



Australian Government
Civil Aviation Safety Authority

RPAS
REMOTELY PILOTED AIRCRAFT SYSTEMS



BVLOS Operations in Australian Airspace

A regulators perspective

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What sort of BVLOS approvals exist?

Whilst still not common CASA has assessed and issued BVLOS approvals to 11 operators, for operations as diverse as:-

High Altitude Long endurance operations

Package delivery systems

Aerial survey both area and long line

Area security operations, and

EMS operations including aero medical and search and rescue

How is BVLOS defined in regulation?

CASR 101 states:

101.073 Operation must generally be within visual line of sight.

*An unmanned aircraft is being **operated within the visual line of sight** of the person operating the aircraft if the person can continually see, orient and navigate the aircraft to meet the person's separation and collision avoidance responsibilities, with or without corrective lenses, but without the use of binoculars, a telescope or other similar device.*

This is further supported by information contained in Division 5 of the CASA 101 Manual of Standards

But what does that really mean?

Like any outcome based regulation BVLOS only really works when an operator is honest with themselves.

So anyone considering a marginal operation should really be asking themselves “can I really see my aircraft to both orientate and navigate it without visual or electronic aids?” and “Can I really see all of the airspace my aircraft is in and identify any threats early enough to take action?”

Of course its not just airspace we need to consider, we also need to ask “do I really know what’s on the ground below me?”

How does CASA quantify BVLOS?

CASA puts all applications for BVLOS operations through an initial triage screening process.

This process allows for a quick assessment of both the unmitigated air and ground risk associated with the operation.

Applications are then streamed into the following categories:

1. Simple: close proximity operations with a small aircraft, including short periods behind an obstacle.
2. Moderate: longer duration operations generally in remote areas.
3. Complex: Operations which pose a significant unmitigated risk.

Simple BVLOS

Simple BVLOS is generally limited to short range operations of small RPA, where it is difficult to see the aircraft much beyond a few hundred metres.

Simple operations might include short periods of time where an aircraft is not visible due to operating behind an obstacle, such as a structure or vegetation.

Simple operations must pose no more than a low unmitigated risk.

Simple BVLOS is assessed in each local office using CASA's standard processes.

Moderate BVLOS and Standard scenarios

Moderate BVLOS operations include tasks such as area or long line survey in rural or remote areas

Moderate BVLOS cannot include operations near or over people.

Moderate BVLOS cannot include operations in or near controlled airspace or any other airspace volume where regular traffic would be reasonably anticipated, such as VFR routes.

Moderate BVLOS is assessed in regional offices with oversight from a central management team. CASA's uses a lite version of the Specific Operations Risk Assessment process (SORA) to ensure a consistent assessment process.

What are Standard Scenarios?

CASA has recently developed a number of standard scenarios for operations which meet certain predefined rules based criteria and comply with the methods and principles of the SORA

Benefits:

- » Standardises the process for assessment of BVLOS applications in remote areas
- » Provides clarity to applicants as to the minimum requirements for remote area BVLOS operations
- » Makes the application process easier for applicants and CASA
- » Provides a internationally accepted SORA compliant solution

Proposed Remote Area

1. <400FT AGL in remote areas

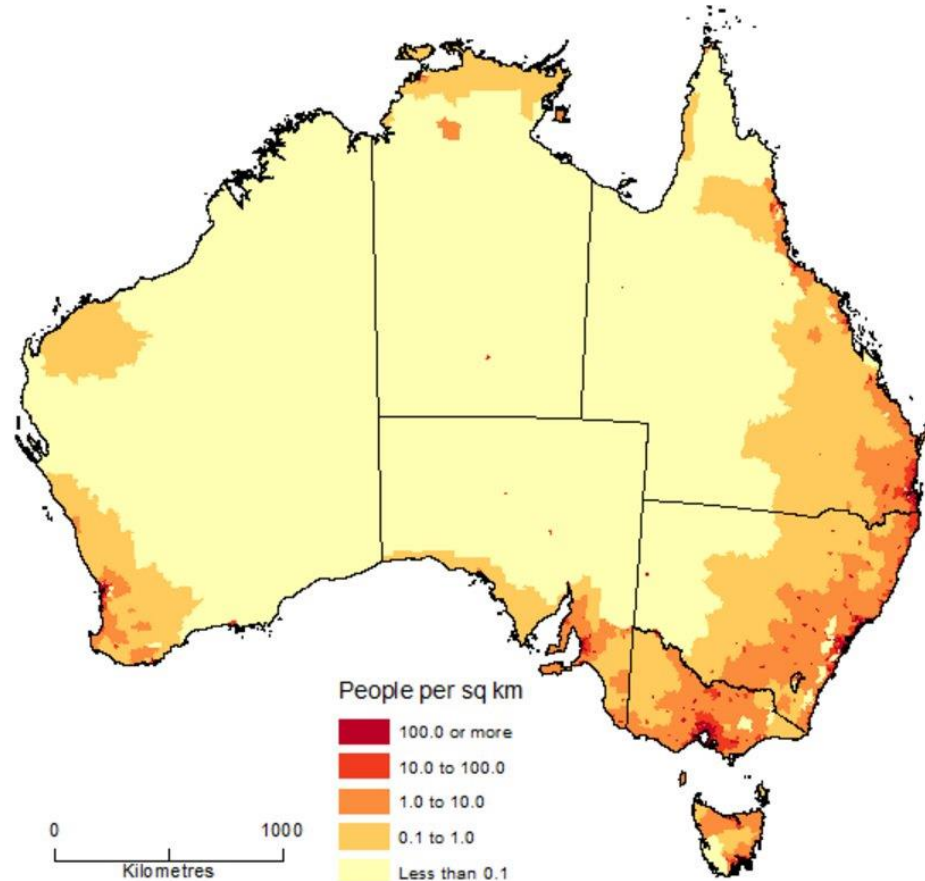
2. >400FT AGL but <5000FT AMSL in remote areas

Population density < 2 persons KM²

Flight area well clear of controlled civil aerodromes and Controlled airspace lower limits

Aircraft encounter rate less than 1E-4 encounters per flight hour during the operation

Requires robust evidence and stakeholder engagement



When will they be ready to use?

CASA has finalised the standard scenarios and developed supporting material; which is currently undergoing peer review before final executive sign off.

We hope to have the scenarios available by late August, but would welcome anyone to approach us to become an early adopter.

Please email rpas@casa.gov.au to express an interest.

Complex BVLOS and the SORA

Complex BVLOS encompasses a wide range of operations , from the Wing Aviation home deliver program to Airbus Defence & Space HALE operations and many tasks in between.

Complex operations are currently assessed only by a dedicated centralised team using the Joint Authorities for Rulemaking of Unmanned Systems (JARUS) Specific Operations Risk Assessment (SORA) methodology.

SORA is currently accepted by 59 countries and so to an extent provides an internationally transferable outcome, with Australian assessments already used by two other NAA's

What is the SORA?

SORA provides guidance as to what an operator is required to provide to an NAA in order that the NAA might assess and issue an authorisation to fly RPAS in a given environment.

This is not limited only to BVLOS operations, but does lend itself very well to more complex BVLOS Operations.

SORA uses a 10 step process based on a bowtie risk assessment methodology to determine both unmitigated and mitigated risk.

SORA relies primarily on quantitative evidence to support any proposed reduction in risk, but does acknowledge that in certain instances qualitative evidence may be accepted.

A very brief look at SORA Methodology

The SORA methodology consists of ten systematic phases:

Step 1: Description of the ConOps.

Includes flight geography, air and ground based data, technical documentation about the system and operational data including crew competencies training and documentation.

Step 2&3: Determination of the Ground Risk Class (GRC).

Looks at the kinetic energy of the aircraft, operational volumes based on ground data including buffers and any strategic mitigations which might effect the ground risk.

A very brief look at SORA Methodology

Step 4&5: Determination of the Air Risk Class (ARC).

The initial ARC is assessed and then any strategic mitigations are applied.

Step 6: Tactical Mitigation Performance Requirement (TMPR).

The effects of tactical mitigations applied during the operation are assessed.

Step 7: Determine the Specific Assurance Integrity level (SAIL)

This is a value scaled from I-VI derived from the outputs of the prior phases. Anything beyond III begins to require some form of certification like activity.

A very brief look at SORA Methodology

Step 8: Compliance to Operational Safety Objectives (OSO)

The applicant is required to demonstrate compliance to each of the 24 OSO's to a level determined by the associated SAIL.

Step 9: Consideration of adjacent airspace and ground area

The applicant needs to demonstrate how technical containment can be achieved, or revisit buffers.

Step 10: Comprehensive Safety Portfolio.

The applicant submits a comprehensive safety portfolio or safety case; which contains the body of evidence to support the SORA outcome.

A very brief look at SORA Methodology

Don't Panic

CASA provides a comprehensive 2 day workshop to get you on the right track for your first complex application

For more information email rpas@casa.gov.au

Questions?

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<http://jarus-rpas.org>

<https://www.youtube.com/watch?v=sq7wozIzXBM>