown for any purpose and for remuneration either:

- without a ReOC or an RePL over land that is owned or occupied by the RPA owner. The remote pilot would need to hold RPA operator accreditation (as is currently the case)

  or

[49] Micro RPA must comply with the conditions and limitations set out in CASR subparts 101.A to C, Part 101 MOS Chapter 4 and 9, CASA 20/25.

[50] Subregulation 101.237(3) of CASR.

[51] See Subpart 101 B, in particular subregulation 101.055(1) of CASR.

[52] Paragraph 101.237(4)(d) of CASR.

- without a ReOC but with an RePL if the RPA is operated over land that is not owned or occupied by the RPA owner.

Operations within the excluded profile would be subject to the general prohibitions against unsafe operations as under current arrangements.

5.3.3 Feedback

We welcome your feedback on the initial proposal in relation to small excluded RPA as described at paragraph 5.3.2.

The expansion of the small excluded RPA profile could increase pathways for safe R&D operations as well as support commercial operations more broadly. The proposal would offer industry significant reduction in regulatory burden.

We recognise that the expansion of the excluded RPA profile as proposed is a shift from existing arrangements. We want to ensure that the arrangements are proportionate to the safety risks posed by the small RPA operations and that we have considered all possible impacts on industry.

CASA recognises that if the proposal is implemented, other issues, such as appropriate record keeping requirements, will also need to be considered.

5.4 Repetitive assessment processes

R&D operations may attract repetitive assessments or requirements that are disproportionate to the safety risk they pose and are not well suited to the rapid iteration and testing that is characteristic of R&D operations. New and further approval for each iteration may result in extended assessment times and add to regulatory costs for industry participants.

5.4.1 RePL for medium category RPA

CASA does not currently issue category licenses for aeroplanes, helicopters (multirotor and single rotor class), or powered lift for medium RPA.

Remote pilots of medium RPA are licensed for a specific RPA model and must obtain a new RePL endorsement for every individual medium RPA model they intend to operate, with a corresponding amendment generally required to the operator's ReOC. The practical competencies that remote pilots must demonstrate as part of their RePL training to be licensed to operate a medium RPA also reflect this RPA model-centric approach.[53]

CASA has received industry feedback that these requirements impose significant administrative, operational and cost burdens on remote pilots and training organisations and undermine timely commercial deployment.

For R&D operations, changes to the platform being tested (weight, design or other changes) would need to be updated on the RePL. Due to the iterative nature of R&D activities, these requirements could result in repeated applications to CASA, payment of regulatory fees and wait times for processing applications. If the RPA's weight changes significantly, the pilot may need to take additional flight tests, incurring time and financial costs.

CASA is considering how the RePL framework for medium RPA can be improved to reduce regulatory impost for industry while ensuring that the framework continues to be effective in maintaining existing levels of aviation safety.

We will be seeking your input and feedback as we develop policy to address these issues, including on any regulatory changes that may be proposed in 2026.

[53] For example, see section 2.25(6), of the Part 101 MOS.

5.4.2 ReOC variation for categories and types of RPA

ReOC holders must submit any variation to their operating certificate to CASA for review and approval.

Unlike small RPA that are captured on the ReOC as a type and category, for example, small RPA (more than 2 kg but not more than 25 kg) multi-rotor, any change to the existing or intended medium RPA to be used for operations, by type or RPA model, triggers a significant ReOC change process, resulting in administrative and financial costs for both the ReOC holder and CASA.

This is restrictive for all ReOC holders which operate a variety of medium RPA, and particularly for R&D operations, as the weight span for medium RPA ranges from more than 25 kg to not more than 150 kg, with systems and airframes under development changing or increasing frequently.

CASA is considering these issues and will release information about policy to address these issues in 2025-2026.

5.5 Guidance for new and complex applications

We recognise that regulatory predictability for testing and R&D activities, would support industry innovation and growth.

To assist operators develop appropriate concept of operations and related applications, CASA has established the Advanced Operations enquiry and assistance pathway.[54] The process may include a pre-application meeting that allows CASA an opportunity to provide applicants with an overview of the application process and what is needed to support their application, and an opportunity for the applicant to ask CASA questions about the proposed advanced operation. Though the pathway may lead to an application, enquiries are for information sharing and regulatory guidance in the first instance.

Advanced operations may include:

- large RPA (more than 150 kg) that require an experimental certificate for one or more of the purposes under regulation 21.191 of CASR
- large RPA used for commercial purpose
- high altitude operations above Class G airspace, with a lower limit above 8,500 ft
- specific operations risk assessment (SORA) safety assurance and integrity level (SAIL) III or higher operations
- operations over or near people that do not meet the OONP TMI[55]
- autonomous RPAS operations where the remote pilot cannot intervene in the conduct of the flight
- drone delivery services.

The advanced operations enquiry and assistance pathway provides a single dedicated contact point within CASA for industry participants who are intending to conduct novel or complex operations. From CASA's perspective, the enquiries provide an early indication of novel operations and applications for which policy development and/or regulatory change may be required, for those operations to be accommodated within CASA's regulatory framework.

5.5.1 Feedback

We welcome your feedback on additional steps that CASA can take to assist applicants seeking advice on pathways for novel or advanced R&D operations.

[54] See Advanced Operations.

[55] OONP TMI.

Please consider the initiatives that have been described at Chapter 4 that include supporting a ReOC for R&D purposes, and at Chapter 5, options for streamlining regulatory processes and addressing regulatory requirements that give rise to repetitive assessment processes. These proposed initiatives are aimed at streamlining regulatory processes for R&D operations and by extension, the excluded category.

6 Sandboxes

Industry has suggested that beyond providing an enabling regulatory environment for R&D operations or for approving R&D operations, CASA needs to have in place a framework for regulator-industry collaboration through which the data and objective evidence that could inform the evolution of regulatory and safety oversight frameworks, is gathered. From an applicant perspective, it has been suggested that these types of arrangements can reduce regulatory risk as an understanding of the likely evolution of regulatory requirements and safety oversight can be developed and incorporated early in the design and innovation process.

6.1 CASA led initiatives

CASA has implemented initiatives whereby industry participants can trial new and innovative technologies and applications themselves, supported by a CASA instrument, or other regulatory support, that is provided in a business-as-usual way. On one view such initiatives are in the nature of 'sandboxes' even if they are not labelled as such.

With some of these arrangements the primary purpose is to enable industry operations, but as a condition of approval or authorisation or exemption from certain requirements, CASA may seek certain information to inform further policy and regulatory development.

For instance, the OONP TMI requires that all OONP approval instruments include data collection and reporting requirements to enable CASA to assess the adequacy of the controls contained in the OONP approval instrument.[56] CASA is now considering how policy and regulatory processes in relation to RPA operations over and near people can be improved based on the data that has been collected since the OONP TMI came into effect.[57] CASA may adopt a similar approach with some of the initiatives discussed at Chapter 5, to gain information and data that can support policy development and refinement.

Other arrangements support industry in trialling new and innovative approaches with higher levels of involvement from CASA, and again CASA gains insights from these trials.

An example of a CASA led initiative that supports the trial of innovative services by industry is the Automated Airspace Authorisation Trial (AAAT) that CASA commenced in May 2021 with Airservices and drone safety app (DSA) developers, to digitally authorise certain RPA operations within 3 NM (i.e. the no-fly zone) of select controlled aerodromes as well as Sydney Harbour and surrounding areas.[58] The trial is intended to transition to a permanent flight authorisation service delivered through Airservices' Flight Information Management System (FIMS) and participating third party service providers.[59] The trial is enabled under existing regulatory arrangements.[60]

The third-party CASA verified DSA providers that participated in the trial have developed valuable expertise and technical momentum that are critical to the implementation of a viable UTM ecosystem. CASA has gained valuable knowledge and insights through the trial that will inform its safety oversight function of UTM providers including leveraging automated testing capabilities.

[56] See OONP TMI.
[57] In August 2024.
[58] See Automated airspace authorisations | Civil Aviation Safety Authority.
[59] The future of automated airspace authorisations and drone safety apps | Civil Aviation Safety Authority
[60] Under regulations 11.245 and 101.030 of CASR and subsection 4.03 (7) of the Part 101 MOS. See CASA 66/24 — Operation of RPA Within 3 Nautical Miles of a Controlled Aerodrome (CASA-Verified Drone Safety App) Instrument 2024 and CASA 67/24 — Operation of RPA in Sydney Harbour Restricted Areas, R405A and R405B (CASA-Verified Drone Safety App) Instrument 2024

6.2 Regulatory sandboxes

CASA also supports a 'regulatory sandbox' concept that contemplates a higher level of collaboration between CASA and industry.

CASA's regulatory sandbox concept has a number of key elements:

- CASA will identify a regulatory area of strategic priority that can benefit from real-world trials. We will identify areas where there is value and utility in a regulatory sandbox approach to support and complement our safety objectives.
- CASA would need to consider dedicated resources to shape, and develop mechanisms to support, the enablement of a regulatory sandbox, prior to allowing any operations to occur. We will publish an 'invitation to participate' and from this we will identify suitable industry, academic and government participants to collaborate with us in the exercise.
- We may open the invitation to all stakeholders or target specific stakeholders, depending on the circumstances. We will provide key details of the project. For example, proposed scope, duration, and objectives. We will also provide an outline of what we expect stakeholders to provide in support of their submissions and what they would need to provide to CASA during the trial.
- Our Executive Committee would then consider submissions that satisfy the relevant criteria and conditions, yet to be detailed in proposed invitations to collaborate.

CASA is open to proposals and suggestions made by industry, academia and government to identify if a regulatory sandbox arrangement is appropriate, noting that the purpose of a CASA regulatory sandbox is not to only enable R&D by industry. CASA may also identify areas in which it invites industry participation in sandbox activities. The regulatory sandbox concept would be utilised in areas that are of strategic priority interest to CASA.

CASA observes that industry-led R&D activities that do not engage CASA in specific and collaborative data collection and analysis activities would not be suitable for the regulatory sandbox concept.

6.3 Industry led initiatives

CASA may not have an interest in data collection, or want to take a collaborative approach to learning, in respect of all uncrewed aircraft R&D operations that industry may be interested in conducting.

However, CASA support industry led R&D initiatives in a business as usual (BAU) way under existing legislation through the use of authorisations and exemptions, as appropriate.

Some examples of industry led R&D operations that CASA has supported in a BAU way include the testing of remotely piloted high-altitude airships,[61] flight testing of electric flying racing cars,[62] and supporting RPA trials for a range of emerging use cases.[63]

[61] See for example Stratoship conducts stratospheric flight - Australian Defence Magazine

[62] See for example Airspeeder | The Electric Flying Car Racing Series — World's first flying racing car makes historic flight.

[63] See for example Drone trial to expedite medical deliveries in remote NT Aboriginal community - News Hub

7 Flight test areas

Australia is home to several uncrewed aircraft flight testing centres, where operators can conduct flight tests under existing regulatory structures.

Private commercial entities may set up their own testing facilities (to test and develop their own products/platforms) and seek the relevant authorisations from CASA as applicable to their intended R&D operations. Commercial entities may also set up flight test facilities with the necessary infrastructure and support that can be utilised by other commercial entities and individuals to conduct testing activities.

Flight test ranges in overseas jurisdictions like Canada and the United States are approved test sites with dedicated airspace and ground facilities.[64] Where there is a higher degree of involvement of the relevant national aviation authority in operations at the flight test ranges, conceptually the arrangements supporting those test ranges may be similar to the sandbox type arrangements that we discuss at Chapter 6.

CASA does not approve 'flight test ranges'[65] as CASA is not able to assign sole use or dedicated airspace to the operations. Rather CASA supports flight testing within an area through operational approvals.

CASA approves specific operational concepts for the proposed operational area and seeks to assess the air risk and the ground risk of the proposed operations within that area for the purpose of determining appropriate safety and airspace management controls.

There may be limitations on what can be enabled at locations where operational approvals have been issued. Where residual airspace risk requires a formal mitigation, an Airspace Change Proposal may be necessary. In assessing such proposals, CASA must consider not only the applicant's safety case but also broader impacts on other airspace users. Factors such as proximity to aerodromes, existing flight paths, and surrounding airspace activity may render some flight test area locations unsuitable. There is no legal pathway for CASA to devolve responsibility for airspace to another entity—CASA would always need to retain control over the affected airspace. CASA understands that this undermines some conceptualisations of flight test ranges.

As discussed in Chapter 4, any eligible person may apply to CASA for an area approval to conduct uncrewed aircraft R&D operations. On application from a person, CASA provides approval for an area—as an area for the operation of uncrewed aircraft generally or a particular class of operations.[66] The assessment and outcome of an application for an area approval depends on the type of the RPA to be operated, the operational area in which the flights will take place, including the airspace and altitude and the associated ground and air risk. Operations within the approved area must be conducted within regulatory requirements and conditions of approval.

BVLOS and higher-risk operations have key requirements:

- The applicant must provide an application including information and evidence supporting a risk assessment using CASAs guidance on the SORA methodology for the flight test area.[67]
- For RPA operations, the application must identify an eligible ReOC holder. The approval instrument is linked to the ReOC identifier and the holder who is responsible for compliance with regulatory and operational requirements for the operation(s).
- Personnel operating the uncrewed aircraft must hold appropriate qualifications and licences in accordance with CASA requirements.
- The information that has been provided from the operator to CASA must satisfy the CASA delegate that the operator has a satisfactory safety case to support its proposed operations, has the operational

[64] See for example Airspace – Foremost UAS Range

[65] As the term is understood in overseas jurisdictions.

[66] Regulation 101.030 of CASR.

[67] Information regarding regulatory requirements for BVLOS operations and application processes is available on CASA's website.

procedures established and has conducted a risk assessment. CASA can then issue an area approval instrument under regulations 11.056, 101.029 and 101.030 of CASR.

Excluded category RPA operations, including for flight test purposes, may be conducted with no further authorisation from CASA provided the operation is within the SOC and applicable excluded operational profile limitations like the landowner connection or RePL requirements.

ReOC holders are able to conduct flight test operations in accordance with their ReOC privileges with minimal interaction with CASA or by seeking flight authorisations.

7.1 Improvements to regulatory processes

It is unclear to what extent the procedures and requirements that are described above are more onerous for commercial 'public' flight test facilities.

The test facility operators of these types of facilities could put in place arrangements that assist in streamlining the CASA approval process for individual operators. For instance, the test facilities operator could develop a set of templates that individual operators use to support the application however CASA would still need to assess the individual operator.[68] Certain elements of the risk assessment could be mitigated in advance by the test facility operator. For example, stakeholder engagement, the emergency response plan, the air risk assessment and the ground risk assessment. Other items CASA may then need to consider for individual operators would be specific to that operation, such as the operations safety objectives (OSOs) if SORA is used to conduct the assessment.

There may be scope to further streamline processes for individual operators who chose to utilise public flight test facilities, as CASA would be assessing operations at a repeatable known location with known ground and air risks.

7.1.1 Feedback

Please consider Chapter 6 Sandboxes and Chapter 7 Flight test areas. We would like your feedback on potential use cases for a regulatory sandbox, or an industry led initiative, and what type of operations might be conducted at a public flight test facility or area.

[68] If the assessment is at a location other than the flight test range the templates might not be appropriate.