



# Australian Government

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## Civil Aviation Safety Authority

I, PHILIPPA JILLIAN SPENCE, Director of Aviation Safety, on behalf of CASA, make this instrument under regulation 61.035 of the *Civil Aviation Safety Regulations 1998*.

**[Signed P. Spence]**

Pip Spence  
Director of Aviation Safety

11 November 2024

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### Part 61 Manual of Standards Amendment Instrument 2024 (No. 1)

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**1 Name of instrument**

This instrument is the *Part 61 Manual of Standards Amendment Instrument 2024 (No. 1)*.

**2 Commencement**

- (1) Subject to subsection (2), this instrument commences on the day after it is registered.
- (2) Schedules 1, 3 and 4 commence immediately after the commencement of Schedule 2.

**3 Amendment of the Part 61 Manual of Standards**

Schedules 1 and 2 amend the *Part 61 Manual of Standards Instrument 2014*.

#### Schedule 1 Amendments

**[1] Schedule 1A, Dictionary of abbreviations**

*insert*

AAL	Above aerodrome level
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**[2] Schedule 1, Section G, Appendix G.3 Gyroplane category rating (RPL) – *Reserved***

*substitute*

#### Appendix G.3 Gyroplane category rating (RPL)

##### Aeronautical knowledge standards

Unit code	Unit of knowledge
BAKC	Basic aeronautical knowledge
RFRC	RPL Flight rules and air law

Unit code	Unit of knowledge
PHFC	PPL Human factors
RMTC	RPL Meteorology
RBKG	Basic aeronautical knowledge – gyroplane

### Practical flight standards – gyroplane category

Unit code	Unit of competency
C1	Communicating in the aviation environment
C2	Perform pre- and post-flight actions and procedures
C4	Manage fuel
C5	Manage passengers and cargo
NTS1	Non-technical skills 1
NTS2	Non-technical skills 2
G1	Control gyroplane on the ground
G2	Take-off gyroplane
G3	Control gyroplane in normal flight
G4	Land gyroplane
G5	Gyroplane advanced manoeuvres
G6	Manage abnormal situations – single-engine gyroplane

### [3] Schedule 1, Section H, Appendix H.4 Gyroplane category rating (PPL) – *Reserved*

*substitute*

### Appendix H.4 Gyroplane category rating (PPL)

#### Aeronautical knowledge standards

Unit code	Unit of knowledge
BAKC	Basic aeronautical knowledge
RFRC	RPL Flight rules and air law
RMTC	RPL Meteorology
PHFC	PPL Human factors
RBKG	Basic aeronautical knowledge – gyroplane
PAKC	PPL Aeronautical knowledge
PFRC	PPL Flight rules and air law
PHFC	PPL Human factors
PNVC	PPL Navigation
PMTC	PPL Meteorology

Unit code	Unit of knowledge
POPC	PPL Operations, performance and planning
PAKG	PPL Aeronautical knowledge – gyroplane
PFRG	PPL Flight rules and air law – gyroplane
POPG	PPL Operations, performance and planning – gyroplane

### Practical flight standards

Unit code	Unit of competency
C1	Communicating in the aviation environment
C2	Perform pre- and post-flight actions and procedures
C3	Operate aeronautical radio
C4	Manage fuel
C5	Manage passengers and cargo
NTS1	Non-technical skills 1
NTS2	Non-technical skills 2
NAV	Navigate aircraft
G1	Control gyroplane on the ground
G2	Take-off gyroplane
G3	Control gyroplane in normal flight
G4	Land gyroplane
G5	Gyroplane advanced manoeuvres
G6	Manage abnormal situations – single-engine gyroplane
ONTA	Operate at non-towered aerodrome
OGA	Operate in Class G airspace
CTR	Operate at a controlled aerodrome
CTA	Operate in controlled airspace

### [4] Schedule 1, Section I, Appendix I.4 Gyroplane category rating (CPL) – *Reserved*

*substitute*

### Appendix I.4 Gyroplane category rating (CPL)

#### Aeronautical knowledge standards

Unit code	Unit of knowledge
BAKC	Basic aeronautical knowledge
RFRC	RPL Flight rules and air law

<b>Unit code</b>	<b>Unit of knowledge</b>
RMTC	RPL Meteorology
PHFC	PPL Human factors
RBKG	Basic aeronautical knowledge – gyroplane
PAKC	PPL Aeronautical knowledge
PFRC	PPL Flight rules and air law
PHFC	PPL Human factors
PNVC	PPL Navigation
PMTC	PPL Meteorology
POPC	PPL Operations, performance and planning
PAKG	PPL Aeronautical knowledge – gyroplane
PFRG	PPL Flight rules and air law – gyroplane
POPG	PPL Operations, performance and planning – gyroplane
CAKC	CPL Aeronautical knowledge
CADC	CPL Aerodynamics
CFRC	CPL Flight rules and air law
CHFC	CPL Human factors
CNVC	CPL Navigation
CMTC	CPL Meteorology
COPC	CPL Operations, performance and planning
CAKG	CPL Aeronautical knowledge – gyroplane
CADG	CPL Aerodynamics – gyroplane
CFRG	CPL Flight rules and air law – gyroplane
COPG	CPL Operations, performance and planning – gyroplane

### **Practical flight standards**

<b>Unit code</b>	<b>Unit of competency</b>
C1	Communicating in the aviation environment
C2	Perform pre- and post-flight actions and procedures
C3	Operate aeronautical radio
C4	Manage fuel
C5	Manage passengers and cargo
NTS1	Non-technical skills 1
NTS2	Non-technical skills 2
NAV	Navigate aircraft

Unit code	Unit of competency
G1	Control gyroplane on the ground
G2	Take-off gyroplane
G3	Control gyroplane in normal flight
G4	Land gyroplane
G5	Gyroplane advanced manoeuvres
G6	Manage abnormal situations – single-engine gyroplane
IFF	Full instrument panel manoeuvres
IFL	Limited instrument panel manoeuvres
RNE	Radio navigation – en route
ONTA	Operate at non-towered aerodrome
OGA	Operate in Class G airspace
CTR	Operate at a controlled aerodrome
CTA	Operate in controlled airspace

**[5] Schedule 1, Section J, Appendix J.1 Aeroplane category rating (MPL)**

*omit*

AAGC

*insert*

AGKC

**[6] Schedule 1, Section J, Appendix J.1 Aeroplane category rating (MPL)**

*omit*

AAGA

*insert*

AGKA

**[7] Schedule 1, Section K, Appendix K.1 Aeroplane category rating (ATPL)**

*omit*

AAGC

*insert*

AGKC

**[8] Schedule 1, Section K, Appendix K. 1 Aeroplane category rating (ATPL)**

*omit*

AAGA

*insert*  
AGKA

**[9] Schedule 1, Section K, Appendix K.2 Helicopter category rating (ATPL)**

*omit*  
AAGC

*insert*  
AGKC

**[10] Schedule 1, Section K, Appendix K.2 Helicopter category rating (ATPL)**

*omit*  
AAGH

*insert*  
AGKH

**[11] Schedule 1, Section L, Appendix L.3 Single-engine gyroplane class rating**

*substitute*

**Appendix L.3 Single-engine gyroplane class rating**

**Practical flight standards**

<b>Unit code</b>	<b>Unit of competency</b>
C2	Perform pre- and post-flight actions and procedures
C4	Manage fuel
NTS1	Non-technical skills 1
NTS2	Non-technical skills 2
G1	Control gyroplane on the ground
G2	Take-off gyroplane
G3	Control gyroplane in normal flight
G4	Land gyroplane
G5	Gyroplane advanced manoeuvres
G6	Manage abnormal situations – single-engine gyroplane

**[12] Schedule 1, Section L, after Appendix L.15 Single-engine helicopter type rating**

*insert*

**Appendix L.15A Gyroplane type rating**

**Aeronautical knowledge standards**

Unit code	Unit of knowledge
TYPG	Pilot type rating – gyroplane

**Practical flight standards**

Unit code	Unit of competency
C2	Perform pre- and post-flight actions and procedures
C4	Manage fuel
NTS1	Non-technical skills 1
NTS2	Non-technical skills 2
G1	Control gyroplane on the ground
G2	Take-off gyroplane
G3	Control gyroplane in normal flight
G4	Land gyroplane
G5	Gyroplane advanced manoeuvres
G6	Manage abnormal situations – single-engine gyroplane

**[13] Schedule 1, Section L, Appendix L.18 Cruise relief aeroplane type rating**

*substitute*

**Appendix L.18 Cruise relief aeroplane type rating**

**Aeronautical knowledge standards**

Unit code	Unit of knowledge
TYPA	Pilot type rating – aeroplane

**Practical flight standards**

Unit code	Unit of competency
TR-CR	Type rating – cruise relief aeroplane
NTS1	Non-technical skills 1
NTS2	Non-technical skills 2

**[14] Schedule 1, Section O, Appendix O.1 NVFR rating, Aeronautical knowledge standards – Reserved**

*substitute*

**Appendix O.1 NVFR rating**

**Aeronautical knowledge standards**

Unit code	Unit of knowledge
NVFR	NVFR rating – all aircraft categories

**[15] Schedule 1, Section Q, Appendix Q.7 Aerial mustering – gyroplane endorsement – Reserved**

*substitute*

**Appendix Q.7 Aerial mustering – gyroplane endorsement**

**Practical flight standards**

Unit code	Unit of competency
NTS1	Non-technical skills 1
NTS2	Non-technical skills 2
LL-G	Gyroplane low-level operations
LL-M	Aerial mustering operations

**[16] Schedule 1, Section R, Appendix R.3 Gyroplane aerial application endorsement**

*substitute*

**Appendix R.3 Gyroplane aerial application endorsement**

**Aeronautical knowledge standards**

Unit code	Unit of knowledge
AAGG	Aerial application rating — gyroplane endorsement

**Practical flight standards**

Unit code	Unit of competency
NTS1	Non-technical skills 1
NTS2	Non-technical skills 2
LL-G	Gyroplane low-level operations
AA3	Gyroplane aerial application operation



**[17] Schedule 1, Section S, after Appendix S.9 Formation flying (helicopter) flight activity endorsement**

*insert*

**Appendix S.10 Formation flying (gyroplane) flight activity endorsement**

**Practical flight standards**

Unit code	Unit of competency
F AE-10	Formation flying gyroplane

**[18] Schedule 2, Section 4, GYROPLANE CATEGORY, GSE Single-engine gyroplane**

*substitute*

**GYROPLANE CATEGORY**

**G1 Control gyroplane on the ground**

**1 Unit description**

This unit describes the skills and knowledge required to operate a gyroplane on the ground.

**2 Elements and performance criteria**

**2.1 G1.1 – Start and stop engine**

The person must be able to demonstrate their ability to do the following:

- (a) perform engine start and after start actions;
- (b) perform engine shutdown and after shutdown actions;
- (c) manage engine start and shutdown malfunctions and emergencies;
- (d) consider ground surface in relation to contamination and propeller care during engine start and stop activities;
- (e) control gyroplane movement during and after engine start.

**2.2 G1.2 – Conduct prerotation**

The person must be able to demonstrate their ability to do the following:

- (a) operate rotor brake (if fitted);
- (b) conduct prerotation;
- (c) prevent blade flap;
- (d) maintain rotor disc position within limits during prerotation and ground manoeuvring.

**2.3 G1.3 – Taxi gyroplane**

The person must be able to demonstrate their ability to do the following while taxiing a gyroplane:

- (a) check and confirm proper functioning of the wheel brake system;
- (b) taxi gyroplane in accordance with prevailing aerodrome conditions;
- (c) perform applicable taxi checks, including checking the following:
  - (i) steering function normal and take appropriate action in the event of a malfunction;
  - (ii) instruments for correct readings;

- (iii) altimeter setting;
- (d) maintain taxi speed and control of the gyroplane;
- (e) manage engine and rotors on ground;
- (f) maintain rotor clearance from other aircraft, obstructions, and persons;
- (g) maintain the gyroplane on the taxiway centreline;
- (h) ensure correct handling techniques are applied to take into account wind from all 4 quadrants;
- (i) coordinate taxi speed and rotor disc position to control rotor RPM and prevent blade flap.

**3 Range of variables**

- (a) activities are performed in accordance with published procedures;
- (b) sealed, gravel and grass runways and taxiways;
- (c) sufficient wind that requires control adjustment (may be simulated);
- (d) hazardous weather (may be simulated);
- (e) hot and cold engine starts in accordance with appropriate checklists.

**4 Underpinning knowledge of the following:**

- (a) typical single-engine aircraft systems;
- (b) differences between normally aspirated and fuel-injected systems;
- (c) carburettor icing;
- (d) cause and effect of fuel vaporisation;
- (e) typical aircraft performance characteristics of single-engine gyroplanes and the effects of local weather conditions on performance;
- (f) gyroplane weight and balance and how to calculate the gyroplane CG;
- (g) the contents of the aircraft flight manual applicable to the gyroplane being flown;
- (h) the environmental conditions that represent VMC and day VFR flight rules;
- (i) propeller wash, rotor wash and jet blast and how they affect other aircraft;
- (j) effects of wind on rotor blades;
- (k) the meaning of the following:
  - (i) light and marshalling signals;
  - (ii) aerodrome markings, signals and local procedures;
- (l) care of propellers and rotors;
- (m) the actions to be taken in the event of a rotor brake failure or failure of the wheel brake, tyre or steering;
- (n) the relevant sections of the AIP;
- (o) rotor prerotation procedures;
- (p) the effects of wind on rotor blades;
- (q) performing weight and balance calculations;
- (r) loading within specified limitations;
- (s) cause and effect of ground resonance and recall actions in the event of ground resonance;
- (t) correct handling techniques in the event of blade flap;
- (u) aerodrome markings;
- (v) light and marshalling signals.

## **G2 Take-off gyroplane**

### **1 Unit description**

This unit describes the skills and knowledge required to complete pre-take-off checks, take-off gyroplane into wind and in cross-wind conditions and perform after take-off checks in a gyroplane.

### **2 Elements and performance criteria**

#### **2.1 G2.1 – Carry out pre-take-off procedures**

- (a) correctly identify critical airspeeds, configurations, and emergency and abnormal procedures for normal and cross-wind take-offs;
- (b) brief on plan of action to ensure the safest outcome in the event of abnormal or emergency operations;
- (c) apply correction for the existing wind;
- (d) perform pre-take-off and line-up checks;
- (e) ensure approach path is clear of conflicting traffic and other hazards before lining up for take-off;
- (f) align the gyroplane on the runway centreline in take-off direction.

#### **2.2 G2.2 – Take-off gyroplane**

- (a) apply the controls correctly to maintain longitudinal alignment on the centreline of the runway, if appropriate, before initiating and during the take-off;
- (b) adjust the power controls taking into account the existing conditions;
- (c) monitor power controls, settings, and instruments during take-off;
- (d) apply power to accelerate gyroplane and achieve flying rotor RPM in accordance with appropriate aircraft flight manual;
- (e) prevent blade flap;
- (f) use throttle and controls to balance gyroplane on main gear before lift-off;
- (g) achieve desired rotor RPM for flight not later than minimum power speed;
- (h) perform the take-off applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner;
- (i) trim the gyroplane accurately (if applicable);
- (j) perform gear retractions, power adjustments (as applicable) and other required pilot-related activities;
- (k) maintain flight path along the runway extended centreline as required;
- (l) maintain climb speed at best angle or best rate while observing height-velocity diagram considerations;
- (m) recognise take-off abnormalities and take appropriate action to reject take-off (can be simulated);
- (n) reduce take-off power to climb power in accordance with the aircraft flight manual.

#### **2.3 G2.3 – Take-off gyroplane in a cross-wind**

- (a) perform a take-off in a gyroplane making appropriate adjustments for cross-wind conditions;
- (b) maintain the runway centreline and extended centreline.

#### **2.4 G2.4 – Carry out after take-off procedures**

- (a) perform after take-off check;
- (b) maintain the appropriate climb segment at the nominated heading and airspeed;
- (c) manoeuvre according to local and standard procedures;
- (d) maintain traffic separation.

- 2.5 **G2.5 – Take-off gyroplane from ‘short field’**
- (a) perform take-off in gyroplane to achieve the minimum length take-off performance;
  - (b) perform take-off in gyroplane to achieve the obstacle clearance parameters.
- 2.6 **G2.6 – Take-off gyroplane from ‘rough or soft field’**
- (a) perform take-off in gyroplane to achieve the minimum ground roll during take-off;
  - (b) accelerate gyroplane in ground effect to achieve climb speed.
- 3 Range of variables**
- (a) sealed, gravel and grass runways and taxiways;
  - (b) engine start and shutdown malfunctions and emergencies covered by the aircraft flight manual;
  - (c) simulated hazardous weather;
  - (d) for take-off in cross-wind, the cross-wind component must be as follows:
    - (i) for RPL, greater than 10 kts;
    - (ii) otherwise, 70% of the maximum permitted for the type of gyroplane being flown.
- 4 Underpinning knowledge of the following:**
- (a) aircraft flight manual limitations;
  - (b) calculating take-off and landing performance;
  - (c) obtaining and calculating the cross-wind and down or up wind components;
  - (d) factors affecting take-off and initial climb performance;
  - (e) interpreting windsock indications and determining wind direction and speed;
  - (f) take-off distance required calculation;
  - (g) aerodrome charts and an ability to interpret them;
  - (h) local topographical charts to identify safe areas for engine-failure purposes and noise abatement considerations.

## **G3 Control gyroplane in normal flight**

### **1 Unit description**

This unit describes the skills and knowledge required to control a gyroplane while performing normal flight manoeuvres.

### **2 Elements and performance criteria**

#### **2.1 G3.1 – Climb gyroplane**

- (a) set and maintain climb power as altitude is increased;
- (b) operate and monitor all aircraft systems when commencing, during, and completing a climbing flight manoeuvre;
- (c) select power, attitude and configuration as required for the flight path, balance and trim the gyroplane accurately (if applicable), and apply smooth, coordinated control inputs for the following climbing manoeuvres:
  - (i) normal climb;
  - (ii) best angle of climb ( $V_x$ );
  - (iii) best rate of climb ( $V_y$ );
- (d) anticipate level-off altitude and achieve straight and level flight.

#### **2.2 G3.2 – Maintain straight and level flight**

- (a) operate and monitor all aircraft systems during straight and level flight manoeuvres;

- (b) select power, attitude and configuration as required, balance and trim the gyroplane accurately (if applicable), apply carburettor heat as applicable and apply smooth, coordinated control inputs for the following straight and level manoeuvres:
  - (i) slow speed;
  - (ii) normal cruise;
  - (iii) high-speed;
  - (iv) during acceleration and deceleration;
  - (v) except for the RPL, maximum range speed;
  - (vi) except for the RPL, maximum endurance speed;
- (c) maintain altitude;
- (d) maintain desired speed.

2.3 **G3.3 – Descend gyroplane**

- (a) operate and monitor all aircraft systems during descending flight manoeuvres;
- (b) select power, attitude and configuration as required, balance and trim the gyroplane accurately (if applicable), apply carburettor heat as applicable and apply smooth, coordinated control inputs for the following straight descending manoeuvres:
  - (i) glide;
  - (ii) powered;
  - (iii) approach configuration;
- (c) monitor and control engine temperature;
- (d) anticipate level-off altitude and achieve straight and level flight.

2.4 **G3.4 – Turn gyroplane**

- (a) operate and monitor all aircraft systems during turning flight manoeuvres;
- (b) select power, attitude and configuration as required for the flight path, balance and trim the gyroplane accurately (if applicable), apply carburettor heat as applicable and apply smooth, coordinated control inputs for the following turning manoeuvres:
  - (i) level turn;
  - (ii) climbing turn;
  - (iii) climbing turn at best angle of climb;
  - (iv) climbing turn at best rate of climb;
  - (v) powered descending turn;
  - (vi) gliding descending turn;
  - (vii) descending turn in approach and landing configuration.

2.5 **G3.5 – Perform circuits and approaches**

- (a) operate and monitor all aircraft systems when operating the gyroplane in the circuit;
- (b) allow for wind effect on all legs of the circuit;
- (c) perform a full circuit pattern (5 legs), balance and trim the gyroplane (if applicable) while applying smooth, coordinated control inputs to achieve flight path as follows:
  - (i) track upwind along extended centreline to minimum 500 ft AAL;
  - (ii) establish and maintain cross-wind leg tracking 90° to the runway;
  - (iii) establish and maintain downwind leg tracking parallel to, and at a specified distance from, the runway at circuit height;
  - (iv) establish base leg tracking 90° to the runway at a specified distance from the runway threshold;
  - (v) track and maintain the gyroplane on final approach flight path with specified or appropriate runway;

- (d) perform checks as required throughout circuit;
- (e) establish the approach and landing configuration appropriate for the runway and meteorological conditions, and adjust the engine controls as required for the following:
  - (i) commence and control approach descent path;
  - (ii) adjust descent commencement point to take account of extended downwind leg or traffic adjustments;
  - (iii) set and maintain approach configuration not below 500 ft AAL;
  - (iv) identify and maintain the nominated aiming point;
  - (v) maintain a stabilised approach angle at the nominated airspeed to the round-out height;
  - (vi) verify existing wind conditions, make proper correction for drift, and maintain a precise ground track;
  - (vii) apply airspeed allowances for wind gusts;
  - (viii) configure gyroplane for landing;
- (f) maintain lookout, aircraft separation and position in the circuit with reference to other aircraft traffic in the circuit area.

## 2.6 **G3.6 – Local area airspace**

- (a) identify the following using an appropriate chart for the local area and circuit area:
  - (i) geographical features;
  - (ii) geographical limits;
  - (iii) restricted, controlled and uncontrolled airspace areas;
  - (iv) state local airspace limits;
  - (v) the transit route between the departure aerodrome and training area;
  - (vi) the geographical limits of the training area;
  - (vii) aerodromes and landing areas within the local area;
- (b) maintain orientation and pinpoint location by using geographical features and a local area chart;
- (c) transit from the circuit area and transit to the designated training area;
- (d) operate within a transit lane (if applicable);
- (e) remain clear of restricted, controlled and other appropriately designated airspace;
- (f) operate in the vicinity of local aerodromes and landing areas;
- (g) transit from the designated training area to the circuit area;
- (h) set QNH appropriately;
- (i) correctly determine which runway is to be used for landing;
- (j) ensure runway is serviceable and available;
- (k) position gyroplane for arrival into the circuit.

## 3 **Range of variables**

- (a) activities are performed in accordance with published procedures;
- (b) gyroplane with fixed or retractable undercarriage;
- (c) simulated hazardous weather;
- (d) approach and landing configurations:
  - (i) normal;
  - (ii) glide;
- (e) circuit patterns:
  - (i) normal 1,000 ft AAL circuit;
  - (ii) low-level 500 ft AAL circuit;

- (iii) full circuit pattern, including 5 legs;
- (iv) shortened circuit pattern;
- (f) day VFR conditions;
- (g) local area airspace limitations.

**4 Underpinning knowledge of the following:**

- (a) operation of the controls;
- (b) use of trim controls;
- (c) forces acting on a gyroplane during descent;
- (d) forces acting on a gyroplane in a turn;
- (e) effect of angle of bank on load factor;
- (f) effects of turn on magnetic compass performance;
- (g) dangers of turbulence and wake turbulence when flying at high speed;
- (h) circuit patterns and procedures;
- (i) dangers of wind shear, turbulence and wake turbulence;
- (j) aircraft systems;
- (k) aircraft performance;
- (l) aircraft weight and balance;
- (m) hazards when performing performance manoeuvres;
- (n) relationship between induced drag and operating at slow airspeed;
- (o) engine considerations during prolonged climbing and descending;
- (p) contents of the aircraft flight manual;
- (q) environmental conditions that represent VMC;
- (r) day VFR flight rules;
- (s) local area operating procedures;
- (t) relevant sections of the AIP;
- (u) principles of aerodynamics;
- (v) function of primary controls;
- (w) theory and application of best rate and angle of climb;
- (x) forces and moments acting during straight and turning level, climbing and descending flight;
- (y) relationship of attitude and power to trim.

**G4 Land gyroplane**

**1 Unit description**

This unit describes the skills and knowledge required to conduct a landing in a gyroplane.

**2 Elements and criteria**

**2.1 G4.1 – Land gyroplane**

- (a) maintain a constant landing position aim point;
- (b) achieve a smooth, positively-controlled transition from final approach to touchdown, including the following:
  - (i) control ballooning during flare;
  - (ii) touchdown at a controlled rate of descent, in the specified touchdown zone within tolerances;
  - (iii) control bouncing after touchdown;
  - (iv) touchdown aligned with the runway centreline;

- (c) ensure aircraft separation is maintained;
- (d) maintain positive directional control and cross-wind correction during the after-landing roll;
- (e) use drag techniques and braking devices, as applicable, to bring the gyroplane to a stop;
- (f) complete the applicable after-landing checks.

**2.2 G4.2 – Land gyroplane in a cross-wind**

- (a) verify existing wind conditions, correct for drift and maintain ground track;
- (b) configure the gyroplane for the cross-wind landing;
- (c) control the gyroplane during the transition from final approach to touchdown and during after-landing roll to compensate for the cross-wind conditions.

**2.3 G4.3 – Conduct a missed approach**

- (a) recognise the conditions when a missed approach should be executed;
- (b) execute a missed approach when it is safe to do so;
- (c) transition from approach to missed approach smoothly, and with positive control:
  - (i) select power, pitch attitude and configuration to control gyroplane; and
  - (ii) manoeuvre gyroplane clear of the ground and conduct after take-off procedures; and
  - (iii) make allowance for wind during go-around; and
  - (iv) complete after take-off checks.

**2.4 G4.4 – Perform recovery from missed landing**

- (a) recognise when a missed landing is occurring and when it is appropriate to take recovery action;
- (b) execute recovery from a missed landing only when it is safe to do so;
- (c) transition from missed landing to missed approach smoothly, and with positive control:
  - (i) select power, pitch attitude and configuration to control gyroplane; and
  - (ii) manoeuvre gyroplane clear of the ground and conduct after take-off procedures; and
  - (iii) make allowance for wind during go-around.

**2.5 G4.5 – Short landing**

- (a) land gyroplane to achieve the obstacle clearance parameters;
- (b) land gyroplane at nominated touchdown point at appropriate speed;
- (c) control ballooning during flare;
- (d) control bouncing after touchdown;
- (e) maintain direction after touchdown;
- (f) apply maximum braking using rotor and wheel brakes;
- (g) stop gyroplane within landing distance available.

**3 Range of variables**

- (a) activities are performed in accordance with published procedures;
- (b) sealed, gravel and grass runways and taxiways;
- (c) simulated hazardous weather;
- (d) for landing a gyroplane in cross-wind, the cross-wind component must be as follows:
  - (i) for RPL, greater than 10 kts;
  - (ii) otherwise, 70% of the maximum permitted for the type of gyroplane being flown.



- 4 Underpinning knowledge of the following:**
- (a) typical single-engine aircraft systems;
  - (b) calculate aircraft performance;
  - (c) aircraft limitations;
  - (d) weight and balance;
  - (e) effects of headwind and tailwind on approach and landing;
  - (f) options when local conditions are not suitable for landing;
  - (g) causes of loss of control of gyroplane on landing;
  - (h) contents of the aircraft flight manual;
  - (i) environmental conditions that represent VMC;
  - (j) day VFR flight rules;
  - (k) propeller wash, rotor wash and jet blast;
  - (l) relevant sections of the AIP.

## **G5 Gyroplane advanced manoeuvres**

### **1 Unit description**

This unit describes the skills and knowledge required to perform advanced manoeuvres in a gyroplane.

### **2 Elements and performance criteria**

#### **2.1 G5.1 – Recover gyroplane from slow flight and flight behind the power curve**

- (a) complete pre-manoevre checks;
- (b) operate and monitor all aircraft systems when operating the gyroplane at slow speed;
- (c) recover from slow flight and vertical descent in accordance with the gyroplane height-velocity diagram;
- (d) select power, attitude and configuration as required for the flight path, balance and trim the gyroplane accurately (if applicable), apply carburettor heat as applicable and apply smooth, coordinated control inputs for the following slow flight manoeuvres:
  - (i) minimum level flight speed;
  - (ii) maintain forward speed when below minimum level flight speed;
- (e) recover from flight below minimum flight speed;
- (f) coordinate use of power and cyclic to increase airspeed above minimum level flight speed;
- (g) regain level flight by nominated altitude.

#### **2.2 G5.2 – Turn gyroplane steeply**

- (a) complete pre-manoevre checks;
- (b) perform steep-level turn using a nominated bank angle, ending on a nominated heading or geographical feature, without altitude change;
- (c) perform steep descending turn using a nominated bank angle, ending on a nominated heading or geographical feature through a minimum of 500 ft;
- (d) balance gyroplane;
- (e) recognise and recover from any spiral.

#### **2.3 G5.3 – Minimum forward airspeed and ‘S’ turn descents**

- (a) complete pre-manoevre check;
- (b) conduct minimum forward airspeed descent maintaining airspeed and desired track;

- (c) recover from minimum forward airspeed descent to balanced level flight;
- (d) perform descending balanced 'S' turn while maintaining minimum forward airspeed;
- (e) exit from descending 'S' turn at minimum forward airspeed to a specified heading or geographical feature in balanced level flight.

### **3 Range of variables**

- (a) activities are performed in accordance with published procedures;
- (b) manoeuvres are performed within operating limits of gyroplane;
- (c) gyroplane with fixed or retractable undercarriage;
- (d) sealed, gravel and grass runways and taxiways;
- (e) windsock located on aerodrome;
- (f) simulated hazardous weather;
- (g) day VFR conditions;
- (h) local area operational limitations such as noise abatement and aerodrome curfews.

### **4 Underpinning knowledge of the following:**

- (a) operational circumstances where steep turns are required;
- (b) aerodynamic and gyroplane operational considerations related to slow flight, vertical, steep turns, upset gyroplane states, including but not limited to the following:
  - (i) effects of those factors on gyroplane fuel and pitot systems;
  - (ii) effects of weight and 'g' force during turns;
- (c) contents of the aircraft flight manual;
- (d) environmental conditions that represent VMC;
- (e) day VFR flight rules;
- (f) relevant sections of the AIP.

## **G6 Manage abnormal situations – single-engine gyroplanes**

### **1 Unit description**

This unit describes the skills and knowledge required to accurately assess an abnormal situation, reconfigure the gyroplane, control the gyroplane and execute appropriate manoeuvres to achieve a safe outcome with no injury to personnel or damage to the gyroplane or property.

### **2 Elements and performance criteria**

#### **2.1 G6.1 – Manage engine failure – take-off (simulated)**

- (a) maintain control of the gyroplane;
- (b) establish and maintain best gliding speed;
- (c) perform emergency actions from recall actions as time permits;
- (d) manoeuvre the gyroplane to achieve the safest possible outcome;
- (e) brief and ensure passengers adopt brace position and harness security;
- (f) advise others such as ATS and other aircraft of intentions if time permits.

#### **2.2 G6.2 – Manage engine failure in the circuit area (simulated)**

- (a) maintain control of the gyroplane;
- (b) establish best gliding speed;
- (c) perform recall actions as time permits;
- (d) select a suitable landing area within easy gliding distance, on the aerodrome or elsewhere;

- (e) manoeuvre the gyroplane to achieve the safest possible outcome;
- (f) perform emergency procedures;
- (g) advise ATS or other agencies capable of providing assistance of situation and intentions;
- (h) brief passengers about flight situation, brace position and harness security;
- (i) land the gyroplane ensuring safest outcome if an engine restart is not achieved.

2.3 **G6.3 – Perform forced landing (simulated)**

- (a) perform forced landing procedures as follows:
  - (i) identify complete engine failure condition and control gyroplane;
  - (ii) perform immediate actions;
  - (iii) formulate a plan, including selecting the most suitable landing area;
  - (iv) establish optimal glide path to position the gyroplane for a landing on the selected landing area;
  - (v) perform emergency procedures if the engine cannot be restarted;
  - (vi) advise ATS or other agencies capable of providing assistance of situation and intentions;
  - (vii) brief passengers about flight situation, brace position and harness security;
  - (viii) land the gyroplane ensuring safest outcome if engine restart is not achieved;
- (b) perform forced landing following partial engine failure as follows:
  - (i) identify partial engine failure;
  - (ii) perform recall actions;
  - (iii) adjust flight controls to establish flight path to maximise performance for partial engine condition and maintain an appropriate airspeed;
  - (iv) establish radiocommunications where possible;
  - (v) perform partial engine failure actions;
  - (vi) formulate a plan to recover gyroplane to a safe landing area or aerodrome, taking into account that partial failure might lead to a complete engine failure at any time;
  - (vii) manoeuvre the gyroplane to a selected landing area or aerodrome and position for a safe landing;
  - (viii) advise ATS, or other agencies capable of providing assistance of situation and intentions;
  - (ix) brief passengers about flight situation, brace position and harness security;
  - (x) develop and maintain a contingency plan for coping with a complete engine failure throughout the manoeuvre;
  - (xi) shutdown and secure engine and gyroplane when a safe landing position is established.

2.4 **G6.4 – Conduct precautionary search and landing (simulated condition)**

- (a) make a decision to perform precautionary landing in time available;
- (b) declare PAN and communicate intentions;
- (c) configure gyroplane for reduced visibility manoeuvring, if applicable;
- (d) perform precautionary search procedure;
- (e) select landing area, carry out an inspection and assess its suitability for landing, taking into account:
  - (i) unobstructed approach and overshoot paths;
  - (ii) whether landing area length is adequate for landing;
  - (iii) whether landing area surface is suitable for gyroplane type and clear of hazards;

- (iv) meteorological conditions;
- (f) maintain orientation and visual contact with the landing area;
- (g) declare PAN and advise ATS or other agencies capable of providing assistance of situation and intentions;
- (h) brief passengers about flight situation, brace position and harness security;
- (i) land, manage passengers and secure gyroplane.

**2.5 G6.5 – Manage other abnormal situations**

- (a) identify the situation and maintain control of the gyroplane;
- (b) manage abnormal and emergency situations;
- (c) advise ATS or other agencies capable of providing assistance of situation and intentions;
- (d) identify when an emergency evacuation of a gyroplane is required;
- (e) execute an emergency evacuation of the gyroplane.

**2.6 G6.6 – Recover from unusual flight attitudes**

- (a) identify unusual attitude flight conditions;
- (b) recover from unusual attitudes by adjusting pitch, bank and power to resume controlled and balanced flight;
- (c) apply controlled corrective action while maintaining aircraft performance within limits.

**3 Range of variables**

- (a) activities are performed in accordance with published procedures;
- (b) discontinue simulated manoeuvres that would be terminated by a forced landing when the assessor is satisfied that the landing standard would be achieved;
- (c) approved gyroplane with dual controls, electronic intercom and dual control brakes, if fitted;
- (d) aerodromes or landing areas;
- (e) sealed, gravel and grass surfaces;
- (f) wake, orographic and mechanical turbulence;
- (g) classes of airspace designated by the regulator;
- (h) limitations, such as those imposed by local noise abatement procedures and curfews;
- (i) operational hazards, which may include variable surfaces, loose objects, personnel, birds and propeller wash, rotor wash and jet blast;
- (j) simulated abnormal and emergency situations;
- (k) simulated hazardous weather.

**4 Underpinning knowledge of the following:**

- (a) engine failure scenarios and procedures for partial and complete power loss;
- (b) forced landing scenarios and procedures;
- (c) suitable fields for forced landings and precautionary landings;
- (d) considerations when practicing emergencies and abnormal operations;
- (e) causes leading to precautionary landings and precautionary search procedures;
- (f) judging descent profiles in various configurations;
- (g) prioritising activities during emergencies and abnormal situations;
- (h) cause and effect of, and avoidance and recovery actions of, pilot-induced oscillation (PIO);
- (i) cause and effect of, and avoidance of gust-induced oscillation (GIO);
- (j) ditching;
- (k) passenger control and briefing;

- (l) VMC and day VFR flight rules;
- (m) low-flying hazards;
- (n) the fuel system and causes and effects of fuel vaporisation;
- (o) gyroplane operational and starter motor limitations;
- (p) all gyroplane limitations;
- (q) effects of excessive cooling on engine performance during descent and methods to counter these effects;
- (r) use of carburettor heat (if fitted to the gyroplane);
- (s) hazards during maximum-rate descents;
- (t) contents of the aircraft flight manual;
- (u) relevant sections of the AIP;
- (v) effects of 'g' forces during turns;
- (w) effects of induced drag;
- (x) hazards and effects of a sideslip on gyroplane performance and systems (where sideslip is permitted by aircraft flight manual);
- (y) hazards associated with minimum forward airspeed descents;
- (z) ground hazards associated with minimum ground roll and soft-surface operations;
- (za) principles of maximum rate and minimum radius turn;
- (zb) causes of and corrective actions to manage adverse aerodynamic situations;
- (zc) causes and effects of negative 'g' and power pushover.

**[19] Schedule 2, Section 5, subheading LOW LEVEL RATING**

*substitute*

**LOW-LEVEL RATING**

**[20] Schedule 2, Section 5, LOW-LEVEL RATING, LL-PL Powered-light low-level operations – Reserved**

*substitute*

**LL-PL Powered-lift aircraft low-level operations – Reserved**

**[21] Schedule 2, Section 5, LOW-LEVEL RATING, LL-G Gyroplane low-level operations, item 1 (Unit description)**

*omit*

helicopter

*insert*

gyroplane

**[22] Schedule 2, Section 5, AERIAL APPLICATION RATING, AA3 Gyroplane aerial application operation – Reserved**

*substitute*

**AA3 Gyroplane aerial application operation**

**1 Unit description**

This unit describes the skills and knowledge required to conduct aerial application operations other than firefighting operations in gyroplanes.

## **2 Elements and performance criteria**

### **2.1 AA3.1 – Pre-flight actions**

- (a) self-assess personal fitness for flight and planned operation;
- (b) determine suitability of gyroplane for type of operation;
- (c) conduct pre-flight of gyroplane and role equipment to determine serviceability for planned operations;
- (d) check and complete required maintenance documentation as applicable;
- (e) confirm minimum equipment and minimum crew and instrumentation requirements for planned operations are met;
- (f) check operation of role equipment, including the serviceability of the jettison (dump) door;
- (g) check and adjust role equipment calibration;
- (h) planning and risk management;
- (i) determine the requirement to operate at low level;
- (j) identify hazards, analyse the risks and implement a decision to safely conduct low-level operations – ensure gyroplane type and performance is appropriate for the task;
- (k) assess and allow for the effects of fatigue and physical health on pilot performance;
- (l) analyse and apply actual and forecast weather conditions to low-level operations;
- (m) develop an aerial application management plan;
- (n) interpret treatment area map;
- (o) understand that aircraft limitations apply to the operation except those exempted by CASA (maximum take-off weight);
- (p) identify potential hazards and operational requirements, assess risks and apply risk controls, including powerlines, houses, susceptible crops and environmentally-sensitive areas;
- (q) demonstrate an ability to make a command decision on the safety or otherwise of the proposed application, including refusing to undertake an application where the risks are considered to be too high;
- (r) make appropriate selection of application pattern and direction of treatment taking into consideration safety, efficiency, hazards and terrain;
- (s) plan fuel requirements;
- (t) confirm acceptable aircraft performance for conditions;
- (u) confirm location of ground support personnel;
- (v) confirm normal and abnormal ops communications and signals;
- (w) confirm logistical considerations are in place, including local airstrip condition, fuel, products, ground support and access to strip, SARWATCH, water, and personal supplies, including adequate water and food.

### **2.2 AA3.2 – Fly to, assess, land and take off from an operational airstrip**

- (a) perform low-level navigation to an operational airstrip at an appropriate height;
- (b) perform assessment of an operational airstrip, including strip length, conditions, direction, identification of hazards, meteorological conditions;
- (c) select the most suitable loading area;
- (d) perform pre-landing and pre-take-off checks;
- (e) select a 'no go, go around, commitment' point for landings;
- (f) select a touchdown point for landings;
- (g) identify and manage issues relating to aircraft weight, performance, strip length, slope, surface, direction, load, surrounds, hazards and meteorological conditions;
- (h) demonstrate appropriate short-field landing and take-off techniques and being prepared to dump if required;

- (i) identify an appropriate dumping point for each take-off, including adequate safety buffers;
  - (j) demonstrate operations from a 1-way airstrip.
- 2.3 **AA3.3 – Fly between operational airstrip and application area**
- (a) perform low-level navigation from an operational airstrip to an application area;
  - (b) select the most appropriate route and height between the operational strip and application area considering terrain, stock, populated areas, housing and hazards.
- 2.4 **AA3.4 – Conduct operations at a certified aerodrome**  
Perform operations in accordance with the published procedures and requirements.
- 2.5 **AA3.5 – Conduct an aerial survey of a treatment area**
- (a) develop an appropriate plan for conduct of an aerial survey;
  - (b) identify the treatment area boundaries;
  - (c) confirm map accuracy;
  - (d) identify susceptible crops and environmentally-sensitive areas;
  - (e) identify hazards on the map;
  - (f) identify potential emergency landing area(s);
  - (g) check and identify any hazards not on the map, including sun glare and shadows from hills;
  - (h) assess wind speed and direction;
  - (i) identify clean-up runs required;
  - (j) confirm or amend the aerial application management plan, including pattern type and direction of treatment and possible suspension of application if conditions are not acceptable.
- 2.6 **AA3.6 – Fly gyroplane at low level**  
Identify and avoid buildings, personnel, vehicles, animals, vegetation and nuisance areas.
- 2.7 **AA3.7 – Perform steep turns and procedure turns at or below 500 ft AGL**
- (a) conduct balanced steep-level ( $\pm 100$  ft) climbing and descending turns at a nominated speed;
  - (b) conduct procedure turns with varying power settings.
- 2.8 **AA3.8 – Manoeuvre and navigate at low level**
- (a) manoeuvre gyroplane at a height below 500 ft AGL;
  - (b) navigate gyroplane to a predetermined destination at altitudes at or below 500 ft AGL;
  - (c) demonstrate awareness of wind effect in the vicinity of obstructions, mountainous terrain and illusions;
  - (d) identify wind velocity;
  - (e) recognise and manage illusions of slipping and skidding during turns in windy conditions;
  - (f) recognise and manage impact of sun glare on increased risk of collision with obstacles;
  - (g) operate adjacent to powerlines and wires;
  - (h) identify requirement to operate in the vicinity of powerlines and wires and manage risk;
  - (i) identify poles, cross trees, wires and insulators to assist powerline and wire location;
  - (j) recognise and manage effect of rising and descending terrain on gyroplane performance;

- (k) demonstrate operation from non-certified or registered landing areas;
  - (l) re-enter treatment area with gyroplane aligned for treatment run;
  - (m) identify and monitor wind speed and direction;
  - (n) recognise and manage adverse effects of wind caused by terrain and obstructions;
  - (o) recognise and manage false horizon illusions;
  - (p) maintain a constant altitude over featureless terrain or water;
  - (q) establish and maintain appropriate height and speed over treatment area.
- 2.9 **AA3.9 – Manage flight at low speed and flight behind the power curve**
- (a) recognise approach to minimum level flight speed during any phase of flight;
  - (b) resume normal balanced flight before entering flight behind the power curve;
  - (c) recover from flight behind the power curve at simulated low level in accordance with the height-velocity diagram.
- 2.10 **AA3.10 – Execute forced landing from below 500 ft AGL**
- (a) identify potential forced-landing areas before and during low-level operations;
  - (b) recognise engine failure or any other emergency requiring a forced landing and execute recall actions;
  - (c) maintain control of gyroplane – select the most appropriate landing area within gliding distance while avoiding any powerlines or obstructions;
  - (d) manoeuvre gyroplane to a landing area that achieves the safest outcome;
  - (e) explain plan of action and landing techniques that would ensure the safest outcome when committed to forced landing on unfavourable terrain or water.
- 2.11 **AA3.11 – Conduct operations over and under powerlines**
- (a) identify powerlines both in and outside the treatment area during an aerial survey;
  - (b) interpret powerline infrastructure cues so as to aid wire run identification;
  - (c) demonstrate technique for accurately assessing wire height, including flying parallel to wires;
  - (d) identify and manage other hazards relevant to operations near powerlines, such as pole stays, crop height, fences or machinery;
  - (e) make command decisions whether to fly over or under a wire;
  - (f) conduct treatment over wires, including adequate safety buffers for pull-up and let-down and accurate cut-off and on of application equipment;
  - (g) conduct treatment under wires, including safe clearance;
  - (h) terminate approaches towards powerlines when passage beneath is unachievable;
  - (i) explain the relevant human factors that may affect operations near powerlines, particularly distraction, short-term memory limitations and inattentive blindness.
- 2.12 **AA3.12 – Apply substances**
- (a) apply substances in accordance with aerial application management plan;
  - (b) establish and maintain correct application height relevant to terrain, application type and meteorological conditions;
  - (c) control airspeed and flight profile appropriately on entry/re-entry to treatment area;
  - (d) engage and shut off application equipment at appropriate points;
  - (e) manoeuvre around and over hazards in the treatment area with adequate safety buffers;
  - (f) use aircraft smoker (if fitted) to identify and monitor wind direction;
  - (g) monitor application flow rate, pressure and product remaining;
  - (h) conduct clean-up runs, including extra safety check for hazards;
  - (i) demonstrate command decisions to continue with, amend or suspend operations due to changing conditions.



- 2.13 **AA3.13 – Operate at low level in hilly terrain**
- (a) manipulate gyroplane at low level in hilly terrain;
  - (b) establish and maintain safe height relevant to application type;
  - (c) demonstrate contour flying;
  - (d) identify and select appropriate natural markers to aid situational awareness;
  - (e) demonstrate approaches to higher ground, including identification of escape routes;
  - (f) demonstrate turns in hilly terrain;
  - (g) demonstrate awareness and management of the effects of wind and turbulence in hilly terrain, including lee effects;
  - (h) demonstrate awareness of illusions in hilly terrain, including false horizon effect and shadows.
- 2.14 **AA3.14 – Manage abnormal and emergency situations during low-level operations**
- (a) identify potential forced-landing areas before and during aerial application operations;
  - (b) identify abnormal or emergency situation;
  - (c) conduct abnormal or emergency procedures during application operations;
  - (d) maintain control of gyroplane, jettison load if required, and avoid any powerlines or hazards;
  - (e) conduct a practice forced landing from 500 ft.
- 2.15 **AA3.15 – Jettison load (simulated where not fitted)**
- (a) jettison a full liquid load during take-off before lift off, and maintain control of gyroplane;
  - (b) jettison a full liquid load immediately after take-off and maintain control of gyroplane;
  - (c) jettison a full liquid load during flight and control pitch changes to ensure maintenance of altitude (+100/-0 ft) by adjustments of cyclic and power.
- 3 Range of variables**
- (a) activities are performed in accordance with published procedures;
  - (b) day VFR in variable weather conditions;
  - (c) approved aircraft;
  - (d) approved low-flying areas;
  - (e) operational airstrips;
  - (f) man-made or natural obstacles;
  - (g) undulating, hilly or mountainous terrain;
  - (h) emergency and abnormal situations;
  - (i) hazardous weather conditions;
  - (j) mental and physical fatigue;
  - (k) heat stress and dehydration;
  - (l) maintaining situational awareness;
  - (m) in-flight distractions.
- 4 Underpinning knowledge of the following:**
- (a) CASA exemptions relating to maximum take-off weight and applicability of other aircraft limitations;
  - (b) applicable regulations that relate to the conduct of a safe operation;
  - (c) low-level meteorology;
  - (d) relevant aerodynamics and aircraft performance;
  - (e) aircraft flight manual, performance, engine and systems;

- (f) human factors;
- (g) safety hazards and risks of flight at low level;
- (h) role equipment;
- (i) factors to be considered when determining payload weight for each application;
- (j) aircraft configuration for the gyroplane being flown, when jettisoning a full load;
- (k) characteristics of the gyroplane being flown when jettisoning a full load;
- (l) flight control and throttle actions required to maintain control of the gyroplane being flown when jettisoning a full load.

**[23] Schedule 2, Section 5, FIR9 Multi-crew training endorsement, clause 3 (Range of variables), paragraph (c)**

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classroom

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**[24] Schedule 2, Section 6, after FAE-9 Formation flying — helicopter**

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**FAE-10 Formation flying — gyroplane**

**1 Unit description**

This unit describes the skills and knowledge required to fly a gyroplane in formation, plan a formation flight, brief all participants and lead a formation.

**2 Elements and performance criteria**

**2.1 FAE-10.1 – Fly echelon formation**

- (a) maintain the specified echelon right and left formation stations while remaining in the lateral plane of the lead aircraft during all manoeuvres and phases of flight;
- (b) balance gyroplane;
- (c) apply standard clear and concise radiotelephony phraseology to ensure precise advice to formation lead and other formation aircraft;
- (d) perform pairs take-off;
- (e) perform pairs stream take-off and join up;
- (f) apply specified procedures and hand signals (non-verbal) for take-off;
- (g) maintain the specified echelon position during take-off.

**2.2 FAE-10.2 – Fly line astern formation**

- (a) maintain the specified line astern formation station while remaining stepped down and in line astern with the lead aircraft during all manoeuvres and phases of flight;
- (b) maintain in line with lead aircraft;
- (c) balance gyroplane.

**2.3 FAE-10.3 – Perform station changes**

Manoeuvre the gyroplane to specified alternative formation stations during all phases of flight in the briefed sequence, while remaining clear of all other formation aircraft.

**2.4 FAE-10.4 – Perform manoeuvres in echelon and line astern**

- (a) straight and level at various airspeeds;
- (b) level turns at various airspeeds;
- (c) climbing:

- (i) straight;
- (ii) turning;
- (d) descending at various speeds:
  - (i) straight;
  - (ii) turning;
- (e) flight in various aircraft configurations:
  - (i) straight and level;
  - (ii) turning and level;
  - (iii) descending in straight flight;
  - (iv) descending and turning;
- (f) perform break and rejoin:
  - (i) recognise loss of contact with formation or any other requirement to break away and implement a decision to break away from the formation;
  - (ii) break away from formation lead by creating positive track and height separation with the remaining formation aircraft;
  - (iii) notify formation leader of break away;
  - (iv) maintain track and height separation until cleared by formation leader to rejoin the formation;
  - (v) regain visual contact with leader;
  - (vi) transmit rejoin intentions;
  - (vii) maintain vertical separation with the remaining formation aircraft;
  - (viii) establish and manage overtaking speed while maintaining vertical separation;
- (g) establish a flight path that will ensure the gyroplane will pass behind and below the formation in the event of a join-up overshoot and position the gyroplane into the recognised formation position;
- (h) perform circuit and stream landing:
  - (i) conduct formation break into the circuit;
  - (ii) maintain separation with other formation aircraft;
  - (iii) manage wake turbulence;
  - (iv) land in turn;
  - (v) perform formation landing;
- (i) maintain formation position;
- (j) carry out pre-landing checks;
- (k) configure aircraft on leader's call;
- (l) land aircraft:
  - (i) after landing, ensure horizontal and lateral separation is established;
  - (ii) after clearing runway establish formation taxiing position;
  - (iii) conduct after-landing checks;
- (m) perform formation overshoot:
  - (i) maintain formation position;
  - (ii) configure gyroplane on instructions from leader;
  - (iii) complete applicable after take-off checks.

## 2.5 **FAE-10.5 – Plan a formation flight**

- (a) identify the task requirements for the flight;
- (b) arrange crews, briefing venue and time, and coordinate aircraft availability;
- (c) analyse tasks to be achieved and determine the manoeuvres and formations that ensure safe achievement of the task;

- (d) plan flight route to allow task achievement in the time available and within performance capabilities of the flight, while complying with all air traffic, area limitations and navigation requirements;
- (e) plan actions in the event of abnormal or emergency situations involving the formation.

**2.6 FAE-10.6 – Brief and debrief formation pilots**

- (a) explain and confirm the ground and flight manoeuvres to be conducted;
- (b) explain and confirm timings, routes, speeds and altitudes to be flown;
- (c) identify and nominate deputy leader and explain and confirm responsibilities;
- (d) explain and confirm communication procedures, in-flight minimum fuel, abnormal and emergency procedures and method of return for landing;
- (e) identify achievements and any faults or errors that occurred during the formation flight and provide guidance and feedback to other formation members during the post-flight debrief.

**2.7 FAE-10.7 – Lead a formation flight**

- (a) manoeuvre lead aircraft using controlled corrective action to ensure a stable platform for pilots flying in formation stations;
- (b) manoeuvre the formation anticipating and allowing for formation size, proximity to obstructions, terrain, airspace limitations, weather conditions and air traffic, while ensuring compliance with regulatory requirements;
- (c) direct and control the formation using precise standard radio phraseology and hand and other signal procedures;
- (d) manage lost contact procedures in accordance with standard operating procedures;
- (e) monitor formation members' flight performances and react appropriately to any problems.

**2.8 FAE-10.8 – Manage abnormal and emergency situations during formation flight**

- (a) control aircraft and formation when leading;
- (b) manage abnormal or emergency situations in accordance with standard operating procedures or the aircraft flight manual, both as flight leader and as pilot in command of a non-lead aircraft.

**3 Range of variables**

- (a) activities are performed in accordance with published procedures;
- (b) day VFR;
- (c) 2 or more aircraft.

**4 Underpinning knowledge of the following:**

- (a) left and right echelon positions for the gyroplane being flown;
- (b) the reference points that are used to achieve a specified formation position;
- (c) line astern position for the gyroplane being flown;
- (d) how to manoeuvre from echelon to line astern;
- (e) how to manoeuvre from echelon right to echelon left;
- (f) how to manoeuvre from line astern to echelon;
- (g) the verbal and non-verbal signals for:
  - (i) commence take off roll;
  - (ii) position changes;
  - (iii) radio receiver failure;
  - (iv) radio transmitter failure;
- (h) lost contact procedure;

- (i) formation rejoin procedures.

**[25] Schedule 3, Appendix 1., Section 1.1, Unit 1.1.4 RBKG: RPL Basic aeronautical knowledge – gyroplane – *Reserved***

*substitute*

**Unit 1.1.4 RBKG: RPL Basic aeronautical knowledge – gyroplane**

**1. Power plants and systems**

**1.1 Prerotation systems**

- 1.1.1 Describe types of prerotation systems and their operation.

**2. Aerodynamics**

**2.1 Lift and drag**

- 2.1.1 Match each of the following terms with an appropriate definition in relation to a gyroplane rotor:

- (a) production of lift by rotor;
- (b) advancing and retreating blades;
- (c) autorotation;
- (d) rotor disc area;
- (e) blade coning;
- (f) tip path plane;
- (g) disc loading;
- (h) translational lift;
- (i) retreating blade stall;
- (j) dissymmetry of lift;
- (k) teetering hinge;
- (l) centrifugal force;
- (m) effect of engine torque;
- (n) self-governing aspect;
- (o) reverse airflow;
- (p) coordinated flight.

**3. Rotor systems**

**3.1 Rotor systems**

- 3.1.1 Describe the operation of the cyclic control.
- 3.1.2 Describe the operation and application of the following:
  - (a) trim devices;
  - (b) rotor RPM gauge;
  - (c) rotor brake;
  - (d) prerotator/spin-up control;
  - (e) achieving rotor rigidity;
  - (f) securing rotor blades;
  - (g) ground effect.

## **4. Operations and performance**

### **4.1 Take-off and landing performance**

- 4.1.1 Describe effect of a cross-wind during taxi, take-off and landing.
- 4.1.2 Describe use of height-velocity diagram.
- 4.1.3 State effect (increase/decrease) of the following factors on take-off, landing, and take-off climb performance:
  - (a) strength of headwind/tailwind component;
  - (b) air temperature;
  - (c) density height (non-standard conditions);
  - (d) airfield elevation;
  - (e) runway slope and surface, including wet and soft runways;
  - (f) ground effect and windshear;
  - (g) long and/or wet grass;
  - (h) best angle of climb and best rate of climb.

### **4.2 Descents**

- 4.2.1 State the effect on rate, angle of descent and attitude resulting from changes in the following:
  - (a) power – constant IAS;
  - (b) idle power – constant IAS.
- 4.2.2 Describe methods of achieving maximum rate of descent.
- 4.2.3 State the effect of headwind/tailwind on the glide path and glide distance (relevant to the earth's surface).
- 4.2.4 Describe risks associated with minimum forward airspeed descents.

### **4.3 Turning**

- 4.3.1 Describe rotor disc position in a turn.
- 4.3.2 Describe what is meant by a balanced turn in relation to the yaw string.
- 4.3.3 Explain why a gyroplane executing balanced level turns at low level may appear to slip or skid when turning from downwind and into wind and from into wind to downwind.
- 4.3.4 State use of power in maintaining a level turn.
- 4.3.5 Describe method of losing height in a turn.

### **4.4 Level flight**

- 4.4.1 Describe the factors that determine maximum airspeed in level flight.
- 4.4.2 Describe the factors that determine minimum airspeed for sustained level flight.
- 4.4.3 Describe the power available and power required curves and their relationship to the following:
  - (a) best speed for range;
  - (b) best speed for endurance;
  - (c) backside of the power curve;
  - (d) behind the power curve.

### **4.5 Landing**

- 4.5.1 Explain slowing rotor RPM post-landing.

#### 4.6 Gyroplane limitations

- 4.6.1 Understand the causes and effects of, and avoidance and recovery procedure for, the following:
- (a) power pushover;
  - (b) pilot-induced oscillation (PIO);
  - (c) gust-induced oscillation (GIO);
  - (d) fast taxi/low rotor RPM;
  - (e) turning limitations during taxi in windy conditions;
  - (f) rapid acceleration on take-off;
  - (g) rotor shake on take-off;
  - (h) lift off low airspeed/high angle of attack;
  - (i) blade flapping/overteetering;
  - (j) negative flight load manoeuvres;
  - (k) high-speed flight;
  - (l) spiral descent;
  - (m) extending the glide;
  - (n) extreme turbulence;
  - (o) ground resonance;
  - (p) behind power curve/minimum level flight speed;
  - (q) taxiing on rough terrain;
  - (r) unsecured rotor blades;
  - (s) rotor blade contamination.

#### 4.7 Other

- 4.7.1 Explain why gliding at any indicated airspeed other than the speed for minimum rate of descent will reduce the gliding distance that can be achieved in still air.

### [26] Schedule 3, Appendix 1., Section 1.2, Unit 1.2.6 PAKG: PPL aeronautical knowledge – gyroplane

*substitute*

#### Unit 1.2.6 PAKG: PPL aeronautical knowledge – gyroplane

##### 1. Power plants and systems

##### 1.1 Rotor systems

- 1.1.1 Describe the differences between the following rotor systems:
- (a) semirigid rotor;
  - (b) articulated rotor.
- 1.1.2 Explain each of the following terms in relation to a gyroplane rotor:
- (a) vectors acting on various sections of a rotor blade in flight;
  - (b) rotational velocity;
  - (c) pitch angle;
  - (d) rotor force;
  - (e) reverse flow;
  - (f) axis of rotation;
  - (g) state the relationship between CG position, rotor force and stability;

- (h) relationship of thrust line profile and CG.

## **1.2 Take-off and landing performance**

- 1.2.1 Differentiate between pressure height and density height.
- 1.2.2 Describe how to use an altimeter to obtain:
  - (a) pressure height of an aerodrome;
  - (b) elevation of an aerodrome.
- 1.2.3 Explain the following terms:
  - (a) maximum structural take-off and landing weight;
  - (b) climb weight limit.
- 1.2.4 State the likely results of exceeding gyroplane weight limits.

## **[27] Schedule 3, Appendix 1., Section 1.2, Unit 1.2.12 CAKG: CPL aeronautical knowledge – gyroplane – Reserved**

*substitute*

### **Unit 1.2.12 CAKG: CPL aeronautical knowledge – gyroplane**

#### **1. Propellers**

- 1.1 Compare performance characteristics of various propeller and engine systems, including the following:
  - (a) gyroplanes with fixed-pitch propellers and those fitted with a variable-pitch propeller;
  - (b) engine operation (within limits) at high MP/low RPM and low MP/high RPM;
  - (c) normally aspirated and turbocharged/supercharged engines.
- 1.2 Explain the following in relation to a variable-pitch propeller adopting either a full fine or full coarse pitch when the propeller oil pressure is lost:
  - (a) centrifugal twisting moment (CTM) tends to reduce (fine) pitch;
  - (b) counter weights, when used, increase (coarsen) pitch;
  - (c) oil pressure is used to decrease pitch if counterweights are fitted;
  - (d) oil pressure is used to increase pitch if counterweights are not fitted.
- 1.3 Describe the following terms:
  - (a) blade angle, helix angle/pitch;
  - (b) propeller thrust and torque;
  - (c) thrust horsepower (THP);
  - (d) brake horsepower (BHP).
- 1.4 Describe how a propeller converts engine power into thrust and explain what is meant by fine and coarse pitch stops.

#### **2. Constant speed units (CSU)**

- 2.1 Explain the principle of operation of a CSU.
- 2.2 Describe the effect of a CSU malfunction on engine operation.
- 2.3 Explain the method of using engine controls in the event of a malfunction of a CSU.



- 2.4 Describe the cockpit indications in a gyroplane fitted with a variable-pitch propeller which could signify:
- (a) the presence of engine ice; and
  - (b) when engine ice has been cleared after application of carburettor heat.
- 2.5 Explain the effect of using carburettor heat on gyroplanes fitted with a CSU.
- 2.6 Describe how power output is controlled when operating gyroplanes fitted with a variable-pitch propeller and describe how engine instruments are used to monitor power.
- 2.7 List the precautions necessary if operating a variable-pitch propeller when:
- (a) conducting ground checks; and
  - (b) changing power (i.e. use of throttle/RPM levers).

### **3. Undercarriage system**

- 3.1 Describe the purpose and function of the following:
- (a) oleos/shock struts;
  - (b) shimmy dampers;
  - (c) nosewheel steering/castoring.
- 3.2 Describe the purpose and function of the following retractable undercarriage components:
- (a) uplocks/down locks;
  - (b) anti-retraction devices;
  - (c) aural/visual warning devices;
  - (d) emergency systems;
  - (e) free fall;
  - (f) electric, hydraulic, pneumatic.

## **[28] Schedule 3, Appendix 1., Section 1.3, Unit 1.3.4 CADG: CPL aerodynamics – gyroplane – *Reserved***

*substitute*

### **Unit 1.3.4 CADG: CPL aerodynamics – gyroplane**

#### **1. Aerodynamics**

##### **1.1 Rotor blade aerodynamics**

- 1.1.1 Explain the aerodynamic properties of a rotor blade in respect to the following:
- (a) aerofoil shape;
  - (b) blade twist.
- 1.1.2 Explain the meaning of the following terms:
- (a) rotor force;
  - (b) rotor drag;
  - (c) total resultant;
  - (d) relative wind;
  - (e) rotational airflow;
  - (f) dissymmetry of lift;
  - (g) centrifugal force;

- (h) blade coning;
  - (i) blade flapping/overteetering;
  - (j) retreating blade stall;
  - (k) translational lift.
- 1.1.3 Explain the vectors acting on a rotor blade in flight.
- 1.1.4 Calculate rotor disc loading.
- 1.1.5 Explain the causes and effects of, and avoidance and correct recovery procedure for, the following:
- (a) power pushover;
  - (b) flight on backside of the power curve;
  - (c) flight behind the power curve;
  - (d) rotor vibration on take-off;
  - (e) negative flight load manoeuvres;
  - (f) high-speed flight;
  - (g) ground resonance;
  - (h) pilot-induced oscillation;
  - (i) lift off/low airspeed and high angle of attack.

## **2. Autorotative flight**

- 2.1 Explain the meaning of the following terms:
- (a) autorotation;
  - (b) autorotation in forward flight;
  - (c) vertical autorotation.

## **3. Manoeuvres**

- 3.1 Explain the relationship between speed, bank angle, radius and rate of turn during a balanced level turn.
- 3.2 For a given IAS, determine the approximate angle of bank to achieve a rate 1 turn (360° in 2 minutes).
- 3.3 Explain height/velocity diagram.

### **[29] Schedule 3, Appendix 1, Section 1.4, Unit 1.4.1, heading**

*omit*

**AAGC**

*insert*

**AGKC**

### **[30] Schedule 3, Appendix 1, Section 1.4, Unit 1.4.2, heading**

*omit*

**AAGA**

*insert*

**AGKA**

**[31] Schedule 3, Appendix 1, Section 1.4, Unit 1.4.3, heading**

*omit*

**AAGH**

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**AGKH**

**[32] Schedule 3, Appendix 1., Section 1.5, Unit 1.5.5 PFRG: PPL flight rules and air law – gyroplane – *Reserved***

*substitute*

**Unit 1.5.5 PFRG: PPL flight rules and air law – gyroplane**

**1. Flight Rules**

**1.1 Documentation**

1.1.1 Given an item of operational significance:

- (a) select the appropriate reference document – CAR, CASR, CAO, AIP (Book), CAAP; and
- (b) extract relevant and current information from these documents.

1.1.2 Decode information contained in ERSA, NOTAM and AIP supplements.

1.1.3 Understand the terms and abbreviations in AIP GEN that are relevant to flight in accordance with VFR.

**2. Licence privileges and limitations**

2.1 State the privileges and limitations of the PPL gyroplane.

2.2 For the PPL with gyroplane category rating, describe:

- (a) recent experience requirements;
- (b) classification of operations.

**3. Flight rules and conditions of flight**

3.1 Describe which documents must be carried on board an aircraft during flight in Australian airspace.

3.2 Apply the relevant rules that relate to the following:

- (a) carriage and discharge of firearms;
- (b) aerodromes where operations are not restricted to runways;
- (c) the conditions relating to flight in PRD areas;
- (d) the conditions relating to flight in Designated Remote Areas.

3.3 Apply the relevant rules that relate to the following:

- (a) aerodrome meteorological minima;
- (b) flights over water;
- (c) carriage of:
  - (i) cargo; and
  - (ii) sick and disabled persons; and
  - (iii) parachutists; and
  - (iv) dangerous goods; and

- (v) animals; and
- (vi) flotation and survival equipment; and
- (vii) firearms.

- 3.4 State the requirements to test radio equipment before taxi and maintain a listening watch.
- 3.5 Extract the restrictions pertaining to the carriage of passengers on certain flights.
- 3.6 Recall the precautions pertaining to the security of safety harnesses and other equipment before solo flight in dual control aircraft.

#### **4. Aerodromes**

- 4.1 State a pilot's responsibilities relating to the use of aerodromes.

#### **5. Airspace**

- 5.1 Differentiate between the various classifications of airspace.
- 5.2 With respect to the following terms, explain each term, identify any airspace boundaries on appropriate charts, and extract vertical limits of designated airspace from charts or ERSA:
  - (a) flight information service FIR, FIA, OCTA;
  - (b) ATC service CTA, CTR;
  - (c) radio 'reports' and 'broadcasts';
  - (d) VFR route and lanes of entry;
  - (e) PRD areas;
  - (f) CTAF areas;
  - (g) controlled aerodromes.

#### **6. Altimetry**

- 6.1 Recall the datum from which an altimeter indicates height when the following are set on the subscale:
  - (a) area QNH;
  - (b) local QNH;
  - (c) QFE;
  - (d) standard pressure setting.
- 6.2 Recall the procedures that are carried out with the altimeter at the transition altitude and the transition layer on climb and descent.
- 6.3 Derive from AIP the transition layer for any given area QNH.
- 6.4 Recall the method of using an altimeter to derive local QNH.
- 6.5 Recall the meaning of the following:
  - (a) height;
  - (b) altitude;
  - (c) flight level.
- 6.6 Recall the following parameters from the ICAO standard atmosphere:
  - (a) MSL temperature;
  - (b) pressure lapse rate.

## **7. Security**

- 7.1 Explain the term ADIZ and extract from the AIP:
- (a) the general requirements for operations in this zone; and
  - (b) the action by the pilot of the intercepted aircraft.
- 7.2 State the powers vested in a pilot in command.

## **8. Emergencies and SAR**

- 8.1 Describe what the intermittent use of navigation and landing lights by an aircraft are used to indicate.
- 8.2 State the difference between an incident and an accident.
- 8.3 Reserved.
- 8.4 Explain the term SARTIME and how it might be used.
- 8.5 State the document that contains emergency procedures.
- 8.6 Extract from the AIP and ERSA the responsibilities of a pilot regarding.
- (a) the notification of accidents and incidents; and
  - (b) emergency procedures.
- 8.7 Describe examples of "hazards to navigation" that must be reported by pilots.

### **[33] Schedule 3, Appendix 1., Section 1.5, Unit 1.5.11 CFRG: CPL flight rules and air law – gyroplane – *Reserved***

*substitute*

#### **Unit 1.5.11 CFRG: CPL flight rules and air law – gyroplane**

### **1. Limitations**

- 1.1 Describe the requirements for holding flight crew licences, ratings and endorsements that apply to gyroplane operations.
- 1.2 Describe the obligations gyroplane pilots must comply with in relation to general competency, flight reviews and proficiency checks.
- 1.3 Describe the rules pertaining to flight and duty time limitations for CPL licence holders.

### **2. Air operations**

- 2.1 Describe circuit procedures for gyroplane operations.
- 2.2 Describe the requirements for operating in Classes C and D airspace and special VFR clearance provisions.
- 2.3 State the minimum flight instruments required to operate a gyroplane under VFR.
- 2.4 State the rules for placarding unserviceable instruments.

**[34] Schedule 3, Appendix 1., Section 1.9, Unit 1.9.4 POPG: PPL operations, performance and planning – gyroplane – *Reserved substitute***

**Unit 1.9.4 POPG: PPL operations, performance and planning – gyroplane**

**1. General flight planning and performance**

1.1 Determine whether a given ALA is suitable for a gyroplane to take off and land safely in accordance with guidelines contained in CASA guidance material.

**2. Take-off and landing performance**

2.1 State the effect (increase/decrease) of the following factors on take-off, landing, and take-off climb performance:

- (a) strength of headwind/tailwind component;
- (b) air temperature;
- (c) QNH;
- (d) density height (non-standard conditions);
- (e) airfield elevation;
- (f) runway slope and surface, including wet and slushy runways;
- (g) ground effect and windshear;
- (h) frost on an aircraft.

2.2 Differentiate between pressure height and density height.

2.3 Explain the terms:

- (a) maximum structural take-off and landing weight; and
- (b) climb weight limit.

2.4 State the likely results of exceeding gyroplane weight limits.

**3. Density height**

3.1 Using the methods under subsection 3.2, determine density height, given the following:

- (a) OAT and pressure height;
- (b) using cockpit temperature and an altimeter setting of 1013.2 hPa.

3.2 For subsection 3.1, the methods are the following:

- (a) density altitude charts;
- (b) manual computer;
- (c) aircraft flight manual charts;
- (d) mathematics.

**4. Take-off and landing performance**

4.1 Use the aircraft flight manual to extract maximum structural take-off and landing weights.

4.2 Given a typical flight scenario, use performance charts to extract:

- (a) maximum take-off weight A;
- (b) maximum landing weight A;
- (c) take-off distance required (TODR) B;

- (d) landing distance required (LDR) B;
- (e) climb weight limit.

## **5. Climb, cruise and descent performance**

- 5.1 From typical charts or tables extract/determine the following data for climb, cruise and descent:
- (a) time, speed, distance, fuel flow/quantity;
  - (b) appropriate engine settings;
  - (c) rates of climb/descent;
  - (d) the conditions under which a gyroplane will achieve maximum range and endurance.

**[35] Schedule 3, Appendix 1., Section 1.9, Unit 1.9.8 COPG: CPL operations, performance and planning – gyroplane – *Reserved substitute***

## **Unit 1.9.8 COPG: CPL operations, performance and planning – gyroplane**

### **1. Operational knowledge**

#### **1.1 Aerodromes and gyroplane landing areas (ALAs)**

- 1.1.1 ALAs are included as a topic in this syllabus for the purposes of a pilot's responsibilities in accordance with CAR and CASR.
- 1.1.2 Explain and apply the following terms used in CASA publications and documents:
  - (a) take-off distance available (TODA);
  - (b) take-off distance required (TODR);
  - (c) landing distance available (LDA);
  - (d) landing distance required (LDR).
- 1.1.3 Determine whether a given aerodrome or ALA is suitable for a gyroplane to take off and land safely in accordance with guidelines contained in CASA guidance material.

### **2. Climb, cruise and descent performance**

- 2.1 From typical charts or tables extract/determine the following data for climb, cruise and descent:
- (a) time, speed, distance, fuel flow/quantity;
  - (b) appropriate engine settings;
  - (c) rates of climb/descent;
  - (d) the conditions under which a gyroplane will achieve maximum range and endurance.

### **3. Forward climb performance**

- 3.1 Given graphical or tabular information typical of that provided in an aircraft flight manual for a single-engine gyroplane, extract the following:
- (a) the best rate of climb for various conditions of pressure altitude, temperature and weight;

- (b) the service ceiling for various conditions of pressure altitude, temperature and weight.

#### **4. Cruise performance**

- 4.1 Given graphical or tabular information typical of that provided in an aircraft flight manual for a single-engine gyroplane, calculate the following:
- (a) maximum payload which may be carried after determining the fuel requirements and the nature of the operation;
  - (b) endurance for holding or search for various combinations of gyroplane weight and fuel;
  - (c) maximum range, given weight, fuel carried and cruising altitude.

#### **5. Weight and balance**

- 5.1 Given a typical aircraft flight manual for a single-engine gyroplane:
- (a) extract the following weight and balance information:
    - (i) MTOW;
    - (ii) capacity and arm of the baggage lockers;
    - (iii) capacity, arm, grade and specific gravity of the fuel;
    - (iv) location and arms of the seating;
  - (b) determine the forward, aft and lateral limits of the CG for a given weight in the case of the above gyroplane;
  - (c) determine whether the gyroplane is safely loaded for flight given various combinations of weight and balance data using arithmetical methods or the specified loading system for the gyroplane;
  - (d) calculate the adjustment of load required to achieve a CG within specified limits if previously determined to be outside limits;
  - (e) calculate where to position additional load items so that the CG is retained within the specific limits.

#### **6. Flight plan preparation**

- 6.1 Apply the responsibilities of a pilot in command in relation to weather and operational briefing before planning a VFR flight.
- 6.2 Given a route, select appropriate charts for the flight and list the operations for which it is mandatory to obtain a weather briefing.
- 6.3 List the weather services available, and nominate the sources and methods of obtaining this information.
- 6.4 State the minimum flight notification required, the methods of submitting this notification, and identify the flight plan details that must be submitted.

#### **[36] Schedule 3, Appendix 2, Section 2.3, Unit 2.3.3**

*omit*

##### **1 Reserved**

#### **[37] Schedule 3, Appendix 2, Section 2.3, Unit 2.3.3**

*omit*

##### **Environment affects**



*insert*

#### **Environmental effects**

**[38] Schedule 3, Appendix 2, Section 2.3, Unit 2.3.3, subclause 1.3, heading**

*substitute*

**1.3 Helicopter landing sites (HLS)**

**[39] Schedule 3, Appendix 2, Section 2.3, after Unit 2.3.3**

*insert*

### **Unit 2.3.4 AAGG: aerial application rating – gyroplane endorsement**

#### **1. Aircraft performance**

##### **1.1 Environmental effects**

- 1.1.1 Explain how loads and turn rate affect aircraft performance (airspeed, rotor RPM, disc angle of attack, inertia).
- 1.1.2 Explain ground effect and its impact on aircraft performance.
- 1.1.3 Explain possible aerodynamic and controllability effects associated with load dumping.
- 1.1.4 Explain how temperature, height above mean sea level (AMSL), pressure, humidity, weight, field surface and relative wind affect each of the following:
  - (a) lift-off distance;
  - (b) climb angle;
  - (c) rate of climb;
  - (d) landing stop distance.
- 1.1.5 Explain how temperature, height above mean sea level (AMSL), pressure, and humidity affect power available and power required.

##### **1.2 Determine payload**

Determine the following using information from the aircraft flight manual:

- (a) the maximum payload and fuel that may be carried;
- (b) calculation of CG under different load configurations.

##### **1.3 Height-velocity diagram**

- 1.3.1 Explain the implications of flying inside the gyroplane height-velocity diagram.
- 1.3.2 Explain the implications of allowing speed to decay behind the power curve.

##### **1.4 Rotor disc behaviour**

- 1.4.1 Explain rotor disc behaviour under negative 'g'.
- 1.4.2 Explain the effect of rapid load reduction on the rotor disc and aircraft performance.

##### **1.5 Rotor blade contamination**

- 1.5.1 Explain the degradation of performance with contamination on rotor blades (e.g. mud picked up by rotor during operations).

## **2. Flight and duty times**

2.1 Explain the flight and duty time limitations for pilots conducting aerial application operations.

### **[40] Schedule 3, Appendix 2, Section 2.7, Unit 2.7.1 NVFR: NVFR rating – all aircraft categories**

*substitute*

#### **Unit 2.7.1 NVFR: NVFR rating – all aircraft categories**

### **1. Flight Rules**

- 1.1 Describe the privileges and limitations of the rating.
- 1.2 Describe the minimum NVFR aircraft equipment requirements.
- 1.3 Describe the ALA dimension and lighting requirements as applicable.
- 1.4 Describe the flight planning requirements (including notification and weather forecast requirements).
- 1.5 Describe the requirements for determining LSALT.
- 1.6 Describe the requirements for descent below LSALT.
- 1.7 Explain the alternate aerodrome planning requirements (including night circuit training flights).

### **2. Flight at Night**

#### **2.1 Operations**

- 2.1.1 Describe the principles of operations, limitations and errors for the radio navigation systems used.
- 2.1.2 Explain the requirements for departure and descent for clearance from terrain.
- 2.1.3 Describe the operation of PAL.

#### **2.2 Human factors**

- 2.2.1 Explain the human factors and physiological limitations for the conduct of operations at night as described in CASA guidance material for NVFR operations.

### **[41] Schedule 3, Appendix 3, Section 3.2, Unit 3.2.3 FETR: Flight engineer type rating – all aircraft**

*renumber as Unit 3.2.4*

### **[42] Schedule 3, Appendix 3, Section 3.2, after Unit 3.2.2 TYPH: Pilot type rating – helicopter**

*insert*

#### **Unit 3.2.3 TYPG: Pilot type rating – gyroplane**

### **1. General note for this unit**

The following knowledge standards may not be relevant for all aircraft type ratings and can be ignored if not applicable to an aircraft type.

## **2. Gyroplane limitations and documentation**

- 2.1.1 Identify aircraft limitations and locate information contained in the aircraft flight manual.
- 2.1.2 Perform pre-flight inspection and determine serviceability of the gyroplane for flight.
- 2.1.3 Apply MEL and CDL, where applicable.
- 2.1.4 Determine the effects of ADs, ASB/SB where pilot action may be required, as applicable to type.
- 2.1.5 Aware of licensing obligations for variants, where applicable.

## **3. Weight and balance**

- 3.1.1 Calculate CG for gyroplane and determine if within prescribed limits.
- 3.1.2 Determine trim settings, where applicable.
- 3.1.3 Describe the effects of fuel use and management on CG, if any.
- 3.1.4 Describe the effects of changes to CG on aircraft performance.
- 3.1.5 Awareness of aircraft weight limitations, loading limits, cargo hold limitations, and any load/weight limitations for operational equipment contained in the aircraft flight manual supplement.

## **4. Meteorology and adverse weather operations**

- 4.1.1 Interpret weather forecasts typically required to conduct a flight in the gyroplane.
- 4.1.2 State the requirements for low-visibility operations.
- 4.1.3 Describe the effect on aircraft operations of the following conditions:
  - (a) ice, slush or snow (as applicable);
  - (b) turbulence penetration;
  - (c) heavy rain or falling snow;
  - (d) windshear techniques during take-off, approach and landing (as applicable);
  - (e) cold weather operations (as applicable);
  - (f) low-visibility operations (as applicable).

## **5. Aerodynamics and performance**

- 5.1.1 Describe basic aerodynamics for single main rotor.
- 5.1.2 Describe the following aerodynamic effects as they apply to the particular gyroplane:
  - (a) rotor blade flap;
  - (b) retreating blade stall;
  - (c) effect of engine torque;
  - (d) ground resonance.
- 5.1.3 Determine the airspeeds to meet performance requirements for different configurations and phases of flight.
- 5.1.4 Describe limits of normal operating envelope.
- 5.1.5 Discuss the meteorological performance limiting factors.
- 5.1.6 Discuss any unique operational characteristics, including terrain and environment and runway requirements/limitations.

- 5.1.7 Describe the operation and application of the following:
  - (a) trim devices;
  - (b) rotor RPM gauge;
  - (c) rotor brake;
  - (d) prerotator/spin-up control;
  - (e) height-velocity diagram;
  - (f) securing rotor blades.
- 5.1.8 Determine the airspeeds to meet performance requirements for different phases of flight.
- 5.1.9 Describe manoeuvring below minimum level speed and recovery.

## **6. Fuel and engine oil systems**

- 6.1.1 Describe the following in relation to the gyroplane's fuel system:
  - (a) location of fuel tank/s and capacity;
  - (b) normal and abnormal fuel system operation and distribution;
  - (c) location and type of pumps used;
  - (d) vents system and location of vents and drains;
  - (e) system controls and indicators;
  - (f) minimum grades, colour and additives required, if any;
  - (g) minimum fuel temperature;
  - (h) indications of reduced or loss of fuel flow;
  - (i) determining level of engine oil;
  - (j) oil system indicators and grade of oil required;
  - (k) fuel and oil system limitations.

## **7. Engines**

- 7.1.1 Describe type of engine/s installed, the main components, rated thrust or horsepower and indicators required for operation.
- 7.1.2 State engine start limits, as applicable.
- 7.1.3 Describe engine controls and their function.
- 7.1.4 Describe normal and abnormal engine operations.
- 7.1.5 Describe the operation of the ignition system.
- 7.1.6 Describe the method of feathering and unfeathering the propeller/s, where applicable.

## **8. Electrical system**

- 8.1.1 Describe core components of the gyroplane's electrical system.
- 8.1.2 Describe the system design and operation, including use of AC or DC power, as applicable.
- 8.1.3 Explain the methods of power generation.
- 8.1.4 Describe the electrical system protections and locations of key components.
- 8.1.5 Explain the indications of normal and degraded system operation.
- 8.1.6 Describe the location of connections for external sources of power, if applicable.
- 8.1.7 Describe the use of the APU when used to provide a source of electrical power.

## **9. Hydraulic system**

- 9.1.1 Describe core components of the gyroplane's hydraulic system/s and their method of operation, including alternative sources of operation.
- 9.1.2 Describe normal system operating pressure and system protections to prevent damage to components or system.
- 9.1.3 Explain the method of determining sufficient system capacity, indicators and controls.
- 9.1.4 Describe systems operated by the hydraulic system/s.

## **10. Undercarriage and brakes**

- 10.1.1 Describe the undercarriage system components and safety systems.
- 10.1.2 Explain normal and alternative method of undercarriage operations.
- 10.1.3 Describe the operation of the nosewheel steering system, if installed.
- 10.1.4 Describe the brake system components and normal and abnormal operations.
- 10.1.5 Explain the operation of the anti-skid system and limitations, if installed.
- 10.1.6 Determine brake energy limits and brake cooling requirements.

## **11. Pneumatic system**

- 11.1.1 Describe the gyroplane's pneumatic system components and methods of operation.
- 11.1.2 Describe system limitations and safety devices.

## **12. Environmental system**

- 12.1.1 Explain the operation of the gyroplane's heating, demisting and airconditioning systems and normal and emergency modes of operation and limitations.

## **13. Flight controls**

- 13.1.1 Describe flight controls and their method of operation.
- 13.1.2 Describe limitations and safety features that prevent structural damage to the gyroplane.

## **14. Ice and rain protection**

- 14.1.1 Describe the gyroplane's ice protection system/s, detection systems and explain their operation, if applicable.
- 14.1.2 Describe anti-ice system limitations, if applicable.

## **15. Fire and overheat protection**

- 15.1.1 Describe the fire and overheat protection system/s installed on the gyroplane, including indicators and extinguishing agents used.
- 15.1.2 Determine the serviceability of the system/s.
- 15.1.3 Describe the power sources required for system operation.

## **16. Flight instruments**

- 16.1.1 Describe the system/s that provides data to the primary flight instruments.
- 16.1.2 Describe the power sources for the primary flight instruments/displays.
- 16.1.3 Describe the operation of the warning systems.
- 16.1.4 Describe alternative sources of input or power for flight instrument operation.

16.1.5 Describe the operation of EFIS system and redundant modes of operation.

**17. Navigation and radar systems (when installed)**

- 17.1.1 Describe the operation of the gyroplane's navigation, communication and surveillance system/s.
- 17.1.2 Describe the operation of the gyroplane's navigation receivers and how to determine their operational status and integrity.
- 17.1.3 Describe the gyroplane's weather detection system/s and safety precautions.
- 17.1.4 Explain the operation of the gyroplane's FMS and integration with other aircraft systems.
- 17.1.5 Determine ANP for RNP operations.
- 17.1.6 Describe the operation of the gyroplane's windshear detection system.

**18. Autoflight system (when installed)**

- 18.1.1 Explain the operation of the autopilot and autothrottle, if installed, in flight operation in all modes.
- 18.1.2 Describe failure annunciations, pilot actions and limitations.
- 18.1.3 Explain the integration of aircraft navigation systems with the autoflight system.

**19. Communications**

- 19.1.1 Can operate all the aircraft communication systems, voice and data when installed.
- 19.1.2 Describe the operation of aircraft intercommunication systems.
- 19.1.3 Describe the operation of the communications system in the event of changes in power source.
- 19.1.4 Explain the operation of the CVR and DFDR and requirements for operation.

**20. Airframe**

- 20.1.1 Describe airframe construction, materials, cowling and firewalls, as applicable.
- 20.1.2 Describe rotor system.
- 20.1.3 Describe the operation of the doors, exits, windows and monitoring systems.

**21. Miscellaneous systems**

- 21.1.1 Describe other systems installed in the gyroplane that are likely to be used by the flight crew to operate the gyroplane.
- 21.1.2 Describe the location and operation of emergency equipment installed on the aircraft.

**[43] Schedule 5, Section G, Appendix G.1 RPL Aeroplane category rating flight test, subclauses 3.2 and 3.8, note**

*omit*  
, C3

**[44] Schedule 5, Section G, Appendix G.2 RPL Helicopter category rating flight test, subclause 3.8, note**

*omit*  
C3,

**[45] Schedule 5, Section G, Appendix G.3 RPL Gyroplane category rating flight test, RESERVED**

*substitute*

**Appendix G.3 RPL Gyroplane category rating flight test**

**1. Flight test requirements**

An applicant for a recreational pilot licence with gyroplane category rating flight test must demonstrate the following:

- (a) knowledge of the topics listed in clause 2;
- (b) ability to conduct the activities and manoeuvres mentioned in clause 3, within the operational scope and under the conditions mentioned in clause 4, to the competency standards required under section 12 of this MOS which are relevant to the flight test.

**2. Knowledge requirements**

For paragraph 1 (a), the following topics are listed:

- (a) privileges and limitations of the recreational pilot licence with gyroplane category rating;
- (b) applicability of drug and alcohol regulations;
- (c) aircraft instrument requirements for VFR operations;
- (d) emergency equipment requirements;
- (e) fuel planning and oil requirements for the flight;
- (f) managing passengers and the carriage of cargo;
- (g) aircraft speed limitations;
- (h) aircraft systems.

**3 Activities and manoeuvres**

**3.1** For paragraph 1 (b), the activities and manoeuvres set out in subclauses 3.2 to 3.9 are mentioned.

*Note* The activities and manoeuvres are not required to be conducted in the order in which they appear in this Appendix.

**3.2 Pre-flight**

*Note* The relevant competency standards are in unit codes C2 and C4.

- (a) perform pre-flight actions and procedures;
- (b) perform pre-flight inspection;
- (c) refuel a gyroplane (may be assessed by questioning).

**3.3 Ground operations, take-off, departure and climb**

*Note* The relevant competency standards are in unit codes G1, G2 and G3.

- (a) complete all relevant checks and procedures;
- (b) perform prerotation;
- (c) taxi a gyroplane;
- (d) plan, brief and conduct take-off and departure procedures;
- (e) conduct a cross-wind take-off;
- (f) conduct a short-field take-off;
- (g) conduct a simulated rough or soft-field take-off;

- (h) conduct climbs on constant heading and climbing turns, including at least 2 of the following:
  - (i) best angle of climb ( $V_x$ );
  - (ii) best rate of climb ( $V_y$ );
  - (iii) cruise climb.

### 3.4 En route cruise

*Note* The relevant competency standards are in unit code G3.

- (a) maintain straight and level flight, and turn a gyroplane;
- (b) navigate and transit from a circuit area to a training area and return;
- (c) operate safely in local area airspace;
- (d) establish and maintain cruise flight for at least 1 of the following configurations:
  - (i) turbulence;
  - (ii) high speed.

### 3.5 Test specific activities and manoeuvres

*Note* The relevant competency standards are in unit codes G1, G5 and G6.

- (a) enter and recover from each of the following flight conditions:
  - (i) a spiral descent;
  - (ii) level flight on the backside of the power curve;
  - (iii) flight behind the power curve;
  - (iv) conduct steep-level turns of at least 45° angle of bank;
- (b) manage an engine failure after take-off;
- (c) conduct a precautionary search;
- (d) manage the following malfunctions:
  - (i) a malfunction during start or shutdown;
  - (ii) any 1 of the following that is not performed under subparagraph (i):
    - (A) an aircraft system malfunction;
    - (B) engine or cabin fire;
    - (C) radio failure;
- (e) perform a forced landing.

### 3.6 Descent and arrival

*Note* The relevant competency standards are in unit code G3.

- (a) conduct descents maintaining constant heading and descending turns;
- (b) plan and conduct aerodrome arrival and circuit joining procedures.

### 3.7 Circuit, approach and landing

*Note* The relevant competency standards are in unit codes G3, G4 and G6.

- (a) conduct normal circuit pattern, approach and landing;
- (b) conduct a cross-wind landing;
- (c) conduct a short-field landing;
- (d) perform a go-around procedure;
- (e) perform after-landing actions and procedures.

### 3.8 Shutdown and post-flight

*Note* The relevant competency standards are in unit codes G1 and C2.

- (a) park, shutdown and secure a gyroplane;
- (b) complete post-flight administration.



### 3.9 General requirements

*Note* The relevant competency standards are in unit codes G3, C1, C4, C5, NTS1 and NTS2.

- (a) maintain an effective lookout;
- (b) maintain situational awareness;
- (c) assess situations and make appropriate decisions;
- (d) set priorities and manage tasks effectively;
- (e) maintain effective communication and interpersonal relationships;
- (f) recognise and manage threats;
- (g) recognise and manage errors;
- (h) recognise and manage undesired aircraft states;
- (i) communicate effectively using appropriate procedures for the airspace being used during the test;
- (j) manage the aircraft systems required for the flight;
- (k) manage the fuel system and monitor the fuel plan and fuel usage during the flight;
- (l) manage passengers and the carriage of cargo.

## 4. Operational scope and conditions

4.1 For paragraph 1 (b), the following operational scope applies to the flight test:

- (a) managing an aircraft system, which is not required for the flight, is not an assessable item unless the applicant uses the system during the flight;
- (b) simulated carriage of passengers and cargo;
- (c) simulated private local area operation;
- (d) operating in Class G airspace at a non-towered aerodrome;
- (e) emergencies and abnormal situations relating to aircraft systems, powerplants and the airframe are simulated and limited to those described in the aircraft flight manual.

4.2 For paragraph 1 (b), the following conditions apply to the flight test:

- (a) activities and manoeuvres are performed in accordance with published procedures;
- (b) must be conducted in a gyroplane;
- (c) must be conducted by day under the VFR;
- (d) operating at a non-towered aerodrome may be simulated if the test is conducted at a controlled aerodrome;
- (e) if the aerodrome cross-wind conditions for the runway used during the test are less than 70% of the maximum in the aircraft flight manual, evidence that the applicant has demonstrated competency performing cross-wind take-off and landing manoeuvres can be taken from the applicant's training records.

## [46] Schedule 5, Section H, Appendix H.4 PPL Gyroplane category rating flight test, RESERVED

*substitute*

### Appendix H.4 PPL Gyroplane category rating flight test

#### 1. Flight test requirements

An applicant for a private pilot licence with gyroplane category rating flight test must demonstrate the following:

- (a) knowledge of the topics listed in clause 2;
- (b) ability to conduct the activities and manoeuvres mentioned in clause 3, within the operational scope and under the conditions mentioned in clause 4, to the

competency standards required under section 12 of this MOS which are relevant to the flight test.

## **2. Knowledge requirements**

For paragraph 1 (a), the following topics are listed:

- (a) privileges and limitations of the private pilot licence with gyroplane category rating;
- (b) applicability of drug and alcohol regulations;
- (c) aircraft instrument requirements for VFR operations;
- (d) emergency equipment requirements;
- (e) requirements for landing areas and aerodromes;
- (f) GNSS and its use in VFR navigation;
- (g) fuel planning and oil requirements for the flight;
- (h) loading and unloading fuel;
- (i) managing passengers and the carriage of cargo;
- (j) aircraft loading system;
- (k) aircraft performance and landing calculations;
- (l) pilot maintenance authorisations;
- (m) gyroplane speed limitations;
- (n) aircraft systems;
- (o) activities and manoeuvres.

## **3. Activities and manoeuvres**

### **3.1** For paragraph 1 (b), the activities and manoeuvres set out in subclauses 3.2 to 3.9 are mentioned.

*Note* The activities and manoeuvres are not required to be conducted in the order in which they appear in this Appendix.

### **3.2** Pre-flight

*Note* The relevant competency standards are in unit codes C2, C4 and NAV.

- (a) perform pre-flight actions and procedures;
- (b) perform the pre-flight inspection;
- (c) refuel a gyroplane (may be assessed by questioning).

### **3.3** Ground operations, take-off, departure and climb

*Note* The relevant competency standards are in unit codes G1, G2, G3, C3 and NAV.

- (a) complete all relevant checks and procedures;
- (b) taxi a gyroplane;
- (c) plan, brief and conduct take-off and departure procedures;
- (d) conduct a cross-wind take-off;
- (e) conduct a short-field take-off;
- (f) conduct climbs on constant heading and climbing turns, including at least 2 of the following:
  - (i) best angle of climb ( $V_x$ );
  - (ii) best rate of climb ( $V_y$ );
  - (iii) cruise climb.

### **3.4** En route cruise

*Note* The relevant competency standards are in unit codes G3, NAV and RNE.

- (a) maintain straight and level flight, and turn gyroplane;
- (b) navigate en route;

- (c) establish and maintain cruise flight for at least 1 of the following conditions:
  - (i) turbulence;
  - (ii) holding;
  - (iii) range;
- (d) navigate at low level;
- (e) perform a lost recovery procedure;
- (f) perform a diversion procedure;
- (g) navigate using instrument navigation systems.

### 3.5 Test specific activities and manoeuvres

*Note* The relevant competency standards are in unit codes G1, G5, G6 and C3.

- (a) enter and recover from each of the following flight conditions:
  - (i) a spiral descent;
  - (ii) level flight on the backside of the power curve;
  - (iii) flight behind the power curve;
  - (iv) conduct steep-level turns of at least 45° angle of bank;
- (b) manage an engine failure after take-off;
- (c) conduct a precautionary search;
- (d) manage the following malfunctions:
  - (i) a malfunction during start or shutdown;
  - (ii) any 1 of the following that is not performed under subparagraph (i):
    - (A) an aircraft system malfunction;
    - (B) engine or cabin fire;
    - (C) radio failure;
- (e) perform a forced landing.

### 3.6 Descent and arrival

*Note* The relevant competency standards are in unit codes G3 and NAV.

- (a) conduct descents maintaining constant heading and descending turns;
- (b) plan and conduct aerodrome arrival and circuit joining procedures.

### 3.7 Circuit, approach and landing

*Note* The relevant competency standards are in unit codes G3, G4 and G6.

- (a) conduct normal circuit pattern, approach and landing;
- (b) conduct a cross-wind landing;
- (c) conduct short-field landing approaches and landings;
- (d) perform a go-around procedure;
- (e) perform after-landing actions and procedures.

### 3.8 Shutdown and post-flight

*Note* The relevant competency standards are in unit codes G1 and C2.

- (a) park, shutdown and secure a gyroplane;
- (b) complete post-flight administration.

### 3.9 General requirements

*Note* The relevant competency standards are in unit codes C1, C3, C4, C5, CTA, CTR, OGA, ONTA, NAV, NTS1 and NTS2.

- (a) maintain an effective lookout;
- (b) maintain situational awareness;

- (c) assess situations and make appropriate decisions;
- (d) set priorities and manage tasks effectively;
- (e) maintain effective communication and interpersonal relationships;
- (f) recognise and manage threats;
- (g) recognise and manage errors;
- (h) recognise and manage undesired aircraft states;
- (i) operate in controlled airspace;
- (j) operate in Class G airspace;
- (k) operate at a controlled aerodrome;
- (l) operate at a non-towered aerodrome;
- (m) communicate effectively using appropriate procedures for the airspace being used during the test;
- (n) manage the aircraft systems required for the flight;
- (o) manage the fuel system and monitor the fuel plan and fuel usage during the flight;
- (p) manage passengers and the carriage of cargo.

#### **4. Operational scope and conditions**

**4.1** For paragraph 1 (b), the following operational scope applies to the flight test:

- (a) managing an aircraft system, which is not required for the flight, is not an assessable item unless the applicant uses the system during the flight;
- (b) simulated carriage of passengers and cargo;
- (c) simulated private cross-country operation;
- (d) operating in Class G and controlled airspace;
- (e) emergencies and abnormal situations relating to aircraft systems, powerplants and the airframe are simulated and limited to those described in the aircraft flight manual.

**4.2** For paragraph 1 (b), the following conditions apply to the flight test:

- (a) activities and manoeuvres are performed in accordance with published procedures;
- (b) must be conducted in a gyroplane;
- (c) must be conducted by day under the VFR;
- (d) the flight must include:
  - (i) operating in Class G airspace and in controlled airspace; and
  - (ii) operating at a non-towered aerodrome and a controlled aerodrome;
- (e) if the area where the test is conducted does not have controlled airspace or a controlled aerodrome, or they are unavailable, operating in controlled airspace or at a controlled aerodrome may be simulated, as applicable;
- (f) if the aerodrome cross-wind conditions for the runway used during the test are less than 70% of the maximum in the aircraft flight manual, evidence that the applicant has demonstrated competency performing cross-wind take-off and landing manoeuvres can be taken from the applicant's training records.

**[47] Schedule 5, Section I, Appendix I.4 CPL Gyroplane category rating flight test, RESERVED**

*substitute*

**Appendix I.4 CPL Gyroplane category rating flight test**

**1. Flight test requirements**

An applicant for a commercial pilot licence with gyroplane category rating flight test must demonstrate the following:

- (a) knowledge of the topics listed in clause 2;
- (b) ability to conduct the activities and manoeuvres mentioned in clause 3, within the operational scope and under the conditions mentioned in clause 4, to the competency standards required under section 12 of this MOS which are relevant to the flight test.

**2. Knowledge requirements**

For paragraph 1 (a), the following topics are listed:

- (a) privileges and limitations of the commercial pilot licence with gyroplane category rating;
- (b) requirements for an AOC;
- (c) classification of operations;
- (d) type of information contained in an aircraft flight manual;
- (e) flight and duty time limits;
- (f) applicability of drug and alcohol regulations;
- (g) aircraft instrument requirements for day VFR commercial operations;
- (h) emergency equipment requirements;
- (i) requirements for landing areas and aerodromes;
- (j) GNSS and its use in VFR navigation;
- (k) fuel planning and oil requirements for the flight;
- (l) loading and unloading fuel;
- (m) managing passengers and the carriage of cargo;
- (n) aircraft loading system;
- (o) normal and abnormal operation of the propeller system fitted to the gyroplane that is being used for the test;
- (p) aircraft performance and landing calculations;
- (q) pilot maintenance authorisations;
- (r) gyroplane speed limitations;
- (s) aircraft systems.

**3. Activities and manoeuvres**

**3.1** For paragraph 1 (b), the activities and manoeuvres set out in subclauses 3.2 to 3.9 are mentioned.

*Note* The activities and manoeuvres are not required to be conducted in the order in which they appear in this Appendix.

**3.2** Pre-flight

*Note* The relevant competency standards are in unit codes C2, C4 and NAV.

- (a) perform pre-flight actions and procedures;
- (b) perform a pre-flight inspection;
- (c) refuel a gyroplane (may be assessed by questioning).

### 3.3 Ground operations, take-off, departure and climb

*Note* The relevant competency standards are in unit codes G1, G2, G3, C3 and NAV.

- (a) complete all the relevant checks and procedures;
- (b) taxi a gyroplane;
- (c) plan, brief and conduct take-off and departure procedures;
- (d) conduct a cross-wind take-off;
- (e) conduct a short-field take-off;
- (f) conduct climbs on constant heading and climbing turns, including at least 2 of the following:
  - (i) best angle of climb ( $V_x$ );
  - (ii) best rate of climb ( $V_y$ );
  - (iii) cruise climb.

### 3.4 En route cruise

*Note* The relevant competency standards are in unit codes G3, NAV and RNE.

- (a) maintain straight and level flight, and turn gyroplane;
- (b) navigate en route;
- (c) establish and maintain cruise flight for at least 1 of the following conditions:
  - (i) turbulence;
  - (ii) holding;
  - (iii) range;
- (d) navigate at low level;
- (e) perform a lost recovery procedure;
- (f) perform a diversion procedure;
- (g) navigate using instrument navigation systems.

### 3.5 Test specific activities and manoeuvres

*Note* The relevant competency standards are in unit codes G1, G5, G6 and C3.

- (a) enter and recover from each of the following flight conditions:
  - (i) a spiral descent;
  - (ii) level flight on backside of the power curve;
  - (iii) flight behind the power curve;
  - (iv) conduct steep-level turns of at least 45° angle of bank;
- (b) manage an engine failure after take-off;
- (c) conduct a precautionary search;
- (d) manage the following malfunctions:
  - (i) a malfunction during start or shutdown;
  - (ii) any 1 of the following that is not performed under subparagraph (i):
    - (A) an aircraft system malfunction;
    - (B) engine or cabin fire;
    - (C) radio failure;
- (e) perform a forced landing.

### 3.6 Descent and arrival

*Note* The relevant competency standards are in unit codes G3 and NAV.

- (a) conduct descents maintaining constant heading and descending turns;
- (b) plan and conduct aerodrome arrival and circuit joining procedures.

### **3.7 Circuit, approach and landing**

*Note* The relevant competency standards are in unit codes G3, G4 and G6.

- (a) conduct normal circuit pattern, approach and landing;
- (b) conduct a cross-wind landing;
- (c) conduct short-field landing;
- (d) perform a go-around procedure;
- (e) perform after-landing actions and procedures.

### **3.8 Shutdown and post-flight**

*Note* The relevant competency standards are in unit codes G1 and C2.

- (a) park, shutdown and secure a gyroplane;
- (b) complete post-flight administration.

### **3.9 General requirements**

*Note* The relevant competency standards are in unit codes G3, C1, C3, C4, C5, CTA, CTR, OGA, ONTA, NAV, NTS1 and NTS2.

- (a) maintain an effective lookout;
- (b) maintain situational awareness;
- (c) assess situations and make appropriate decisions;
- (d) set priorities and manage tasks effectively;
- (e) maintain effective communication and interpersonal relationships;
- (f) recognise and manage threats;
- (g) recognise and manage errors;
- (h) recognise and manage undesired aircraft states;
- (i) operate in controlled airspace;
- (j) operate in Class G airspace;
- (k) operate at a controlled aerodrome;
- (l) operate at a non-towered aerodrome;
- (m) communicate effectively using appropriate procedures for the airspace being used during the test;
- (n) manage the aircraft systems required for the flight;
- (o) manage the fuel system and monitor the fuel plan and fuel usage during the flight;
- (p) manage passengers and the carriage of cargo.

## **4. Operational scope and conditions**

### **4.1** For paragraph 1 (b), the following operational scope applies to the flight test:

- (a) managing an aircraft system, which is not required for the flight, is not an assessable item unless the applicant uses the system during the flight;
- (b) simulated carriage of passengers and cargo;
- (c) simulated charter cross-country operation with 1 sector to a small feature turning point or remote aerodrome;
- (d) operating in Class G and controlled airspace;
- (e) emergencies and abnormal situations relating to aircraft systems, powerplants and the airframe are simulated and limited to those described in the aircraft flight manual.

### **4.2** For paragraph 1 (b), the following conditions apply to the flight test:

- (a) activities and manoeuvres are performed in accordance with published procedures;
- (b) the gyroplane used for the flight test must have a powerplant with 1 of the following:
  - (i) turbine engine with propeller;

- (ii) piston engine with fixed or variable-pitch propeller;
- (c) must be conducted by day under the VFR;
- (d) must include:
  - (i) operating in Class G airspace and in controlled airspace; and
  - (ii) operating at a non-towered aerodrome and a controlled aerodrome;
- (e) if the area where the test is conducted does not have controlled airspace or a controlled aerodrome, or they are unavailable, operating in controlled airspace or at a controlled aerodrome may be simulated, as applicable;
- (f) if the aerodrome cross-wind conditions for the runway used during the test are less than 70% of the maximum in the aircraft flight manual, evidence that the applicant has demonstrated competency performing cross-wind take-off and landing manoeuvres can be taken from the applicant's training records.

**[48] Schedule 5, Section L, Appendix L.3 Single-engine gyroplane class rating, RESERVED**

*substitute*

**Appendix L.3 Single-engine gyroplane class rating flight test**

**1. Flight test requirements**

- 1.1** An applicant for a single-engine gyroplane class rating flight test must demonstrate the following:
- (a) knowledge of the topics listed in clause 2;
  - (b) ability to conduct the activities and manoeuvres mentioned in clause 3, within the operational scope and under the conditions mentioned in clause 4, to the competency standards required under section 12 of this MOS which are relevant to the flight test.
- 1.2** An applicant who completes a flight test in a gyroplane covered by the single-engine gyroplane class rating and meets the flight test standard for the grant of a pilot licence with gyroplane category rating is taken to meet these flight test requirements.

**2. Knowledge requirements**

For paragraph 1.1 (a), the following topics are listed:

- (a) privileges and limitations of the class rating;
- (b) flight review requirements;
- (c) navigation and operating systems;
- (d) normal, abnormal and emergency flight procedures;
- (e) operating limitations;
- (f) weight and balance limitations;
- (g) aircraft performance data, including take-off and landing performance data;
- (h) flight planning.

**3. Activities and manoeuvres**

- 3.1** For paragraph 1.1 (b), the activities and manoeuvres set out in subclauses 3.2 to 3.9 are mentioned.

*Note* The activities and manoeuvres are not required to be conducted in the order in which they appear in this Appendix.

**3.2 Pre-flight**

*Note* The relevant competency standards are in unit codes C2 and C4.

- (a) perform pre-flight actions and procedures;



- (b) perform a pre-flight inspection;
- (c) refuel a gyroplane (may be assessed by questioning).

### 3.3 Ground operations, take-off, departure and climb

*Note* The relevant competency standards are in unit codes G1, G2 and G3.

- (a) complete all relevant checks and procedures;
- (b) taxi a gyroplane;
- (c) plan, brief and conduct take-off and departure procedures;
- (d) conduct a cross-wind take-off;
- (e) conduct a short-field take-off;
- (f) conduct climbs on constant heading and climbing turns, including at least 2 of the following performance configurations:
  - (i) best angle of climb ( $V_x$ );
  - (ii) best rate of climb ( $V_y$ );
  - (iii) cruise climb.

### 3.4 En route cruise

*Note* The relevant competency standards are in unit code G3.

- (a) maintain straight and level flight, and turn a gyroplane;
- (b) navigate and transit from an aerodrome circuit area to a training area and return;
- (c) operate safely in local area airspace;
- (d) establish and maintain cruise flight for at least 1 of the following conditions:
  - (i) turbulence;
  - (ii) high speed.

### 3.5 Test specific activities and manoeuvres

*Note* The relevant competency standards are in unit codes G1, G5 and G6.

- (a) enter and recover from each of the following, 1 of which must be in the approach configuration:
  - (i) a spiral descent;
  - (ii) flight behind the power curve/minimum level flight speed;
- (b) conduct steep-level turns of at least 45° angle of bank;
- (c) manage an engine failure after take-off;
- (d) manage the following malfunctions:
  - (i) a malfunction during start or shutdown;
  - (ii) any 1 of the following that is not performed under subparagraph (i):
    - (A) an aircraft system malfunction;
    - (B) engine or cabin fire;
    - (C) radio failure;
- (e) perform a forced landing.

### 3.6 Descent and arrival

*Note* The relevant competency standards are in unit code G3.

- (a) conduct descents and descending turns;
- (b) plan and conduct aerodrome arrival and circuit joining procedures.

### 3.7 Circuit, approach and landing

*Note* The relevant competency standards are in unit codes G3, G4 and G6.

- (a) conduct normal circuit pattern, approach and landing;

- (b) conduct a cross-wind landing;
- (c) conduct short-field landings;
- (d) conduct simulated rough or soft-field take-off;
- (e) perform a go-around procedure;
- (f) perform after-landing actions and procedures.

### 3.8 Shutdown and post-flight

*Note* The relevant competency standards are in unit codes G1 and C2.

- (a) park, shutdown and secure a gyroplane;
- (b) complete post-flight administration.

### 3.9 General requirements

*Note* The relevant competency standards are in unit codes G3, C1, C4, C5, NTS1 and NTS2.

- (a) maintain an effective lookout;
- (b) maintain situational awareness;
- (c) assess situations and make appropriate decisions;
- (d) set priorities and manage tasks effectively;
- (e) maintain effective communication and interpersonal relationships;
- (f) recognise and manage threats;
- (g) recognise and manage errors;
- (h) recognise and manage undesired aircraft states;
- (i) communicate effectively using appropriate procedures for airspace being used during the test;
- (j) manage the aircraft systems required for the flight;
- (k) manage the fuel system and monitor the fuel plan and fuel usage during the test;
- (l) manage passengers and the carriage of cargo.

## 4. Operational scope and conditions

### 4.1 For paragraph 1.1 (b), the following operational scope applies to the flight test:

- (a) managing an aircraft system, which is not required for the flight, is not an assessable item unless the applicant uses the system during the flight;
- (b) simulated carriage of passengers and cargo;
- (c) simulated private local area operation;
- (d) operating in Class G airspace, at a non-towered aerodrome;
- (e) emergencies and abnormal situations relating to aircraft systems, powerplants and the airframe are simulated and limited to those described in the aircraft flight manual.

### 4.2 For paragraph 1.1 (b), the following conditions apply to the flight test:

- (a) activities and manoeuvres are performed in accordance with published procedures;
- (b) conducted in:
  - (i) a gyroplane that is covered by the single-engine gyroplane class rating, except where the flight test must be conducted in an approved flight simulator in accordance with subregulation 61.245 (2); or
  - (ii) a flight simulator approved for the purpose;
- (c) conducted by day under the VFR;
- (d) if the aerodrome cross-wind conditions for the runway used during the test are less than 70% of the maximum in the aircraft flight manual, evidence that the applicant has demonstrated competency performing cross-wind take-off and landing manoeuvres can be taken from the applicant's training records.

**[49] Schedule 5, Section L, after Appendix L.7, Single-engine helicopter type rating flight test**

*insert*

**Appendix L.7A Gyroplane type rating flight test**

**1. Flight test requirements**

- 1.1** An applicant for a gyroplane type rating flight test must demonstrate the following:
- (a) knowledge of the topics listed in clause 2;
  - (b) ability to conduct the activities and manoeuvres mentioned in clause 3, within the operational scope and under the conditions mentioned in clause 4, to the competency standards required under section 12 of this MOS which are relevant to the flight test.
- 1.2** An applicant who completes a flight test in a gyroplane covered by the gyroplane type rating and meets the flight test standard for the grant of a pilot licence with gyroplane category rating is taken to meet these flight test requirements.

**2. Knowledge requirements**

For paragraph 1.1 (a), the following topics are listed:

- (a) privileges and limitations of the type rating;
- (b) flight review requirements;
- (c) navigation and operating systems;
- (d) normal, abnormal and emergency flight procedures;
- (e) operating limitations;
- (f) weight and balance limitations;
- (g) aircraft performance data, including take-off and landing performance data;
- (h) flight planning.

**3. Activities and manoeuvres**

- 3.1** For paragraph 1.1 (b), the activities and manoeuvres set out in subclauses 3.2 to 3.9 are mentioned.

*Note* The activities and manoeuvres are not required to be conducted in the order in which they appear in this Appendix.

**3.2 Pre-flight**

*Note* The relevant competency standards are in unit codes C2 and C4.

- (a) perform pre-flight actions and procedures;
- (b) perform a pre-flight inspection;
- (c) refuel a gyroplane (may be assessed by questioning).

**3.3 Ground operations, take-off, departure and climb**

*Note* The relevant competency standards are in unit codes G1, G2 and G3.

- (a) complete all relevant checks and procedures;
- (b) taxi a gyroplane;
- (c) plan, brief and conduct take-off and departure procedures;
- (d) conduct a cross-wind take-off;
- (e) conduct a short-field take-off;
- (f) conduct climbs on constant heading and climbing turns, including at least 2 of the following performance configurations:
  - (i) best angle of climb (V<sub>x</sub>);

- (ii) best rate of climb ( $V_y$ );
- (iii) cruise climb.

### 3.4 En route cruise

*Note* The relevant competency standards are in unit code G3.

- (a) maintain straight and level flight, and turn a gyroplane;
- (b) navigate and transit from an aerodrome circuit area to a training area and return;
- (c) operate safely in local area airspace;
- (d) establish and maintain cruise flight for at least 1 of the following conditions:
  - (i) turbulence;
  - (ii) high speed.

### 3.5 Test specific activities and manoeuvres

*Note* The relevant competency standards are in unit codes G1, G5 and G6.

- (a) enter and recover from each of the following, 1 of which must be in the approach configuration:
  - (i) a spiral descent;
  - (ii) flight behind the power curve/minimum level flight speed;
- (b) conduct steep-level turns of at least 45° angle of bank;
- (c) manage an engine failure after take-off;
- (d) manage the following malfunctions:
  - (i) a malfunction during start or shutdown;
  - (ii) any 1 of the following that is not performed under subparagraph (i):
    - (A) an aircraft system malfunction;
    - (B) engine or cabin fire;
    - (C) radio failure;
- (e) perform a forced landing.

### 3.6 Descent and arrival

*Note* The relevant competency standards are in unit code G3.

- (a) conduct descents and descending turns;
- (b) plan and conduct aerodrome arrival and circuit joining procedures.

### 3.7 Circuit, approach and landing

*Note* The relevant competency standards are in unit codes G3, G4 and G6.

- (a) conduct normal circuit pattern, approach and landing;
- (b) conduct a cross-wind landing;
- (c) conduct short-field landings;
- (d) conduct simulated rough or soft-field take-off;
- (e) perform a go-around procedure;
- (f) perform after-landing actions and procedures.

### 3.8 Shutdown and post-flight

*Note* The relevant competency standards are in unit codes G1 and C2.

- (a) park, shutdown and secure a gyroplane;
- (b) complete post-flight administration.

### 3.9 General requirements

*Note* The relevant competency standards are in unit codes G3, C4, NTS1 and NTS2.

- (a) maintain an effective lookout;

- (b) maintain situational awareness;
- (c) assess situations and make appropriate decisions;
- (d) set priorities and manage tasks effectively;
- (e) maintain effective communication and interpersonal relationships;
- (f) recognise and manage threats;
- (g) recognise and manage errors;
- (h) recognise and manage undesired aircraft states;
- (i) communicate effectively using appropriate procedures for airspace being used during the test;
- (j) manage the aircraft systems required for the flight;
- (k) manage the fuel system and monitor the fuel plan and fuel usage during the test;
- (l) manage passengers and the carriage of cargo.

#### **4. Operational scope and conditions**

**4.1** For paragraph 1.1 (b), the following operational scope applies to the flight test:

- (a) managing an aircraft system, which is not required for the flight, is not an assessable item unless the applicant uses the system during the flight;
- (b) simulated carriage of passengers and cargo;
- (c) simulated private local area operation;
- (d) operating in Class G airspace, at a non-towered aerodrome;
- (e) emergencies and abnormal situations relating to aircraft systems, powerplants and the airframe are simulated and limited to those described in the aircraft flight manual.

**4.2** For paragraph 1.1 (b), the following conditions apply to the flight test:

- (a) activities and manoeuvres are performed in accordance with published procedures;
- (b) conducted in:
  - (i) a gyroplane that is covered by the gyroplane type rating, except where the flight test must be conducted in an approved flight simulator in accordance with subregulation 61.245 (2); or
  - (ii) a flight simulator approved for the purpose;
- (c) conducted by day under the VFR;
- (d) if the aerodrome cross-wind conditions for the runway used during the test are less than 70% of the maximum in the aircraft flight manual, evidence that the applicant has demonstrated competency performing cross-wind take-off and landing manoeuvres can be taken from the applicant's training records.

### **[50] Schedule 5, Section Q, Appendix Q.1 Low-level rating flight test**

*substitute*

#### **Appendix Q.1 Low-level rating flight test**

##### **1. Flight test requirements**

An applicant for a low-level rating flight test must demonstrate the following:

- (a) knowledge of the topics listed in clause 2, which are relevant to the endorsements that are being assessed during the test;
- (b) ability to conduct the activities and manoeuvres mentioned in clause 3, within the operational scope and under the conditions mentioned in clause 4, to the competency standards under section 12 of this MOS that are relevant to the endorsements that are being assessed during the test.

## 2. Knowledge requirements

For paragraph 1 (a), the following topics are listed:

- (a) privileges and limitations of a low-level rating and each of the endorsements included in the test;
- (b) flight review requirements;
- (c) the limitations of GNSS;
- (d) wind effect at low level and associated flying conditions;
- (e) analysis of actual and forecast weather relevant to low-level operations;
- (f) effect of mountainous terrain on airflow and associated flying conditions;
- (g) assessment of the geographical characteristics of an area where flying operations are to be conducted to ensure the task can be completed safely;
- (h) hazards associated with low flying and how to identify them before and during a low-level operation;
- (i) effects of extreme environmental conditions on pilot health and performance;
- (j) effects of fatigue and physical health on pilot performance;
- (k) risk assessment techniques;
- (l) managing risks at low level;
- (m) aircraft performance, including the following:
  - (i) maximum rate turning;
  - (ii) minimum radius turning;
  - (iii) best angle of climb;
  - (iv) best rate of climb;
  - (v) 1 engine inoperative performance and manoeuvring (if applicable).

## 3 Activities and manoeuvres

3.1 For paragraph 1 (b), the activities and manoeuvres set out in subclauses 3.2 to 3.9 are mentioned.

*Note* The activities and manoeuvres are not required to be conducted in the order in which they appear in this Appendix.

### 3.2 Pre-flight

*Note* The relevant competency standards are in unit codes C2 and LL-A, LL-G or LL-H (as applicable).

- (a) plan a low-level operation;
- (b) identify hazards and manage risks;
- (c) ensure performance capability of the aircraft;
- (d) consult and brief all stakeholders about the proposed operation;
- (e) perform pre-flight actions and procedures.

### 3.3 Ground operations, take-off, departure and climb

*Note* The relevant competency standards are in unit codes C3, NAV, and A1, A2 and A3 or G1, G2, G3 and G4 or H1, H2, H3, H4 and H5 (as applicable).

- (a) complete all relevant checks and procedures;
- (b) plan, brief and conduct take-off and departure procedures.

### 3.4 En route cruise

*Note* The relevant competency standards are in unit codes NAV, and A3 and LL-A, or G3 and LL-G, or H5 and LL-H (as applicable).

Conduct appropriate checks and procedures before descending below 500 ft AGL.

### 3.5 Test specific activities and manoeuvres

*Note* The relevant competency standards are in unit codes LL-A, LL-G or LL-H (primary), LL-M, LL-SO and LL-WR (as required).

- (a) navigate at low level;
- (b) identify and use escape routes;
- (c) identify, and operate in the vicinity of, powerlines and wires;
- (d) operate in hilly terrain;
- (e) manage wind effects, sloping terrain, false horizons and sun glare;
- (f) for the aeroplane low-level endorsement, do the following:
  - (i) conduct steep turns, maximum rate turn and minimum radius turn;
  - (ii) conduct procedure turns;
  - (iii) recover from approach to stalls – level and turning;
  - (iv) recover from high energy and low energy unusual attitudes;
  - (v) for a test that is conducted in a single-engine aeroplane:
    - (A) recover from a wing drop at the stall; and
    - (B) perform a forced landing;
  - (vi) for a test that is conducted in a multi-engine aeroplane, manage an engine failure;
- (g) for the helicopter low-level endorsement, do the following:
  - (i) conduct steep turns;
  - (ii) manoeuvre the helicopter at low level and conduct flight at various speeds and configurations;
  - (iii) for a flight test that is conducted in a single-engine helicopter, perform a forced landing;
  - (iv) for a flight test that is conducted in a multi-engine helicopter, manage an engine failure;
  - (v) perform quick stop manoeuvres into wind and downwind;
  - (vi) recover from high energy and low energy unusual attitudes;
- (h) for the gyroplane low-level endorsement, do the following:
  - (i) enter and recover from the following:
    - (A) a spiral descent;
    - (B) flight behind the power curve/minimum level flight speed;
  - (ii) perform a forced landing;
- (i) for the aerial mustering endorsement, do the following:
  - (i) plan a stock-mustering operation;
  - (ii) manoeuvre the aircraft in all planes below 500 ft AGL;
  - (iii) perform climbing, descending, low-speed and high-speed manoeuvres;
  - (iv) perform reversal turns, decelerations and steep turns;
  - (v) conduct stock mustering operations;
- (j) for the sling operations endorsement, do the following:
  - (i) prepare for an external sling load operation;
  - (ii) plan an external sling load operation and conduct pre-flight briefings;
  - (iii) operate the aircraft during external load operations;
  - (iv) manage abnormal and emergency situations during external load operations;
- (k) for the winch and rappelling operations endorsement, do the following:
  - (i) plan a winch or rappelling operation and conduct pre-flight briefings;
  - (ii) operate the helicopter during a winch or rappelling operation;

- (iii) manage abnormal and emergency situations during a winch or rappelling operation;
- (iv) conduct post-flight activities.

### 3.6 Descent and arrival

*Note* The relevant competency standards are in unit codes NAV and A3, G3 or H5 (as applicable).

Plan and conduct an arrival and circuit joining procedures.

### 3.7 Circuit, approach and landing

*Note* The relevant competency standards are in unit codes A3 and A4, or G2, G3 and G4, or H2, H3 and H4 (as applicable).

- (a) conduct a low-level circuit, approach and landing;
- (b) perform after landing actions and procedures.

### 3.8 Shutdown and post-flight

*Note* The relevant competency standards are in unit codes C2 and A1, G1 or H1 (as applicable).

- (a) park, shutdown and secure the aircraft;
- (b) complete post-flight administration.

### 3.9 General requirements

*Note* The relevant competency standards are in unit codes NTS1 and NTS2, and LL-A, LL-G or LL-H (as applicable).

- (a) maintain an effective lookout;
- (b) maintain situational awareness;
- (c) assess situations and make appropriate decisions;
- (d) set priorities and manage tasks;
- (e) maintain effective communication and interpersonal relationships;
- (f) recognise and manage threats;
- (g) recognise and manage errors;
- (h) recognise and manage undesired aircraft state;
- (i) communicate effectively using appropriate procedures for the airspace being used for the test;
- (j) manage the aircraft systems required for the flight;
- (k) manage the fuel system and monitor the fuel plan and fuel usage during the test.

## 4. Operational scope and conditions

### 4.1 For paragraph 1 (b), the following operational scope applies to the flight test:

- (a) managing an aircraft system, which is not required for the flight, is not an assessable item unless it is used by the applicant;
- (b) conduct a low-level operation;
- (c) the applicant is only required to demonstrate competency in the activities and manoeuvres mentioned in paragraphs 3.5 (f) to (k) that are applicable to the endorsements covered by the flight test;
- (d) emergencies and abnormal situations relating to aircraft systems, powerplants and the airframe are simulated and limited to those described in the aircraft flight manual.

### 4.2 For paragraph 1 (b), the following conditions apply to the flight test:

- (a) activities and manoeuvres are performed in accordance with published procedures;
- (b) the aircraft must be certified for the operations that apply to the endorsement the flight test is for;
- (c) must be conducted by day under the VFR.



**[51] Schedule 5, Section R, Appendix R.1 Aerial application rating and aerial application endorsement flight test**

*substitute*

**Appendix R.1 Aerial application rating and aerial application endorsement flight test**

**1. Flight test requirements**

An applicant for an aerial application rating flight test must demonstrate the following:

- (a) knowledge of the topics listed in clause 2, which are relevant to the endorsements that are being assessed during the test;
- (b) ability to conduct the activities and manoeuvres mentioned in clause 3, within the operational scope and under the conditions mentioned in clause 4, to the competency standards under section 12 of this MOS, which are relevant to the endorsements that are being assessed during the test.

**2. Knowledge requirements**

For paragraph 1 (a), the following topics are listed:

- (a) privileges and limitations of an aerial application rating and the aerial application endorsement included in the test;
- (b) proficiency check requirements;
- (c) limitations of GNSS;
- (d) wind effect at low level and associated flying conditions;
- (e) analysis of actual and forecast weather relevant to application operations;
- (f) the effect of mountainous terrain on airflow and associated flying conditions;
- (g) assessment of the geographical characteristics of the area of flying operations to ensure safe completion of the task;
- (h) the hazards associated with low flying and how to identify them before and during a low-level operation;
- (i) the effects of extreme environmental conditions on pilot health and performance;
- (j) the effects of fatigue and physical health on pilot performance;
- (k) risk assessment techniques;
- (l) managing risks at low level;
- (m) aircraft performance, including where appropriate for the category of the aircraft used for the test:
  - (i) maximum rate turning; and
  - (ii) minimum radius turning; and
  - (iii) best angle of climb; and
  - (iv) best rate of climb; and
  - (v) 1 engine inoperative performance and manoeuvring (if applicable).

**3. Activities and manoeuvres**

**3.1** For paragraph 1 (b), the activities and manoeuvres set out in subclauses 3.2 to 3.9 are mentioned.

*Note* The activities and manoeuvres are not required to be conducted in the order in which they appear in this Appendix.

**3.2 Pre-flight**

*Note* The relevant competency standards are in unit codes AA1 and AA2.

- (a) plan an application operation;

- (b) identify hazards and manage risks;
- (c) ensure the performance capability of the aircraft being used is adequate for the operation;
- (d) consult with and brief stakeholders;
- (e) perform pre-flight actions and procedures.

### 3.3 Ground operations, take-off, departure and climb

*Note* The relevant competency standards are in unit codes LL-A, LL-G and LL-H (as applicable).

- (a) complete all relevant checks and procedures;
- (b) plan, brief and conduct take-off and departure procedures.

### 3.4 En route cruise

*Note* The relevant competency standards are in unit code LL-A, LL-G or LL-H (as applicable).

Conduct appropriate checks and procedures before descending below 500 ft AGL.

### 3.5 Test specific activities and manoeuvres

*Note* The relevant competency standards are in unit codes AA1, AA2 and LL-A, LL-G or LL-H (as applicable).

- (a) for a day aerial application endorsement (all aircraft categories) at low level do the following:
  - (i) perform straight flight, steep turns and procedure turns;
  - (ii) navigate;
  - (iii) manage wind effects, sloping and hilly terrain, false horizons and sun glare;
  - (iv) demonstrate the use of escape routes;
  - (v) recover from high energy and low energy unusual attitude conditions;
  - (vi) for the following:
    - (A) if the test is conducted in a single-engine aircraft, perform a forced landing;
    - (B) if the test is conducted in a multi-engine aircraft, manage an engine failure;
  - (vii) fly to, assess, land and take off from an operational airstrip or HLS;
  - (viii) fly between an operational airstrip or HLS and an application area;
  - (ix) conduct an aerial survey of an application area;
  - (x) conduct operations over and under powerlines;
  - (xi) apply substances;
  - (xii) operate aircraft using GNSS swath guidance equipment (if fitted);
  - (xiii) operate at low level in hilly terrain;
  - (xiv) jettison a load;
- (b) for an aeroplane aerial application endorsement, at low level, do the following in an aeroplane:
  - (i) conduct maximum rate turns and minimum radius turns;
  - (ii) recognise and avoid the stall and recover from a simulated low-altitude stall;
  - (iii) for single-engine aeroplanes, recover from a wing drop at the stall;
  - (iv) conduct an application operation at a certified aerodrome (if available);
  - (v) manage abnormal and emergency situations;
- (c) for a helicopter aerial application endorsement, do the following:
  - (i) manoeuvre the helicopter at low level and conduct flight at various speeds and configurations;
  - (ii) perform quick-stop manoeuvres into wind and downwind;

- (iii) manage risks associated with operating a helicopter during application operations;
- (d) for a gyroplane aerial application endorsement, do the following:
  - (i) enter and recover from the following:
    - (A) maximum rate turns and minimum radius turns;
    - (B) a spiral descent;
    - (C) flight behind the power curve/minimum level flight speed;
  - (ii) manoeuvre the gyroplane at low level and conduct flight at various speeds and configurations;
- (e) for a firefighting endorsement (all categories), do the following:
  - (i) demonstrate awareness of relevant human factors;
  - (ii) perform pre-flight actions relevant to firefighting operations;
  - (iii) demonstrate understanding of fire agency procedures, fire traffic management and other aircraft separation procedures that apply to firefighting operations;
  - (iv) plan for and manage applicable operational risks;
  - (v) fly to, assess, land and take off from an operational airstrip or HLS or pick-up point;
  - (vi) fly between operational airstrip or HLS and drop zone;
  - (vii) conduct an aerial survey of a fire area;
  - (viii) apply substances;
  - (ix) operate aircraft at maximum permissible weights for fire operations;
  - (x) operate at low level in hilly terrain;
  - (xi) operate in high winds, high-density altitude and high turbulence;
  - (xii) conduct low-visibility operations;
  - (xiii) manage abnormal and emergency situations during a firebombing operation in the vicinity of a fire ground;
  - (xiv) jettison load safely;
- (f) for a helicopter firefighting endorsement, do the following:
  - (i) replenish helicopter load with snorkel or bucket;
  - (ii) manage known helicopter risks during firefighting operations;
- (g) for a night aerial application operation endorsement, do the following in a relevant aircraft (as applicable):
  - (i) check the serviceability of the aircraft and the equipment to be used;
  - (ii) conduct a risk assessment for the operation;
  - (iii) conduct the pre-flight actions;
  - (iv) determine whether an airstrip or HLS is suitable for night operations;
  - (v) conduct a take-off and landing at night at an airstrip or HLS remote from ground lighting;
  - (vi) transit from an airstrip to the treatment area;
  - (vii) operate work lights to illuminate the treatment area.

### 3.6 Descent and arrival

*Note* The relevant competency standards are in unit code LL-A, LL-G or LL-H (as applicable).

Plan and conduct an arrival and circuit joining procedures.

### 3.7 Circuit, approach and landing

*Note* The relevant competency standards are in unit code LL-A, LL-G or LL-H (as applicable).

- (a) conduct a low-level circuit, approach and landing (day only);

- (b) perform after-landing actions and procedures.

### **3.8 Shutdown and post-flight**

*Note* The relevant competency standards are in unit code LL-A, LL-G or LL-H (as applicable).

- (a) park, shutdown and secure the aircraft;
- (b) complete post-flight administration.

### **3.9 General requirements**

*Note* The relevant competency standards are in unit codes LL-A, LL-G or LL-H (as applicable), NTS1 and NTS2.

- (a) maintain an effective lookout;
- (b) maintain situational awareness;
- (c) assess situations and make appropriate decisions;
- (d) set priorities and manage tasks effectively;
- (e) maintain effective communication and interpersonal relationships;
- (f) recognise and manage threats;
- (g) recognise and manage errors;
- (h) recognise and manage undesired aircraft states;
- (i) communicate effectively using appropriate procedures for the airspace being used during the test;
- (j) manage the aircraft systems required for the flight;
- (k) manage the fuel system and monitor the fuel plan and fuel usage during the flight.

## **4. Operational scope and conditions**

### **4.1** For paragraph 1 (b), the following operational scope applies to the flight test:

- (a) managing an aircraft system, which is not required for the flight, is not an assessable item unless the applicant uses the system during the flight;
- (b) conduct operations that are relevant to the endorsements being assessed;
- (c) emergencies and abnormal situations relating to aircraft systems, powerplants and the airframe are simulated and limited to those described in the aircraft flight manual.

### **4.2** For paragraph 1 (b), the following conditions apply to the aerial application rating flight test:

- (a) conducted in an aircraft that is suitable for the endorsements being assessed in the test (refer subregulation 61.1115 (2));
- (b) conducted by day under the VFR except where the test is for a night endorsement;
- (c) the aircraft used for an aerial application rating flight test must be of the appropriate category and be capable of being operated for the kind of operations that are covered by the endorsement or endorsements which the flight test is for.

## **[52] Schedule 6, Appendix 4 Aerial application rating proficiency check**

*substitute*

### **Appendix 4 Aerial application rating proficiency check**

#### **1. Proficiency check requirements**

An applicant for an aerial application rating proficiency check must demonstrate the following:

- (a) knowledge of the topics listed in clause 2, which are relevant to the endorsement(s) that are being assessed during the check;

- (b) ability to conduct the activities and manoeuvres mentioned in clause 3, within the operational scope and under the conditions mentioned in clause 4, to the competency standards required under section 13 of this MOS, which are relevant to the endorsements that are being assessed during the check.

## **2. Knowledge requirements**

For paragraph 1 (a), the following topics are listed:

- (a) privileges and limitations of an aerial application rating and the endorsements held by the applicant;
- (b) proficiency check requirements;
- (c) limitations of GNSS;
- (d) wind effect at low level and associated flying conditions;
- (e) analysis of actual and forecast weather relevant to application operations;
- (f) the effect of mountainous terrain on airflow and associated flying conditions;
- (g) assessment of the geographical characteristics of the area of flying operations to ensure safe completion of the task;
- (h) the hazards associated with low flying and how to identify them before and during a low-level operation;
- (i) the effects of extreme environmental conditions on pilot health and performance;
- (j) the effects of fatigue and physical health on pilot performance;
- (k) risk assessment techniques;
- (l) managing risks at low level;
- (m) aircraft performance, including where appropriate for the category of the aircraft used for the check:
  - (i) maximum rate turning;
  - (ii) minimum radius turning;
  - (iii) best angle of climb;
  - (iv) best rate of climb;
  - (v) 1 engine inoperative performance (if applicable);
  - (vi) helicopter manoeuvring (if applicable).

## **3. Activities and manoeuvres**

- 3.1** For paragraph 1 (b), the activities and manoeuvres set out in subclauses 3.2 to 3.9 are mentioned.

*Note* The activities and manoeuvres are not required to be conducted in the order in which they appear in this Appendix.

### **3.2 Pre-flight**

*Note* The relevant competency standards are in unit codes AA1 and AA2.

- (a) perform pre-flight actions and procedures;
- (b) plan an application operation;
- (c) identify hazards and manage risks;
- (d) ensure the performance capability of the aircraft being used is adequate for the operation.

### **3.3 Ground operations, take-off, departure and climb**

*Note* The relevant competency standards are in unit code LL-A, LL-G or LL-H (as applicable).

- (a) complete all relevant checks and procedures;
- (b) plan, brief and conduct take-off, departure procedure.

### 3.4 En route cruise

*Note* The relevant competency standards are in unit code LL-A, LL-G or LL-H (as applicable).

Conduct appropriate checks and procedures before descending below 500 ft AGL.

### 3.5 Check specific activities and manoeuvres

*Note* The relevant competency standards are in unit codes AA1, AA2 and LL-A, LL-G or LL-H (as applicable).

- (a) at low level, do the following:
  - (i) manoeuvre at various speeds and configurations;
  - (ii) navigate;
  - (iii) apply substances;
  - (iv) jettison load;
- (b) for the aeroplane aerial application endorsement, at low level, do the following:
  - (i) perform steep turns and procedure turns at or below 500 ft AGL;
  - (ii) recognise and avoid the stall and recover from a simulated low-altitude stall;
- (c) for a check conducted in a single-engine aeroplane or gyroplane, perform a forced landing from below 500 ft AGL;
- (d) manage abnormal and emergency situations during low-level operations;
- (e) for the firefighting endorsements (all categories), do the following:
  - (i) demonstrate a thorough understanding of fire agency procedures, fire traffic management and other aircraft separation procedures that apply to firefighting operations;
  - (ii) conduct an aerial survey of a fire area;
  - (iii) apply firebombing substances;
  - (iv) operate aircraft at maximum permissible weights for fire operations;
  - (v) manage abnormal and emergency situations during a firebombing operation;
- (f) for the helicopter firefighting endorsement, replenish the helicopter load with snorkel or bucket (as applicable);
- (g) for the gyroplane aerial application endorsement, at low level, do the following:
  - (i) steep turns and procedure turns at or below 500 ft AGL;
  - (ii) a spiral descent;
  - (iii) flight at minimum level flight speed;
  - (iv) manage abnormal and emergency situations.

### 3.6 Descent and arrival

*Note* The relevant competency standards are in unit code LL-A, LL-G or LL-H (as applicable).

Plan and conduct descent, arrival and circuit joining procedures.

### 3.7 Circuit, approach and landing

*Note* The relevant competency standards are in unit code LL-A, LL-G or LL-H (as applicable).

- (a) conduct a low-level circuit, approach and landing (day only);
- (b) perform after-landing actions and procedures.

### 3.8 Shutdown and post-flight

*Note* The relevant competency standards are in unit code LL-A, LL-G or LL-H (as applicable).

- (a) park, shutdown and secure the aircraft;
- (b) complete post-flight administration.

### 3.9 General requirements

*Note* The relevant competency standards are in unit codes LL-A, LL-G or LL-H (as applicable), NTS1 and NTS2.

- (a) maintain an effective lookout;
- (b) maintain situational awareness;
- (c) assess situations and make appropriate decisions;
- (d) set priorities and manage tasks effectively;
- (e) maintain effective communication and interpersonal relationships;
- (f) recognise and manage threats;
- (g) recognise and manage errors;
- (h) recognise and manage undesired aircraft states;
- (i) communicate effectively using appropriate procedures for the airspace being used during the test;
- (j) manage the aircraft systems required for the flight;
- (k) manage the fuel system and monitor the fuel plan and fuel usage during the flight.

## 4. Operational scope and conditions

4.1 For paragraph 1 (b), the following operational scope applies to the proficiency check:

- (a) managing an aircraft system, which is not required for the flight, is not an assessable item unless the applicant uses the system during the flight;
- (b) conducting operations that are relevant to the endorsements being assessed;
- (c) the check may be conducted by observation if the check is conducted in a single-seat aircraft;
- (d) emergencies and abnormal situations relating to aircraft systems, powerplants and the airframe are simulated and limited to those described in the AFM.

4.2 For paragraph 1 (b), the following conditions apply to the aerial application rating proficiency check:

- (a) conducted in an aircraft that is suitable for the endorsements being assessed in the test (see paragraph 61.1110 (4) (a));
- (b) conducted by day under the VFR.

## [53] Schedule 7, Appendix L Aircraft rating flight review

*substitute*

### Appendix L Aircraft rating flight review

#### 1. Flight review requirements

1.1 The flight review requirements for an applicant who does not hold a commercial, multi-crew pilot or air transport pilot licence are specified in subclause 1.2.

1.2 For subclause 1.1, the applicant must demonstrate competency, in the units of competency mentioned in clause 3, by doing the following:

- (a) for manoeuvres in a class-rated aeroplane — performing operations within the flight tolerances specified in table 1 in Section 1 of Schedule 8 of this MOS;
- (b) for manoeuvres in a type-rated aeroplane — performing operations within the tolerances specified in table 2 in Section 1 of Schedule 8 of this MOS;
- (c) for manoeuvres in a class-rated single-engine helicopter — performing operations within the flight tolerances specified in table 3 in Section 1 of Schedule 8 of this MOS;
- (d) for manoeuvres in a type-rated helicopter — performing operations within the flight tolerances specified in table 4 in Section 1 of Schedule 8 of this MOS;

- (e) for manoeuvres in a gyroplane — performing operations within the flight tolerances specified in table 6 in Section 1 of Schedule 8 of this MOS.

**1.3** The flight review requirements for an applicant who holds a commercial, multi-crew pilot or air transport pilot licence are specified in subclause 1.4.

**1.4** For subclause 1.3, the applicant must demonstrate competency, in the units of competency mentioned in clause 3, by doing the following:

- (a) for manoeuvres in an aeroplane — performing operations within the tolerances specified in table 2 in Section 1 of Schedule 8 of this MOS;
- (b) for manoeuvres in a helicopter — performing operations within the flight tolerances specified in table 4 in Section 1 of Schedule 8 of this MOS;
- (c) for manoeuvres in a gyroplane — performing operations within the flight tolerances specified in table 7 in Section 1 of Schedule 8 of this MOS.

**1.5** For subclauses 1.2 and 1.4, a sustained deviation outside of the applicable flight tolerance is not permitted.

## 2. Knowledge requirements

The applicant is required to demonstrate knowledge of the topics specified in clause 4 of each unit of competency mentioned in the table in clause 3, Practical flight standards, except where the topic is not relevant for the particular aircraft rating.

## 3. Practical flight standards

Unit code	Unit of competency	Modifications
C1	Communicating in aviation environment	Nil
C2	Perform pre- and post-flight actions and procedures	Nil
NTS1	Non-technical skills 1	Nil
NTS2	Non-technical skills 2	Nil
FR-SEAC	Single-engine aeroplane class rating flight review	This unit is only required if the flight review is for the single-engine aeroplane class rating.
FR-MEAC	Multi-engine aeroplane class rating flight review	This unit is only required if the flight review is for the multi-engine aeroplane class rating.
FR-SEAT	Single-engine aeroplane type rating flight review	This unit is only required if the flight review is for the single-engine aeroplane type rating.
FR-MEAT	Multi-engine aeroplane type rating flight review	This unit is only required if the flight review is for the multi-engine aeroplane type rating.
FR-SEHT	Single-engine helicopter class rating flight review	This unit is only required if the flight review is for the single-engine helicopter class rating or the single-engine helicopter type rating.
FR-MEHT	Multi-engine helicopter type rating flight review	This unit is only required if the flight review is for the multi-engine helicopter type rating.
FR-SEGC	Single-engine gyroplane class rating flight review	This unit is only required if the flight review is for the single-engine gyroplane class rating.



## [54] Schedule 7, Appendix O Night VFR rating flight review

*substitute*

### Appendix O Night VFR rating flight review

#### 1. Flight review requirements

- 1.1** An applicant for a night VFR rating flight review must demonstrate competency, in the units of competency mentioned in clause 3, by doing the following:
- (a) conducting an operation at night under the VFR;
  - (b) for manoeuvres in an aeroplane — performing operations within the flight tolerances specified in table 1 in Section 1 of Schedule 8 of this MOS;
  - (c) for manoeuvres in a helicopter — performing operations within the flight tolerances specified in table 3 in Section 1 of Schedule 8 of this MOS;
  - (d) for manoeuvres in a gyroplane — performing operations within the flight tolerances specified in table 6 in Section 1 of Schedule 8 of this MOS.
- 1.2** However, for paragraphs 1.1 (b) and (c), a sustained deviation outside of the applicable flight tolerance is not permitted.

#### 2. Knowledge requirements

The applicant is required to demonstrate knowledge of the following topics except where the topic is not relevant to the flight test:

- (a) the privileges and limitations of the NVFR rating;
- (b) flight review requirements;
- (c) night recency requirements;
- (d) NVFR operations;
- (e) the interpretation of operational and meteorological information;
- (f) ground and aircraft lighting requirements;
- (g) use of instrument and navigation systems;
- (h) take-off minima;
- (i) holding and alternate requirements;
- (j) operational requirements and procedures for all airspace classifications;
- (k) operations below LSALT for night operations;
- (l) hazardous weather and conditions;
- (m) ERSA normal and emergency procedures.

#### 3 Practical flight standards

Unit Code	Unit of competency	Modifications
NTS1	Non-technical skills 1	Nil
NTS2	Non-technical skills 2	Nil
IFF	Full instrument panel manoeuvres	Nil
IFL	Limited instrument panel manoeuvres	Nil
NVR1	Conduct a traffic pattern at night	Nil

Unit Code	Unit of competency	Modifications
NVR2	Night VFR – single-engine aircraft	<p>This unit is only required if the flight review is conducted in a single-engine aircraft.</p> <p>The following elements are not required:</p> <ul style="list-style-type: none"> <li>(a) NVR2.13 – <i>Conduct a diversion to revised route or alternate aerodrome at night;</i></li> <li>(b) NVR2.15 – <i>Perform a go-round.</i></li> </ul> <p>The following elements are not required if the applicant completed a Night VFR rating flight review within the previous 24 months and these elements were included in that flight review:</p> <ul style="list-style-type: none"> <li>(a) NVR2.2 – <i>Obtain and use current operational documents;</i></li> <li>(b) NVR2.3 – <i>Prepare flight plan for NVFR flight;</i></li> <li>(c) NVR2.4 – <i>Determine operational requirements;</i></li> <li>(d) NVR2.5 – <i>Make flight notification;</i></li> <li>(e) NVR2.6 – <i>Program navigation system;</i></li> <li>(f) NVR2.11 – <i>Manage hazardous weather conditions.</i></li> </ul> <p>For element NVR2.9 – <i>Navigate the aircraft under NVFR</i>, the performance criteria are the following:</p> <ul style="list-style-type: none"> <li>(a) cockpit and instrument lighting are adjusted to allow reference to documentation, instruments and lookout;</li> <li>(b) fixes aircraft position using navigation systems;</li> <li>(c) tracks are intercepted and maintained to and from stations or navigation positions.</li> </ul>

## [55] Schedule 7, Appendix Q Low-level rating flight review

*substitute*

### Appendix Q Low-level rating flight review

#### 1. Flight review requirements

- 1.1** A low-level rating flight review must include an assessment of competency of at least 1 low-level endorsement.
- 1.2** An applicant for a low-level rating flight review must demonstrate competency, in the units of competency mentioned in clause 3, by doing the following:
- (a) conducting low-level operations;
  - (b) for manoeuvres in an aeroplane — performing operations within the flight tolerances specified in table 2 in Section 1 of Schedule 8 of this MOS;

- (c) for manoeuvres in a helicopter — performing operations within the flight tolerances specified in table 4 in Section 1 of Schedule 8 of this MOS;
- (d) for manoeuvres in a gyroplane — performing operations within the flight tolerances specified in table 6 in Section 1 of Schedule 8 of this MOS.

**1.3** However, for paragraphs 1.2 (b) and (c), a sustained deviation outside of the applicable flight tolerance is not permitted.

## **2. Knowledge requirements**

The applicant is required to demonstrate knowledge of the following topics:

- (a) the privileges and limitations of the low-level rating and low-level endorsements held by the applicant;
- (b) flight review requirements;
- (c) operating the aircraft's navigation and operating systems;
- (d) applying operating limitations;
- (e) weight and balance requirements;
- (f) the interpretation of operational and meteorological information;
- (g) applying aircraft performance data, including take-off and landing performance data for the class of aircraft;
- (h) operational requirements and procedures – all airspace classifications;
- (i) airworthiness requirements;
- (j) reporting requirements;
- (k) ERSA normal and emergency procedures;
- (l) recent changes to legislation and procedures;
- (m) wind effect at low level and associated flying conditions;
- (n) the effect of mountainous terrain on airflow and associated flying conditions;
- (o) the hazards of, and managing the risks associated with, low flying;
- (p) operating in hilly terrain;
- (q) aircraft performance, including:
  - (i) maximum rate turning; and
  - (ii) minimum radius turning; and
  - (iii) best angle of climb; and
  - (iv) best rate of climb; and
  - (v) 1 engine inoperative performance (if applicable);
- (r) the effects of typical and extreme environmental conditions on pilot health and performance that are relevant to aerial application operations;
- (s) the effects of fatigue and physical health on pilot performance;
- (t) analysis of actual and forecast weather relevant to low-level operations;
- (u) assessment of the geographical characteristics of the area of flying operations to ensure safe completion of the task.

## **3. Practical flight standards**

<b>Unit Code</b>	<b>Unit of competency</b>	<b>Modifications</b>
C1	Communicating in aviation environment	Nil
C2	Perform pre- and post-flight actions and procedures	Nil
LL-A	Aeroplane low-level operations	For this unit, the following elements are not required:

Unit Code	Unit of competency	Modifications
		<p>(a) LL-A.2 – <i>Flight component</i>;</p> <p>(b) LL-A.3 – <i>Aircraft handling</i>;</p> <p>(c) LL-A.8 – <i>Operate at low level in hilly terrain</i>.</p> <p>If the flight review is conducted in a single-engine aeroplane, element LL-A.7 – <i>Execute engine failure (simulated) from below 500 ft AGL (multi-engine aeroplane only)</i> is not required.</p> <p>If the flight review is conducted in a multi-engine aeroplane, element LL-A.6 – <i>Execute forced landing (simulated) from below 500 ft AGL (single-engine aeroplane only)</i> is not required.</p>
LL-H	Helicopter low-level operations	<p>For this unit, the following elements are not required:</p> <p>(a) LL-H.2 – <i>Flight component</i>;</p> <p>(b) LL-H.3 – <i>Aircraft handling (at an altitude above 1,500 ft AGL)</i>;</p> <p>(c) LL-H.7 – <i>Operate at low level in hilly terrain</i>.</p> <p>If the flight review is conducted in a single-engine helicopter, element LL-H.6 – <i>Execute engine failure (simulated) from below 500 ft AGL (multi-engine aeroplane only)</i> is not required.</p> <p>If the flight review is conducted in a multi-engine helicopter, element LL-H.5 – <i>Execute autorotative forced landing (simulated) from below 500 ft AGL (single-engine aeroplane only)</i> is not required.</p>
LL-G	Gyroplane low-level operations	<p>For this unit, the following elements are not required:</p> <p>(a) LL-G.2 – <i>Flight component</i>;</p> <p>(b) LL-G.3 – <i>Aircraft handling</i>;</p> <p>(c) LL-G.6 – <i>Operate at low level in hilly terrain</i>.</p>
LL-M	Aerial mustering operations	Nil
LL-SO	Sling operations	Nil
LL-WR	Winch and rappelling operations	Nil

**[56] Schedule 8, Section 1, Table 3: Helicopter general flight tolerances – private level**

*substitute*

**Table 3: Helicopter general flight tolerances – private level**

**Applicability**

The flight tolerances in this subsection apply to the following licences and ratings:

- (a) recreational pilot licence;
- (b) private pilot licence;
- (c) aircraft class rating;
- (d) NVFR rating.

**Requirements**

A person is required to perform flight manoeuvres within the flight tolerances mentioned in this table to be assessed as competent in the associated unit of competency.

**Flight tolerances**

Flight path or manoeuvre		Flight tolerances	
Hover		±1 m of hover point	
Ground taxi/hover taxi and manoeuvring		±1 m of track	
		±5° of nominated heading	
		±20% of nominated height	
Climbing		-0 +5 kts nominated IAS	
Level off from climb and descent		±100 ft of nominated altitude	
Straight and level	Altitude	±100 ft	
	IAS	±5 kts	
	Heading	±5° of nominated heading	
Power descent	IAS	±5 kts	
	Heading	±5° of nominated heading	
Turns	Angle of bank	Angle of bank ±5°	
	Altitude	±100 ft of nominated altitude	
Exit turn onto a heading	Initial	±15° of heading	
	Sustained	±5° of heading	
Level speed in IMC – U/A recovery		Not less than $V_{min}$ IMC	
Final approach airspeed		-0 +10 kts	
Landing (normal)		Within a 5 m diameter circle of nominated point	
Multi-engine – 1 engine disengaged	Heading	±5° of nominated heading	
	IAS	±10 kts of nominated speed/not below approach speed for configuration	
		Altitude	±100 ft

Flight path or manoeuvre		Flight tolerances
Control helicopter during advanced manoeuvres – steep turns	Speed	±5 kts
	Exit on specified heading	±15° initially, then ±5°
	Descending turns	Through a minimum descent of 500 ft
Autorotation – single-engine helicopter	Heading	±5° Able to turn into the last known wind direction and maintain heading within tolerance
	IAS	±5 kts From recommended minimum rate of descent airspeed
Advanced manoeuvre – autorotative flight	Descent at nominated heading	±5°
	Manufacturer's recommended speed	±5 kts
	Steep turn altering heading	360° using 45° bank
	Best range speed and minimum descent rate	±5 kts
	Distance from the nominated touchdown or termination point	±25 m
Advanced manoeuvre – power recovery	Rotor RPM	Within limitation
	Nominated minimum descent altitude	+100/-0 ft
	Climb speed	±5 kts

**[57] Schedule 8, Section 1, Table 4: Helicopter general flight tolerances – professional level**

*substitute*

**Table 4: Helicopter general flight tolerances – professional level**

**Applicability**

The flight tolerances in this subsection apply to the following licences and ratings:

- (a) commercial pilot licence;
- (b) multi-crew pilot licence;
- (c) air transport pilot licence;
- (d) pilot instructor rating;
- (e) private IFR rating;
- (f) instrument rating;
- (g) flight examiner rating;
- (h) aerial application rating;

- (i) low-level rating;
- (j) aircraft type rating.

## Requirements

A person is required to perform flight manoeuvres within the flight tolerances mentioned in this table to be assessed as competent in the associated unit of competency.

## Flight tolerances

Flight path or manoeuvre		Flight tolerances
Hover		±0.5 m of hover point
Ground taxi/hover taxi and manoeuvring		±1 m of track
		±5° of nominated heading
		±20% of nominated height
Climbing		-0 +5 kts nominated IAS
Level off from climb and descent		±100 ft of nominated altitude
Straight and level	Altitude	±100 ft
	IAS	±5 kts
	Heading	±5° of nominated heading
Power descent	IAS	±5 kts
	Heading	±5° of nominated heading
Turns	Angle of bank	Angle of bank ±5°
	Altitude	±100 ft of nominated altitude
Exit turn onto a heading	Initial	±15° of heading
	Sustained	±5° of heading
Level speed in IMC – U/A recovery		Not less than $V_{min}$ IMC
Final approach airspeed		-0 +10 kts
Landing (normal)		Within a 5 m diameter circle of nominated point
Multi-engine – 1 engine disengaged	Heading	±5° of nominated heading
	IAS	±10 kts of nominated speed/not below approach speed for configuration
Control helicopter during advanced manoeuvres – steep turns	Altitude	±100 ft
	Speed	±5 kts
	Exit on specified heading	±15° initially, then ±5°
	Descending turns	Through a minimum descent of 500 ft
Autorotation – single-engine helicopter	Heading	±5° Able to turn into the last known wind direction and maintain heading within tolerance
	IAS	±5 kts From recommended minimum rate of descent airspeed
Advanced manoeuvre – autorotative flight	Descent at nominated heading	±5°

Flight path or manoeuvre		Flight tolerances
	Manufacturer's recommended speed	±5 kts
	Steep turn altering heading	360° using 45° bank
	Best range speed and minimum descent rate	±5 kts
	Distance from the nominated touchdown or termination point	±25 m
Advanced manoeuvre – power recovery	Rotor RPM	Within limitation
	Nominated minimum descent altitude	+100/-0 ft
	Climb speed	±5 kts

**[58] Schedule 8, Section 1, Table 6: Gyroplane class rating tolerances – private**

*substitute*

**Table 6: Gyroplane general flight tolerances – private level**

**Applicability**

The flight tolerances in this subsection apply to the following licences and ratings:

- (a) recreational pilot licence;
- (b) private pilot licence;
- (c) aircraft class rating;
- (d) NVFR rating.

**Requirements**

A person is required to perform flight manoeuvres within the flight tolerances mentioned in this table to be assessed as competent in the associated unit of competency.

**Flight tolerances**

Flight path manoeuvre		Flight Tolerances
Ground taxi and manoeuvring		±1.5 m of track/centreline
Climbing	Best rate	-0 +5 kts of nominated airspeed
	Best angle	±5 kts of nominated airspeed
	Heading	±5° of nominated heading
Level off from climb and descent		±100 ft of nominated altitude
Straight and level	Altitude	±100 ft
	IAS	±5 kts
	Heading	±5° of nominated heading
Power descent airspeed	IAS	±10 kts



Flight path manoeuvre		Flight Tolerances
	Heading	±10° of nominated heading
	Rate of descent	±150 ft/min
Turns	Angle of bank	Angle of bank ±5°
	Altitude	±100 ft of nominated altitude
Exit turn onto a heading	Initial	±15° of heading
	Sustained	±10° of heading
Final approach airspeed		±5 kts
Touchdown		±2 m of centreline
Landing (normal)		±50 m of selected touchdown point

**[59] Schedule 8, Section 1, Table 7: Gyroplane class rating tolerances – professional**

*substitute*

**Table 7: Gyroplane general flight tolerances – professional level**

**Applicability**

The flight tolerances in this subsection apply to the following licences and ratings:

- (a) commercial pilot licence;
- (b) pilot instructor rating;
- (c) instrument rating;
- (d) private IFR rating;
- (e) flight examiner rating;
- (f) aerial application rating;
- (g) low-level rating;
- (h) aircraft type rating.

**Requirements**

A person is required to perform flight manoeuvres within the flight tolerances mentioned in this table to be assessed as competent in the associated unit of competency.

**Flight tolerances**

Flight path manoeuvre		Flight tolerances
Ground taxi and manoeuvring		±1.5 m of track/centreline
Climbing	Best rate	-0 +5 kts of nominated airspeed
	Best angle	±5 kts of nominated airspeed
	Heading	±5° of nominated heading
Level off from climb and descent		±100 ft of nominated altitude
Straight and level	Altitude	±100 ft
	IAS	±10 kts
	Heading	±10° of nominated heading
Power descent airspeed	IAS	±10 kts

Flight path manoeuvre		Flight tolerances
	Heading	±10° of nominated heading
	Rate of descent	±150 ft/min
Turns	Angle of bank	Angle of bank ±5°
	Altitude	±100 ft of nominated altitude
Exit turn onto a heading	Initial	±15° of heading
	Sustained	±10° of heading
Final approach airspeed		±5 kts
Touchdown		±2 m of centreline
Landing (normal)		±50 m of selected touchdown point

## Schedule 2 Consequential amendments to glider provisions

### [1] Schedule 1, Section Z, Appendix Z.1 Glider pilot licence

*substitute*

#### Appendix Z.1 Glider pilot licence

##### Practical flight standards

Unit code	Unit of competency
S1	Control glider on the ground
S2	Take-off glider
S3	Control glider in normal flight
S4	Land glider
S5	Glider advanced manoeuvres
S6	Manage abnormal situations and emergencies — gliders
S7	Navigation — gliders
NTS1	Non-technical skills 1
NTS2	Non-technical skills 2
PPF-S	Perform pre- and post-flight actions and procedures — gliders

### [2] Schedule 2, Section 4, GLIDER CATEGORY, PPF-G Perform pre- and post-flight procedures gliders

*substitute*

#### PPF-S Perform pre- and post-flight procedures — gliders

**[3] Schedule 2, Section 4, GLIDER CATEGORY**

*substitute each reference to an abbreviation in column 1 (wherever occurring) with the corresponding reference in column 2*

<b>Column 1</b>	<b>Column 2</b>
G1	S1
G2	S2
G3	S3
G4	S4
G5	S5
G6	S6
G7	S7

**Schedule 3 Transitional provisions relating to amendments in Schedule 1**

If an instrument, approval, authorisation, document or other writing contains a reference to a unit in column 1 of the following table that is the subject of an amendment in Schedule 1 of this instrument, it will, on and from the commencement of this Schedule, be taken to be a reference to the corresponding unit in column 2:

<b>Column 1</b>	<b>Column 2</b>
AAGA: ATP Aircraft general knowledge – aeroplane	AGKA: ATP Aircraft general knowledge – aeroplane
AAGH: ATP Aircraft general knowledge – helicopter	AGKH: ATP Aircraft general knowledge – helicopter
AAGC: ATP Aircraft general knowledge – common	AGKC: ATP Aircraft general knowledge – common

**Schedule 4 Transitional provisions relating to amendments in Schedule 2**

If an instrument, approval, authorisation, document or other writing contains a reference to an abbreviation in column 1 of the following table that is the subject of an amendment in Schedule 2 of this instrument, it will, on and from the commencement of this Schedule, be taken to be a reference to the corresponding abbreviation in column 2:

<b>Column 1</b>	<b>Column 2</b>
G1	S1
G2	S2
G3	S3
G4	S4
G5	S5
G6	S6
G7	S7
PPF-G	PPF-S