



**Australian Government**

# **AVIY3077A Manage remote pilot aircraft systems (RPAS) in abnormal flight situations**

**Release 1**

# **AVIY3077A Manage remote pilot aircraft systems (RPAS) in abnormal flight situations**

## **Modification History**

Release 1. This is the first release of this unit.

This unit replaces and is equivalent to AVIY3071A Manage remote pilot aircraft systems (RPAS) in abnormal flight conditions.

## **Unit Descriptor**

This unit involves the skills and knowledge required to accurately assess an abnormal situation and perform immediate and subsequent actions, configure the remote pilot aircraft (RPA), select an emergency recovery area and land with no injury to personnel or damage to the aircraft or property.

Abnormal situations may include engine failure at launch or during flight; a stall; an incipient or full spin; a forced recovery; or other abnormal operational situations involving equipment, instruments, control, airframe, fire or other emergencies.

## **Application of the Unit**

Work must be carried out in compliance with the relevant licence and RPAS rating requirements of the Civil Aviation Safety Authority (CASA); relevant airspace control requirements; Visual Meteorological Conditions (VMC); regulations, safety codes, protocols and procedures relevant to managing abnormal RPA flight situations.

Use for Defence Aviation is to be in accordance with relevant Defence Orders and Instructions.

Operations are conducted across a variety of operational contexts within the Australian Aviation Industry.

Work is performed under limited supervision.

Note:

Where an abnormal situation might potentially cause damage to the RPAS and/or be harmful to personnel and property, evidence for assessment purposes should be obtained from other than observation of performance in an actual abnormal operational situation (e.g. through using an appropriate simulator and/or structured questioning, or termination of a simulated forced recovery at a point where the assessment of an outcome can be made).

## **Licensing/Regulatory Information**

Refer to Application of the Unit.

## **Pre-Requisites**

Nil.

## Employability Skills Information

This unit contains employability skills.

## Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

## Elements and Performance Criteria

- |   |     |  |
|---|-----|--|
| <b>1 Manage loss of thrust after take-off</b>             | 1.1 | Loss of thrust is identified as an abnormal situation  |
|   | 1.2 | RPA is controlled at all times according to workplace procedures   |
|   | 1.3 | Immediate recovery actions are performed in accordance with Flight Manual/Pilot's Operating Handbook (POH)                       |
|   | 1.4 | A recovery area within gliding distance is selected, and emergency procedures are performed in accordance with Flight Manual/POH |
|   | 1.5 | Appropriate flight profile is flown to enable controlled recovery  |
|   | 1.6 | Controlled recovery is achieved according to workplace procedures  |
| <b>2 Perform forced recovery following loss of thrust</b> | 2.1 | Control of RPA is maintained at all times  |
|   | 2.2 | Immediate actions are performed in accordance with Flight Manual/Pilot's Operating Handbook (POH)                                |
|   | 2.3 | A recovery area within gliding distance is selected and RPA is manoeuvred to nominated recovery area as applicable               |
|   | 2.4 | Consideration is given to restarting the engine when appropriate   |
|   | 2.5 | Flight profile is flown from which a controlled recovery could be achieved   |
|   | 2.6 | Controlled recovery is achieved according to workplace procedures  |
| <b>3 Recognise and recover from stall</b>                 | 3.1 | Stall signs and symptoms are recognised  |
|   | 3.2 | Height loss, consistent with RPA type is identified  |
|   | 3.3 | RPA altitude and power settings are adjusted to resume normal flight   |

on advent of stall

- 4 Recognise and recover from an incipient spin**
  - 4.1 Incipient spin signs and symptoms are recognized
  - 4.2 Recovery at incipient spin stage (stall with wing drop) is performed and controlled flight is resumed
  - 4.3 Recovery at incipient spin stage during a turn is performed and controlled flight is resumed
  
- 5 Conduct precautionary search and recovery**
  - 5.1 Search and recovery intentions are communicated to the RPA crew
  - 5.2 Aircraft is configured for appropriate inspection flight profile
  - 5.3 Recovery area is selected and inspected for suitability of safe approach, recovery distance, surface, and obstacle clearance.
  
- 6 Manage RPAS abnormal and emergency situations**
  - 6.1 Abnormal and emergency situations are identified, and managed in accordance with relevant emergency procedures and regulatory requirements
  - 6.2 Appropriate emergency procedures are followed in accordance with Flight Manual/POH and published procedures while maintaining control of the RPA
  - 6.3 Control of RPA is maintained at all times

## Required Skills and Knowledge

This section describes the knowledge and skills required for this unit.

### Required knowledge:

- Risk identification, analysis and control
- Error management, including error types, causes and consequences as relevant to this unit
- Human performance and its limitations, including the senses, memory and situational awareness as relevant to this unit
- The decision making process as relevant to this unit
- Management of fatigue as relevant to this unit
- Stress, workload and time pressure management in relation to this unit
- Effective communication as relevant to this unit
- Relevant sections of Civil Aviation Regulations and Orders pertaining to abnormal flight situations
- In Defence context, relevant Defence Orders and Instructions
- Relevant work health and safety (WHS)/occupational health and safety (OHS) and environmental procedures and regulations
- Principles of aerodynamics
- Functions and effects of all RPA flight controls
- Controllability checks and external inspection procedures
- Engine failure emergency procedures
- Explain the effects of a partial engine failure on RPA performance with respect to straight and level flight and turning while maintaining level flight
- Describe the hazards associated with turning an RPA at slow speed using large angles of bank while maintaining level flight following a partial engine failure after launch
- Explain what factors should be considered when deciding whether to recover immediately or proceed to a more suitable recovery area after a partial engine failure
- Practical action plans for use in the event of an engine failure after launch
- A plan of action to be used in the event of an engine failure in flight, other than after launch
- Factors affecting a stall
- Symptoms of the approach to the stall and the stall
- Causes of stalling
- Recovery techniques
- The potential dangers of unbalanced flight at slow speed
- Actions required to recover from an incipient spin (wing drop at point of stall) if applicable
- Action required to recover from a stall during a turn if applicable
- Spin entry and recovery techniques if applicable
- The difference between a spin and spiral dive

- Height loss whilst gliding including minimum height to achieve safe turns towards selected recovery area
- Action planning processes
- All applicable checklist items
- Emergency radio procedures
- Actions to be conducted following a forced recovery
- Hazards associated with flying operations at low level
- Ditching procedures when specified in the Flight Manual/Pilot's Operating Handbook (POH) or company operations manual

### **Required skills:**

- Operate the RPA within its limitations,
- Compensate for the secondary effects of controls if applicable
- Identify symptoms of incipient and developed stalls if applicable
- Recognise situations which may require a precautionary recovery
- Perform various functions simultaneously as required
- Ensure compliance with relevant emergency procedures and regulatory requirements
- Select and use relevant equipment in abnormal RPA flight situations
- Use instruments and displays to monitor RPA performance
- Communicate effectively with others when managing abnormal RPA flight situations including radio use
- Read and interpret instructions, regulations, procedures and other information relevant to managing abnormal RPA flight situations
- Interpret and follow operational instructions and prioritise workload
- Complete documentation related to abnormal RPA flight situations
- Operate electronic communication equipment to required protocol
- Work collaboratively with others when managing abnormal RPA flight situations
- Adapt appropriately to cultural differences in the workplace, including modes of behaviour and interactions with others
- Promptly report and/or rectify any identified problems that may occur when managing abnormal RPA flight situations in accordance with regulatory requirements and workplace procedures
- Implement contingency plans for unexpected events that may arise when managing abnormal RPA flight situations
- Apply precautions and required action to minimise, control or eliminate hazards that may exist during abnormal RPA flight situations
- Monitor and anticipate operational problems and hazards and take appropriate action
- Monitor work activities in terms of planned schedule
- Modify activities dependent on differing workplace contingencies, situations and environments

- Work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- Adapt to differences in equipment and operating environment in accordance with standard operating procedures
- Select and use required personal protective equipment conforming to industry and WHS/OHS standards
- Implement WHS/OHS procedures and relevant regulations
- Identify and correctly use equipment required to manage abnormal aircraft flight situations

## Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills, the range statement and the assessment guidelines for this Training Package.

### **Critical aspects for assessment and evidence required to demonstrate competency in this unit**

The evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the Elements, Performance Criteria, Required Skills, Required Knowledge and include:

- risk management
- human factors
- safety management systems and:
- required knowledge and skills
- relevant legislation and workplace procedures
- other relevant aspects of the range statement

### **Context of and specific resources for assessment**

Performance is demonstrated consistently over time and in a suitable range of contexts.

Resources for assessment include access to:

- a range of relevant exercises, case studies and/or other simulated practical and knowledge assessment, and/or
- access to an appropriate range of relevant operational situations in the workplace.

In both real and simulated environments, access is required to:

- relevant and appropriate materials and equipment, and
- applicable documentation including workplace procedures, regulations, codes of practice and operation manuals.

### **Method of assessment**

Practical assessment must occur in a:

- real or appropriately simulated environment.

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate to this unit:

- knowledge and performance questions and direct observation.



## Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

- Tasks may be undertaken in:
- Visual Line of Sight
  - Visual Meteorological conditions
- Performance may be demonstrated in:
- single engine RPA
  - multi engine RPA
  - synthetic training device approved by appropriate authority
  - variable air traffic conditions
  - variable flight situations
  - abnormal situations
- Performance may be demonstrated on an aircraft with:
- fully functioning controls
  - with the use of a suitable simulator
- Aircraft may include:
- Remotely Piloted Aircraft (RPA)/Unmanned aircraft
- Crew may include:
- Remote Pilot
  - Remote Observer
  - Payload and Sensor operators, managers or technicians
- Instruments may be:
- fitted flight instruments
  - head up displays
  - Graphic displays and screens
- Limitations may be imposed by:
- local noise abatement requirements and curfews
- Classes of airspace must be:
- in Class G airspace as designated by the regulator, and may be in:
    - restricted and danger areas
    - military control zones
- Abnormal conditions may include:
- engine failure at take-off
  - engine failure during flight
  - stall
  - incipient spin
  - forced landing
  - RPAS abnormal operational situations involving equipment, instruments, control, airframe, fire or other emergency
- Landing and recovery areas may include:
- sealed
  - gravel
  - grass

Dependent on the type of organisation concerned and the local terminology used, workplace procedures may include:

- company procedures
- enterprise procedures
- organisational procedures
- established procedures
- standard operating procedures

Information/documents may include:

- relevant sections of Civil Aviation Safety Regulations and Civil Aviation Orders pertaining to the various abnormal flight situations including Day Visual Flight Rules (Day VFR)
- in Defence context, relevant Defence Orders and Instructions
- Flight Manual/Pilot's Operating Handbook (POH)
- Manual of Standards
- Aeronautical Information Publication (AIP)
- En Route Supplement Australia (ERSA)
- charts
- operations manuals
- approved checklists
- emergency procedures
- workplace procedures and instructions and job specification
- induction and training materials
- conditions of service, legislation and industrial agreements including workplace agreements and awards

Applicable regulations and legislation may include:

- relevant Civil Aviation Safety Regulations and Civil Aviation Orders
- in Defence context, relevant Defence Orders and Instructions
- relevant state/territory WHS/OHS legislation
- relevant state/territory environmental protection legislation
- relevant Australian Standards

Performance includes tolerances specified in either of:

- relevant licence and aircraft rating requirements of the Civil Aviation Safety Authority (CASA) such as:
  - Manual of Standards
- relevant Defence documentation such as:
  - Defence Orders and Instructions

## **Unit Sector(s)**

Not applicable.

## **Competency Field**

Y - Aircraft Operation and Traffic Management