V-TOL AEROSPACE

AUTONOMOUS ROBOTIC INTELLIGENCE

V-TOL Aerospace (ARN:750709)
Operations Manual

AUTHORITY

This Operations Manual provides procedures to comply with the requirements in Part 101 of the Civil Aviation Safety Regulations 1998 (CASR Part 101) and is provided for the sole use and guidance of the operational personnel of:

V-TOL AEROSPACE
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TABLE OF CONTENTS

COMPLIANCE DECLARATION

I hereby acknowledge that I have received the instructions, procedures and data contained in the manual identified in the footer of this page.

I also understand that the contents of this manual have been devised to ensure the safety and standardisation of operations conducted by *V-TOL Aerospace*.

I agree to abide by the instructions contained in the manual at all times.

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NOTE: A copy of this page must be returned to the Chief Remote Pilot with each revision of the manual. The original form should be retained in the manual holder's copy of the manual.

General

0.1. Applicability

This manual contains instructions for the operation and management of Remotely Piloted Aircraft Systems (RPAS) and all persons involved in the operation of RPAS that are controlled under the authority of the *V-TOL Aerospace* Remotely Piloted Aircraft Operator's Certificate (ReOC).

0.2. Distribution Control

Upon commencement, each person engaged in an operational capacity will be given read-only access to the Operations Manual suite which is kept on the OPERATOR'S intranet. The staff member's name and email address will be added to the distribution list maintained by the Chief Remote Pilot to ensure they receive future amendment updates via email. Once the staff member has read the manual, they must email the Chief Remote Pilot confirming that they have read the content and agree to maintain RPAS in accordance with the manual.

The Chief Remote Pilot shall keep these confirmation emails on file.

The Chief Remote Pilot will keep the manual up-to-date at all times, notifying employees and CASA of any amendments by email. These emails will require a confirmation email from employees confirming receipt of the amendment. The Chief Remote Pilot will keep the confirmation emails on file. These confirmation emails will be regarded as an undertaking by the staff member that they have read the amendment and will operate RPAS in accordance with the manual. If CASA subsequently indicates that a particular amendment is not acceptable, then any action and / or changes required by CASA shall be followed and / or implemented as soon as reasonably practicable.

Copies of any manual not accessed directly from the intranet are not controlled and must not be used as a basis for controlling operations unless it has been verified that the uncontrolled copy is the same as the current (intranet) edition of the manual.

The Chief Remote Pilot shall annually review the Operations Manual to ensure the relevance and currency of all procedures. A record of the review shall be made in the controlled copy on the intranet indicating that the review has been completed and indicating whether any amendments were required as a result of the review.

0.3. Compliance Requirement

The instructions, procedures and information contained in this manual have been devised to ensure legality, safety and standardisation in the conduct of operations. They are to be observed by all operating personnel. Personnel are reminded of their obligation to comply with the Civil Aviation Act, Regulations and Orders and such directives, aeronautical information and notices as issued in CASA and Airservices Australia publications.

Nothing in this manual takes precedence over CASA regulations or permits unsafe operation.

0.4. Amendment Procedure

Where in the light of operating experience, errors are found in the manual or deficiencies in the manner in which operations are conducted, recommendations for amendment action shall be submitted to the Chief Remote Pilot.

All changes to 'Schedule 1 – RPAS Operating Types and Nominated Personnel' must be notified to, and accepted by, CASA. Changes to correct typographical errors or changes to subordinate documents, including Appendices to this manual, may be accepted and approved by the Chief Remote Pilot.

0.5. Revision Log

Date	Affected sections	Summary of revision	Authorised by
27 June 2019	All	Review and update to meet new legislation and standards	M. Xavier
8 December 2020	All	Further review and update to meet new legislation and standards including Part 6	M. Xavier
6 August 2021	Section 6, Schedule 1	Update to cover 25kg aircraft	M. Xavier

0.6. Abbreviations, Acronyms and Definitions

AGL Above Ground Level

AIP Aeronautical Information Package

ALA Authorised Landing Area

ATSB Australian Transport Safety Bureau

ATC Air Traffic Control

AUSA Australian Unmanned Systems Academy

BVLOS Beyond Visual Line of Sight

CASA Civil Aviation Safety Authority

CASR Civil Aviation Safety Regulations

CFI Chief Flying Instructor

CRP Chief Remote Pilot

ERSA En Route Supplement Australia

EVLOS Extended Visual Line of Sight

HLS Helicopter Landing Site

JSA Job Safety Assessment

MOS Manual of Standards

NM Nautical Miles

NOTAM Notice to Airmen

RePL Remote Pilot Licence

ReOC Remotely Piloted Aircraft Operators Certificate

RP Remote Pilot

RPA Remotely Piloted Aircraft (same meaning as UAV)

RPAS Remotely Piloted Aircraft System (same meaning as UAS)

TEM Threat and Error Management

UAS Unmanned Aircraft System (same meaning as RPAS)

UAV Unmanned Aerial Vehicle (same meaning as RPA)

UOC Unmanned Aerial Vehicle Operators Certificate (Same meaning as ReOC)

VLOS Visual Line of Sight

VMC Visual Meteorological Conditions

1. General Administration

1.1. Profile

V-TOL Aerospace (The Company) is a Remotely Piloted Aircraft Systems (RPAS) business based in Rocklea, Queensland. We specialise in Original Equipment Manufacture of fixed-wing and multi-rotor remotely piloted aircraft, Aerial Mapping, Photography, Imagery, Topography, Inspection, Videography, Surveying, Spotting, Training and other UAV-based tasks, as required.

1.2. Statement of Compliance

All aerial operations using RPAS will be conducted in accordance with the conditions and limitations placed on the Remotely Piloted Aircraft Operator's Certificate (ReOC). A copy of the approved ReOC is included at Appendix 1 of this manual.

1.3. Organisational Structure
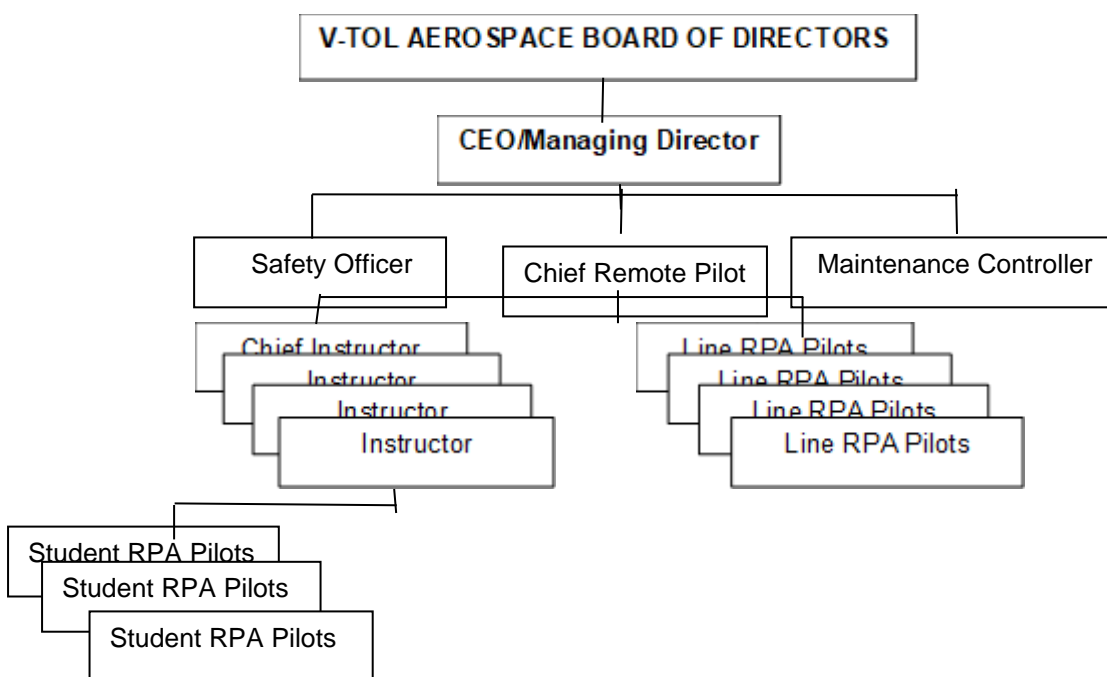
Nominated Personnel in the positions of CEO/Director, Chief Remote Pilot, Chief Instructor and Maintenance Controller must be included in Schedule 1 of this manual.

1.4. Accountabilities & Responsibilities

1.4.1. Accountabilities of CEO/Director

The CEO/Director is accountable for safety and corporate compliance. They will provide the necessary resources so that all operations and maintenance can be conducted to meet company obligations, goals and objectives including finance and human resources. The CEO is accountable to ensure the currency of the ReOC and will ensure that any operation conducted on behalf of the company is conducted under the control and authority of the Chief Remote Pilot and/or Maintenance Controller as identified on the ReOC.

The CEO/Director is required to advise CASA of any of the following:

- changes to the company's name or registered address
- nomination of a new Maintenance Controller or Chief Remote Pilot
- changes to the financial status of the operator (bankruptcy, liquidation, etc.)
- respond to safety related surveys or questionnaires

1.4.2. Responsibilities of Chief Remote Pilot

The Chief Remote Pilot is responsible for all operational matters and Remote Pilot (RP) training affecting the safety of operations.

The role and responsibilities of the Chief Remote Pilot include:

- ensuring that operations are conducted in compliance with the Civil Aviation Act and the CASR
- maintaining a record of qualifications held by each RP
- monitoring and maintaining operational standards and supervising RP(s) who work under the authority of the ReOC
- maintaining a complete and up-to-date reference library of operational documents as required by CASA for the class of operations conducted
- developing applications for approvals and permissions where required to facilitate operations
- developing checklists and procedures relating to flight operations
- being the point of contact with CASA
- notifying CASA prior to any change to this manual or its schedule.

1.4.3. Responsibilities of Chief Flying Instructor

The Chief Flying Instructor is responsible for:

- Ensuring student records are kept up to date
- Authorisation of training flights
- Overseeing quality of training standards
- Ensuring syllabus is current and relevant
- Investigation of student and instructor incidents
- Instructor and student discipline
- Ensuring flight training flights are undertaken IAW this Part, CASA AC's and CASR 101 Parts retaining to UAS/RPA flight training

1.4.4. Responsibilities of Maintenance Controller

The Maintenance Controller is responsible for ensuring the maintenance of Remotely Piloted Aircraft Systems (RPAS) in accordance with manufacturers' specifications.

The role and responsibilities of the Maintenance Controller include:

- controlling all RPAS maintenance, either scheduled or unscheduled
- keeping records of personnel permitted to perform maintenance on RPA including details of their training and qualifications
- developing, enforcing and monitoring RPAS maintenance standards
- maintaining records of RPAS defects and unserviceable items
- ensuring that specialist equipment items including payload equipment are serviceable and operate in accordance with any supporting documentation
- maintaining a thorough technical knowledge of RPAS operating under the authority of the ReOC
- ensuring maintenance activities are conducted in accordance with the procedures detailed in the relevant RPAS section of the RPAS Operational Procedures (Library)
- investigating all significant defects in the RPAS.

1.4.5. Responsibilities of Remote Pilot in Command

For the purposes of this manual a 'Remote Pilot' includes a holder of a 'Remote Pilot Licence' or 'UAV Controllers Certificate'.

The Remote Pilot of a RPA is responsible for:

- conducting flights in accordance with these procedures
- safe operation of the RPA
- acting in accordance with these procedures
- complying with applicable regulatory requirements and supporting documents such as the AIP.

1.4.6. Responsibilities of Flight Termination System Controller

For some operations, aircraft may be fitted with a Flight Termination System required to ensure that the aircraft does not depart from the approved flight geography and contingency airspace. For some operations with aircraft fitted with an FTS, an FTS Controller will be identified as part of the crew. Their responsibilities include:

- ensuring the FTS is pre-flighted and serviceable for the operation
- activating the FTS at the briefed time and confirming to the PIC and Mission commander that the FTS is operational
- monitoring FTS state during the operation
- If, at any time, the PIC or MC direct flight termination, independently generating the signal to initiate termination.

1.4.7. Responsibilities of a Mission Commander

Where multiple aircraft are to be operated at the same time in an area of operations, a suitably experienced RPAS Pilot may be nominated by the Chief RPA Pilot to be the activity mission commander.

The mission commander will be responsible for ensuring safe separation between company operated aircraft and efficient on-going operations at the launch and recovery site(s). The required qualifications for a Mission Commander are captured in Appendix 11 to the Operations Procedures (Library) (Appendix 4 to this document). If a Mission Commander is appointed, their responsibilities include:

- Conducting daily safety and mission briefings as required by company documentation

- Authorising and directing daily operations (if delegated in writing by Chief Remote Pilot)
- Coordinating activities by all flight and support crew members
- Directing responses to unplanned events, incidents or accidents

The mission commander can cease the activity at any time should he/she deem it necessary for safety reasons. While the PIC will retain responsibility for the individual aircraft, the mission commander is responsible for overall mission safety.

1.4.8. Responsibilities of a Type Specialist

For the purposes of this manual a type specialist (if appointed) is a Remote Pilot with a type certification not held by the CRP, who advises the CRP on aspects of flight operations related specifically to type specialist requirements.

A Type Specialist is responsible for:

- providing advice and guidance to the CRP for specialised type operations.
- ensuring specialist operations are planned within type restrictions and to countersign flight authorisations for specified type only.
- liaising with Maintenance Controller and providing any technical information for cause analysis, symptomatic problems, etc, related to the specific type
- instructing remote pilots internally to operate the specific RPA type IAW induction requirements.

All other aspects of flight operations are still governed and overseen by the CRP as per V-TOL's documented procedures.

1.4.9. Responsibilities of Camera Operators, Spotters and Others

All camera operators, spotters, observers and other persons involved in the operation of RPAS controlled under the authority of the ReOC are required to comply with the procedures set out in this manual and any lawful direction given to them by a UAV controller or Remote Pilot in command.

1.5. General Operating Standards

1.5.1. Fitness for Duty

The operator is committed to providing an environment that ensures the optimal performance of any person working under the authority of this ReOC.

Remote Pilots or any other person involved in the operations of RPAS are required to consider their fitness for duty prior to undertaking any duty under the authority of this ReOC, including but not limited to the following factors:

- general well being
- being adequately rested
- alcohol consumption
- drugs and medication use
- adversely affected by stress
- mental fitness.

1.5.1.1. Alcohol consumption

Remote Pilots or any other person involved in the operations of RPAS under the authority of this ReOC shall not perform their duties whilst under the influence of alcohol. *Alcohol must not be consumed less than 8 hours prior to RPAS operations or during any period of an*

operation. As a 'safety-sensitive aviation activity,' operational person(s) working under the authority of this ReOC may be randomly tested for alcohol and other drugs and are required to conform with any drug and alcohol testing requirements as directed by CASA.

1.5.1.2. Drugs and medication use

Remote Pilots or any other person involved in the operations of RPAS shall not perform their duties whilst having consumed, used, or absorbed any drug, pharmaceutical or medicinal preparation or other substance in any quantity that will impair their ability to perform their duties under the authority of this ReOC.

All persons working under the authority of this ReOC must not perform any task if their performance can be adversely affected by medication (prescription or non-prescription). It is their responsibility to advise the Chief Remote Pilot about any medication that they are taking that may negatively impact on their performance.

No person working under the authority of this ReOC is permitted to perform any tasks whilst under the influence of illegal drugs.

1.5.1.3. Fatigue management

When authorising any operation, the Chief Remote Pilot must ensure the potential for fatigue is minimised. This includes consideration of travel time to a location, the complexity and duration of an operation, the time of day, and other environmental conditions that can impact on the performance of a person working under the authority of this ReOC.

Persons working under the authority of this ReOC must not conduct RPAS activities if, considering the circumstances of the operation, they have reason to believe that they are suffering from, or are likely to suffer from, fatigue that may impair their performance.

Persons working under the authority of this ReOC must immediately report fatigue-related concerns to the Chief Remote Pilot who will take appropriate action to remedy the situation.

1.5.2. Transportation of Dangerous Goods

Parts of the RPAS may be classified as dangerous goods and may present a significant risk during transportation.

Depending on the type, role or configuration of an RPAS, the following goods could be considered as dangerous:

- LiPo batteries and fuel cells
- internal combustion engines
- fuel, chemicals, poisons and their containers and dispensers
- magnetising materials
- pyrotechnics, flares and firearms.

Full disclosure must be made to the carrier prior to the consignment or carriage of dangerous goods. The Maintenance Controller, as delegate to the CRP, is to ensure that the carrier's instructions in relation to the transport and applicable packaging requirements for dangerous goods are complied with.

1.5.3. Remote Pilot Administration

1.5.3.1. Remote Pilot qualifications

All Remote Pilots working under the authority of the ReOC must hold a valid Remote Pilot Licence issued by CASA for the type and rating of RPA being operated on behalf of the operator.

1.5.3.2. Remote Pilots to Maintain Log Books

Remote Pilots are required to have a personal Remotely Piloted Aircraft (RPA) log book. V-TOL staff Log Book pages containing all flight details are produced electronically and pilots

are responsible for ensuring the accuracy and currency of these records. The records will also be kept in staff personnel files and retained for at least three years after the member has ceased employment with V-TOL.

1.5.3.3. Remote Pilots to be competent

Remote Pilots are required to be familiar with this manual and associated policies and procedures.

The Chief Remote Pilot is responsible for ensuring that Remote Pilots and all other persons working under the authority of this ReOC are competent prior to conducting commercial operations.

1.5.4. Flight Conduct

1.5.4.1. Flight Authorisation

The Chief Remote Pilot may nominate specific locations (listed on the Approved Operations Location Register (Appendix 5)) where approval for each operation is not required, on the proviso that the operation is not a specialised operation.

All other RPAS operations must be authorised by the Chief Remote Pilot and recorded on a Flight Authorisation Form (Appendix 1 of the RPAS Operational Procedures (Library)).

The Chief Remote Pilot is responsible for the operational standards and supervision of Remote Pilots who are working under the authority of the ReOC.

1.5.4.2. Persons permitted to operate RPA

Only those persons checked in accordance with Part C of this Manual and authorised by the Chief Remote Pilot may operate an RPA under the authority of the ReOC.

1.5.4.3. Handover/takeover procedures

In operations where the handover of control is required between Remote Pilots, the Handover/Takeover Procedures detailed in the RPAS Operational Procedures (Library) must be adhered to.

1.5.4.4. Remote Pilot briefing including emergency procedures

Where an operation involves more than one person, the Remote Pilot or Mission Commander must provide a safety brief to each person involved in the operation. The safety briefing must provide details of the actions and responsibilities of everyone involved in the operation (refer Appendix 2 of the RPAS Operational Procedures (Library)).

1.5.4.5. Use of checklists

A number of checklists exist to ensure the safe operation of RPAS. These checklists include, but are not limited to:

- Job Safety Assessment (JSA) - Appendix 5 of the RPAS Operational Procedures (Library)
- Pre-Operational Briefing Checklist - Appendix 2 of the RPAS Operational Procedures (Library)
- Pre-Flight Checklists – RPA, ground station & role equipment specific
- Post-Flight Checklists - RPA, ground station & role equipment specific.

Where a checklist has been developed all operations and activities must be conducted in accordance with the checklist.

1.6. Operating RPAS

The Remote Pilot Aircraft System (RPAS) includes a number of elements, each with their own unique operational requirements. Each element has an interface with the other

elements in the RPAS and as such, these inter-relationships need to be considered. The main elements of a RPAS are as follows:

- the RPA

the RPA ground station
- aircraft launch and recovery equipment
- the payload and role equipment.

1.6.1. Source of RPAS Operating Instructions

Each element of the RPAS must be operated in accordance with the manufacturer's instructions as contained or referenced in the supporting operational and maintenance documents for each RPAS configuration.

1.6.2. RPAS Operational Procedures (Library)

The RPAS Operational Procedures (Library) is available to all people conducting activities under the authority of the ReOC. The Chief Remote Pilot is responsible for maintaining the library.

The RPAS Operational Procedures (Library) contains:

- a section that contains general and specific operational procedures,
- a section for each RPAS type operated under the authority of the ReOC.

The specific section for each RPAS will include the following information:

- maintenance information such as pre/post flight checks, maintenance schedules, maintenance manuals for RPA/ground station/camera, etc.
- RPAS operational information such as RPAS user manuals for RPA/ground station/camera, etc.

Information included in the RPAS Operational Procedures (Library) may be a hard copy or electronic document, or included by reference to an external online platform.

The Chief Remote Pilot must ensure that all information required to safely conduct an operation is available to the Remote Pilot. Where online information is used, the Chief Remote Pilot will consider the availability of online connections or offline access prior to the authorisation of the operation.

1.6.3. Precedence of Manuals

If differences exist between the manufacturer's instructions and the operator's operational or maintenance procedures, the manufacturer's procedures will be followed unless the operator's procedure provides a higher safety standard.

If any person conducting operations under the authority of this ReOC identifies a difference between the operator's and manufacturer's procedures, the difference must be reported to the Chief Remote Pilot / Maintenance Controller (as appropriate).

1.6.4. RPAS Serviceability Prior to Operation

Pre-flight and post flight checks are mandated for all operations. The Remote Pilot must record the completion of these checks on the Flight Log. All defects found in the RPAS must be recorded on the Defect/ Maintenance Log and the Maintenance Controller notified.

The Remote Pilot must ensure that all defects or outstanding maintenance actions detailed in the Defect/Maintenance Log have been addressed prior to operation of the RPAS.

1.6.5. Method of Recording Hours in Service and Defects

Each Remote Pilot is responsible for ensuring that 'time in service' is recorded in the RPAS Aircraft Flight Log and all defects and maintenance is recorded in the RPAS Maintenance and Defect Log. Section F of this manual details the procedures for recording of RPAS defects and maintenance requirements. Time in service is the time between motor(s) start up to motor(s) shutdown.

1.6.6. Maintenance Control of RPAS

All RPAS operated under the authority of this ReOC will be operated under the maintenance control of the operator. Each RPA operated under this ReOC is identified in Schedule 1.

2. Procedures

2.1. Limitations and Conditions

All operations must be carried out within the limitations and conditions as detailed in this manual, the RPAS Operational Procedures (Library) (which is appendix 4 to this Manual), or any other permission, exemption or approval issued by CASA. Refer to Appendix 2 of this manual for all permissions, exemptions and approvals held by the operator.

2.2. Feasibility Check and Job Safety Assessment (JSA)

Before a task can be carried out a job feasibility check must be performed to ensure it is within the scope of the ReOC & the organisations operating policies. The following flowchart represents the process to be followed to determine if a task may proceed.
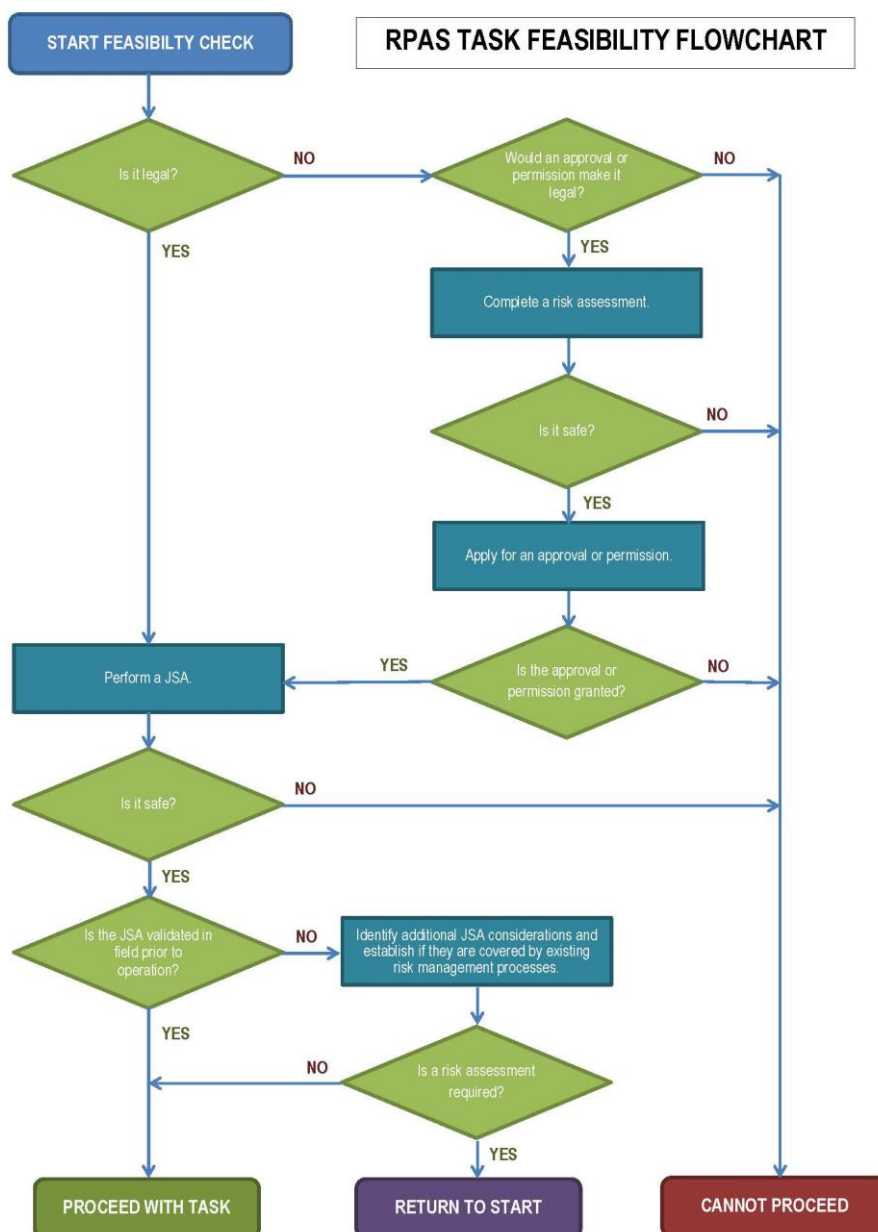
2.2.1. The operation is to be compliant with CASR Part 101

The first step of the feasibility process is to determine whether the operation can be conducted in compliance with aviation legislation. Consideration should be given to all applicable Federal, State or Territory legislation.

In determining if an operation can be conducted in compliance with such legislation, the following matters must be considered, where applicable:

- are operations in accordance with the conditions listed in the schedule for the ReOC or other regulatory Approval, Permission, or Exemption?
- will operations be conducted greater than 400 ft AGL?
- will operations be conducted in controlled airspace or restricted airspace?
- will operations be conducted within 3 NM of any aerodrome (including any HLS or ALA listed in ERSA)?
- will operations be conducted within the approach or departure path of a runway or over a movement area?
- will operations be conducted over or within a populous area?
- will operations be conducted closer than 30 metres from any person (including subjects) who is not directly involved in the operation of the RPAS?
- will operations be conducted beyond VLOS?
- will operations be conducted at night, in cloud, or in conditions other than Day VMC?
- are operations prohibited by any other Local, State or Federal Regulation?
- will operations create a hazard to another aircraft, another person or property?

2.2.2. Approval, Permission or Exemption

The Chief Remote Pilot is responsible for applying to CASA for any aviation related Area Approval, Permission and/or Exemption required for an RPAS operation. In general, these requests will be supported by an appropriate safety case and risk assessments to support the proposed operation. If available and appropriate, a digital simulated flight rehearsal of the operation should be produced and provided to CASA, as part of an application.

2.2.3. Perform a JSA

A JSA (refer Appendix 5 of the RPAS Operational Procedures (Library)) must be performed during the feasibility planning phase to determine if the operation is viable. Note: the JSA may be applicable to a number of flights at the same location over an extended period.

As a minimum, the JSA must consider the following:

- gathering the necessary maps and charts (either hard copy or electronic) for the area
- determining the climate & expected weather is suitable for RPAS limitations and the intended flight operation
- reviewing the Notice to Airmen (NOTAM) related to the operations area
- the possibility of a person(s) moving into the area of operation or landing area during flight
- footpath, roads, or other rights of way
- suitable take-off and landing areas (including alternate landing locations)
- ability to maintain a minimum of 30m separation from the public
- obstructions, natural & manmade (buildings, trees etc.)
- possible radio & data-link interference (power lines, antennas etc.)
- ability to maintain visual line of sight
- remote pilot's ability matches RPAS/location/task

- permission from land owner
- privacy considerations, potential issues & laws
- local restrictions, bylaws
- need for signage or no signage.

2.2.4. Validation of the JSA

The initial JSA will make a number of assumptions about the proposed operation that must be validated by the Remote Pilot or appointed delegate at the location prior to any operations (forecast weather/wind, location of persons, etc.). The Remote Pilot must record on the JSA any:

- variations that exist to the initial JSA assumptions
- new risks or hazards that have been identified at the location
- new risks or hazards that may occur during the operations at the location.

The completed JSA must be returned to the Chief Remote Pilot who will keep it as a record of the operation for a period of at least two years.

2.2.5. Is a Risk Assessment Required?

A risk assessment is required to identify any risk that has not been adequately mitigated by existing risk control measures and procedures. If an assumption made in the initial JSA is no longer valid, or the Remote Pilot identifies a new risk, these matters must be considered and detailed in the JSA.

If the Remote Pilot (RP) is unable to mitigate the risk using an existing procedure, a Risk Assessment must be completed in accordance with Appendix 3 of this manual.

It is critical that the risk assessment in the JSA is conducted prior to opening V-TOL NEURON for the first time at a new location. A V-TOL RPA, as a fail-safe, will not enable flight operations unless the Risk Assessment has been completed by the RP. It is the responsibility of the RP in command to ensure all safety mitigation strategies are in place as directed by the CRP.

2.3. Threat and Error Management

Threat and Error Management (TEM) is a consideration for all aspects of RPAS operations.

A threat is defined as an event (in relation to the environment or the aircraft) or an error (from another aircraft, air traffic control or maintenance) occurring outside the influence of persons operating under the authority of this ReOC. Threats are defined as "events or errors that occur beyond the influence of the flight crew, increase operational complexity, and which must be managed to maintain the margins of safety".

Threats shall be managed by:

- adhering to maintenance requirements and standards
- compliance with operational requirements
- diligence to the JSA requirements and pre-flight GCS checks
- thorough pre-flight & post-flight RPA inspections
- application of appropriate site controls in accordance with the JSA.

An error is defined as an action or inaction that leads to a deviation from persons operating under the authority of this ReOC or organisational intentions or expectations. Error in the operational context is considered as a factor reducing the margin of safety and increasing the probability of adverse events. Prevention of errors is encouraged through the use of checklists, operating procedures, clear communications, pilot training and currency.

Management of errors is achieved through:

- training and currency to identify and react to errors in a timely manner
- prioritising operational tasks: aviate, navigate and communicate
- RPAS check lists, maintenance and configuration attention
- no-blame philosophy with regard to incident reporting debriefs.

TEM is considered in all aspects of standard operating procedures. The Risk Assessment is the key document to identify and mitigate potential issues to standard operations. Job specific TEM is identified as an item for consideration on the JSA at both the initial and on-site stage.

Common job specific TEM issues are dealt with in the JSA and during pre-flight on the GCS check lists. Common threats/errors and responses considered to manage threats and errors are:

- loss of control and flyaway: toggle controller options (FBW/Stab/Manual), invoke return to home, radio broadcast
- low flying aircraft in conflict: abort operations and land, radio broadcast
- loss of visual line of sight: hover (cease operating the controls), move to be in line of sight
- crash, damage to RPA and/or battery: The battery may be unstable and explode/ catch fire; area shall be monitored for at least 15 minutes prior to recovery.

2.4. Normal and Non-normal Operations

2.4.1. Normal Operations

The procedure for Normal Operations is detailed in the RPAS Operational Procedures (Library). In addition to the operational procedures detailed for a specific RPA in the relevant user's manual, the Normal Operations procedure details how a normal operation will be conducted by the RPAS operational crew including:

- JSA validation & pre-flight procedures
- take-off, approach, landing and recovery procedures
- post-flight procedures (including mission debrief)
- reporting (technical, flight log, defect, etc.).

2.4.2. Non-normal Operations

The procedure for Non-normal Operations is detailed in the RPAS Operational Procedures (Library). In addition to the emergency procedures detailed for a specific RPA in the relevant user's manual, the Non-normal Operations procedure details how an emergency situation will be handled by the RPAS operational crew including:

- immediate response to loss of control situations
- post-crash procedures
- lost aircraft procedures
- emergency contact and reporting requirements
- accident and incident reporting.

3. Specialised Operations

The specialised operations detailed below may be conducted subject to authorisation by CASA. Operations within Prohibited or Restricted areas are subject to the approval of the authority controlling the area. Copies of all permissions, exemptions and approvals held by the operator can be found in Appendix 2 of this manual.

3.1. Operations within 3NM of aerodromes

Remote Pilots must not operate an RPA within 3NM of an aerodrome (including any HLS or ALA listed in ERSA) unless the operation has been authorised by the Chief Remote Pilot. An additional approval is required from CASA for any operations:

- within 3NM of an aerodrome that has an active ATC service (section 4.4.3.2);
- in the approach or departure paths of an aerodrome (section 4.4.3.3); or
- over the movement area of an aerodrome (section 4.4.3.4).

The Chief Remote Pilot will conduct a risk assessment in accordance with Section 4.2.5 of this manual for any risk associated with this operation that has not been mitigated by the procedure for 'Operations within 3nm of Uncontrolled Aerodromes' detailed in the RPAS Operational Procedures (Library).

3.2. Operations near controlled aerodromes

Unless otherwise permitted by Airservices, Remote Pilots must not operate an RPA within 3NM of the boundary of an aerodrome that has an active ATC service. The Chief Remote Pilot is responsible to ensure that operations are not planned or approved for such areas.

If permission is granted to operate in the above area, the operation is only permitted if all of the conditions of the relevant permission can be met. Procedures for operating in these areas, including any specific training requirements or competency standards for Remote Pilots, are detailed in the RPAS Operational Procedures (Library).

Operations below 400ft AGL in a control zone outside of 3NM of the boundary of an aerodrome that has an active ATC service is permitted provided consideration is given to the risks that may exist with respect to other airspace users. Risk treatments may include positioning of the activity, radio broadcast, the issue of NOTAMs, consultation with other airspace users, etc.

The Chief Remote Pilot will conduct a risk assessment for each of these types of operations in accordance with Section 4.2.5 of this manual prior to authorisation of the operation. If all risks are satisfactorily mitigated, the Chief Remote Pilot will detail any special operational requirements on the JSA prior to authorising the operation.

3.3. Operations in the approach or departure paths of an aerodrome

Unless otherwise permitted by CASA, the Remote Pilot must ensure the RPA is not operated at any altitude in the approach or departure path of an Aerodrome, including any ALA or HLS listed in ERSA. The Chief Remote Pilot is responsible for ensuring that operations are not planned or approved for such areas.

If permission is granted to operate in the approach or departure path of an Aerodrome the operation is only permitted if all of the conditions of the relevant permission can be met. Procedures for operating within the approach or departure path of an Aerodrome including any specific training requirements or competency standards for Remote Pilots will be detailed in the RPAS Operational Procedures (Library).

3.4. Operations over the movement area of an aerodrome

Unless otherwise permitted by CASA (or for a controlled aerodrome only Airservices), the Remote Pilot must ensure the RPA is not operated over the movement area of an Aerodrome, including any ALA or HLS listed in ERSA. The Chief Remote Pilot is responsible for ensuring that operations are not planned or approved for such areas.

If permission is granted to operate over the movement area of an Aerodrome the operation is only permitted if all of the conditions of the relevant permission can be met. Procedures for operating over the movement area of an Aerodrome including any specific training requirements or competency standards for Remote Pilots will be detailed in the RPAS Operational Procedures (Library).

Where operations are permitted by CASA, the operations are only permitted if all of the conditions of the relevant permission can be met. Procedures for operating in the movement area of an Aerodrome including procedures for training requirements, competency standards, etc., will be detailed in the RPAS Operational Procedures (Library).

3.5. Operations at night, in cloud or in conditions other than Day VMC

Unless otherwise permitted by CASA, the Remote Pilot must ensure the RPA is not operated at night, in cloud or in conditions other than Day VMC. The Chief Remote Pilot is responsible for ensuring that operations are not planned or approved for such conditions.

If permission is granted to operate at night, in cloud or in conditions other than Day VMC, the operation is only permitted if all of the conditions of the relevant permission can be met. Procedures for at night, in cloud or in conditions other than VMC including any specific training requirements or competency standards for Remote Pilots, will be detailed in the RPAS Operational Procedures (Library).

3.6. Operations above 400ft AGL

Unless otherwise permitted by CASA, the Remote Pilot must ensure the RPA is not operated above 400ft AGL. The Chief Remote Pilot is responsible for ensuring that operations are not planned or approved for such areas.

If permission is granted to operate above 400ft AGL, the operation is only permitted if all of the conditions of the relevant permission can be met. Procedures for operations above 400ft including any specific training requirements or competency standards for Remote Pilots will be detailed in the RPAS Operational Procedures (Library).

3.7. Operations beyond visual line of sight (BVLOS)

For the purposes of this requirement, visual line of sight is defined as an operation in which the Remote Pilot can maintain direct visual contact with the aircraft, aided only by spectacles or contact lenses (not binoculars or telescopes etc.) to manage its flight and meet separation and collision avoidance responsibilities.

Unless otherwise permitted by CASA, the Remote Pilot must ensure the RPA is not operated BVLOS. The Chief Remote Pilot is responsible for ensuring that operations are not planned or approved for such areas.

If permission is granted to operate BVLOS, the operation is only permitted if all of the conditions of the relevant permission can be met. Procedures for operations BVLOS including any specific training requirements or competency standards for Remote Pilots will be detailed in the RPAS Operational Procedures (Library).

3.8. Operations over populous areas

Unless otherwise permitted by CASA, the Remote Pilot must ensure the RPA is not operated over a populous area. The Chief Remote Pilot is responsible for ensuring that no operation is planned or approved for such areas until approval from CASA has been obtained.

A *populous area* is defined as an area that has a sufficient density of population for some aspect of the operation, or some event that might happen during the operation (in particular, a fault in, or failure of, the aircraft) to pose an unreasonable risk to the life, safety or property of somebody who is in the area but is not connected with the operation.

If permission is granted to operate over a populous area, the operation is only permitted if all of the conditions of the relevant permission can be met. Procedures for operations over a populous area including any specific training requirements or competency standards for Remote Pilots will be detailed in the RPAS Operational Procedures (Library).

3.9. Hazardous Operations

The Remote Pilot must ensure the RPA is not operated in such a way to create a hazard to another aircraft, another person or property. Unless otherwise authorised by the Chief Remote Pilot (Flight Authorisation Form), Remote Pilots must ensure the RPA is operated at least 500ft vertically or 1500m horizontally from any airborne manned aircraft.

3.10. Operations in restricted or prohibited airspace

The Remote Pilot must ensure the RPA is not operated in restricted or prohibited airspace unless otherwise permitted by the authority controlling the airspace. All operations must be in accordance with any conditions imposed by the controlling authority. The Chief Remote Pilot is responsible for ensuring that operations are not planned or approved for such areas without the permission of the controlling authority.

Where permission has been obtained to operate in restricted or prohibited airspace, the Chief Remote Pilot will detail the conditions of this approval on the JSA prior to authorising the operation.

3.11. Operations near people

Unless otherwise authorised by the Chief Remote Pilot (Flight Authorisation Form), the Remote Pilot must ensure the RPA is not operated within 30m of any person who is not directly involved with the operation of the RPA. Persons being filmed or photographed such as actors, athletes, or members of the public, are the subject of an operation. They are not considered as being directly involved in the operation of the RPA and as such, the 30m rule applies.

The Chief Remote Pilot may provide authorisation to a Remote Pilot to operate within 30m but no closer than 15m of a person(s) provided consent has been obtained from that person(s). Authorisation to operate within 30m but no closer than 15m of a person must be in accordance with the procedures detailed in the RPAS Operational Procedures (Library) that cover the risk management of the operation including, operating procedures, risk assessment and the training/competency standards required of Remote Pilots prior to operations of RPA in close proximity to people.

3.12. Accident/Incident Reporting

All persons working under the authority of this ReOC must report, as soon as practicable, any accident, incident or near miss and provide a situation report to the Chief Remote Pilot.

Certain incidents and accidents that relate to RPA operations must also be reported to the Australian Transport Safety Bureau (ATSB). The Chief Remote Pilot is responsible for

notifying the ATSB of these events. The events will be categorised as either an Immediately Reportable Matter (IRM) or Routinely Reportable Matter (RRM) in accordance with the AIP ENR 1.14 as detailed below.

Immediately Reportable Matters	Routinely Reportable Matters
• **Make a report as soon as is reasonably practicable by telephone on 1800 011 034** • **Follow up with a written report within 72 hours**	• Submit a written report within 72 hours

In the event that an operation results in an immediately or routinely reportable matter the Chief Remote Pilot and Remote Pilot in Command must take reasonable steps to preserve any flight planning and operational data, telemetry logs and RPAS components which may assist in validating the cause of the incident.

3.13. Dropping or Discharging Items

The Remote Pilot must not cause anything to be dropped or discharged from an unmanned aircraft in a way that creates a hazard to another aircraft, a person, or property.

3.14. Use or Application of Dangerous Goods

Activities involving the use or application of dangerous goods which do not form part of the RPA must be specifically approved by the Chief Remote Pilot. These activities may also be subject to State or Federal legislation.

3.15. Aeronautical Radio Usage

Good airmanship would generally dictate that the carriage and use of a radio to maintain a radio listening watch is considered the preferable safe mode of operation for all flights.

Some operations will require that a radio listening watch is maintained, and in some circumstances, that radio calls are made. The Chief Remote Pilot must determine if a radio is required as part of their Flight Authorisation and JSA.

If RPAs are operated where the carriage and use of a radio is required, the operation is only permitted if these requirements can be met. A person operating an aviation radio must hold a relevant qualification issued by CASA. Procedures for the use of radios, including any training requirements or competency standards for Remote Pilots, are detailed in the RPAS Operational Procedures (Library).

Remote Pilots are required to hold a Radio qualification (minimum) prior to operating within Class C airspace, unless the Remote Pilot holds any of the following:

a. an aeronautical radio operator certificate;
b. a flight crew licence;
c. an air traffic control licence;
d. a military qualification equivalent to a licence mentioned in paragraph (b) or (c);
e. a flight service licence.

The Chief Remote Pilot will not authorise operations within Class C airspace unless the Remote Pilot has at least one of the above qualifications.

4. RPAS Maintenance

4.1. Maintenance Programming

4.1.1. Scope of Maintenance

The primary purpose of maintenance is to ensure the ongoing safety and reliability of RPAS through both preventative maintenance and inspection processes. RPAS must be kept in a good state of order and repair and any reported or observed defects with the RPAS must be investigated and remedied before further operation of the RPAS.

Maintenance schedules provide for the routine repair, servicing and testing (preventative maintenance) of the RPAS.

A maintenance schedule will consider the mechanical, avionic, and computer-based systems (including software and firmware) associated with the:

- RPA and their power sources such as batteries, fuel cells, etc.
- RPAS support equipment including transmitter/receiver equipment, radio devices, and any other item of plant or equipment associated with the operations or use of the RPA
- RPA role equipment and their fittings such as cameras, electronic sensing devices, etc.

4.1.2. Maintenance to be in Accordance with Schedules

All maintenance to be carried out on RPAS will be scheduled in accordance with the manufacturer's specifications where that information exists and is relevant.

If a manufacturer does not provide details concerning the scheduling of maintenance, or the information is not relevant, the Maintenance Controller may:

- develop a schedule for the maintenance based on best practice standards and document it in a RPAS maintenance schedule
- place the item 'on condition' in accordance with section 6.1.4 below.

The Maintenance Controller will ensure that where maintenance schedules have been developed for an RPAS, this schedule will be recorded in the relevant RPAS section of the RPAS Operational Procedures (Library) and referenced in Aircraft Flight Operations Manuals.

4.1.3. Variation of Maintenance Schedules

If operational experience identifies that the existing maintenance schedule is deficient, the Maintenance Controller will vary the maintenance scheduling to ensure the ongoing reliability of the RPAS.

The Maintenance Controller must not allow the maintenance schedule to be less onerous than the manufacturer's specifications. All variations of the maintenance schedule will be recorded in the relevant RPAS section of the RPAS Operational Procedures (Library).

The Maintenance Controller will review each schedule periodically to ensure the most current instructions are in use.

4.1.4. 'On Condition' Maintenance

All components of an RPAS including those on a maintenance schedule are subject to ongoing 'on condition' monitoring through the Pre-flight and Post-flight inspections.

The Pre-flight and Post–flight inspections are used to identify damage, wear, malfunction or unserviceability, and any defects found during these inspections will be recorded on the Release to Service (Appendix 7 of the RPAS Operational Procedures (Library)).

The Maintenance Controller will monitor the failure rate of each RPAS component that is 'on condition' or subject to a maintenance schedule to ensure the schedule is effective in minimising unserviceable items and operational disruptions.

4.1.5. Minimum Requirements for Maintenance Schedules

Maintenance schedules will include the following items for each RPAS & approved payload operated under the authority of the ReOC:

- Pre-flight Inspection Checklist
- Post Flight Inspection Checklist
- Periodic/Post Maintenance Checklist.

The content of these checklists will be detailed in each specific RPAS section of the RPAS Operational Procedures (Library).

4.2. Maintenance Procedures

4.2.1. Maintenance Instructions

All maintenance carried out on RPAS operated under the authority of the ReOC will be carried out in accordance with any manufacturer's instructions that exist for that maintenance. The instructions will be detailed in each specific RPAS section of the RPAS Operational Procedures (Library).

4.2.2. Repair or Replacement of Components

Components must be repaired or replaced where they show signs of unserviceability, abnormality or damage unless the damage is insignificant to the operation of the RPAS (e.g. scratches or cosmetic damage).

4.2.3. Firmware/Software Updates

Avionic and control system software is only to be updated after the version has been confirmed as tested and fit-for-purpose and stable. A post maintenance test flight, in a controlled and safe location, must be completed as part of the maintenance activity whenever a software or firmware update is applied.

Where an issue arises with new software / firmware version the component is to be rolled back to the previous stable version before the RPAS is used in commercial operations.

Records of firmware or software updates will be documented in the aircraft maintenance log and include details of any test flights and version numbers relevant to the update.

All aircraft & GCS electronic logs (T-Logs & BIN-Logs) are to be copied onto the maintenance server during any programmed or non-programmed servicing. These Logs are to be saved and archived when an Auto-Pilot is retired. These are to be retained indefinitely.

4.3. Maintenance Authorisation

4.3.1. Maintenance Personnel to be Authorised

The Maintenance Controller authorises the following people to conduct maintenance on RPAS:

- Remote Pilots who have completed the induction programme
- manufacturers of RPAS items and their approved service agents
- organisations and service providers assessed by the Maintenance Controller as being competent to provide RPAS maintenance services.

4.3.2. Remote Pilot Maintenance Authorisation

Remote Pilots who have completed the induction programme are authorised by the Maintenance Controller to conduct the following maintenance:

- replacement of propellers
- pre-flight and post-flight inspections
- replacement and charging of batteries
- fitting and removal of payloads and role equipment.
- weight/position adjustments to ensure compliance to CG criteria
- fix/unfix of nuts, bolts and fittings that form a part of attaching and detaching simple removable elements (wings, undercarriage, payloads, etc.)
- recording maintenance in the RPAS logs

4.4. Defects

A *defect* is defined as any confirmed abnormal condition of an item whether or not this could eventually result in a failure. In addition to imperfections that may impair the structure, composition, or function of the RPAS, the scope of this definition also includes any intermittent failure, spurious warning, or fault in the operation of a RPAS that may cause it to deviates from its manufacturer's specifications.

All defects identified in any part of the RPAS (RPA, transmitter/receiver, role equipment, etc.) must be recorded as soon as they are identified and prior to further operation of the RPAS.

During operations, only those defects the Remote Pilot has been authorised to repair may be rectified by the Remote Pilot. All other defects must remain **'open'** until the Maintenance Controller has assessed and rectified the defect.

The Maintenance Controller must be immediately notified when a defect is identified in the field that cannot be rectified by the Remote Pilot. In these situations, the Maintenance Controller will consult with the Remote Pilot on the action that will be taken to remedy the defect.

In situations that a defect cannot be rectified, the Remote Pilot will suspend the RPAS operation and notify the client of the situation. Under no circumstances is the aircraft to be operated if there is an open RPAS defect.

4.5. Recording of Defects and Maintenance

It is the responsibility of all person(s) involved in the operation of RPAS to report defects as they occur and record the maintenance they have conducted on the RPAS.

Defects and maintenance will be recorded on the *Defect and Maintenance Log* (Appendix 7 of the RPAS Operational Procedures (Library)). All open defect items must be closed prior to flight.

Remote Pilots must forward Defect and Maintenance Logs to the Maintenance Controller as follows:

- for open defects – as soon as practicable
- for defects rectified by the Remote Pilot – as soon as possible upon return to the operating base.

The Maintenance Controller will review all defects and where necessary, make adjustments to the RPAS Maintenance Plan to enhance the serviceability of RPAS components and improve the reliability of RPAS operations.

The Maintenance Controller will file the Defect and Maintenance Log for each element of the RPAS, and keep this record for the life of the RPAS element.

Note: the Pre/Post Flight Check is recorded on the RPAS Time in Service Log rather than the Defect and Maintenance Log.

4.6. Release to Service Log

The *Release to Service Log* (Appendix 6 of the RPAS Operational Procedures (Library)) is used by the Remote Pilot to record details of the flight times and the Pre/Post Flight Checks conducted on RPA.

When a RPAS Time in Service Log becomes full, the Remote Pilot will transfer the cumulative total of flight hours to a new RPAS Time in Service Log and forward the completed RPAS Time in Service Log to the Maintenance Controller.

The Maintenance Controller will file the RPAS Time in Service Log for each RPA operated under the authority of the ReOC and unless specified otherwise in the MOS keep this record for the life of the RPA.

4.7. Flight Tests

Following all maintenance and before final sign-off for completion of maintenance task, the person carrying out the maintenance or another person nominated by the Maintenance Controller shall carry out a flight test of the aircraft to verify that it operates correctly in all available modes.

Flight test requirements for each RPAS type will be developed by the Maintenance Controller in consultation with the Chief Remote Pilot to take into account the capabilities, operating modes and tasking of the RPAS.

Details of the flight test requirements for each RPA are detailed in the relevant RPAS section of the RPAS Operational Procedures (Library).

All flight data information captured by V-TOL Aerospace flight control software NEURON is to be downloaded into the maintenance system during RPAS C Checks to ensure an accurate record of flight time for each aircraft is retained for future review and use.

5. Internal Training

The training requirements for those persons working under the authority of the ReOC include consideration of their general training needs with regards to this Operations Manual, RPAS Flight Manuals & equipment, and specific operational activities that the person will be involved in, such as specialised operations.

5.1. Persons Permitted to Conduct Training

The Chief Remote Pilot and person(s) nominated by the Chief Remote Pilot are permitted to provide internal training. The Chief Remote Pilot will ensure that appropriate measures of competency are in place to ensure the effectiveness of training that has been provided.

5.2. Record Keeping

The Chief Remote Pilot is responsible for ensuring records are kept of all training and proficiency checks (including flight tests) that are conducted on any person involved in operations under the authority of the ReOC. Unless otherwise specified in the MOS, all training records will be kept for a minimum of three years. Where records are saved in a soft copy format, where possible, records will be kept indefinitely.

5.3. Remote Pilot Induction Training Requirements

Remote Pilots must complete the following induction training prior to commercial operations:

- Policy and Procedure training in accordance with Appendix 3 of the RPAS Operational Procedures (Library)
- RPAS type training as specified in Appendix 4 of the RPAS Operational Procedures (Library) on the types that the Remote Pilot is to be authorised to fly.

5.4. Remote Pilot Type Conversion Training Requirements

Remote Pilots who have not completed training on a particular type of RPAS must complete RPAS type training (Appendix 4 of the RPAS Operational Procedures (Library)) prior to operating a RPA in any commercial operation conducted under the authority of this ReOC.

5.5. Remote Pilot Training for Specialised Operations

Training requirements for specialised operational activities (e.g. night time operations, BVLOS, etc.,) are detailed in the 'RPAS Operational Procedures (Library)'. Specialised Operation may include, but are not limited to:

- night time VLOS operations
- EVLOS operations
- BVLOS operations
- operations within controlled airspace above 400ft AGL
- operations within 3nm of an aerodrome
- Swarm operations
- operations in the vicinity of electrical infrastructure

5.5.1. Remote Pilot Night VLOS Training Requirements

Remote Pilots must complete Night VLOS training in accordance with Appendix 7 of the RPAS Operational Procedures (Library) prior to operating a RPA in any night time VLOS operations conducted under the authority of this ReOC.

5.5.2. Remote Pilot EVLOS Training Requirements

Remote Pilots must complete EVLOS training in accordance with Appendix 8 of the RPAS Operational Procedures (Library) prior to operating a RPA in any EVLOS operation conducted under the authority of this ReOC.

5.5.3. BVLOS Training

Remote Pilots must complete BVLOS training in accordance with Appendix 8 of the RPAS Operational Procedures (Library) prior to operating a RPA in BVLOS operations conducted under the authority of this ReOC.

5.5.4. Training for Operations in Controlled Airspace above 400'

Remote Pilots must complete Ops in Controlled Airspace training in accordance with Appendix 9 of the RPAS Operational Procedures (Library) prior to operating a RPA in Controlled Airspace above 400'; conducted under the authority of this ReOC.

5.5.5. Training for Operations Within 3nm of Aerodromes

Remote Pilots must complete appropriate training in accordance with Appendix 10 of the RPAS Operational Procedures (Library) prior to operating a RPA within 3nm of aerodromes conducted under the authority of this ReOC.

5.5.6. Training for Swarm Operations

Remote Pilots must complete the appropriate training in accordance with Appendix 11 of the RPAS Operations Procedures (Library) prior to conducting any approved Swarm Operations under the authority of this ReOC.

5.5.7. Training for Operations in the Vicinity of Electricity Infrastructure

Remote pilots must complete training in accordance with Appendix 12 of the RPAS Operations Procedures (Library) prior to conducting any approved Operations in the vicinity of Electricity Infrastructure under the authority of this ReOC.

5.6. Observer Training

Observers who perform crew functions associated with EVLOS, BVLOS and Swarm operations, must complete the training syllabus at Appendix 13 of the RPAS Operational Procedures (Library) prior to performing such duties under the authority of this ReOC.

5.7. Use of Simulators

V-TOL Aerospace employees and students of AUSA may undergo or undertake training and assessment on simulation devices. These devices are configured to meet, the same operational requirements, conditions and behaviours of the aircraft being simulated. Each simulated flight activity, including operational rehearsals are to be authorised by the Chief Remote Pilot, or for AUSA students, the AUSA Chief Instructor. Instructional flights using simulation devices that require assessment may have a maximum Instructor/Student ratio of one (1) to two (2). Each simulator is to be deemed serviceable by the Maintenance Controller prior to being used for any operational rehearsal or training purpose.

6. AUSTRALIAN UNMANNED SYSTEMS ACADEMY RPAS FLYING SCHOOL OPERATIONS

Reference material

Document type	Title
Regulations	*Civil Aviation Safety Regulations 1998*
Part 101 of CASR	Part 101 of the *Civil Aviation Safety Regulations 1998 (CASR)*
Part 101 MOS	Manual of Standards to Part 101 of the CASR 1998

Forms

Form no.	Title
Form 101-01	Application for Remote Pilot License (RePL), initial and variation
Form 101-02	Application for RPA Operators Certificate (ReOC), initial issue and variation
Form 101-03	Application for ReOC (Renewal)
Form 101-04	Application for ReOC Nominated Personnel (CEO, CRP & Maintenance Controller)
Form 101-05	Used by ReOC training Organisations to submit a course issue of RePLs
Form 101-09	Application for RPA Flight Authorisation / Approval / Permission

Revision history

Revisions to this Section are recorded below in order of most recent first.

Version no.	Date	Parts / sections	Details
2.0	December 2020	All	Complete Revision IAW Part 101 MOS
1.0	June 2012	All	First Issue (as Part E of Operations Manual)

Table 6-1: Definitions for this section

aeronautical knowledge component	the theory component of a RePL training course, as mentioned in subparagraph 101.295 (2) (a) (iii) of CASR.
aeronautical knowledge standards	means the standards and requirements for the aeronautical knowledge component of a RePL training course as defined in section 2.05 of the Part 101 MOS.
automated operation	for an RPA, means that after take-off and until it lands, the RPA either: • flies a predetermined flight path programmed into the RPAS before take-off; or • changes its flight path or configuration in flight solely because of dynamic updating of pre-programmed turning, way point data, or configuration settings; and **Note:** Dynamic updating involves electronically changing an RPA's flight path without the manual operation of command and control levers or switches. • is not subject to any manual operation.
category	for an RPA, means 1 of the following: • the aeroplane category • the helicopter (multirotor class) category • the helicopter (single rotor class) category • the powered-lift category.

Complexity	refers to whether the RPA:
	
	• is generally operated in automated mode, or manual mode, or has a liquid-fuel system; and
	• is of a particular design and make, including of a design and make that:
	
	   − stems from a common basic design; and
	   − is essentially similar in different models.

curriculum	A representation of the lessons or training periods from an operator's ***syllabus*** and the duration over which they will be conducted in order to achieve a specific training outcome.
Examiner	for a small, very small, medium or large RPA, or for GELP assessments, means 1 of the following: • the chief remote pilot of a certified RPA operator who is qualified as a RePL training instructor; or • a RePL training instructor who is authorised by the chief remote pilot in accordance with the RPA operator's documented practices and procedures.
manual operation	for an RPA, means the use, by the remote pilot, of a manual mechanism that is part of the RPAS, in order to exercise control over the RPA, including by reconfiguring the RPA.
practical competency component	the component of a RePL training course for the manual or automated operation of a category of RPA that an applicant for a RePL proposes to operate, as mentioned in subparagraph 101.295 (2) (b) (i) of CASR.
practical competency standards	the standards and requirements for the practical competency component of a RePL training course as defined in section 2.05 of the Part 101 MOS.

RePL training course	is the expression used to denote an RPL training course as defined in the CASR Dictionary.
RePL training course instructor	a training instructor for a RePL training course who satisfies the requirements of section 2.30 of the Part 101 MOS.
RePL training organisation	a person certified as an RPA operator under regulation 101.335 of CASR whose operations include the conduct of a RePL training course.
RePL training organisation's procedures	a RePL training organisation's documented practices and procedures for paragraph 101.335 (1) (d) of CASR.
RePL training unit	means a unit of aeronautical knowledge or a unit of practical competency for a RePL training course: • prescribed in Schedules 2 and 3 of the *Part 101* MOS, for the purposes of the definition of **RPL training course** in Part 1 of the CASR Dictionary; and • contained in Schedules 4 and 5 of the *Part 101* MOS respectively.
RePL training unit content	for a **RePL training unit**, means the content for the RePL training unit: • mentioned in column 2 of an item in an Appendix of Schedules 2 and 3 of the *Part 101* MOS; and • described for the corresponding unit in Schedules 4 and 5 of the *Part 101* MOS, respectively.
RPL training course	see RePL training course.
Size	refers to whether the RPA is of a particular size, being: • Micro, <250g • Very Small, >250g - <2kg • Small, >2kg – <25kg • Medium, >25kg - <150kgs • Large, >150kg.
syllabus	in relation to a **RePL training course**, is a summarised description of all academic content, such as lessons or training periods, which is approved by CASA to be conducted by the operator. The syllabus specifically indicates what **RePL training unit content** is included in each lessons or training period.
theory component of a RePL training course	means the aeronautical knowledge component of the course.
type	for an **RPA**, means an RPA of a particular: • category; and • size; and • complexity.

6.1. RPL Training Organisation

Outline of organisational structure of the Australian Unmanned Systems Academy (AUSA):

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                    ┌─────────────────────────────┐
                    │  V-TOL Aerospace Pty Limited │
                    └─────────────────────────────┘
                                 │
                    ┌─────────────────────────────┐
                    │      Board of Directors      │
                    └─────────────────────────────┘
                                 │
  ┌──────────────────┐  ┌─────────────────────────┐
  │    Australian    │  │    Managing Director    │
  │ Unmanned Systems │  └─────────────────────────┘
  │     Academy      │              │
  └──────────────────┘              │
  ┌──────────────────┐  ┌────────────────────┐   ┌──────────────────────┐
  │       CEO        │  │ Chief Remote Pilot │───│ Maintenance Controller│
  └──────────────────┘  └────────────────────┘   └──────────────────────┘
           │                       │                        │
  ┌──────────────────┐  ┌────────────────────┐   ┌──────────────────────┐
  │     Students     │  │  Chief Flying      │   │   Line RPA Pilots     │
  └──────────────────┘  │    Instructor      │   └──────────────────────┘
                        └────────────────────┘
                                 │
                        ┌────────────────────┐
                        │    Instructors     │
                        └────────────────────┘
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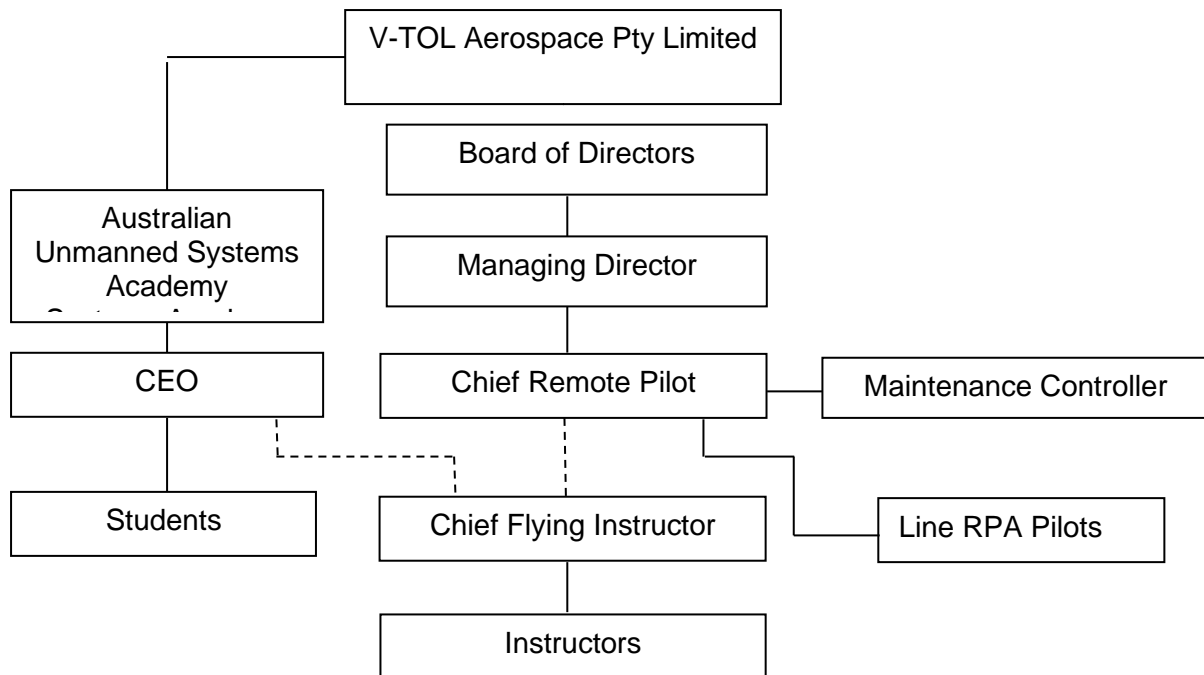
6.2. RePL Training Course

6.2.1. RePL training overview

V-TOL Aerospace Pty Ltd (V-TOL) wholly-owned subsidiary Australian Unmanned Systems Academy (AUSA) will be operating as an RePL training provider under V-TOL's ReOC and will be providing RePL training for the following RPAS Categories:

- Initial & Upgrade - Aeroplane <7kg
- Initial & Upgrade - Multi-rotor <25kg

The practical competency component of AUSA's RePL training course will provide training in both the automated operation mode and the manual mode for the relevant category of RPA.

6.2.2. RePL syllabus of training

AUSA's RePL training complies with the Part 101 Manual of Standards defined units of aeronautical knowledge and units of practical competency for an RePL training course in accordance with the following RePL syllabus of training as shown at Annex 2 to Chapter 6.

Prior to operating, changes to the AUSA RePL syllabus of training must be approved by CASA.

6.2.3. RePL training course curriculum

The RePL training course curriculums captured at Annex 3 to Section 6 have been approved by CASA. The individual lessons within each course curriculum may be rearranged as per operational requirements but reduction of the overall course duration or the removal of lessons or training periods from a course must be documented and submitted to CASA for

approval. The CRP will record the approval of such a change within the course record of each student attending that course.

For an RePL training course including the Aeronautical knowledge standards - Common units, there can be no less than 15 hours of contact time with an RePL training instructor during the aeronautical knowledge component of the RePL training course.

No part of the practical competency component of an RePL training course may be delivered by a RePL training instructor who is not in the physical presence of the person being trained.

6.2.3.1.   Initial & Upgrade - Aeroplane <7kg

See Annex 3

6.2.3.2.   Initial & Upgrade - Multi-rotor <25kg

See Annex 3

6.3.   Nominated RePL instructors and examiner requirements

6.3.1. RePL instructor qualifications

All RePL instructors conducting AUSA's RePL training course must have one or more of the following instructional qualifications:

- a pilot instructor rating issued under Part 61; or
- a Certificate IV in Training and Assessment; or
- a tertiary level qualification in teaching that is recognised as such by a State or Territory government; or
- a certificate of completion or equivalent in the Principles and Methods of Instruction course.

6.3.2. RePL instructor experience

RePL Instructors must have a minimum 20 logged hours of non-training operational experience under a ReOC, operating each of the RPAS categories for which they will be conducting practical RePL training.

6.3.3. RePL examiner experience

Examiners must have 2 years'piloting experience in aviation operations and be qualified on type to be an examiner for a relevant RPAS.

6.3.4. RePL instructor licencing

RePL Instructors must only provide RePL training on the RPAS category and weight that appears on their RePL, AUSA's ReOC and approved by the CRP in accordance with table in Section 5.

6.3.5. RePL instructor induction training

The RePL instructor must demonstrate to the Senior RePL Training Instructor (SRTI) a minimum of three lessons containing aeronautical knowledge units and three lessons containing practical competency units prior to being approved as an RePL Instructor.

6.3.6. RePL instructor currency requirements

All RePL instructors must have been assessed by the SRTI, conducting one lesson containing aeronautical knowledge units and one lesson containing practical competency units in the previous 12 months. The CRP must maintain a record this assessment for a period of 7 years.

RePL Instructors must also meet the currency requirements for Remote Pilots in accordance with Section 1.5.3.3.

6.3.7. RePL instructor/examiner nomination

Only a CRP who meets the requirements in section 5.4 or employees who meet the requirements in section 5.4 and who have been authorised by the Chief Remote Pilot in the table below may conduct RePL training instruction and examination.

Table 6-2: Authorised Instructors

Employees authorised as RePL Instructors and/or examiners				
Name in full	**ARN**	**RePL Categories authorised for training**	**RePL Examiner**	**Date authorised**
Frank Kerswell Martin	821304	Aeroplane <7kg Multi-rotor <25kg	Yes	07/12/2020
Joseph John McGee	1072261	Aeroplane <7kg Multi-rotor <7kg	No	07/12/2020
John Douglas Thynne	148202	Multi-rotor <25kg	No	07/12/2020
Bradley John Perren	554514	Multi-rotor <7kg	No	07/12/2020
Kye Howard Morton	1089274	Ground Instructor	No	01/06/2021
Nicholas Dion Hine	1160642	Ground Instructor	No	15/10/2021

6.4. RePL training course administration

6.4.1. Training material amendment policy

Any proposed changes or improvements to a RePL training course lesson plans, lessons or other training related documents are required to be submitted to the CRP or SRTI for review.

6.4.2. RePL instructor handbook

A guide for RePL instructors on the intent, focus and outcomes of each lesson can be found in appropriate lesson plans.

The RePL instructor handbook contains the following:

- **Lesson plans**
- **Exam/flight test examiners guide.**

6.4.3. Approved RPAS for RePL training

Aircraft to be operated for practical RePL training and supporting role equipment of the RPAS must be appropriate for the licence being applied for. The RPAS must be able to conduct all practical flight manoeuvres required for the student to meet the practical competency standards. The following RPA models are approved by the CRP for RePL training:

- MR <25kgs – DJI Mavic (<2kg), V-TOL Swift(<2kg), V-TOL Wasp (<7kg), V-TOL Seeker (<7kg), V-TOL Hornet (<25kg)
- FW <7kgs – V-TOL Condor

6.5. Conduct of Training

6.5.1. Authorisation of training flights

All training flights are to be authorised by the Chief Flying Instructor and in accordance with the training field JSA.

Instructors are responsible for ensuring authorisation for the training flight has been granted by the CFI.

6.5.2. Student Flying Progress Record

The Student Flying Progress Record at Annex 6 to Section 6 of this document is to be completed for each flight in accordance with the instructions contained in the document. Student Flying Progress Records will be retained by AUSA for at least seven years.

6.5.3. Investigation of student and instructor incidents and accidents

All students are to be aware of AUSA safety policy and should be familiar with the Safety Management System.

The instructor is to notify the Chief Flying Instructor immediately an incident or accident has occurred.

If the accident is serious and damage to public property or persons has occurred the instructor is to call the fire/police/ambulance and render assistance.

On return to the AUSA the instructor will and the student may fill out an incident or hazard report and submit to the safety officer via the normal process, provided in Section 4.4.4.

If the incident is **minor** and **no damage** has occurred, the flight is to cease immediately and the training flight postponed pending a review.

The Chief Flying Instructor or a nominated delegate will undertake an investigation within 24hrs of the reported incident.

The Chief Flying Instructor may take the following action depending the severity of the incident or accident:

- Disciplinary action for both the student and instructor
- Suspend the student's flight training pending a flight review
- Suspend the instructor pending a detailed review
- Student taken off the course

6.5.4. Action to be taken following an accident or incident

Refer to 4.4.4 & 5.2.4.

6.5.5. Training at Schools and Colleges

AUSA has gained approval to conduct training for high school students to RePL standard. Such operations will be conducted in accordance with this part.

The details of such schools and colleges, including flying training areas, are recorded in the AUSA electronic document system with appropriate approvals and permissions if applicable. Flight training areas are also loaded in the V-TOL Flight Simulators to enable students & instructors to familiarise and rehearse various flight operations prior to conducting practical flight training and assessment at those locations.

6.5.6. Operations at other training locations

On occasions there may be a requirement to conduct RPAS flight training at other locations. The Chief Remote Pilot together with AUSA staff will consider and assess requests for other RPAS flight training locations on a case-by-case basis.

Such requests will be required to go through the normal chain of approval requiring consultation with CASA and the necessary stakeholders.

Any new training locations for use by AUSA that receive approval will be added to this section and maps of the areas added to the Flight Simulators & Training GCSs.

6.5.7. Instructor – student discipline

Any discipline matters between instructor and students will be handled in the first instance by the Chief Flying Instructor.

If the incident is a minor offence and is the first incident involving the student or instructor, the Chief Flying Instructor can issue a warning and no further action will be taken.

If the incident is a second offence or is classified as a major incident than the AUSA will convene a discipline review panel. A discipline review panel will consist of:

1. AUSA CEO
2. Chief RPA Pilot (V-TOL Aerospace)
3. Chief Flying Instructor (V-TOL Aerospace)
4. Safety Officer (V-TOL Aerospace)
5. Independent panel member (RQAC/AAA/ACUO)

The discipline review panel will have the following authority depending on the severity of the incident:

Students:

- Suspend a student from flight training activities if the student has continually breached safety procedures or standard operating procedures put in place for the safety of other airspace users.
- Remove the student from the course if the panel review the incident as a serious breach of safety that could have endangered the public or other airspace users or will bring harm to the reputation of the AUSA and V-TOL Aerospace.

Instructors:

- Re-allocate instructor to other duties pending final review.
- Recommend the instructor has his/her instructor endorsement removed.

6.5.8. Use of radio

Before commencement of flight training phases students must have successfully completed the use of radio syllabus and hold a radio certificate of competency (aviation) or Aeronautical Radio Operators Certificate (AROC).

Before commencement of any flight training activity, students will advise the necessary ATC authority that the training area is to become active, if applicable.

During flight training the student is to make the necessary 'area broadcasts' as per requirements stipulated in any Air Traffic Control Procedures, the JSA or IAW this Manual for the designated RPAS training area.

For air traffic control procedures for UAS training areas refer to the appendices of this section.

6.5.9. Credits for past training

Refer to recognition of prior learning in AUSA course administration manual.

6.5.10. Upgrading of an Existing RePL

A student who holds an RePL in the small category with a 7kg gross weight limitation can remove the limitation by passing the practical competency flight test conducted by an examiner in accordance with the relevant flight test standards in Annex 3, on an RPA with a gross weight of more than 7kg. The student is also required to have completed the aeronautical knowledge component of an RePL training course and passed an examination, in all of the units of knowledge that are required for the relevant RPA prior to upgrade.

6.6. Operational training areas

The following locations are intended to be used for operational training:

- Willowbank Airfield YWIN

A comprehensive risk assessment must be completed and reviewed annually for RePL training areas. Additionally, each location listed above must have a flight authorisation and job safety assessment completed in accordance with the feasibility assessment procedure in Section 2.2.

Job safety assessments for all operational training areas are to be stored in the V-TOL Document library. Electronic copies will be available on the AUSA My Learning Platform – www.unmannedsytems.edu.au.

6.7. Course completion

A student is deemed to have successfully completed AUSA's RePL training course by achieving all of the following:

- **passed the aeronautical knowledge examination (if required – See section 5.6.2)**
- **been assessed as competent in the relevant practical competency units**
- **passed the relevant flight test**
- **remedied any knowledge deficiencies.**

Each student who successfully completes AUSA's RePL training course must be issued with a certificate of course completion. The certificate must:

- **identify the RPA training organisation and the student**

- **identify the RePL training course completed, and when it was completed by the student; and**
- **be signed and dated by the CRP of the organisation.**

A template certificate of course completion can be found www.unmannedsytems.edu.au.

6.7.1. Notification to CASA

AUSA will notify CASA when a student successfully completes AUSA's RePL training course through the CASA Portal, or, when the Portal is not available, by submitting the applicable form.

For students who are applying for an initial RePL and do not need to conduct the theory component of the RePL course, the applicable form must be used.

RePL application forms can be found here https://www.casa.gov.au/drones/documents-and-forms.

6.8. RePL aeronautical knowledge examination

6.8.1. RePL examination requirement

To pass the theory component of AUSA's RePL training course, the student must pass an RePL aeronautical knowledge examination.

Where no units of aeronautical knowledge are conducted in a RePL training course, there is no requirement for the student to sit an aeronautical knowledge examination.

RePL examination questions

The CRP is responsible for maintaining 4 unique sets of questions. Each question set must be such that, while the same topics may be the subject of questions in some or all of the sets, no questions may appear in a set:

- **in exactly the same form or presentation as in any other set; or**
- **as requiring exactly the same answer, from exactly the same range of choices, as in any other set.**

For an RePL training course which includes the aeronautical knowledge standards - Common units, the exam must be a minimum of 80 questions. The exact number will be determined by the specific units of aeronautical knowledge conducted.

Where the common units of the aeronautical knowledge component are not conducted, the minimum number of exam questions will be determined by the specific units of aeronautical knowledge conducted.

The RePL aeronautical knowledge examinations are securely retained in the AUSA My Learning plarform found at www.unmannedsytems.edu.au with restricted access.

6.8.2. RePL examination conduct

To pass the aeronautical knowledge component of a RePL training course an applicant must pass the RePL examination. The minimum mark for the examination is 85%.

The specifics of each RePL aeronautical knowledge examination including duration, marking process and permitted documents is detailed on the individual examination cover sheet.

The following applies to all exams:

- **examinations, each comprising one of the unique sets of questions, must be randomly rotated:**

- – **for each RePL training course; and**
- – **for each examination which an applicant is re-sitting.**

- • **the duration of each examination must be 15 minutes, plus 1 minute per question in the exam**
- • **the examination must be supervised by an examiner**
- • **students caught being coached or prompted by any person during the examination will automatically fail and have to re-sit a different exam**
- • **the examination must be a closed-book examination, except for any documents concerning RPAS that are:**

  - – **authored by CASA and published on its website; or**
  - – **authored by AA and published on its website.**

- • **immediately after the examination, the exam must be handled in a way such that no part of the examination can be retained physically or electronically by a student.**

6.9. RePL examination marking & knowledge deficiency report (KDR)

Each RePL aeronautical knowledge examination must be assessed by a RePL examiner.

Within 1 day of completing an aeronautical knowledge examination, the examiner should provide each sitting student with their result in writing and, where appropriate, a KDR (see Annex 5 to Section 6 for KDR form). In circumstances where a result and/or KDR cannot be provided within 1 day, it must be provided in writing within 7 days of completing the exam.

A KDR form is to be provided to all students who achieved a result of less than 100%. The KDR form must inform the student of the items of the aeronautical knowledge units with respect to which the student answered examination questions incorrectly by listing each incorrect answer as a knowledge deficiency. The KDR form cannot reference the exact exam question which was answered incorrectly. Each knowledge deficiency is remedied only if, after an oral examination, the student has satisfied either the examiner or the CRP that the knowledge that was the subject of the KDR has been satisfactorily understood and that this satisfaction has been recorded on the KDR form.

On completion of the KDR process, the examiner must sign the KDR form and make a copy to be added to the student's course record, this record must be kept for a period of seven (7) years.

6.10. RePL examination not yet competent (NYC) policy

A student who achieved less than 85% must not re-sit an examination until all knowledge deficiencies identified in the KDR form are remedied.

If a student does not pass the examination on the first attempt or at a second attempt, they must sit an interview with an examiner who will provide the student a written plan of study for the student to follow before a third attempt. The examiner must state in writing that if the student doesn't pass on the third attempt, they will need to repeat the aeronautical knowledge component of the RePL training course. This plan is to be signed by both the student and the examiner.

If a student does not pass the examination on the third attempt, no further attempts must be made without the student repeating the aeronautical knowledge component of the RePL training course and at least 14 days having passed since the previous attempt.

6.11. RePL examination security

By providing a declaration of compliance to the CRP, each employee agrees to comply with the examination security procedures below.

AUSA employees must ensure that the 4 unique sets of questions for examinations, and each examination question within a set is not disclosed to students of AUSA's RePL training courses outside of the exam conditions defined in the RePL examination conduct section 6.7.2.

When stored physically or digitally, the 4 unique sets of questions for examinations must not be accessible to anyone who hasn't agreed to comply with these examination security procedures.

This policy applies in all cases, except when a request for a copy of the examination or any question is made in writing by CASA.

6.12. RePL examination amendment policy

All aeronautical knowledge examinations are to be reviewed annually.

AUSA may without CASA approval modify up to 10% of the total number of multiple questions in any 12-month period. Any modifications made to the examinations must be kept as a written record for five (5) years, of which questions were modified, date of the modification and why. These records are held in V-TOL's electronic records under the secure AUSA folder "Examinations".

Amendments beyond 10% of the total number of questions in any 12-month period will require the exam to be submitted to CASA for approval prior to using it in an RePL training course.

6.13. Simulator training

AUSA will utilise simulators to achieve lesson objectives which are unable to be practically conducted and assessed due to unsafe flight conditions, variables required not being present, or being deemed not reasonable for reasons related to safety.

6.13.1. Approved simulators

AUSA will use Neuron™ Sim and Real Fly (RF) for RePL training.

Procedures and policy for use of AUSA's simulators can be found within Section 6.12.1.

6.13.2. RPA flying experience

The use of a simulator to gain RPA flying experience does not count towards the required minimum 5 hours required under RPA standard operating conditions as per CASR 101.295(2)(c).

6.14. RePL flight test

6.14.1. RePL flight test conduct

The specifics of each flight test including tested behaviours, marking process, permitted documents and equipment are to be detailed in the individual flight test and its cover sheet. A student must successfully demonstrate his or her understanding of the knowledge requirements and competency in all flight test behaviours in order to have been deemed to have passed the RePL flight test.

Only one student is to be assessed by one examiner at a time.

The RePL Flight tests can be found at Annex ?

6.14.2. Flight test not yet competent (NYC) policy

In the event an applicant (student) fails a flight test, the applicant may re-attempt the complete flight test but only after completing such additional remedial training as is specified in writing by the flight test examiner on the flight test record. The specified additional remedial training must be based on the deficient competencies which resulted in the applicant failing the flight test.

6.15. RePL Training course record keeping

6.15.1. RePL examination record keeping

Each student's aeronautical knowledge examination as completed, must be retained for no less than 12 months.

A Examination Record (see Annex 4) must be completed for each aeronautical knowledge examination conducted and retained as hard copy or stored digitally, with the course record for not less than seven years.

6.15.2. RePL flight test record keeping

Each student's flight test paper must be digitally recorded or stored as a hard copy with their student record for not less than seven years. This includes any records relating to additional training required due to deficiencies that led to a failed flight test.

Annex 1 to Section 6 - RPL training course codes

Table 1-4: RPL training course codes

Aeronautical knowledge standards - Common units	
RBAK	Basic aviation knowledge for RPAS
RACP	Airspace, charts and aeronautical publications for RPAS
RBMO	Basic meteorology for RPAS operations
REES	Electrical and electronic systems for RPAS
RHPF	Human performance for RPAS
RKOP	RPAS knowledge — operations and procedures
RORA	Operational rules and air law for RPAS
RAFM	Automated flight management systems for RPAS — knowledge

Table 6-5: Aeronautical knowledge standards

Aeronautical knowledge standards - Category/type specific units	
RBKA	RPA that is an aeroplane — aircraft knowledge and operation principles
RBKM	RPA that is a multirotor — aeronautical knowledge and operation principles
RBKH	RPA that is a helicopter — aeronautical knowledge and operation principles
RBKP	RPA that is a powered-lift aircraft — aircraft knowledge and operation principles
REFE	RPA with liquid-fuel system — knowledge

Table 6-6: Practical competency standards

Practical competency standards - Common units	
GEL	General English language proficiency
RC1	Perform pre- and post-operation actions and procedures for RPAS
RC2	Energy management for RPAS
RC3	Manage crew, payload and bystanders for RPAS operation
RC4	Navigation and operations of RPAS
RNT	Non-technical skills for operation of RPAS
RAF	Automated flight management systems for RPAS — operation

Table 6-7: Practical competency standards

Practical competency standards - Category/type specific units	
RA1	RPA that is an aeroplane — ground operation and launch
RA2	RPA that is an aeroplane — normal operation
RA3	RPA that is an aeroplane — land and recover
RA4	RPA that is an aeroplane — advanced manoeuvres
RA5	RPA that is an aeroplane — abnormal and emergency operations
RM1	RPA that is a multirotor — control on ground, launch, hover and landing
RM2	RPA that is a multirotor — normal operations
RM3	RPA that is a multirotor — advanced manoeuvres
RM4	RPA that is a multirotor — abnormal situations and emergencies

Table 6-7: Practical competency standards

Annex 2 to Section 6 – Course Syllabus

Lesson Code	Lesson Name	RePL Unit Code	RePL Unit Items
Intro	Introduction	n/a	n/a
RePL Theory Lessons			
TAK 1	Basic Aviation Knowledge 1	RBAK	1-4
TAK 2	Basic Aviation Knowledge 1	RBAK	5
TAK 3	Basic Aviation Knowledge 1	RBAK	6
TAK 4	Basic Aviation Knowledge 1	RBAK	7
TAK 5	Basic Aviation Knowledge 1	RBAK	8-9
TACP 1	Airspace Charts and Publications 1	RACP	1
TACP 2	Airspace Charts and Publications 1	RACP	2-3
TACP 3	Airspace Charts and Publications 1	RACP	4
TMET	Basic Meteorology	RBMO	All items Included
TEES 1	Electrical and Electronic Systems 1	REES	1 2(a)(i)-(v)
TEES 2	Electrical and Electronic Systems 2	REES	2(a)(vi)-(xii), (b), (c), (d) and (e)
TEES 3	Electrical and Electronic Systems 3	REES	3-4
TEES 4	Electrical and Electronic Systems 4	REES	5-6 7(a)
TEES 5	Electrical and Electronic Systems 5	REES	7(b)-(c) 8-9
THPF 1	Human Factors 1	RHPF	1-2
THPF 2	Human Factors 2	RHPF	3-4
THPF 3	Human Factors 3	RHPF	5-6
TOPS 1	Operations and Procedures 1	RKOP	1-2 & 4
TOPS 2	Operations and Procedures 2	RKOP	3
TOPS 3	Operations and Procedures 3	RKOP	5-7
TOPS 4	Operations and Procedures 4	RKOP	8-9
TRAL	Rules and Law	RORA	All items included
TAFM	Automated Flight Management	RAFM	All items included
TFW1	Fixed Wing1	RBKA	1-2
TFW2	Fixed Wing2	RBKA	3-6
TFW3	Fixed Wing3	RBKA	7-9
TMR 1	Multirotor 1	RBKM	1, 3-4
TMR 2	Multirotor 2	RBKM	2, 5-6
TMR 3	Multirotor 3	RBKM	7-10
Practical Lessons			
ELP	English Proficiency	GEL	All items included
PFWS1	Fixed WingSim 1	RA1-2	All items included
		RA3	1(a)-(d)
PFWS 2	Fixed WingSim 2	RA1-3	All items included
		RA4	2
PFWS 3	Fixed WingSim 3	RC1	1-2, 3(a)-(d), 5(b)-(d)
		RC4	1(b), 2(a)-(b), 3-6
		RC2	1-2
		RNT	8
		RA1	All items included
		RA3	1(a)-(d)
		RAF	1-2

PFWS 4	Fixed WingSim 4	RA1	All items included
		RA4	1, 3-4
		RA5	All items included
		RAF	All items included
PFW 5	Fixed Wing Flying	RC2	3
		RNT	1-2
		RA1-2	All items included
		RA3	1(a)-(d)
PFW 6	Fixed Wing Flying	RC3	3
		RNT	1-3
		RA1-3	All items included
		RA4	2
PFW 7	Fixed Wing Flying	RC1	All items included
		RC2	1-2
		RC3	1-2
		RC4	1(b), 2(a)-(b), 3-6
		RNT	1-5
		RA1	All items included
		RA3	1(a)-(d)
		RAF	1-2
PFW 8	Fixed Wing Flying	RC4	2(c)-(d)
		RNT	1-7
		RA1	All items included
		RA4	1, 3-4
		RA5	All items included
		RAF	All items included
PFW 9	Fixed Wing Flying - Revision	-	No items included
PFW 10	Fixed Wing Flying – RePL Flight Test	-	No items included
PMRS1	Multirotor Sim 1	RM1	1-2, 3(a)-(d), (f)
		RM2	All items included
		RM3	2
		RM4	2
PMRS 2	Multirotor Sim 2	RM1	3(e)
		RM3	1-2
		RM4	1, 3-4
PMRS 3	Multirotor Sim 3	RC1	1-2, 3(a)-(d), 5(b)-(d)
		RC4	1(b), 2(a)-(b), 3-6
		RC2	1-2
		RNT	8
		RAF	1-2
PMRS 4	Multirotor Sim 4	RM1	3(e)
		RM3	1-2
		RM4	1, 3-4
		RAF	All items included

PMR 5	Multirotor Flying	RM1	1-2, 3(a)-(d), (f)
		RM2	All items included
		RM3	2
		RM4	2
PMR 6	Multirotor Flying	RM1	3(e)
		RM3	All items included
		RM4	1, 3-4
PMR 7	Multirotor Flying	RC1	1-2, 3(a)-(d), 5(b)-(d)
		RC4	1(b), 2(a)-(b), 3-6
		RC2	1-2
		RNT	8
		RAF	1-2
PMR 8	Multirotor Flying	RM1	3(e)
		RM3	All items included
		RM4	1, 3-4
		RAF	All items included
PMR 9	Multirotor Flying - Revision	-	No items included
PMR 10	Multirotor Flying - RePL Flight test	-	No items included

Annex 3 to Section 6 – AUSA Course Curriculum

Initial Multirotor RePL Course

The AUSA Initial Multirotor RePL Course will be conducted over 5 days and include an Aeronautical Knowledge Exam in accordance with Section 6.8 and a Practical Flight Test in accordance with Annex 4 to Section 6. The course will include a minimum of 5 hours flight time (simulator and practical, with no more than 50% simulator). The course will include the following lessons from the syllabus at Annex 2: Intro

- Intro
- ELP
- TAK 1-5
- TACP 1-3
- TMET
- TEES 1-5
- THPF 1-3
- TOPS 1-4
- TRAL
- TAFM
- TMR 1-3
- PMRS 1-4
- PMR 5-10

Upgrade Multirotor RePL Course

Holders of an RePL upgrading to include a Multirotor on their licence must complete the following lessons from the syllabus at Annex 2:
- PMR 5
- PMR 6
- PMR 10

In addition, if the applicant doesn't hold a RePL rating in the Multirotor category, the following is also required:
- TMR 1
- TMR 2
- TMR 3

Remove a Weight Limitation from a Small Multirotor Licence

Initial Fixed Wing RePL Course

The AUSA Initial Fixed wing RePL Course will be conducted over 5 days and include an Aeronautical Knowledge Exam in accordance with Section 6.8 and a Practical Flight Test in accordance with Annex 4 to Section 6. The course will include a minimum of 5 hours flight time (simulator and practical, with no more than 50% simulator). The course will include the following lessons from the syllabus at Annex 2: Intro

- Intro
- ELP

- TAK 1-5
- TACP 1-3
- TMET
- TEES 1-5
- THPF 1-3
- TOPS 1-4
- TRAL
- TAFM
- PFWS 1-3
- PFW 5-10

Upgrade Fixed Wing RePL Course

Holders of an RePL upgrading to include a Fixed Wing on their licence must complete the following lessons from the syllabus at Annex 2:
- PFW 6
- PFW 7
- PFW 8
- PFW 10

In addition, if the applicant doesn't hold a RePL rating in the Fixed Wing category, the following is also required:
- TFW 1
- TFW 2
- TFW 3

Annex 4 to Section 6 – Examination Record

Table 6-3: Example of Examination

Course ID	Exam ID	Examiner	Exam Date

Applicant's name	Applicant's ARN	Attempt No.	Result	KDRs completed

REMOTE PLOT LICENCE
EXAMINATION

Generated on:- 4\11\2020

Examination Duration	90 Minutes
Pass Mark	85%

Course _____

Candidates Name (Please Print) _____ ARN_____

Candidates Signature _____ Date_____

Knowledge Deficiency Report	

Total Marks Available	Required Pass Mark	Marks Obtained	% Obtained
98	83		

AUSTRALIAN UNMANNED SYSTEMS ACADEMY

Academy Student Flying Progress Record

Level 1 Day VMC (VLoS)

Student Name:_____   **ARN:** _____   **Course:**_____

How to Complete this Flying Progress Record

NOTE:- This record is to be retained by the training organization
as an enduring record of student progress and achievement.

Operational Premise:-

- All flights are conducted by a two man crew, comprising the Pilot in Command, and the Co-Pilot.
- To successfully complete the training program ALL aspects of the training program must be completed to competency level 2
- For Training Flights 1 and 2 the flight time is attributed solely to the Student Co-Pilot (SCO). No flight time is attributed to the Student Pilot in Command (SPIC).
- For flights 3 through 8 flight time accrued by each Pilot equates to their respective time as Pilot flying.
- As the training program is a progressive program Pilots should not proceed to the next training flight until they have satisfactorily completed the current training flight.
- Log Books and Training Records are to be completed immediately following the conclusion of each training flight.

Time Determination:-

When determining flight time the following is to be observed:-

- Flight time is allocated in 6 minute intervals, in the following manner:-

0 to 6 min =	0.1hr	30 to 36 min =	0.6hr
6 to 12 min =	0.2hr	36 to 42 min =	0.7hr
12 to 18 min =	0.3hr	42 to 48 min =	0.8hr
18 to 24 min =	0.4hr	48 to 54 min =	0.9hr
24 to 30 min =	0.5hr	54 to 60 min =	1.0hr

Training Program Required Flight Time - Simulator Time Vs. Flight Time

Each student Pilot must accrue a minimum of FIVE hours of flight time, of which NO MORE THAN 50% flight time can be accrued on the Flight Simulators. Recognition of previous experience for both Simulator and Manual Flight is discretionary and will be subject to a competency test.

Competency Levels:-

The following competency levels will apply during flight training:-

Student Competency Coding:
5. Requires Further Instruction
4. Requires Further Practice
3. Standard Required for Unassisted Flight
2. Standard Required for Pilot Certificate
1. Standard Required for Instructor

Student Name ....

Date of Birth ..../...................../.................. Sex | M | F |

Contact Mobile No. ....

Address ....

....

....

City:... Post Code:..................

No.	Milestone	✓	Checked	Date	Signature
1	Association Membership (if a member of an aviation based org) copy on file			/ /	
2	Waiver Signed copy on file			/ /	
3	Valid Car Drivers Licence and Expiry Date or Medical Certificate Validated copy on file			/ /	
4	PPL, CPL, RA Aus Details or similar copy on file			/ /	
5	Existing Log Book Details (if applicable) copy on file			/ /	
6	Aviation Knowledge Exam passed		%	/ /	
7	Radio Exam Passed		%	/ /	
8	Air Legislation Exam Passed		%	/ /	
9	RPA Flight Evaluation Test Passed			/ /	
10	RPA Student Log Book Checked			/ /	
11	RPA OEM Certificate Issued (V-TOL)			/ /	
12	UAV Controller Certificate Issued (CASA)			/ /	
13	Endorsement Multirotor:-			/ /	
14	Endorsement (UAV/UAS Type):-				
15	Endorsement (UAV/UAS Type):-				

SIMULATOR TRAINING   **All Training Flights**

Lesson Code	SF	SF	SF	SF	EC	CD	TN	S&L	A&L	GCS	TR	LR	LR	SF	WP	WP	SF	FS	PI	PI	AOI	AOI	FS	GF	GF	FL
Date / Instructor / R/N	Real Flight or Neuron	Takeoff	Entering Straight & Level flight	Co-ordinated Turns	Manual landings	Effects of Controls	Climbing & Descending	Turning	Straight & Level Flight	Approach & Landing	Ground Control Station	Take-off Rally Position	Landing Rally Position	Land Point position	Simulated Flight	Placement of Waypoints	Types of Waypoint	Simulated Mission	Fail-Safe Implementation	Point of Interest as (Lat/Long)	Point of interest - aerial image	Fence line.	Imaging point of interest	Implementation of Fail-Safes	GeoFence - Inclusion	GeoFence- Exclusion	Forced Landings

Student Competency Coding: **5** Requires Further Instruction   **4** Requires Further Practice   **3** Standard Required for Solo Flight

SIMULATOR TRAINING

DI	TO	WP	MI	TO		MI
Planning Complete Mission	Ability to Follow Checklists	Appropriate use of Waypoints	Ability to Follow Intended Flight Path	Selection and Use of Flight Modes		Mission Viability

SIM Hours
Brought Forward
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs
Hrs

Total this page : Hrs

2	Standard Required for Pilot Certificate	1	Standard Required for Instructor

Instructor/CFI Signature: .... Date: /   /   Student Signature .... Date: /   /

FLIGHT TRAINING – PILOT (Fixed Wing)   Training Flight Competencies

Lesson Code	GCS (G) or Co-Pilot (C)	Pre-Flight	Stabilised Launch	Climbing & Descending	Straight & Level Flight	Turning	Circuits	Forced Landings/ Motor Failure	Stabilised Landing	Handover - Takeover	Environmental Conditions	Checks at Take-Off Rally	Checks at Landing Rally	Post-Flight Checklist	Auto Landing	Positioning Take-Off Rally	Positioning Landing Rally	Use and Placement of Waypoints	Mission Viability	GCS Operations	Inspection of Point of Interest	Inspection of Area of Interest	Geofence – Inclusion & Exclusion	Low Battery Demonstrated	Loss of Communications Demonstrated
		DI	TO	CD	S&L	TN	CT	FL	A&L	TO	DI	TR	LR	PF	A&L	TR	LR	WP	MI	GCS	PI	AOI	GF	FS	FS
Competency applies to:- G = Pilot (GCS) C = Co-Pilot (Field) B = Both G & C		B	C	C	C	C	C	C	C	B	B	B	B	B	B	G	G	G	B	G	G	G	G	G	G
Date — Instructor																									

Student Competency Coding: | 5 | Requires Further Instruction | 4 | Requires Further Practice | 3 | Standard Required for Solo Flight

FLIGHT TRAINING – PILOT (Fixed Wing)

GCS																							CF
B	B	B	B	B	B	B	B	B	B	B	B	B	B	G	B	B	B						B
Voice Commands/Comply with Regulations	Adapt to differences in Equipment and environment	Communicating Effectively/Communication	Control/Eliminate Hazards	Follow Instructions, prioritise and Monitor Work	Apply Aviation Leg &Workplace Procedures	Report/Rectify Identified Equipment Problems	Work collaboratively, Systematically and Safely	Confirm Eqpt Serviceable / Basic Faultfinding	WHS/OHS Procedures & Precautions	Read/Interpret/Follow Instructions	Recognise and Respond to Adverse Aircraft State	Responding to Cultural/Personal	Management of Fatigue and personal Situation	Use and Interpretation of Instrument Data	Maintain Compliance with SOP's and Regulations	Monitor Aircraft Endurance	Source, Interpret and Apply Weather Information					Complete Documentation	Check Flight

Flight Hours

Previous Experience (Discretionary)

SPIC	SCO	Total

Total this page :

2	Standard Required for Pilot Certificate	1	Standard Required for Instructor

Instructor/CFI Signature: _____ Date: / / Student Signature _____ Date: / /

Lesson Code	GCS (G) or Co-Pilot (C)	DI	TO	TO	A&L	MC	MCY	MCC	CIR	F8	OR	ED	FS	A&L	A&L	WP	PI	AOI	WP	PF	DI	CF			
Competency applies to:- G = Pilot (GCS) C = Co-Pilot (Field) B = Both G & C		B	B	C	G	C	C	C	C	C	C	C	C	C	G	G	B	B	G	B	B	B			
		Pre-Flight Checklist	Checks at Take-Off	Stabilised Launch	Auto Take-Off	Circuits Constant Direction	Circuits Yaw	Circuits coordinated	Circles	Figure 8	Orientation Recovery	Emergency Descent	RTL Demonstrated	Stabilized Landing	Auto Landing	Use and Placement of Waypoints	Positioning over Point of Interest	Positioning over Area of Interest	Mission Viability	Post-Flight Checklist	Understand Environmental Conditions	Check Flight			
Date / **Instructor**																										

Student Competency Coding:　　　| 5 | Requires Further Instruction　　　| 4 | Requires Further Practice　　　| 3 | Standard Required for Solo Flight

FLIGHT TRAINING – PILOT (Multirotor)

																											CF
																											B

Flight Hours		
Previous Experience (Discretionary)		
SPIC	SCO	Total

Total this page:

2	Standard Required for Pilot Certificate

1	Standard Required for Instructor

Instructor/CFI Signature: .... Date: /   /   Student Signature .... Date: /   /

Date	Comments	Instructor Signature	Student Signature

Qualification	Date	Solo Standard		Cert. Standard	
		Inst. Sign	Stud. Sign	Inst. Sign	Stud. Sign
UAV Controller Certificate (CASA Exemption EX58/13)					

DI Pre Flight/Daily Inspection
Pre-Flight Inspection.
Understand and meet the obligations with regard to all inspections.
Identify and correctly use equipment required for pre- and post-flight actions.
Refuel/battery check procedures.
Accessing/completing documentation using infotechnology devices.
Correct RPAS configuration selected.
Correct mode selected.

SF Simulated Flight
Simulated flight – take-off.
Simulated flight – climbing & descending.
Simulated flight – turning.
Simulated flight – straight & level.
Simulated flight –powered landings.
Simulated flight – non-powered landings.

TO Take Offs
Pre take-off check list.
Identify obstructions/hazards that may hinder a safe launch.
Prepare aircraft for auto/hand/catapult launch.
Safety - persons and equipment during launch.
Physical hand launch of aircraft.
Stabilized flight during take-off (Fixed Wing).
Apply launch procedures in flight manual.
Handover of aircraft once launched.
Lookout and situational awareness including traffic management.

TR Take-off Rally
Selection of take-off rally location.
Selection of take-off rally radius.
Selection of take-off rally height.
Confirm of aircraft performance prior to mission.
Communications with flight crew.

LR Landing Rally & Landing Point
Selection of landing rally location.
Selection of landing rally radius.
Selection of landing rally height.
Selection of landing rally breakout height.
Selection of landing rally relative to rally point.
Selection of clockwise/anticlockwise flight in landing rally.
Confirmation of landing site safety.
Communications with flight crew.

RY Recovery of RPAS
Demonstrate sound judgment during recovery procedure.
Identify and correctly use equipment required for recovery of RPAS.
Recovery procedures carried out in accordance with operations manual.

EC Operation and Effects of Controls
Lookout and handover technique.
Primary effect of controls – aileron, rudder and elevators.
Secondary effect of controls.
Aileron/rudder co-ordination.
Use of manual control system.

Use of power setting.
Effect of airspeed on ability to follow flight path.
Effect of wind on ability to follow flight path

CD Climbing and Descending

Lookout and situational awareness.
Climb:- **Power + Attitude + Trim** = Performance.
Recovery to S&L:- **Attitude + Power + Trim** = Cruise Speed.
Climb types:- Maximum Rate; Maximum Angle; Normal.
Descent:- **Power + Attitude + Trim** = rate.
Power Controls Descent Rate/Attitude Controls Descent Speed.
Descent Types:- Cruise; Glide; Powered and Approached.
Recovery to S&L:- **Power + Attitude + Trim** = Cruise Speed.

TN Turning

Lookout/Situational Awareness.
Attitude & Bank Angle.
Coordinated turn – Aileron; Rudder; Elevator.
Steep Turns.
Side Slips.
Instrument Indications.

S&L Straight & Level

Lookout & Situational Awareness.
Level Flight:- **Power + Attitude** = Performance.
Recovery to S&L:- **Attitude + Power + Trim** = Cruise Speed.
Maintenance of S&L with Aileron/Rudder/Elevator inputs.
Normal Cruise.

Instrument Indications.
Potential for power/lift/drag imbalances (high power / high nose).
Directional control.

A&L Approach & Landing

Lookout & situational awareness.
Glide approach.
Powered approach.
Aiming point – elevator for speed, throttle for Descent Rate.
Stabilized landings.
Position hold or go around procedure.
Autonomous landings.

FL Forced Landings

Situational Awareness.
Landing Area.
Positioning of UAS for Approach.
Techniques for height loss and positioning.
Short Field Landing technique.
Fault Finding Procedures.
Radio Call and Frequency for use.
Best Glide Speed.
Emergency Landing Checks.

WP Waypoints

Legality of waypoint placement.
Appropriate placement of waypoints to achieve mission.
Selection of waypoint height.
Successfully navigate between waypoints.
Selection of waypoint type.
Understanding waypoint options.
Mission calculations.

GCS Ground Control Station

Lookout/situational awareness.
GCS connection and activation.
GCS launch and landing setup techniques.
Mission planning & waypoints.
AGL & AMSL heights and relevance.
GCS variables and settings.
Emergency procedures.
Communications and responsibilities of ground staff.
Landing sequence.

GF Geofence

Practical positioning of geofence.
Appropriate action on breach of geofence.
Return location appropriately chosen.
Floor and ceiling heights chosen and implemented.
Appropriate activation and deactivation of geofence.

PI Point of Interest Inspection

Navigating to point of interest.
Appropriate use of altitude.
Appropriate use of loiter or fly-by.
Resuming mission after inspection.
Interaction/communications with crew/observer.
Quality of data/images obtained.

AOI Area of Interest Inspection

Navigating to area of interest.
Programming appropriate flight path for area inspection.
Appropriate choice of airspeed.

Appropriate choice of height.
Quality of data/images obtained.

FS Fail Safe Implementation
Low battery condition.
Breach of geofence condition.
Loss of communications with aircraft condition.
Recognise and respond to actual and potential RPAS threats and errors.
Implementing contingency plans including security and backup procedures.

SS Site Selection
Legal viability of site.
Practical viability of site.
Available resources.
Wind and weather.
Privacy issues.
Site security.
Site safety.
Possibility of natural disaster.

MI Mission Planning
Obtaining and clarifying information.
Access and apply relevant regulations, orders and information for planning, pre- and post-flight administrative functions.
Completeness of mission plan.
Risk Assessment and management plan.
Obtaining and utilising weather & environmental conditions.
Interact with data from flight planning systems.
Conduct maintenance and flight briefings.

Interpret & follow operational instructions & prioritise work.
Monitor RPAS endurance.
Viability of waypoints chosen.
Ability to follow mission plan.
Aircraft maintenance release.
Apply precautions & actions to minimise, control or eliminate identified hazards.
Achieve stated mission outcomes.

PF Post Flight
Follow appropriate aircraft checklist.
Battery handling/recharge/storage.
Airframe inspection/handling/storage.
Paperwork and admin procedures.
Maintenance forms and requirements.
Reporting/rectifying problems promptly.

CF Check Flight
Planning mission.
CRM & communications.
Mission implementation (GCS).
Management of mission.
Interpretation of data presented on GCS.
Mission effectiveness and viability.

MC Multirotor Circuits (no yaw)
Fly predetermined circuit (Aircraft not yawed).
Ability to change flight direction at set point.

MCY Multirotor Circuits (yaw)
Fly predetermined circuit (Aircraft yawed at turns).
Ability to change flight direction at set point.

MCC Coordinated Multirotor Circuits
Fly predetermined circuit (Coordinated turns).
Control of height.
Control of speed.
Compensate for wind.

CIR Circles
Fly clockwise and anticlockwise circles.
Orientation fixed direction.
Heading orientation (control of yaw).
Compensate for wind.
Maintain height.

F8 Figure 8 Circuits
Fly inwards and outwards Figure 8 circuits.
Maintain height.
Maintain orientation (control of yaw).

OR Orientation Recovery
Recover orientation of aircraft – Intentional move.
Recover orientation of aircraft – RTL.

ED Emergency Descent
Emergency descent of aircraft – straight line.
Emergency Descent of aircraft – spiral.
Recovery from descent – resume flight.
Recovery from descent – Land.

RO Operate Aeronautical Radio
Confirm serviceability.
Apply BASIC faultfinding.
Adapt to environmental conditions.

Operate electronic communications equipment to required protocol and standard.
Apply legislation.
Comply with regulatory requirements.
Apply workplace procedures.
Communicate effectively.
Use of aviation language.
Selection and use of appropriate PPE.
Interpret and follow instructions.

NF Normal Flight
Operate the RPAS within its limitations.
Read, interpret and follow relevant regulations, instructions, procedures, information and signs and prioritise work.
Transfer RPAS control between crew members as required.
Maintain separation between air traffic.
Identify and correctly using relevant equipment.
Identify and correctly use relevant equipment.
Interpret remote pilot aircraft systems (RPAS) displays.
Perform systematic scan for monitoring RPAS, sub-systems (equipment) and devices.
Read, interpret and follow relevant regulations, instructions, procedures, information and signs.
Use automated systems to manage workload.
Apply relevant remote pilot aircraft systems (RPAS) aeronautical knowledge.

Comply with flight authorisations.
Comply with air traffic instructions and regulatory requirements.
Perform required functions simultaneously as required.
Interpret wind speed and direction.
Select and use appropriate instruments, displays, communications equipment and aids.
Monitor and anticipate operational problems and hazards and plan/take appropriate action.

AF Abnormal Flight
Undertake basic fault finding during RPAS flight.
Monitor and anticipate operational problems and hazards and take appropriate action.
Apply precautions and any required actions to minimise, control or eliminate identified hazards.
Compensate for the secondary or adverse effects of controls.
Ensure compliance with relevant emergency procedures and regulatory requirements.
Identify symptoms of incipient and developed stalls.
Recognise situations that may require a precautionary recovery.

HF Human Factors
Adapt to differences in environment.
Set priorities and manage workload.
Work safely & collaboratively with others.
Communicate effectively with others.

Recognise & respond to RPAS threats and errors.
Apply effective listening techniques.
Manage & control stress before and during RPAS operations.
Manage aspects of lifestyle that may impact on personal performance.
Managing/monitor own physical performance.
Identify symptoms of deterioration in own physiological condition and take appropriate corrective action.
Interpret and follow operational instructions and prioritise work. Monitor work activities in terms of planned schedule.
Maintain compliance with regulatory requirements before and when conducting RPAS operations
Monitor work activities in terms of planned schedule.
Set priorities and manage workload.

AIR Airmanship
Adapt to differences in software and equipment in accordance with standard operating procedures.
Apply relevant air safety practices and regulations.
Identify and rectify undesired RPAS states.
Monitor and anticipate operational problems and hazards and take appropriate action..
Read, interpret and follow instructions, regulations, procedures, information and signs.

Respond appropriately to cultural differences in the workplace.
Report/rectify problems, faults or malfunctions promptly.

WHS Workplace Health and Safety
Implementing work health and safety (WHS)/occupational health and safety (OHS) procedures and relevant regulations.
Applying relevant legislation and workplace procedures.
Implement and ongoing review aviation risk management processes in RPAS contexts.
Apply precautions and required actions to minimise, control or eliminate identified hazards.
Modify activities depending on operational contingencies, risk situations and environments.
Select and use required/appropriate personal protective equipment conforming to industry and WHS/OHS standards.
Apply aviation safety management system policies and procedures for remote pilot aircraft systems (RPAS) operations.
Work systematically with required attention to detail without injury to self or others, or damage to goods or equipment.

NAV Navigation
Interpret and reacting appropriately to light signals from air traffic control.
Remain within a designated area while complying with airspace and air traffic requirements.

Perform navigational functions within the parameters of applicable regulations, orders and operations manual procedures.

TXY Taxi Aircraft (Where appropriate)
Maneuver RPAS on the ground without incident
Use instruments to monitor aircraft taxi performance.
Control and manage RPAS taxi emergencies.
Control remote pilot aircraft systems (RPAS) on the ground in accordance with aircraft flight manual (AFM)/pilot's operating handbook (POH).
Perform various on-ground functions simultaneously as required.

BAT Batteries
Calculate energy source requirements, consumption and endurance.
Identify applicable grade of fuel/fuel cell/battery type for remote pilot aircraft system (RPAS) type.
Implement safety precautions during RPA refueling/battery change/recharging.
Manage operation of RPAS energy source systems.
Monitor energy source usage to achieve desired profile, range or endurance following configuration changes.
Perform energy source quality control checks.
Plan RPAS energy source requirements.

Recognise deteriorating situations impacting on energy source requirements.

APPENDIX 1 - Copy of RPA Operator's Certificate

Australian Government
Civil Aviation Safety Authority

RPA OPERATOR'S CERTIFICATE
(ReOC)

Number CASA.ReOC.0074 Revision No: 1

This certificate is granted pursuant to regulation 101.335 of the
Civil Aviation Safety Regulations 1998 (CASR) to:

## V-TOL AEROSPACE PTY LIMITED

ARN: 750709 ACN: 099 238 016

The holder of this certificate is certified as a Remotely Piloted Aircraft (RPA) operator and is authorised to operate the RPA described in the attached schedules subject to any limitations and conditions in those schedules.

This certificate is effective from 20 March 2019 and will expire on 31 March 2022.

Dan Buric
Section Manager Permissions Issue
Client Services Centre
Stakeholder Engagement

Delegate of the Civil Aviation Safety Authority

20   March 2019

safe skies for all

CAS401 Printed 10/2009
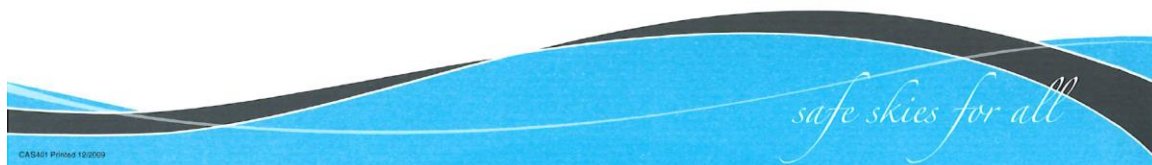
SCHEDULE 1

AUTHORISED RPA

The certificate holder is authorised to conduct operations of the RPA specified in this Schedule in the territories indicated.

RPA Category	Size	In Aust.	Into & Out of Aust.	RPA Type	RPAS Aerial Work	RePL Training
Aeroplane	Up to 25kgs Restricted*	✓	✕		✓	Theory & Operation
Multi-rotor	Up to 25kgs Restricted*	✓	✕		✓	Theory & Operation

** The Operator is limited to the operation of RPA up to 7kgs **only** for the RPA category indicated as 'Restricted*'.*

SCHEDULE 2

PART 1 - GENERAL CONDITIONS

The operator must comply with the following conditions:

1. The number and type of each RPA operated under this RPA Operator's Certificate (ReOC) must be identified in, and operated in accordance with, Schedule 1 of the holder's Operations Manual.

2. The nominated personnel accepted under this ReOC must be identified in accordance with Schedule 1 of the holder's Operations Manual.

3. The authorised RPA operated under this ReOC must not be flown at any altitude within 3 nautical miles of a controlled Aerodrome listed in En Route Supplement Australia (ERSA) or as designated by Airservices Australia, unless the Certificate holder obtains the written permission of CASA for that operation.

    (Note: This permission is in addition to any permission which the operator may need to obtain under sub regulation 101.075 of the Civil Aviation Safety Regulations 1998).

PART 2 - CONDITIONS RELATING TO RePL TRAINING

Reserved

APPENDIX 2 - Permissions, Exemptions and Approvals

Australian Government

Civil Aviation Safety Authority

- Instrument number CASA 01/17

I, SHANE PATRICK CARMODY, Acting Director of Aviation Safety, on behalf of CASA, make this instrument under regulations 11.056 and 101.029 and subregulation 101.095 (1A) of the *Civil Aviation Safety Regulations 1998*.

[Signed S. Carmody]
Shane Carmody
Acting Director of Aviation Safety

22 February 2017

Approval — operation of RPA at night

1   Commencement

This instrument commences on the day of registration.

2   Repeal

Instrument CASA 103/16 with unique identifier F2016N00022 is repealed.

3   Application

This instrument applies to the operation of an RPA, other than a large RPA, by a person who holds a certificate as an RPA operator (the *operator*).

4   Definitions

In this instrument:

authorised remote pilot means the operator's chief remote pilot, or a person authorised by the operator's chief remote pilot to operate the RPA in accordance with clauses 8 and 9 of Schedule 1.

RPAS Sample Operations Manual means the RPAS Sample Operations Manual published by CASA as existing at the time when his instrument commences.

Note   At the time when this instrument commences, the RPAS Sample Operations Manual published by CASA, with Revision Date 06 Feb 17, can be found at: https://www.casa.gov.au/files/sampleoperationsmanualdocx.

5   Approval

(1)   The operator is approved to operate the RPA at night.

(2)   An authorised remote pilot is approved to operate the RPA at night.

6   Conditions

(1)   The approval in subsection 5 (1) is subject to the conditions mentioned in Schedules 1 and 2.

(2)   The approval in subsection 5 (2) is subject to the conditions mentioned in Schedule 2.

Schedule 1   Conditions — operator

1   The operator must have documented practices and procedures, that are approved in writing by CASA or by a Manager or Team Leader of CASA with responsibility for regulatory oversight of RPA operations, for training and testing of individuals in relation to operating RPA at night.

Note At the date of this instrument, the Manager and Team Leader of CASA with responsibility for regulatory oversight of RPA operations are the National Assurance Manager and the RPAS Team Leader in Safety Assurance Branch, Aviation Group.

2   For clause 1, the practices and procedures mentioned in the RPAS Sample Operations Manual for training and testing of individuals in relation to operating RPA at night are taken to be approved by CASA.

Note Practices and procedures for training and testing of individuals in relation to operating RPA at night include those in Part C, Section 3.5.1 (Remote Pilot Training for Specialised Operations) of the RPAS Sample Operations Manual and Appendix 8 (Night VLOS Training Syllabus) of the RPAS Operational Procedures (Library), which is Appendix 4 of the RPAS Sample Operations Manual.

3   The operator must have documented practices and procedures, that are approved in writing by CASA or by a Manager or Team Leader of CASA with responsibility for regulatory oversight of RPA operations, for:

(a)   making records detailing the training and testing undertaken by authorised remote pilots; and

(b)   retention of those records.

4   For clause 3, the practices and procedures mentioned in the RPAS Sample Operations Manual for making and retention of records detailing the training and testing undertaken by personnel involved in RPA operations are taken to be approved by CASA.

Note Practices and procedures for making and retention of training and testing records include those in Section 3.2 (Record Keeping) of the RPAS Sample Operations Manual.

5   The operator must have documented practices and procedures, that are approved in writing by CASA or by a Manager or Team Leader of CASA with responsibility for regulatory oversight of RPA operations, for risk assessment and mitigation processes for operation of RPA at night.

6   For clause 5, the practices and procedures for risk assessment and mitigation mentioned in the RPAS Sample Operations Manual are taken to be approved by CASA.

Note Practices and procedures for risk assessment and mitigation include those in Section 4.2 (Feasibility Check and Job Safety Assessment (JSA)) and Appendix 3 (Risk Assessment) of the RPAS Sample Operations Manual.

7   A copy of this instrument must be included in the operator's documented practices and procedures.

Note For operators using the RPAS Sample Operations Manual, a copy of this instrument and a copy of any other written correspondence with CASA which indicates that the operator is approved to operate under this instrument should be included in Appendix 2 (Permissions, Exemptions and Approvals).

8   The operator must ensure that the RPA is operated by only:

(a)   the operator's chief remote pilot; or

(b)   a person authorised by the operator's chief remote pilot.

9   Before authorising a person to operate the RPA, the operator's chief remote pilot must be satisfied that the person:

(a)   holds a remote pilot licence that authorises the person to operate the RPA; and

(b)   has the knowledge and practical abilities to operate the RPA; and

(c)   has been approved by the operator to operate the RPA in accordance with the operator's documented practices and procedures and this instrument; and

(d)   either:

1.   (i)has received appropriate training and testing in relation to the operation of the RPA at night; or

2.   (ii)will only operate the RPA while receiving training or taking a test in operating RPA at night.

10   Before any operation under this approval, the operator must ensure that a risk assessment is carried out by the operator's chief remote pilot in accordance with the documented practices and procedures mentioned in clause 5.

Schedule 2   Conditions — operator and authorised remote pilot

1   The operator and an authorised remote pilot must comply with a request from CASA for CASA to test the pilot on the pilot's knowledge and practical abilities to operate the RPA in accordance with this instrument.

2   The operator and the authorised remote pilot must ensure that the launch and landing and recovery areas are illuminated so that the position of the RPA can be established and maintained by the authorised remote pilot by visual reference.

Note For example, the areas may be illuminated by portable lighting or airfield lighting.

3   The operator and the authorised remote pilot must ensure that the RPA is fitted with all of the following:

(a)   serviceable equipment for a GPS hold and return to home function;

(b)   serviceable equipment for a GPS lock with a minimum of 7 GPS satellites.

4   The operator and the authorised remote pilot must ensure that the RPA displays orientation lighting when the RPA is in flight.

Note For example, the orientation lighting may consist of LED lights on the front and rear arms of a multi-rotor RPA.

5   The operator and the authorised remote pilot must ensure that ground station software is used to enable the authorised remote pilot to assess the RPA's position.

6   The operator and the authorised remote pilot must not operate the RPA outdoors:

(a)   in rain; or

(b)   if thunderstorms are observed or reported within 5 kilometres of the location of the proposed operation.

APPENDIX 3 - Risk Assessment

Overview

Risk assessment is an essential part of the risk management strategy and is used to determine what risks will be tolerated, mitigated (controlled), or in some cases, avoided. The process is initiated when:

- an assumption made about risk in the Job Safety Assessment (JSA) is no longer valid
- the JSA identifies a new risk, or
- a new operation is undertaken which requires a permission, approval or exemption from CASA or other State or Federal authorities.

Figure 1 below details the safety risk management process that includes the following key areas:

- communication and consultation
- establishing the context
- risk assessment
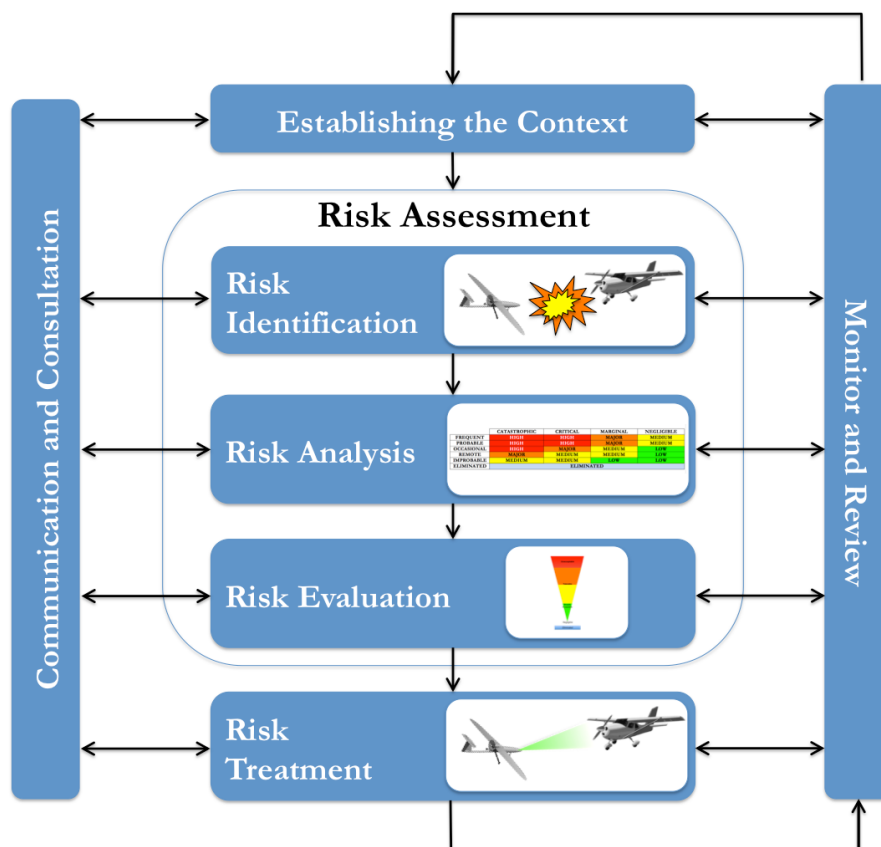- risk treatment
- monitoring and review.

Figure 1 - The safety risk management process (Clothier, 2013)

Communication and Consultation:

Where possible, any person affected by a risk should be identified and consulted with at each stage of the risk management process. The consultation process requires the sharing of information and should provide the genuine opportunity for all people affected by the risk to be part of the decision-making process.

Clear, open and transparent consultation is a key element in successful risk management practices.

Establishing the context:

In addition to communication and consultation, the context of a risk should be established in terms of its compliance with legislative standards and operational/organisational environment. The following steps should be undertaken to establish the context:

1. **Topic Objectives –** Clearly articulate the specific objectives of the RPAS activity that will be undertaken, including locations, proposed time of operations, etc.
2. **External Environment –** identify and consider what additional matters may need to be considered. This may include the identity of key stakeholders, legal/regulatory requirements from other State or Federal authorities, technical matters relevant to the risk, other activities or sensitivities that may impact on the risk, etc.
3. **Internal Environment –** identify and consider if there are any special internal requirements that need to be considered, including staff training, human factors, reliability and suitability of equipment etc.
4. **Stakeholders –** all stakeholders that may be impacted on the risk need to be identified. This may include the client, other airspace users, members of the public, public interest groups, owners and occupiers of buildings, and Local, State or Federal authorities etc.

Risk Assessment - Risk Identification:

Risks need to be identified in terms of what, why and how things occur so further analysis of the risk can be undertaken. This step should identify any risks arising from the operating environment and generate a comprehensive list of risks that could impact on those objectives.

For some activities, especially safety related activities; hazard identification is the first step when identifying risks. A 'hazard' can be a situation that poses a level of threat to life, health, property or the environment; or a form of potentially damaging energy.

Risks can be identified using the following tools:

*   audits or physical inspections
*   accident / incident reports
*   brainstorming
*   decision trees
*   history
*   interview / focus groups
*   personal or organisational experience
*   scenario analysis
*   strengths, weaknesses, opportunities and threats (SWOT) analysis
*   survey or questionnaires.

Some questions to ask when identifying risks:

*   when, where, why, and how are the risks likely to occur?
*   what is the source of each risk?
*   who is likely to be affected by the risk?

Identified risks will be documented on the Risk Control Worksheet detailed in Table 4 below.

Risk Assessment - Risk Analysis:

The objective of this step is to separate the broadly acceptable risks from those risks requiring subsequent treatment. For each identified risk the existing controls need to be analysed in terms of consequence and likelihood in the context of those controls.
A control is defined as a measure that modifies a risk i.e. reducing the consequence and / or likelihood. Controls include any policy, process, practice, device, people, or other actions which modify risk. The method of analysis to be applied will depend on the particular application, the availability of reliable data and the decision-making needs of the activity. Details on risk analysis techniques can be found in *ISO31010:2009 Risk management – Risk assessment techniques*. As appropriate, these techniques may involve the qualitative or quantitative assessment of risk.
The risk assessment matrix is an example of a qualitative tool used to assess consequence and likelihood.   Consequence (Table 1) and Likelihood (Table 2) values are used to derive a Risk Rating (Table 3).   The numeric rating scale should be applied consistently for each activity evaluated and the detailed consequence descriptions need to be considered in the context of the activity that is being assessed.

Risk Assessment - Risk Evaluation:

An evaluation of each identified risk will be conducted to determine those risks that are acceptable and those that require further treatment. Risks that require further action will be mitigated prior to any RPAS operations. The risks that have been accepted will be noted and monitored in accordance with **'Monitor and Review'** process detailed below.
Existing controls and their effectiveness must be taken into account when analysing the risk to derive a Risk Rating score. Details of this risk analysis will be recorded on the Risk Control Worksheet detailed in Table 4 (below).   The analysis will consider the range of potential consequences and how likely they are to occur. Consequence and likelihood are combined to produce an estimated level of risk called the Risk Rating.

Risk Treatment:

In accordance with Table 3 (below), low priority risks (score <4) will be accepted and monitored. Medium risks (score <6), will be reduced to an acceptable level of risk in accordance with 'As Low as Reasonably Practicable' ALARP principles detailed below.
Risks with a score of 6 or higher are not permitted to be accepted by the Chief Remote Pilot.
The ALARP criteria will be used to manage risks that have a significant safety consequence.
It is acknowledged that although the cost of mitigating a risk is a consideration of the ALARP process, it is secondary to what is required by relevant legal standards and measured against what a 'reasonable person' would do to control the risk in similar circumstances.
For this purpose, ALARP is the situation where risk is negligible, or at least at a level where it can be managed by routine procedures.
The importance of insurance is recognised in the risk management process and as such, the operator will ensure that appropriate insurance exists for all RPAS activities that are being undertaken.
For each risk, the risk treatment(s) will be detailed in the applicable part of the Risk Control Worksheet as detailed in Table 4 (below). A new risk assessment will be conducted to determine the suitability of the risk treatment and these details, including a revised risk score, will be entered in the table.

Monitor and Review:

The last step in the Risk Management process is to monitor and review the effectiveness and performance of the risk treatment options, strategies, and the management system and changes which might affect it as follows:

- each step undertaken should be documented to enable effective monitoring and review

- risks and the effectiveness of treatment measures need to be monitored to ensure changing circumstances do not alter the risk priorities
- identification, assessment, and treatments must be reviewed to ensure the risks remain relevant and continue to be managed and that any new or emerging risks are identified and managed.

RISK ASSESSMENT MATRIX - LEVEL OF RISK

Table 1 - Consequence Values

	Consequence					
	0	**1**	**2**	**3**	**4**	**5**
People	No injury	Minor injury that does not require medical treatment	Minor injury that requires first aid treatment	Serious injury causing hospitalisation or multiple medical treatment cases	Permanent injury or disability (including blinding) that may result in hospitalisation of at least one person	One or more deaths, multiple severe injuries or permanent total disability
RPAS	Any element of the RPAS is degraded but task unaffected	A failure not serious enough to cause RPAS damage but which will result in unscheduled maintenance or repair or incomplete task	Minor RPAS damage resulting in damage to components, incomplete task and future unserviceability of RPAS	Significant RPAS damage but repairable	Complete loss of or destruction of a RPAS component (RPA, camera transmitter, sensor, etc.)	Loss of all RPAS elements
Reputation	Small delay, internal inconvenience only	May threaten an element of the service resulting in the task or objective being delayed	Risk does not violate any law and can be easily remedied. It has some effect on reputation and/or external stakeholders	Risk does not violate any law and can be easily remedied. It has some residual effect on reputation and/or external stakeholders and while reputation is damaged it is recoverable	Risk violates a law but can be remedied. It has a residual effect on reputation and/or external stakeholders and may result in damage to reputation	Risk violates a law and is unable to be remedied. It has a significant impact on reputation and/or external stakeholders and will result in loss of reputation
Cost/Property Damage	Negligible	Less than $1,000	More than $1,000 less than $10,000	More than $10,000 less than $100,000	More than $100,000 less than $1,000,000	Loss or damage exceeding $M1
Airspace	No aviation airspace safety implication	Minor breach of aviation safety regulations or RPA Area Approval	Serious issues of compliance with aviation safety regulations, RPA Area Approval or operations resulting in potential avoiding action by a manned aircraft but no collision	Serious issue of compliance with aviation safety regulations or operations or the loss of separation resulting in the potential for a collision with a manned aircraft but the manned aircraft is able to land with no serious injuries or fatalities	Potential for aviation safety incident/s involving multiple life threatening injuries, or fatalities, to less than 10 people	Potential for multiple fatal aviation safety incidents causing multiple fatalities, to 10 or more people
Equitable access of airspace	No effect on access to airspace users	Some users of the airspace may perceive or experience airspace inequality resulting in between 5 to 10 minute delay or minor detour	Some users of the airspace may perceive or experience airspace inequality resulting in more than 10 minute delay or major detours	Most users of the airspace will experience airspace inequality resulting in long delay (>30 minutes) or major detours	All users of the airspace will experience airspace inequality resulting in long delay (>30 minutes) or major detours	Airspace users are prohibited from operating in the airspace causing significant disruptions to operations and financial cost

Table 2 - Likelihood

Likelihood				
	Almost Certain	5	>1 in 10	Is expected to occur in most circumstances
	Likely	4	1 in 10 – 100	Will probably occur
	Possible	3	1 in 100 – 1000	Might occur at some time in the future
	Unlikely	2	1 in 1000 – 10000	Could occur but considered unlikely or doubtful
	Rare	1	1 in 10000 - 100000	May occur in exceptional circumstances
	Extremely Rare	0	< 1 in 100000	Could only occur under specific conditions and extraordinary circumstances

Table 3 – Risk Rating

			Consequence					
			0	1	2	3	4	5
Likelihood	Almost Certain	5	5	6	7	8	9	10
	Likely	4	4	5	6	7	8	9
	Possible	3	3	4	5	6	7	8
	Unlikely	2	2	3	4	5	6	7
	Rare	1	1	2	3	4	5	6
	Extremely Rare	0	0	1	2	3	4	5

Untreated Risk Scores
8,9,10 (Extreme risk) - Task is not permitted. Risk controls are required to ensure residual risk is acceptable.
6,7 (High risk) - Task is not permitted. Risk controls are required to ensure residual risk is acceptable.
4,5 (Medium risk) - Task may proceed, however, risk must be reduced to 'as low as reasonably practicable' (ALARP).
1,2,3 (Low risk) - Task may proceed.

Table 4 – Risk Control Worksheet

Risk No/ ID	Strategic Theme (e.g. operational, legal, financial, resource etc.)	The Risk What can happen and How it can happen	The Consequence	Existing Controls Description and Adequacy (only controls that are currently in place)	Risk Rating			Additional Risk Treatment Strategies (to be implemented to reduce the risk rating to an acceptable level)	Risk Rating after controls		
					L (a)	C (b)	R (a+b)		L (a)	C (b)	R (a+b)

APPENDIX 4 – RPAS Operational Procedures (Library)

Refer to separate RPAS Operational Procedures (Library) document.

APPENDIX 5 – Approved Operations Location Register

The locations listed in this register are locations that have been approved by the Chief Remote Pilot for operations (other than Specialised operations) to be conducted without individual flight authorisations from the Chief Remote Pilot.

Location: Summer Land Camel Farm, 8 Charles Chauvel Dr, Harrisville QLD 4307.		
Coordinates (Latitude, Longitude, Altitude of Ground (AMSL in feet): -27.787347, 152.649373, 280	VHF Frequency: 118.3	Emergency Contact: Jeff Flood Ph: 0419601459
Map:		
Special Conditions: N/A		

Location: Woodlands of Marburg, 174 Seminary Rd, Marburg QLD 4346		
Coordinates: -27.551604, 152.603798	VHF Frequency: 118.3	Emergency Contact: David Ritchie Ph: 0487742538

Map:

Special Conditions: N/A

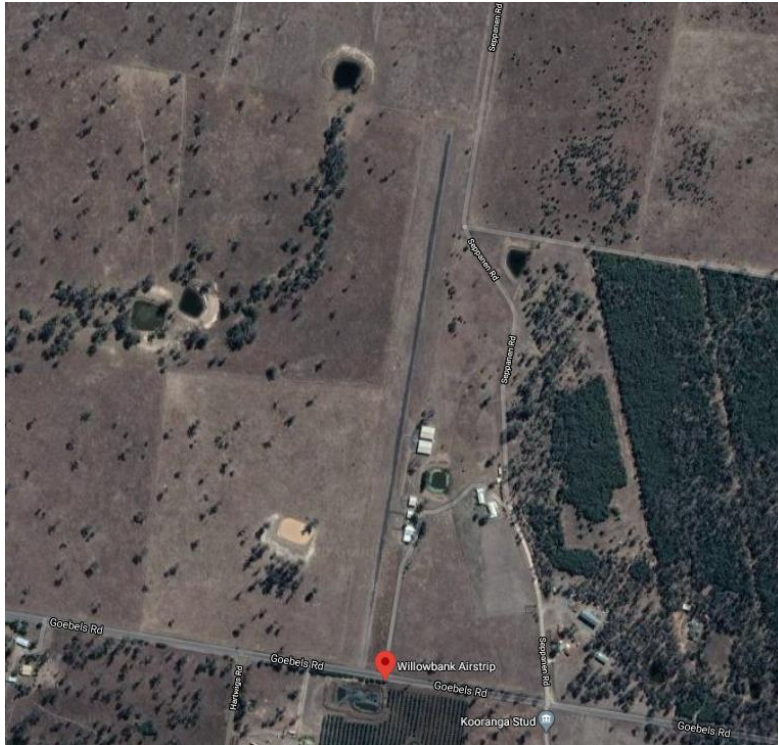| Location: Willowbank Airfield YWIN Goebels Rd Mutdapilly QLD 4307		
Coordinates: -S27 43' 17" E152 38' 32"	VHF Frequency: 118.3	Emergency Contact: Brian Scoffel Ph: 0438734845
Map:		
Special Conditions: NOTAM required IAW Instrument CASA RPAS 2020-4740		

SCHEDULE 1 - RPAS Operating Types and Nominated Personnel

Manufacturer	V-TOL Aerospace
Model / Type	Condor / Fixed Wing
Maximum Take-off Weight	2.8KG
Identity / Serial Number	*Condor003* *Condor004* *Condor005* *Condor007* *Condor010* *Condor011* *Condor018*

Manufacturer	V-TOL Aerospace
Model / Type	Goshawk / Fixed Wing
Maximum Take-off Weight	5KG
Identity / Serial Number	Goshawk009 Goshawk011

Manufacturer	V-TOL Aerospace
Model / Type	Goshawk / Powered Lift (Experimental)
Maximum Take-off Weight	7KG
Identity / Serial Number	Goshawk010

Manufacturer	V-TOL Aerospace
Model / Type	Hornet / Multirotor (Hexacopter)
Maximum Take-off Weight	25KG
Identity / Serial Number	Hornet008 Hornet009

Manufacturer	V-TOL Aerospace
Model / Type	Seeker / Multirotor (Quadcopter)

Maximum Take-off Weight	3.0KG
Identity / Serial Number	Seeker001

Manufacturer	V-TOL Aerospace
Model / Type	Swift / Multirotor (Quadcopter)
Maximum Take-off Weight	2.0KG
Identity / Serial Number	Swift002 Swift005 Swift006 Swift007

Manufacturer	DJI
Model / Type	Inspire T600/ Multirotor (Quadcopter)
Maximum Take-off Weight	3.1KG
Identity / Serial Number	Inspire001

Manufacturer	DJI
Model / Type	Mavic Pro Platinum Mod MTX/ Multirotor (Quadcopter) Mavic Pro Mod M1P Mavic Pro Mod M1P
Maximum Take-off Weight	<2.0KG
Identity / Serial Number	Mavic001 SNo 08QCG6UP125CLF Mavic002 SNo 08Q3G8800SV056 Mavic003 SNo 08QCE9B0224ET7

Nominated Position	Name	ARN	Date Form 101-04 Approved
Chief Remote Pilot	Mark Xavier	0767255	11/10/2007
Maintenance Controller	Joseph McGee	1072261	23/03/2020
CEO	Mark Xavier	0767255	N/A
CFI	Frank Martin	0821304	N/A