SECTION 4: AIRCRAFT RATING STANDARDS

AEROPLANE CATEGORY

A1 Control aeroplane on the ground

1 Unit description

This unit describes the skills and knowledge required to operate an aeroplane on the ground.

2 Elements and performance criteria

2.1 **A1.1 – Start and stop engine**

(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) considers ground surface in relation to contamination and propeller care during engine start and stop activities.

2.2 **A1.2 – Taxi aeroplane**

(a) use aerodrome or landing area charts to taxi aircraft;

(b) comply with taxiway and other aerodrome markings, right-of-way rules and ATC or marshalling instructions when applicable;

(c) perform applicable taxi checks, including the following:

(i) brakes and steering function normally and take appropriate action in the event of a malfunction;

(ii) instruments for correct readings;

(iii) altimeter setting;

(d) maintain safe taxi speed and control of the aircraft;

(e) maintain safe spacing from other aircraft, obstructions, and persons;

(f) maintain the aircraft on the taxiway centreline;

(g) avoid causing a hazard to other aircraft, objects or persons;

(h) correct handling techniques are applied to take into account wind from all 4 quadrants;

(i) correctly manage the engine during taxi manoeuvres.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) single-engine aeroplane with propeller;

(c) aircraft with undercarriage and flaps;

(d) windsock located on the aerodrome;

(e) sufficient wind that requires control adjustment (may be simulated);

(f) hazardous weather (may be simulated);

(g) day VFR conditions;

(h) local area operational limitations such as noise abatement and aerodrome curfews (may be simulated).

4 Underpinning knowledge of the following:

(a) typical single-engine aeroplane aircraft systems;

(b) differences between normally aspirated and fuel-injected systems;

(c) carburettor icing;

(d) the cause and effect of fuel vaporisation;

(e) typical aircraft performance characteristics of single-engine aeroplanes and the effects of local weather conditions on performance;

(f) aircraft weight and balance and the how to calculate aircraft centre of gravity;

(g) the contents of the flight manual and POH for the aircraft being flown;

(h) the environmental conditions that represent VMC;

(i) propeller wash, rotor wash and jet blast and how they affect other aircraft;

(j) the day VFR flight rules;

(k) the meaning of:

(i) light and marshalling signals;

(ii) aerodrome markings, signals and local procedures;

(l) care of propellers;

(m) the actions to be taken in the event of a brake or tyre or steering failure;

(n) the relevant sections of the AIP.

A2 Take-off aeroplane

1 Unit description

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

2 Elements and performance criteria

2.1 A2.1 – 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) work out a plan of action, in advance, to ensure the safest outcome in the event of abnormal operations;

(c) verify and correctly apply correction for the existing wind component to the take-off performance;

(d) perform all pre-take-off and line-up checks required by the aircraft checklist;

(e) ensure approach path is clear of conflicting traffic and other hazards before lining up for take-off;

(f) align the aeroplane on the runway centreline.

2.2 A2.2 – Take off aeroplane

(a) apply the controls correctly to maintain longitudinal alignment on the centreline of the runway, if appropriate, prior to 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 to ensure all predetermined parameters are achieved and maintained;

(d) adjust the controls to attain the desired pitch attitude at the predetermined airspeed to attain the desired performance;

(e) perform the take-off applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner;

(f) trim the aeroplane accurately;

(g) perform gear and flap retractions, power adjustments (as applicable) and other required pilot-related activities;

(h) maintain flight path along the runway extended centreline;

(i) apply the applicable noise abatement and wake turbulence avoidance procedures;

(j) recognise take-off abnormalities and take appropriate action to reject take-off (can be simulated).

2.3 A2.3 – Take off aeroplane in a cross-wind

(a) perform a take-off in an aeroplane making appropriate adjustments for cross-wind conditions;

(b) maintain the runway centreline and extended centreline.

2.4 A2.4 – Carryout after take-off procedures

(a) perform after take-off checklist;

(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 **A2.5 – Take-off aeroplane from 'short field'**

(a) calculate take-off and landing performance in accordance with the aeroplane's performance charts;

(b) perform take-off aeroplane to achieve the minimum length take-off performance;

(c) perform take-off aeroplane to achieve the obstacle clearance parameters.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) aeroplane with piston or turbine powerplant and propeller;

(c) aircraft with nose wheel or tail wheel;

(d) aircraft with fixed or retractable undercarriage;

(e) aircraft with or without flaps;

(f) sealed, gravel or grass runways and taxiways;

(g) windsock located on aerodrome;

(h) engine start and shutdown malfunctions and emergencies covered by the aircraft flight manual;

(i) simulated hazardous weather;

(j) day VFR conditions;

(k) for take-off in cross-wind, the cross-wind component must be:

(i) for RPL, not more than 10 kts;

(ii) otherwise, 70% of the maximum permitted for the type of aeroplane being flown;

(l) local area operational limitations such as noise abatement and aerodrome curfews.

4 Underpinning knowledge of the following:

(a) obtaining or calculating the cross-wind and down or up wind components;

(b) the factors affecting take-off and initial climb performance;

(c) interpreting windsock indications and determining wind direction and speed;

(d) take-off distance required calculation;

(e) aerodrome charts and an ability to interpret them;

(f) local topographical charts to identify safe areas for engine-failure purposes and noise-abatement considerations.

A3 Control aeroplane in normal flight

1 Unit description

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

2 Elements and performance criteria

2.1 A3.1 – Climb aeroplane

(a) operate and monitor all aircraft systems when commencing, during, and completing a climbing flight manoeuvre;

(b) adjust altimeter subscale according to applicable settings;

(c) identify and avoid terrain and traffic;

(d) for the following climbing manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:

(i) cruise climb;

(ii) best angle climb;

(iii) best rate climb;

(e) anticipate level-off altitude and achieve straight and level flight.

2.2 A3.2 – Maintain straight and level flight

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

(b) adjust altimeter subscale according to applicable settings;

(c) identify and avoid terrain and traffic;

(d) for the following straight and level manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:

(i) at slow speed;

(ii) at normal cruise;

(iii) at high-speed cruise;

(iv) during acceleration and deceleration;

(v) except for the RPL, at maximum range;

(vi) except for the RPL, at maximum endurance;

(vii) with flaps selected.

2.3 A3.3 – Descend aeroplane

(a) operate and monitor all aircraft systems during descending flight manoeuvres;

(b) for the following descending manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:

(i) glide;

(ii) powered;

(iii) approach configuration descent (flap and undercarriage);

(c) anticipate level-off altitude and achieve straight and level flight.

2.4 A3.4 – Turn aeroplane

(a) operate and monitor all aircraft systems during turning flight manoeuvres;

(b) for the following turning manoeuvres select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve the required flight tolerances that apply to the manoeuvre:

(i) level turns;

(ii) climbing turn;

(iii) powered descending;

(iv) gliding descending turn;

(c) complete turn manoeuvre on a nominated heading or geographical feature;

(d) turn aeroplane at varying rates to achieve specified tracks;

(e) manoeuvre aeroplane over specified tracks or geographical features.

2.5 **A3.5 – Control aeroplane at slow speeds**

(a) complete pre-manoeuvre checks;

(b) operate and monitor all aircraft systems when operating the aeroplane at slow speed in straight and level, climbing, descending and turning flight;

(c) except for multi-engine aeroplane operations, select power, attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, and apply smooth, coordinated control inputs to achieve stable flight at the required flight tolerances that apply to the following:

(i) minimum approach speed with flaps retracted;

(ii) minimum approach speed in approach configuration;

(iii) flight at speeds just above stall warning activation or at the initial symptoms of stall;

(d) except for multi-engine aeroplane operations, observe audible and visible stall warnings and recover aeroplane to controlled flight;

(e) recognise and respond positively to reduced effectiveness of controls during slow flight manoeuvres;

(f) recognise the need to increase power while manoeuvring in slow flight to maintain nominated altitude and a margin of speed above the stall;

(g) transition from slow speed configuration, using take-off power to achieve nominated speed in excess of 1.5 Vs without loss of height.

2.6 **A3.6 – Perform circuits and approaches**

(a) operate and monitor all aircraft systems when operating the aeroplane in the circuit;

(b) in accordance with specific local procedures, safely perform a full circuit pattern (5 legs) by balancing and trimming the aeroplane accurately while applying smooth, coordinated control inputs to achieve the required flight tolerances specified for the flight path flown during traffic pattern manoeuvres as follows:

(i) track upwind along extended centreline to 500 ft;

(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;

(c) perform checks as required throughout circuit;

(d) establish the approach and landing configuration appropriate for the runway and meteorological conditions, and adjust the power plant 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) align and maintain aircraft on final approach flight path with specified or appropriate runway;

(iv) set and maintain approach configuration not below 500 ft AGL;

(v) identify and maintain the nominated aiming point;

(vi) maintain a stabilised approach angle at the nominated airspeed not less than $1.3V_S$ to the round-out height;

(vii) verify existing wind conditions, make proper correction for drift, and maintain a precise ground track;

(viii) apply speed allowances for wind gusts;

(ix) configure aeroplane for landing;

(e) maintain aircraft separation and position in the circuit with reference to other aircraft traffic in the circuit area.

2.7 **A3.7 – Local area airspace**

(a) using an appropriate chart, for the local area and circuit area:

(i) identify geographical features;

(ii) identify geographical limits;

(iii) identify restricted, controlled and uncontrolled airspace areas;

(iv) state local airspace limits;

(v) identify the transit route between the departure aerodrome and training area;

(vi) identify the geographical limits of the training area;

(vii) identify 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 safely within a transit lane (if applicable);

(e) remain clear of restricted, controlled and other appropriately designated airspace;

(f) operate safely 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 aircraft for arrival into the circuit.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) aeroplane with piston or turbine powerplant and propeller;

(c) aircraft with fixed or retractable undercarriage;

(d) aircraft with or without flaps;

(e) simulated hazardous weather;

(f) approach and landing configurations:

(i) normal;

(ii) flapless;

(iii) glide;

(g) circuit patterns:

(i) normal 1,000 ft AGL circuit;

(ii) low-level 500 ft AGL circuit;

(iii) full circuit pattern, including 5 legs;

(iv) shortened circuit pattern;

(h) day VFR conditions;

(i) local area airspace limitations.

4 Underpinning knowledge of the following:

(a) the primary effects of controls;

(b) the secondary effects of controls;

(c) the stall warning devices;

(d) aircraft systems;

(e) aircraft performance;

(f) aircraft weight and balance;

(g) hazards when performing performance manoeuvres;

(h) turning using a magnetic compass;

(i) relationship between angle of bank, load factor and stall speed;

(j) relationship between induced drag and operating at slow speed;

(k) dangers associated with mechanical and wake turbulence;

(l) engine considerations during prolonged climbing and descending;

(m) contents of the aircraft flight manual and pilot's operating handbook;

(n) environmental conditions that represent VMC;

(o) day VFR flight rules;

(p) local area operating procedures;

(q) relevant sections of the AIP.

A4 Land aeroplane

1 Unit description

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

2 Elements and performance criteria

2.1 A4.1 – Land aeroplane

(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 centreline within tolerances;

(c) ensure separation is maintained;

(d) maintain positive directional control and cross-wind correction during the after-landing roll;

(e) use drag and braking devices, as applicable, in such a manner to bring the airplane to a safe stop;

(f) complete the applicable after-landing checklist items in a timely manner.

2.2 A4.2 – Land aeroplane in a cross-wind

(a) verify existing wind conditions, make proper correction for drift, and maintain a precise ground track;

(b) configure the aeroplane for the cross-wind conditions;

(c) control the aeroplane during the transition from final approach to touchdown and during after-landing roll to compensate for the cross-wind conditions.

2.3 A4.3 – Conduct a missed approach

(a) recognise the conditions when a missed approach should be executed;

(b) make the decision to execute a missed approach when it is safe to do so;

(c) make a smooth, positively-controlled transition from approach to missed approach, including the following:

(i) select power, attitude and configuration to safely control aeroplane;

(ii) manoeuvre aeroplane clear of the ground and conduct after take-off procedures;

(iii) make allowance for wind velocity during go-around;

(iv) avoid wake turbulence.

2.4 A4.4 – Perform recovery from missed landing

(a) recognise when a missed landing is occurring and when it is appropriate to take recovery action;

(b) make the decision to execute recovery from a missed landing only when it is safe to do so;

(c) make a smooth, positively-controlled transition from missed landing to missed approach, including the following:

(i) select power, attitude and configuration to safely control aeroplane;

(ii) manoeuvre aeroplane clear of the ground and conduct after take-off procedures;

(iii) make allowance for wind velocity during go-around;

(iv) avoid wake turbulence.

2.5 **A4.5 – Short landing**

(a) land aeroplane at nominated touchdown point at minimum speed;

(b) control ballooning during flare;

(c) control bouncing after touchdown;

(d) maintain direction after touchdown;

(e) apply maximum braking without locking up wheels;

(f) stops aircraft within landing distance available.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) aeroplane with piston or turbine powerplant and propeller;

(c) aircraft with nose wheel or tail wheel;

(d) aircraft with fixed or retractable undercarriage;

(e) aircraft with or without flaps;

(f) sealed, gravel or grass runways and taxiways;

(g) windsock located on aerodrome;

(h) simulated hazardous weather;

(i) day VFR conditions;

(j) for landing an aeroplane in cross-wind, the cross-wind component must be:

(i) for RPL, not more than 10 kts;

(ii) otherwise, 70% of the maximum permitted for the type of aeroplane being flown;

(k) local area operational limitations such as noise abatement and aerodrome curfews.

4 Underpinning knowledge of the following:

(a) typical single-engine aeroplane aircraft systems;

(b) aeroplane performance;

(c) aeroplane limitations;

(d) aeroplane weight and balance;

(e) options when local conditions are not suitable for landing;

(f) causes of loss of control of aeroplane on landing;

(g) contents of the aircraft flight manual and pilot's operating handbook;

(h) environmental conditions that represent VMC;

(i) day VFR flight rules;

(j) propeller wash, rotor wash and jet blast;

(k) relevant sections of the AIP.

A5 Aeroplane advanced manoeuvres

1 Unit description

This unit describes the skills and knowledge required to perform advanced manoeuvres in an aeroplane.

2 Elements and performance criteria

2.1 A5.1 – Enter and recover from stall

(a) perform stalling pre-manoeuvre checks;

(b) recognise symptoms of a stall;

(c) control the aeroplane by trimming and balancing accurately for slow flight and then applying the required pitch, roll and yaw inputs to enter and recover from the following:

(i) slow flight where initial symptoms of a stall become evident;

(ii) stall, recovering without application of power;

(iii) stall, recovering with full power applied (not required for multi-engine aeroplanes);

(iv) stall under the following conditions:

(A) straight and level flight;

(B) climbing flight (not required for multi-engine aeroplanes);

(C) descending flight (not required for multi-engine aeroplanes);

(D) approach to land configuration;

(E) turning flight (not required for multi-engine aeroplanes);

(d) perform stall recovery including the following:

(i) reduce angle of attack;

(ii) prevent yaw;

(iii) use available power and height to increase the aircraft energy state;

(iv) avoid secondary stall;

(v) re-establish desired flight path and aircraft control with balanced control application;

(e) perform stall recovery in simulated partial and complete engine failure conditions;

(f) perform stall recovery at simulated low altitude.

2.2 A5.2 – Avoid spin

This element only applies to a single-engine aeroplane:

(a) perform stalling pre-manoeuvre checks;

(b) recognise wing drop at the stall;

(c) from balanced flight, recover from stall in the attitudes and configurations most likely to cause a wing drop;

(d) perform recovery where the aeroplane exhibits a tendency to drop a wing at the stall, in accordance with paragraph (d) of subclause 2.1 (5.1 – Enter and recover from stall);

(e) perform stall recovery at simulated low altitude.

2.3 A5.3 – Turn aeroplane steeply

(a) pre-manoeuvre checks for steep turning;

(b) steep level turn using a nominated bank angle, ending on a nominated heading or geographical feature, without altitude change;

(c) steep descending turn using a nominated bank angle, ending on a nominated heading or geographical feature ending on a nominated altitude;

(d) aeroplane operating limits are not exceeded.

2.4 **A5.4 – Sideslip aeroplane (where flight manual permits)**

(a) straight sideslip:

(i) induce slip to achieve increased rate of descent while maintaining track and airspeed; and

(ii) adjust rate of descent by coordinating angle of bank and applied rudder;

(b) sideslipping turn by adjusting the bank angle to turn through minimum heading change of 90° at constant airspeed using sideslip, and exiting the turn on a specified heading or geographical feature, within tolerance;

(c) recover from a sideslip and return the aeroplane to balanced flight.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) manoeuvres are performed within operating limits of aeroplane;

(c) aeroplane with piston or turbine powerplant and propeller;

(d) aircraft with nose wheel or tail wheel;

(e) aircraft with fixed or retractable undercarriage;

(f) aircraft with or without flaps;

(g) sealed, gravel or grass runways and taxiways;

(h) windsock located on aerodrome;

(i) simulated hazardous weather;

(j) day VFR conditions;

(k) 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 aeroplane operational considerations related to slow flight, sideslipping, stalling, spinning, steep turns, upset aeroplane states, including but not limited to the following:

(i) symptoms of approach to stall and throughout the stall manoeuvre until recovery;

(ii) relationship between angle of attack and stall;

(iii) effects of weight, centre of gravity position, ‘g’ force and angle of attack;

(iv) dangers of unbalanced flight;

(v) principle of stick and control and the point of stall;

(vi) priority given to reduce angle of attack during stall manoeuvres;

(vii) loss of height is considered in relation to available height and energy state;

(viii) the technique of converting excess speed to height;

(ix) the technique of converting excess height to speed;

(x) symmetrical and rolling ‘g’ force limitations;

(xi) higher stall speeds when aeroplane is turning;

(xii) effects on fuel, pitot and flap systems;

(c) contents of the flight manual and POH;

(d) environmental conditions that represent VMC;

(e) day VFR flight rules;

(f) relevant sections of the AIP.

A6 Manage abnormal situations – single-engine aeroplanes

1 Unit description

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

2 Elements and performance criteria

2.1 A6.1 – Manage engine failure – take-off (simulated)

(a) correctly identify an engine failure after take-off;

(b) apply the highest priority to taking action to control the aeroplane;

(c) maintain control of aeroplane;

(d) perform recall actions;

(e) perform emergency actions as far as time permits;

(f) manoeuvre the aeroplane to achieve the safest possible outcome;

(g) ensure passengers adopt brace position;

(h) advise others such as ATS and other aircraft of intentions if time permits.

2.2 A6.2 – Manage engine failure in the circuit area (simulated)

(a) correctly identify an engine failure during flight;

(b) apply the highest priority to taking action to control the aeroplane;

(c) perform recall actions;

(d) select a suitable landing area within gliding distance, on the aerodrome or elsewhere;

(e) perform emergency procedures and land the aeroplane if the engine cannot be restarted as time permits;

(f) advise ATS or other agencies capable of providing assistance of situation and intentions;

(g) re-brief passengers about flight situation, brace position and harness security;

(h) land the aeroplane ensuring safest outcome if an engine restart is not achieved.

2.3 A6.3 – Perform forced landing (simulated)

(a) after a simulated complete engine failure has occurred, without prior indications, carryout the following:

(i) identify complete power failure condition and control aeroplane;

(ii) perform immediate actions;

(iii) formulate and describe a recovery plan, including selecting the most suitable landing area;

(iv) establish optimal gliding flight path to position the aeroplane for a landing on the selected landing area;

(v) perform emergency procedures and land the aeroplane if the engine cannot be restarted as time permits;

(vi) advise ATS or other agencies capable of providing assistance of situation and intentions;

(vii) re-brief passengers about flight situation, brace position and harness security;

(viii) land the aeroplane ensuring safest outcome if an engine restart is not achieved;

(b) after a simulated partial engine failure has occurred, without prior indications, carryout the following:

(i) identify partial power failure condition;

(ii) perform recall actions;

(iii) adjust flight controls to re-establish flight path that maximises performance for partial power condition and maintain a safe airspeed margin above stall speed;

(iv) establish radio communications where possible;

(v) perform partial engine failure actions;

(vi) formulate a plan to recover aeroplane to a safe landing area or aerodrome, taking into account that partial failure might lead to a full power failure at any time;

(vii) manoeuvre the aeroplane to a selected landing area or aerodrome using the remaining power to establish an optimal aircraft position for a safe landing;

(viii) advise ATS, or other agencies capable of providing assistance of situation and intentions;

(ix) re-brief passengers about flight situation, brace position and harness security;

(x) maintain a contingency plan for coping with a full power failure throughout the manoeuvre;

(xi) when a safe landing position is established, shut down and secure engine and aeroplane.

2.4 **A6.4 – Conduct precautionary search and landing (simulated condition)**

(a) assess flight circumstances and make an appropriate decision when to perform precautionary landing;

(b) configure aeroplane for conditions;

(c) perform precautionary search procedure;

(d) select landing area, carryout an inspection and assess its suitability for landing, taking into account:

(i) unobstructed approach and overshoot paths;

(ii) landing area length adequate for landing;

(iii) landing area surface is suitable for aeroplane type and clear of hazards;

(e) maintain orientation and visual contact with the landing area;

(f) advise ATS or other agencies capable of providing assistance of situation and intentions;

(g) re-brief passengers about flight situation, brace position and harness security;

(h) land and secure aircraft and manage passengers.

2.5 **A6.5 – Manage other abnormal situations (simulated)**

(a) correctly identify the situation and maintain safe control of the aeroplane at all times;

(b) manage abnormal and emergency situations in accordance with relevant emergency procedures and regulatory requirements;

(c) follow appropriate emergency procedures while maintaining control of the aeroplane;

(d) identify and conduct flight with an unreliable airspeed indication;

(e) correctly identify when an emergency evacuation of an aeroplane is required;

(f) execute a simulated emergency evacuation of an aeroplane;

(g) advise ATS or other agencies capable of providing assistance of situation and intentions.

2.6 **A6.6 – Recover from unusual flight attitudes**

(a) identify nose-high or nose-low unusual attitude flight condition;

(b) recover from nose-low or nose-high 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) single-engine aeroplane with piston or turbine powerplant and propeller;

(c) discontinue simulated manoeuvres that would be terminated by a forced landing when the assessor is satisfied that the landing standard would be achieved;

(d) day VFR conditions.

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) causes leading to precautionary landings;

(d) judging descent profiles in various configurations;

(e) prioritising activities during emergencies and non-normal situations;

(f) ditching;

(g) suitable fields for forced landings and precautionary landings;

(h) considerations when practicing emergencies and non-normal operations;

(i) aircraft performance in a glide (straight and turning);

(j) hazard of sideslip at low altitude;

(k) effects of partial engine power on performance, flight profile, range and landing options;

(l) contents of the flight manual and pilot's operating handbook;

(m) passenger control and briefing;

(n) VMC;

(o) low-flying hazards.

AME Operate multi-engine aeroplane

1 Unit description

This unit describes the skills and knowledge required to operate a multi-engine class-rated aeroplane in non-normal and emergency operations.

2 Elements and performance criteria

2.1 AME.1 – Operate multi-engine aeroplane

(a) start multi-engine aeroplane;

(b) use asymmetric thrust to assist with taxi manoeuvring;

(c) check multi-engine specific systems and instrumentation.

2.2 AME.2 – Manage failures and malfunctions – general

(a) operate and manage aircraft systems;

(b) asymmetric operations for all phases of flight are anticipated and contingencies are planned;

(c) a plan of action is self-briefed or briefed that will ensure the safest outcome in the event of asymmetric operations.

2.3 AME.3 – Manage engine failure and malfunction after take-off (simulated)

(a) manage simulated engine failures and malfunctions effectively whilst maintaining control of the aircraft flight path within specified tolerances;

(b) configure and fly aeroplane to achieve best performance;

(c) replan flight and take action to return to land or divert to alternate.

2.4 AME.4 – Manage engine failure and malfunction en route (simulated)

(a) maintain or regain control of the aeroplane flight path within specified tolerances;

(b) manage failed or malfunctioning engine effectively;

(c) replan flight and take action to continue or divert to alternate.

2.5 AME.5 – Perform rejected take-off – multi-engine aeroplane

(a) abort take-off at or before decision point during the take-off where the abort procedure can be initiated and the aeroplane stopped on the remaining runway or stopway;

(b) reduce power smoothly and promptly;

(c) activate spoilers, prop fine, reverse, thrust reverse, wheel brakes and other drag and braking devices (as applicable);

(d) maintain positive control to bring the aeroplane to a safe stop;

(e) initiate and complete engine failure procedures and checklists.

2.6 AME.6 – Manage engine failure and malfunction during approach and landing (simulated)

(a) maintain control of aeroplane flight path;

(b) nominate decision height for landing;

(c) make decision to continue or abort approach and landing in a safe and timely way;

(d) advise ATS or other agencies capable of providing assistance of situation and intentions;

(e) establish the approach and landing configuration appropriate for the runway or landing area, and meteorological conditions, and adjust the power plant controls as required;

(f) maintain a stabilised approach and nominated airspeed within tolerances;

(g) achieve a smooth, positively-controlled transition from final approach to touchdown in the touchdown zone within tolerances;

(h) maintain positive directional control and cross-wind corrections during the after-landing roll maintaining the centreline within tolerances;

(i) use spoilers, prop reverse, thrust reversers, wheel brakes, and other drag or braking devices, as appropriate, in such a manner to bring the airplane to a safe stop after landing (as applicable).

2.7 **AME.7 – Conduct go-around or missed approach with engine failure (simulated)**

(a) identify and confirm engine failure in a multi-engine aeroplane during a go-around or missed approach;

(b) maintain control of aeroplane;

(c) perform engine inoperative go-around safely not below the decision height.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day VFR or IFR;

(c) class-rated multi-engine aeroplane with dual controls, electronic intercom and dual control brakes;

(d) aerodromes;

(e) appropriate surfaces;

(f) simulated emergencies;

(g) simulated hazardous weather.

4 Underpinning knowledge of the following:

(a) airspeed limitations, including: V_{NO}, V_A, V_X and V_Y, V_{NE}, V_{FE}, V_{LO}, V_{LE}, V_{LO2} (landing gear operations down), maximum cross-wind, turbulence penetration speed and maximum load factor;

(b) emergency airspeeds, including: V_{MCA}, V_{SSE}, engine(s) inoperative climb, approach and final speed, emergency descent and best glide range speeds;

(c) emergency procedures for: engine failure after take-off, engine fire on the ground and airborne, engine failure in the cruise, waste gate failure (if applicable) and propeller or turbine over-speed;

(d) safety implications of asymmetric flight below V_{MCA};

(e) power, flight and configuration requirements that apply to V_{MCA};

(f) methods of regaining control of an aeroplane with a failed engine that is flying at a speed less than V_{MCA};

(g) conditions that would increase V_1 (if stated in AFM and POH);

(h) performance the aeroplane can achieve after reaching V_Y or V_2 during asymmetric flight;

(i) markings on the airspeed indicator that apply to failed engine operations;

(j) normal and cross-wind take-off and landing procedures: climb, cruise, descent procedures, including airspeeds, configurations, method of drift allowance, setting of flight instruments and non-normal and emergency procedures;

(k) technique and procedures used during engine failure on take-off, the appropriate reference airspeeds, and the specific pilot actions required;

(l) technique and procedure for carrying out a rejected take-off after an engine or system(s) failure or warnings, including related safety factors;

(m) technique and procedures used to conduct an asymmetric go-around or missed approach, the appropriate reference airspeeds, and the specific pilot actions required;

(n) other abnormal or emergency items as contained in the flight manual or pilot operating handbook.

TR-CR Type rating – cruise relief aeroplane

1 Unit description

This unit describes the skills and knowledge required for the issue of a cruise-relief type rating.

2 Elements and performance criteria

2.1 TR-CR.1 – Conduct pre-flight inspection

(a) complete pre-flight inspections;

(b) communicate with ground support crew;

(c) ensure all aircraft locking devices and bungs are removed;

(d) prepare and operate aircraft systems correctly.

2.2 TR-CR.2 – Extract pre-flight performance data

(a) extract correct aircraft loading and performance data;

(b) set instrumentation and systems;

(c) obtain and interpret the take-off and departure clearance issued by ATC.

2.3 TR-CR.3 – Request ATC clearance

Obtain, interpret and brief ATC clearance.

2.4 TR-CR.4 – Start engines

(a) start engine correctly;

(b) manage occurrences where specific instructions or checklist items are not published.

2.5 TR-CR.5 – Taxi aircraft

(a) request ATC clearances or make mandatory air traffic broadcast;

(b) push back or power back aircraft safely;

(c) maintain control of aircraft during taxi;

(d) divide attention appropriately between inside and outside the flight deck, to ensure maintenance of control while taxiing and completion of cockpit procedures and checklists;

(e) check instruments in a suitable area clear of traffic and other hazards;

(f) interpret and comply with taxiway, lighting, other aerodrome markings and marshalling instructions;

(g) adjust taxi speed to suit aircraft type, surface conditions, congestion, and maintenance of control, and avoid collision with personnel, obstacles or other aircraft;

(h) apply flying controls, power and brakes to maintain the aircraft on the taxiway centreline while compensating for wind and surface conditions.

2.6 TR-CR.6 – Conduct pre-take-off checks

(a) perform pre-take-off checklist and confirm all systems are within normal operating range;

(b) perform pre-take-off briefing;

(c) confirm, prior to entering runway, that aircraft is positioned on specified or appropriate taxiway;

(d) ensure final approach path is clear of conflicting traffic on specified or appropriate runway.

2.7 TR-CR.7 – Conduct take-off

(a) demonstrate knowledge of airspeeds, configurations, and emergency and abnormal procedures for normal and cross-wind take-offs;

(b) brief a plan of action to ensure the safest outcome in the event of abnormal operations;

(c) verify and correctly apply correction for the existing wind component to the take-off performance;

(d) ensure all pre-take-off checks required by the appropriate checklist items are completed in a timely manner;

(e) align the aircraft on the runway centreline;

(f) apply the controls correctly to maintain longitudinal alignment on the centreline of the runway, if appropriate, prior to initiating and during the take-off;

(g) adjust the power plant controls;

(h) monitor power plant controls, settings, and instruments during take-off to ensure all predetermined parameters are maintained;

(i) adjust the controls to attain the desired pitch attitude at the predetermined airspeed to attain the desired performance;

(j) perform the required pitch changes and, as appropriate, perform and verify the completion of, gear and flap retractions, power adjustments (as applicable) and other required pilot-related activities at the required airspeed within the published tolerances;

(k) use the applicable noise abatement and wake turbulence avoidance procedures;

(l) verify the completion of the appropriate after take-off checklist items in a timely manner;

(m) manage any incident, malfunction or failure during take-off to achieve the safest possible outcome.

2.8 **TR-CR.8 – Operate aircraft in flight**

(a) operate aircraft in normal flight profiles;

(b) operate aircraft systems for normal, non-normal and emergency conditions;

(c) demonstrate the following manoeuvres:

(i) approach to stall and full stall recovery;

(ii) maximum performance turning;

(iii) unusual attitude and upset recovery;

(iv) flight with unreliable airspeed;

(v) emergency descent.

2.9 **TR-CR.9 – Manage engine failure in flight**

(a) maintain control of aircraft flight path;

(b) correctly identify and verify malfunction;

(c) manage failure effectively.

2.10 **TR-CR.10 – Conduct a descent, arrival and landing**

(a) plan and conduct a descent, arrival and landing;

(b) obtain, interpret and brief ATC clearance for descent and arrival;

(c) manage non-normal or emergency conditions;

(d) demonstrate missed approach manoeuvre.

2.11 **TR-CR.11 – Conduct taxi to stand, park and shutdown**

Follow published procedures, taxi, park and shutdown aircraft at the designated parking bay.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day and night VMC or IMC;

(c) approved aircraft or approved flight simulation training device;

(d) simulated abnormal or emergency situations;

(e) flight crew incapacitation (multi-crew operations);

(f) simulated hazardous weather;

(g) sealed, gravel or grass surfaces.

4 Underpinning knowledge of the following:

(a) normal and cross-wind take-off;

(b) instrument take-off;

(c) engine failure during take-off;

(d) the procedures used during engine failure on take-off, the appropriate reference airspeeds, and the specific pilot actions required;

(e) rejected take-off;

(f) departure procedures;

(g) steep turns;

(h) approaches to stalls;

(i) engine failure;

(j) any specific flight characteristics;

(k) recovery from unusual attitudes;

(l) normal and cross-wind approaches and landings;

(m) approach and landing with a (simulated) engine failure;

(n) baulked approach and missed-landing;

(o) no flap or a non-standard flap approach and landing;

(p) critical airspeeds, V-speeds (including tyre rotation limits);

(q) how to calculate landing distance required;

(r) the normal system operating procedures of the aircraft systems;

(s) emergency procedures;

(t) how potential, kinetic and chemical energy relate to an aircraft in flight;

(u) how energy states are manipulated to generate aerodynamic forces that allow an aircraft to be manoeuvred;

(v) the unintended flight conditions of pitch, bank and airspeed that describe upset aircraft state;

(w) the physical symptoms that may or may not be evident in a stall;

(x) stall recovery technique during any nominated phase of flight applicable to the aircraft type being flown;

(y) the upset recovery techniques applicable to the aircraft type being flown at low altitude, and high altitude where the aircraft is pressurised;

(z) Structural integrity of an aeroplane is not ensured when operating at or below maximum manoeuvring speed, if multiple control inputs in one axis, or full control inputs in more than one axis, are initiated at the same time.

TR-SEA Type rating – single-engine aeroplane

1 Unit description

This unit describes the skills and knowledge required for a person to operate a type-rated single-engine aeroplane.

2 Elements and performance criteria

2.1 TR-SEA.1 – Conduct pre-flight inspection

(a) complete pre-flight inspection correctly;

(b) communicate effectively with ground support crew;

(c) ensure all aircraft locking devices, covers and bungs are removed;

(d) prepare and operate aircraft systems.

2.2 TR-SEA.2 – Extract pre-flight performance data

(a) extract correct aircraft loading and performance data;

(b) set instrumentation and systems;

(c) obtain and interpret the take-off and departure clearance issued by ATC.

2.3 TR-SEA.3 – Request ATC clearance

Obtain, interpret and brief ATC clearance.

2.4 TR-SEA.4 – Start engine

(a) start engine;

(b) manage occurrences where specific instructions or checklist items are not published.

2.5 TR-SEA.5 – Taxi aircraft

(a) request ATC clearances or make mandatory air traffic broadcast appropriate to the local airspace and aerodrome;

(b) maintain control of aircraft during taxi;

(c) divide attention appropriately between inside and outside the flight deck, to ensure aircraft control is maintained while taxiing and complete cockpit procedures and checklists;

(d) check instruments in a suitable area clear of traffic and other hazards;

(e) interpret and comply with taxiway, lighting, other aerodrome markings and marshalling instructions;

(f) adjust taxi speed to suit aircraft type, surface conditions, congestion, and maintenance of control; and avoid collision with personnel, obstacles or other aircraft;

(g) apply flying controls, power and brakes to maintain the aircraft on the taxiway centreline while compensating for wind and surface conditions.

2.6 TR-SEA.6 – Conduct pre-take-off checks

(a) perform pre-take-off checklist and confirm all systems are within normal operating range;

(b) perform pre-take-off briefing effectively;

(c) confirm prior to entering runway, that aircraft is positioned on specified or appropriate taxiway;

(d) ensure final approach path is clear of conflicting traffic on specified or appropriate runway.

2.7 TR-SEA.7 – Conduct take-off

(a) apply correct airspeeds, configurations, and emergency and abnormal procedures for normal and cross-wind take-offs;

(b) conduct a briefing covering the plan of action that will ensure the safest outcome in the event of abnormal operations;

(c) verify and correctly apply correction for the existing wind component to the take-off performance;

(d) perform and ensure all pre-take-off checks required by the appropriate checklist items are completed in a timely manner;

(e) align the aircraft on the runway centreline;

(f) apply the controls correctly to maintain longitudinal alignment on the centreline of the runway, if appropriate, prior to initiating and during the take-off;

(g) adjust the powerplant controls correctly;

(h) monitor powerplant controls, settings, and instruments during take-off to ensure all predetermined parameters are maintained;

(i) adjust the controls to attain the desired pitch attitude to attain the desired performance;

(j) perform the required pitch changes and, as appropriate, perform and verify the completion of, gear and flap retractions, power adjustments (as applicable) and other required pilot-related activities at the required airspeed within the published tolerances;

(k) use the applicable noise abatement and wake turbulence avoidance procedures, as applicable;

(l) verify the completion of the appropriate after take-off checklist items in a timely manner.

2.8 **TR-SEA.8 – Incident, malfunction or failure during take-off**

Appropriately manage incident, malfunction or failure during take-off.

2.9 **TR-SEA.9 – Operate aircraft in flight**

(a) operate aircraft in normal flight profiles;

(b) operate aircraft systems for normal, non-normal and emergency conditions;

(c) identify aeroplane upset conditions and take appropriate action to return aeroplane to normal flight;

(d) demonstrate approach to the stall and stall recovery as follows:

(i) recognises approaching stall symptoms;

(ii) reduce AOA at the stall;

(iii) prevents yaw with rudder;

(iv) apply recommended power;

(v) when the wings are unstalled, level them using balanced aileron control;

(vi) recover height loss;

(e) demonstrate maximum performance turning under the following conditions:

(i) maximum rate;

(ii) minimum radius;

(f) demonstrate flight with unreliable airspeed;

(g) demonstrate ability to recover from unusual attitude and upset situations;

(h) demonstrate an emergency descent.

2.10 **TR-SEA.10 – Manage partial and complete engine failure situations in flight**

(a) maintain control of aircraft;

(b) correctly identify and verify failure;

(c) manage failure to achieve safest possible outcome;

(d) perform forced landing;

(e) perform precautionary landing (simulated).

2.11 **TR-SEA.11 – Conduct engine relight and restart in flight**

Maintain control while performing relight and restart.

2.12 **TR-SEA.12 – Conduct a descent, arrival and landing**

(a) plan and conduct a descent, arrival and landing;

(b) obtain, interpret and brief ATC clearance for descent and arrival;

(c) manage non-normal or emergency conditions;

(d) demonstrate missed approach manoeuvre.

2.13 **TR-SEA.13 – Conduct taxi to stand, park and shutdown**

(a) taxi, park and shut down aircraft at the designated parking bay as cleared;

(b) secure aircraft.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day and night VMC or IMC;

(c) upset conditions include the following:

(i) pitch attitude more than 25° nose up;

(ii) pitch attitude more than 10° nose down;

(iii) bank angle more than 45°;

(iv) flying at airspeeds inappropriate to the conditions;

(d) aircraft of the type to which the rating applies;

(e) approved flight simulator.

4 Underpinning knowledge of the following:

(a) normal and cross-wind take-off;

(b) instrument take-off (IFR pilots only);

(c) engine failure during take-off;

(d) rejected take-off;

(e) departure procedures;

(f) steep turns;

(g) approaches to stalls;

(h) engine failure;

(i) any specific flight characteristics (e.g. Dutch roll);

(j) recovery from unusual attitudes;

(k) normal and cross-wind approaches and landings;

(l) approach and landing with a (simulated) engine failure – multi-engine aeroplane;

(m) baulked approach and missed landing;

(n) no flap and non-standard flap approach and landing:

(o) factors that affect an aircraft when full or partial flaps, leading edge flaps, and any other similar devices become inoperative, including aircraft handling;

(p) extract critical airspeeds, V-speeds (including tyre rotation limits);

(q) calculate landing distance required;

(r) normal systems operating procedures;

(s) emergency procedures;

(t) how potential and kinetic energy relate to an aircraft in flight;

(u) how energy states are manipulated to generate aerodynamic forces that allow an aircraft to be manoeuvred;

(v) the unintended flight conditions of pitch, bank and airspeed that describe upset aircraft state;

(w) the physical symptoms that may or may not be evident in a stall;

(x) stall recovery technique during any nominated phase of flight applicable to the aircraft type being flown;

(y) upset recovery techniques applicable to the aircraft type being flown at low altitude, and high altitude where the aircraft is pressurised;

(z) Structural integrity of an aeroplane is not ensured when operating at or below maximum manoeuvring speed, if multiple control inputs in one axis, or full control inputs in more than one axis, are initiated at the same time.

TR-MEA Type rating – multi-engine aeroplane

1 Unit description

This unit describes the skills and knowledge required for a person to operate a type-rated multi-engine aeroplane.

2 Elements and performance criteria

2.1 TR-MEA.1 – Conduct pre-flight inspection

(a) complete pre-flight inspection correctly;

(b) communicate effectively with ground support crew;

(c) ensure all aircraft locking devices, covers and bungs are removed;

(d) prepare and operate aircraft systems.

2.2 TR-MEA.2 – Extract pre-flight performance data

(a) extract correct aircraft loading and performance data;

(b) set instrumentation and systems;

(c) obtain and interpret the take-off and departure clearance issued by ATC.

2.3 TR-MEA.3 – Request ATC clearance

Obtain, interpret and brief ATC clearance.

2.4 TR-MEA.4 – Start engines

(a) start engines;

(b) manage occurrences where specific instructions or checklist items are not published.

2.5 TR-MEA.5 – Taxi aircraft

(a) request ATC clearances or make mandatory air traffic broadcast appropriate to the local airspace and aerodrome;

(b) push back or power back aircraft safely;

(c) maintain control of aircraft during taxi;

(d) divide attention appropriately between inside and outside the flight deck, to ensure aircraft control is maintained while taxiing and cockpit procedures and checklists are completed;

(e) check instruments in a suitable area clear of traffic and other hazards;

(f) interpret and comply with taxiway, lighting, other aerodrome markings and marshalling instructions;

(g) adjust taxi speed to suit aircraft type, surface conditions, congestion, and maintenance of control, and avoid collision with personnel, obstacles or other aircraft;

(h) apply flying controls, power and brakes to maintain the aircraft on the taxiway centreline while compensating for wind and surface conditions.

2.6 TR-MEA.6 – Conduct pre-take-off checks

(a) perform pre-take-off checklist and confirm all systems are within normal operating range;

(b) perform pre-take-off briefing;

(c) confirm, prior to entering runway, that aircraft is positioned on specified or appropriate taxiway;

(d) ensure final approach path is clear of conflicting traffic on specified or appropriate runway.

2.7 TR-MEA.7 – Conduct take-off

(a) demonstrate knowledge of airspeeds, configurations, and emergency and abnormal procedures for normal and cross-wind take-offs;

(b) conduct a briefing covering the plan of action that will ensure the safest outcome in the event of abnormal operations;

(c) verify and correctly apply correction for the existing wind component to the take-off performance;

(d) perform and ensure all pre-take-off checks required by the appropriate checklist items are completed in a timely manner;

(e) align the airplane on the runway centreline;

(f) apply the controls correctly to maintain longitudinal alignment on the centreline of the runway, if appropriate, prior to initiating and during the take-off;

(g) adjust the power plant controls correctly;

(h) monitor power plant controls, settings, and instruments during take-off to ensure all predetermined parameters are maintained;

(i) adjust the controls to attain the desired pitch attitude to attain the desired performance;

(j) perform the required pitch changes and, as appropriate, perform and verify the completion of, gear and flap retractions, power adjustments (as applicable) and other required pilot-related activities at the required airspeed within the published tolerances;

(k) use the applicable noise abatement and wake turbulence avoidance procedures;

(l) verify the completion of the appropriate after take-off checklist items in a timely manner.

2.8 **TR-MEA.8 – Incident, malfunction or failure during take-off**

Manage incidents, malfunctions and failures during take-off as described in the AFM.

2.9 **TR-MEA.9 – Operate aircraft in flight**

(a) operate aircraft in normal flight profiles;

(b) operate aircraft systems for normal, non-normal and emergency conditions;

(c) identify aeroplane upset conditions and take appropriate action to return aeroplane to normal flight;

(d) demonstrate approach to the stall and stall recovery as follows:

(i) recognise approaching stall symptoms;

(ii) at the stall, reduce AOA;

(iii) prevent further yaw with rudder;

(iv) apply recommended power;

(v) when the wings are unstalled, level the wings using aileron control;

(vi) recover height loss;

(e) demonstrate maximum performance turning under the following conditions:

(i) maximum rate;

(ii) minimum radius;

(f) demonstrate flight with unreliable airspeed;

(g) demonstrate her or his ability to recover from unusual attitude and upset situations;

(h) demonstrate an emergency descent.

2.10 **TR-MEA.10 – Manage engine failure in flight**

(a) maintain control of aircraft flight path;

(b) correctly identify and verify failed engine;

(c) manage failure to achieve the safest outcome.

2.11 **TR-MEA.11 – Conducts engine relight and restart in flight**

Relight and restart an engine in flight.

2.12 **TR-MEA.12 – Conduct a descent, arrival and landing**

(a) plan and conduct a descent, arrival and landing;

(b) obtain, interpret and brief ATC clearance for descent and arrival;

(c) manage non-normal or emergency conditions;

(d) demonstrate missed approach manoeuvre.

2.13 **TR-MEA.13 – Conduct taxi to stand, park and shut down**

Follow published procedures taxi, park and shut down aircraft at the designated parking bay.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day and night VMC or IMC;

(c) aircraft of the type which the rating applies to;

(d) approved flight simulation training device if available;

(e) upset conditions include the following:

(i) pitch attitude more than 25° nose up;

(ii) pitch attitude more than 10° nose down;

(iii) bank angle more than 45°;

(iv) flying at airspeeds inappropriate to the conditions;

(f) in the absence of markings, the aircraft is maintained in the centre of the taxiway and at a safe distance from obstacles;

(g) simulated abnormal or emergency situations;

(h) flight crew incapacitation (multi-crew operations);

(i) simulated hazardous weather;

(j) sealed, gravel or grass surfaces.

4 Underpinning knowledge of the following:

(a) normal and cross-wind take-off;

(b) instrument take-off (IFR pilots only);

(c) engine failure during take-off;

(d) rejected take-off;

(e) departure procedures;

(f) steep turns;

(g) approaches to stalls;

(h) engine failure;

(i) any specific flight characteristics (e.g. Dutch roll);

(j) recovery from unusual attitudes;

(k) normal and cross-wind approaches and landings;

(l) approach and landing with a (simulated) engine failure – multi-engine aeroplane;

(m) baulked approach and missed landing;

(n) no flap or a non-standard flap approach and landing;

(o) the factors that affect the characteristics of an aircraft when full or partial flaps, leading edge flaps, and any other similar devices become inoperative, including on aircraft handling;

(p) extract critical airspeeds, V-speeds (including tyre rotation limits);

(q) calculate landing distance required;

(r) normal systems operating procedures;

(s) emergency procedures;

(t) how potential and kinetic energy relate to an aircraft in flight;

(u) how energy states are manipulated to generate aerodynamic forces that allow an aircraft to be manoeuvred;

(v) knows the unintended flight conditions of pitch, bank and airspeed that describe upset aircraft state;

(w) knows the physical symptoms that may or may not be evident in a stall;

(x) stall recovery technique during any nominated phase of flight applicable to the aircraft type being flown;

(y) upset recovery techniques applicable to the aircraft type being flown at low altitude, and high altitude where the aircraft is pressurised.

(z) Structural integrity of an aeroplane is not ensured when operating at or below maximum manoeuvring speed, if multiple control inputs in one axis, or full control inputs in more than one axis, are initiated at the same time.

FR-SEAC SINGLE-ENGINE AEROPLANE CLASS RATING FLIGHT REVIEW

1 Unit description

This unit describes the standards required for a single-engine aeroplane class rating flight review.

2 Elements and performance criteria

2.1 FR-SEAC.1 – Conduct flight

(a) start and taxi aircraft ready for take-off;

(b) perform a normal take-off simulating minimum take-off distance available;

(c) perform departure from circuit area;

(d) perform general handling manoeuvres, including the following:

(i) initiate stall and recover where initial symptoms of a stall become evident;

(ii) perform a full stall and recovery;

(iii) perform steep level and descending turns through at least 360°;

(iv) conduct low flying at 500 ft AGL and perform a reversal turn;

(e) perform circuit rejoin and at least 1 full circuit pattern;

(f) perform a missed approach;

(g) perform a flapless approach and landing;

(h) perform cross-wind take-off and landing if conditions permit;

(i) perform a normal landing simulating minimum landing distance available.

2.2 FR-SEAC.2 – Manage aircraft systems

(a) ensure sufficient fuel is loaded and fuel consumption is monitored and managed throughout the flight;

(b) manage the aircraft fuel system;

(c) manage all other aircraft systems.

2.3 FR-SEAC.3 – Navigation (optional)

(a) plan flight of at least 3 legs and submit flight plan in accordance with AIP;

(b) conduct a departure;

(c) navigate en route using visual and instrument navigation systems;

(d) perform diversion procedure;

(e) conduct arrival.

2.4 FR-SEAC.4 – Airspace

(a) comply with airspace procedures and requirements;

(b) operate aircraft radio and conform to standard radio procedures.

2.5 FR-SEAC.5 – Instrument flying

(a) perform basic flight manoeuvres using full instrument panel;

(b) recover from upset situations and unusual aircraft attitudes to straight and level flight;

(c) perform checks and monitor system for serviceability.

2.6 FR-SEAC.6 – Manage non-normal and emergency conditions

(a) manage a simulated engine failure in the take-off segment (optional);

(b) manage a simulated partial engine failure (optional);

(c) manage a simulated complete engine failure and execute a forced landing;

(d) manage aircraft system malfunctions other than engine failure.

2.7 **FR-SEAC.7 – Non-technical skills**

(a) recognise and manage threats and errors during pre-flight planning and in-flight;

(b) maintain effective lookout and situational awareness;

(c) assess situations and make appropriate decisions;

(d) set priorities and manage tasks;

(e) maintain effective communication with stakeholders;

(f) communicate effectively using aeronautical radio.

2.8 **FR-SEAC.8 – Manage passengers and cargo**

(a) conduct pre-flight and in-flight safety briefings to ensure passengers are familiar with safety procedures, emergency equipment, exits and operational requirements;

(b) manage cargo.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) simulated conditions can be used;

(c) for FR-SEAC.5 – instrument flying, simulated or actual instrument conditions.

4 Underpinning knowledge of the following:

(a) privileges, limitations and responsibilities of the licences, ratings and endorsements the applicant holds;

(b) flight review requirements;

(c) obtaining, interpreting and applying meteorological and aeronautical information;

(d) navigation and flight planning for day VFR operations;

(e) weight and balance and aircraft performance;

(f) operation of systems fitted to the aircraft that is used in the flight review;

(g) extracting and applying aircraft performance data, including take-off and landing performance data for the aircraft that is used in the flight review;

(h) airspace requirements and procedures;

(i) manage cargo and passengers;

(j) hazard identification and risk management;

(k) non-normal and emergency procedures, including full and partial failures;

(l) local operating procedures;

(m) hazardous weather;

(n) airworthiness requirements;

(o) reporting requirements;

(p) ERSA normal and emergency procedures;

(q) current and recently changed legislation and procedures that are relevant to the applicant's licences, ratings and endorsements.

FR-MEAC Multi-engine aeroplane class rating flight review

1 Unit description

This unit describes the standards required for a multi-engine aeroplane class rating flight review.

2 Elements and performance criteria

2.1 FR-MEAC.1 – Conduct flight

(a) start and taxi aircraft ready for take-off;

(b) perform a normal take-off simulating minimal take-off distance available;

(c) perform departure from circuit area;

(d) perform general handling manoeuvres, including the following:

(i) initiate stall and recover where initial symptoms of a stall become evident;

(ii) perform a full stall and recovery;

(iii) perform steep level and descending turns through at least 360°;

(iv) conduct low flying at 500 ft AGL and perform a reversal turn;

(e) perform circuit rejoin and at least 1 full circuit pattern;

(f) perform a missed approach;

(g) perform a normal landing simulating minimum landing distance available.

2.2 FR-MEAC.2 – Manage aircraft systems

(a) ensure sufficient fuel is loaded and fuel consumption is monitored and managed throughout the flight;

(b) manage the aircraft fuel system;

(c) manage all other aircraft systems.

2.3 FR-MEAC.3 – Navigation (optional)

(a) plan flight of at least 3 legs and submit flight plan in accordance with AIP;

(b) conduct a departure;

(c) navigate en route using visual and instrument navigation systems;

(d) perform diversion procedure;

(e) conduct arrival.

2.4 FR-MEAC.4 – Airspace

(a) comply with airspace procedures and requirements;

(b) operate aircraft radio and conform to standard radio procedures.

2.5 FR-MEAC.5 – Instrument flying

(a) perform basic flight manoeuvres using full instrument panel;

(b) recover from upset situations and unusual aircraft attitudes to straight and level flight;

(c) perform checks and monitor system for serviceability.

2.6 FR-MEAC.6 – Manage non-normal and emergency conditions

(a) manage a simulated engine failure in the take-off segment;

(b) manage a simulated partial engine failure;

(c) manage a simulated complete engine failure and execute a simulated asymmetric approach and landing;

(d) manage aircraft system malfunctions.

2.7 **FR-MEAC.7 – Non-technical skills**

(a) recognise and manage threats and errors during pre-flight planning and in-flight;

(b) maintain effective lookout and situational awareness;

(c) assess situations and make appropriate decisions;

(d) set priorities and manage tasks;

(e) maintain effective communication with stakeholders;

(f) communicate effectively using aeronautical radio.

2.8 **FR-MEAC.8 – Manage passengers and cargo.**

(a) conduct pre-flight and in-flight safety briefings to ensure passengers are familiar with safety procedures, emergency equipment, exits and operational requirements;

(b) manage cargo.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) simulated conditions can be used;

(c) for FR-MEAC.5 – instrument flying, simulated or actual instrument conditions.

4 Underpinning knowledge of the following:

(a) privileges, limitations and responsibilities of the licences, ratings and endorsements the applicant holds;

(b) flight review requirements;

(c) obtaining, interpreting and applying meteorological and aeronautical information;

(d) navigation and flight planning for day VFR operations;

(e) weight and balance and aircraft performance;

(f) operation of systems fitted to the aircraft that is used in the flight review;

(g) extracting and applying aircraft performance data, including take-off and landing performance date for the aircraft that is used in the flight review;

(h) airspace requirements and procedures;

(i) manage cargo and passengers;

(j) hazard identification and risk management;

(k) non-normal and emergency procedures, including full and partial failures;

(l) local operating procedures;

(m) hazardous weather;

(n) airworthiness requirements;

(o) reporting requirements;

(p) ERSA normal and emergency procedures;

(q) current and recently changed legislation and procedures that are relevant to the applicant's licences, ratings and endorsements.

FR-MEAT Multi-engine aeroplane type rating flight review

1 Unit description

This unit describes the standards required for a multi-engine aeroplane type rating flight review.

2 Elements and performance criteria

2.1 FR-MEAT.1 – Conduct flight

(a) start and taxi aircraft ready for take-off;

(b) perform a normal take-off simulating minimal take-off distance available;

(c) perform departure from circuit area;

(d) perform general handling manoeuvres, including the following:

(i) initiate stall and recover where initial symptoms of a stall become evident;

(ii) perform a full stall and recovery;

(iii) perform steep level and descending turns through at least 360°;

(iv) conduct low flying at 500 ft AGL and perform a reversal turn;

(e) perform circuit rejoin and at least 1 full circuit pattern;

(f) perform a missed approach;

(g) perform a normal landing simulating minimum landing distance available.

2.2 FR- MEAT.2 – Manage aircraft systems

(a) ensure sufficient fuel is loaded and fuel consumption is monitored and managed throughout the flight;

(b) manage the aircraft fuel system;

(c) manage all other aircraft systems.

2.3 FR- MEAT.3 – Navigation (optional)

(a) plan flight of at least 3 legs and submit flight plan in accordance with AIP;

(b) conduct a departure;

(c) navigate en route using visual and instrument navigation systems;

(d) perform diversion procedure;

(e) conduct arrival.

2.4 FR- MEAT.4 – Airspace

(a) comply with airspace procedures and requirements;

(b) operate aircraft radio and conform to standard radio procedures.

2.5 FR- MEAT.5 – Instrument flying

(a) perform basic flight manoeuvres using full instrument panel;

(b) recover from upset situations and unusual aircraft attitudes to straight and level flight;

(c) perform checks and monitor system for serviceability.

2.6 FR- MEAT.6 – Manage non-normal and emergency conditions

(a) manage a simulated engine failure in the take-off segment;

(b) manage a simulated partial engine failure;

(c) manage a simulated complete engine failure and execute a simulated asymmetric approach and landing;

(d) manage aircraft system malfunctions.

2.7 **FR- MEAT.7 – Non-technical skills**

(a) recognise and manage threats and errors during pre-flight planning and in-flight;

(b) maintain effective lookout and situational awareness;

(c) assess situations and make appropriate decisions;

(d) set priorities and manage tasks;

(e) maintain effective communication with stakeholders;

(f) communicate effectively using aeronautical radio.

2.8 **FR- MEAT.8 – Manage passengers and cargo.**

(a) conduct pre-flight and in-flight safety briefings to ensure passengers are familiar with safety procedures, emergency equipment, exits and operational requirements;

(b) manage cargo.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) simulated conditions can be used;

(c) for FR-MEAT.5 – instrument flying, simulated or actual instrument conditions.

4 Underpinning knowledge of the following:

(a) privileges, limitations and responsibilities of the licences, ratings and endorsements the applicant holds;

(b) flight review requirements;

(c) obtaining, interpreting and applying meteorological and aeronautical information;

(d) navigation and flight planning for day VFR operations;

(e) weight and balance and aircraft performance;

(f) operation of systems fitted to the aircraft that is used in the flight review;

(g) extracting and applying aircraft performance data, including take-off and landing performance date for the aircraft that is used in the flight review;

(h) airspace requirements and procedures;

(i) manage cargo and passengers;

(j) hazard identification and risk management;

(k) non-normal and emergency procedures, including full and partial failures;

(l) local operating procedures;

(m) hazardous weather;

(n) airworthiness requirements;

(o) reporting requirements;

(p) ERSA normal and emergency procedures;

(q) current and recently changed legislation and procedures that are relevant to the applicant's licences, ratings and endorsements.

TR-FE Type rating – flight engineer

1 Unit description

This unit describes the skills and knowledge required by a flight engineer to operate a type-rated aircraft.

2 Elements and performance criteria

2.1 FTM.1 – Conduct pre-flight inspection

(a) complete pre-flight inspection correctly;

(b) communicate effectively with ground support crew;

(c) ensure removal of appropriate aircraft engine protective devices;

(d) prepare and operate aircraft systems.

2.2 FTM.2 – Manage engines

(a) manage engine systems correctly;

(b) manage and monitor aircraft systems as appropriate;

(c) manage occurrences where specific instructions or checklist items are not published.

2.3 FTM.3 – Conduct pre-take-off checks

(a) complete the pre-take-off checklist and confirm all applicable systems are within normal operating range.

2.4 FTM.4 – Conduct take-off

(a) operate flight engineer controls correctly;

(b) adjust the power plant controls correctly;

(c) monitor power plant controls, settings, and instruments during take-off to ensure all predetermined parameters are maintained;

(d) inform the pilot in command of abnormal or emergency situations in a timely manner.

2.5 FTM.5 – Operate aircraft in flight

(a) operate flight engineer systems for normal, non-normal and emergency conditions;

(b) identify an aeroplane upset condition and immediately informs the pilot in command.

2.6 FTM.6 – Manage engine failure in flight

(a) inform pilot in command;

(b) correctly identify and verify failed engine;

(c) manage failure appropriately.

2.7 FTM.7 – Conducts engine relight and restart in flight

2.8 FTM.8 – Conducts shutdown

2.8.1 The person must be able to demonstrate her or his ability to correctly shutdown the aircraft.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day and night VMC or IMC;

(c) upset conditions include the following:

(i) pitch attitude more than 25° nose up;

(ii) pitch attitude more than 10° nose down;

(iii) bank angle more than 45°;

(iv) flying at airspeeds inappropriate to the conditions.

(d) approved multi-engine multi-crew aircraft;

(e) approved flight simulator;

(f) simulated abnormal or emergency situations;

(g) flight crew incapacitation (multi-crew operations);

(h) simulated hazardous weather.

4 Underpinning knowledge of the following:

(a) engine failure during take-off;

(b) rejected take-off;

(c) departure procedures;

(d) aircraft systems failures;

(e) any specific flight characteristics (e.g. Dutch roll);

(f) recognition of unusual attitudes;

(g) recognition of aeroplane upset conditions (aeroplane only);

(h) normal systems operating procedures;

(i) emergency procedures;

(j) approach and landing with a (simulated) engine failure – multi-engine aircraft.

HELICOPTER CATEGORY

H1 Control helicopter on the ground – stationary

1 Unit description

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

2 Elements and performance criteria

2.1 **H1.1 – Start and stop engine**

(a) ensure the helicopter is in a suitable location for starting the engine and rotors;

(b) perform pre-start and start actions;

(c) perform shutdown and after-shutdown actions;

(d) control blade sailing during start and shut down by appropriate positioning of helicopter and use of cyclic pitch;

(e) comply with manufacturer's limitations and report deviations when appropriate;

(f) manage emergencies appropriately (simulated).

2.2 **H1.2 – Engage rotor**

(a) set engine RPM within limits before rotor engagement (if applicable – this is only relevant to the few rotorcraft, including the R22 and R44 which are the most common basic trainers);

(b) engage rotor correctly (if applicable);

(c) maintain engine RPM within limits during rotor engagement;

(d) maintain disc position within operating limits as Rotor RPM (RRPM) increases;

(e) operate rotor brake correctly (if applicable – this is only relevant to the very few rotocraft that can run 1 engine at idle before rotor engagement);

(f) monitor and react appropriately to transmission, hydraulic system and engine indications (if applicable).

2.3 **H1.3 – Control main rotor disc and anti-torque system**

(a) maintain the correct main rotor disc attitude during all RRPM operations;

(b) set correct engine idle RPM;

(c) set correct anti-torque pedal position to compensate for main rotor torque;

(d) maintain correct rotor disc attitude and RRPM while performing other tasks or actions.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) helicopter with dual controls and electronic intercom, if fitted;

(c) engine start and shutdown emergencies covered by the aircraft flight manual;

(d) malfunctions and emergency procedures described in the flight manual;

(e) day VFR;

(f) aerodromes and helicopter landing sites;

(g) obstructions and personnel (simulated);

(h) various wind conditions (may be simulated).

4 Underpinning knowledge of the following:

(a) regulations and procedures relating to the ground operation of rotorcraft;

(b) operational and start limitations of typical helicopters;

(c) applicable helicopter systems;

(d) operating on different surfaces, including sealed and unsealed surfaces;

(e) effect of wind on rotor blade control (blade sailing);

(f) use of the fire extinguisher system fitted to the helicopter;

(g) ground resonance;

(h) dynamic rollover;

(i) local noise abatement procedures and curfews.

H2 Control helicopter in lift-off, hover and landing

1 Unit description

This unit describes the skills and knowledge required to complete pre-take-off checks, lift-off helicopter to the hover, complete hover checks, perform hover, perform aborted lift-off, perform hovering turns and land from the hover.

2 Elements and performance criteria

2.1 H2.1 – Lift-off and hover helicopter, perform hover checks and abort take-off

(a) calculate aircraft performance for the flight;

(b) complete pre-take-off checks;

(c) lift-off helicopter:

(i) set flight controls correctly to prepare for lift-off to the hover at the location;

(ii) use correct flight and power controls to lift helicopter off the surface to a stable hover at the appropriate hover height for the helicopter while controlling heading;

(iii) anticipate and take account of wind effect with appropriate control inputs to maintain position over hover point;

(iv) demonstrate awareness of rotor downwash on surrounding aircraft, people, objects and environment;

(v) confirm the proper functioning of the flight controls and the centre of gravity and power required to hover are within limits;

(d) at a constant and safe hover height, commence, maintain and stop a hover taxi manoeuvre while maintaining power and RRPM within the limits;

(e) remain clear of the manufacturer's 'height-velocity diagram avoid area' when applicable;

(f) perform aborted take-off from the hover.

2.2 H2.2 – Hover helicopter in cross-wind and tailwind

(a) maintain helicopter in flight over a nominated hover point at a nominated height and heading in cross-wind and tailwind;

(b) apply controlled corrective action to maintain a constant rate of turn and counter the effects of wind.

2.3 H2.3 – Perform turn around a mast

(a) turn helicopter around a mast while maintaining a constant height at a constant rate of turn using anti-torque pedals;

(b) stop the turn on a nominated heading;

(c) maintain RPM within limits during the turn.

2.4 H2.4 – Perform turns around nose and tail

(a) turn helicopter around a nominated point on or forward of the nose while maintaining a constant height and specified rate of movement around the point;

(b) turn helicopter around a nominated point on or aft of the tail while maintaining a constant height and specified rate of movement around the point;

(c) commence turns in a specified direction and stop them at a specified heading;

(d) maintain RPM within limits during the turn;

(e) maintain ground track at a constant distance from the nominated point;

(f) use the anti-torque pedals to ensure helicopter is pointed at the nominated turning point.

2.5 H2.5 – Perform sideways and backwards flight

(a) transition from static hover to forward, sideways and backwards flight and terminate this movement over a nominated hover point at a nominated height;

(b) ensure direction of travel is clear of obstructions;

(c) conduct backward movement only after visually checking behind helicopter and adjusting height as required;

(d) maintain sideways and backwards directional control;

(e) maintain RPM within limits during the turn;

(f) maintain rate of movement of helicopter at a safe speed;

(g) maintain lookout in direction of travel;

(h) terminate sideways or backwards movement at desired hover point.

2.6 **H2.6 – Land from the hover**

(a) complete pre-landing checks (if applicable);

(b) nominate touchdown point;

(c) from a stable hover, establish a controlled rate of descent, maintain heading and remain over the nominated hover point;

(d) land helicopter at a suitable rate and maintain a constant heading without lateral or longitudinal drift while maintaining the requisite RRPM during the landing sequence;

(e) ensure helicopter is stable on its undercarriage prior to fully lowering collective;

(f) perform after-landing checks;

(g) for mishandled landing:

(i) recognise when a safe landing cannot be achieved;

(ii) discontinue the landing and return to the hover safely;

(iii) re-establish a stabilised hover;

(iv) land from the stabilised hover.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) helicopter with dual controls and electronic intercom day VFR;

(c) aerodromes and helicopter landing sites;

(d) obstructions and personnel (simulated);

(e) various wind conditions (may be simulated).

4 Underpinning knowledge of the following:

(a) calculates aircraft performance for the flight;

(b) operational and start limitations of typical helicopters;

(c) operating on different surfaces, including sealed and unsealed surfaces;

(d) effect of wind on rotor blade control (blade sailing);

(e) use of the fire extinguisher system fitted to the helicopter being used;

(f) ground resonance;

(g) recirculation;

(h) dynamic rollover;

(i) local noise abatement procedures and curfews.

H3 Taxi helicopter

1 Unit description

This unit describes the skills and knowledge required to taxi a helicopter.

2 Elements and performance criteria

2.1 H.3.1 – Ground taxi helicopter

(a) use correct flight and power control techniques to initiate forward movement of the helicopter on the surface;

(b) check and confirm the proper functioning of the wheel brake system;

(c) use correct flight and power control techniques to ground taxi and manoeuvre the helicopter on appropriate surfaces (wet and dry) at a safe speed in headwind, cross-wind and tailwind conditions;

(d) perform flight instrument checks while taxiing (if applicable);

(e) avoids adverse effects of rotor wash on personnel, aircraft, structures and loose objects;

(f) apply smooth control while ground taxiing and manoeuvring the helicopter with turns at a constant and safe rate of turn while maintaining power and RRPM within the limits;

(g) adjusts taxi speed to suit helicopter type, surface conditions, congestion while maintaining control and desired track and avoiding collision with obstacles and other aircraft;

(h) maintain landing gear in contact with the ground;

(i) apply smooth and controlled actions to terminate at a nominated holding or parking point under different wind and surface conditions;

(j) maintain RRPM within normal operating limits;

(k) observe mast operating limits, if applicable;

(l) ensure final approach path is clear of conflicting traffic.

2.2 H3.2 – Air taxi helicopter

(a) manoeuvre the helicopter while allowing for prevailing conditions, over a prescribed track at a constant height;

(b) maintain alignment of the landing gear with the direction of travel;

(c) remain clear of manufacturer's 'height-velocity diagram avoid area';

(d) maintain RPM within operating limits;

(e) adjust air taxi speed to suit helicopter type, traffic conditions, congestion, and maintenance of control and to avoid collision with obstacles or other aircraft;

(f) ensure final approach path is clear of conflicting traffic.

2.3 H3.3 – Air transit helicopter

(a) obtain transit clearance and complies with ATC instructions (if applicable);

(b) manoeuvre the helicopter, while allowing for prevailing conditions, over a prescribed track at a height not above 100 ft AGL at airspeeds greater than speeds used for air taxiing;

(c) limits movement within the aerodrome boundaries, without incident;

(d) remain clear of manufacturer's 'height-velocity diagram avoid area';

(e) maintain height;

(f) manipulate instruments, switches or devices, when safe to do so, including when the release of the collective pitch level is required, while maintaining height, heading, speed, and attitude and not exceeding RPM or power limits;

(g) avoid conditions that could lead to loss of tail rotor or anti-torque effectiveness;

(h) aligns helicopter with track, or balances, as applicable;

(i) adjust air transit ground speed to suit helicopter type, traffic conditions, congestion, and maintenance of control and to avoid collision with obstacles or other aircraft;

(j) maintain RRPM within normal operating limits;

(k) avoid adverse effect of rotor wash on other aircraft, facilities, loose objects and personnel;

(l) ensure final approach path is clear of conflicting traffic.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) helicopter with dual controls and electronic intercom;

(c) day VFR;

(d) aerodromes and helicopter landing sites;

(e) obstructions and personnel (simulated);

(f) various wind conditions (may be simulated).

4 Underpinning knowledge of the following:

(a) height-velocity diagram;

(b) adverse effects of rotor wash;

(c) ground resonance and action to be taken when it occurs;

(d) taxiway and runway markings;

(e) loss of tail rotor effectiveness and action to be taken when it occurs;

(f) hazards and risks associated with conducting air taxi and air transit manoeuvres.

H4 Take-off helicopter and approach to hover

1 Unit description

This unit describes the skills and knowledge required to prepare a helicopter for take-off, perform take-off and perform an approach to termination at hover.

2 Elements and performance criteria

2.1 H4.1 – Carryout pre-take-off checks

(a) complete pre-take-off checks correctly and clearing turn (if applicable);

(b) assess situation and select safe take-off path;

(c) conduct a take-off safety briefing (this may be carried out prior to take off lift-off to the hover if necessitated by location);

(d) clear the area, taxi into the take-off position, perform line-up checks.

2.2 H4.2 – Take-off helicopter

(a) transition to forward flight and maintain take-off path;

(b) recognise and control translational lift effect;

(c) accelerate to and maintain the recommended or nominated climb speed;

(d) control the helicopter to remain outside of the Height-Velocity (H-V) avoid curve, balanced and trimmed (if applicable);

(e) ensure obstacle clearance;

(f) correct power and attitude are maintained for the profile and IAS to be flown;

(g) landing gear is retracted after a positive rate of climb is established (if applicable);

(h) comply with noise abatement procedures, where applicable;

(i) complete after take-off checks.

2.3 H4.3 – Approach to hover

(a) select a suitable termination point;

(b) complete checklists as applicable for manoeuvre;

(c) intercept and maintain appropriate approach angle and track;

(d) adjust power and attitude to achieve a controlled decreasing closure rate to the termination point;

(e) align the landing gear to the planned approach direction;

(f) recognise and control loss of translational lift;

(g) controls RPM within limits;

(h) terminates approach to the hover over the termination point.

2.4 H4.4 – Perform go-round procedure

(a) recognise adverse conditions that require the execution of a go-round;

(b) initiate go-round safely in the time available;

(c) set power and attitude to achieve safe climb at appropriate IAS;

(d) maintain control throughout go-round procedure;

(e) align landing gear with the planned take-off direction until the point at which balanced flight is required;

(f) perform after-take-off checks.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) helicopter with dual controls and electronic intercom;

(c) day VFR;

(d) aerodromes and helicopter landing sites;

(e) obstructions and personnel (simulated);

(f) various wind conditions (may be simulated).

4 Underpinning knowledge of the following:

(a) vortex ring state;

(b) loss of tail rotor effectiveness (LTE);

(c) low ‘g’ and mast bumping;

(d) overpitching or low RRPM – rotor stall;

(e) recirculation;

(f) contributing operational situations and environmental conditions;

(g) avoidance and recognition of and recovery techniques appropriate to helicopter type;

(h) aircraft systems;

(i) aircraft performance;

(j) aircraft weight and balance;

(k) AFM and POH;

(l) day VFR flight rules.

H5 Control helicopter in normal flight

1 Unit description

This unit describes the skills and knowledge required to control a helicopter in normal flight, whilst flying straight and level, climbing, descending and turning.

2 Elements and performance criteria

2.1 H5.1 – Climb helicopter

(a) set and maintain power and attitude to establish and maintain climb flight on a constant heading for the following profiles:

(i) maintain IAS for cruise climb;

(ii) maintain IAS for best angle of climb (V_X);

(iii) maintain IAS for best rate of climb (V_Y);

(b) set appropriate altimeter settings;

(c) ensure helicopter is balanced and trimmed (if applicable);

(d) maintain power as altitude increases.

2.2 H5.2 – Maintain straight and level flight

(a) set and maintain power and attitude to achieve straight and level flight at nominated airspeeds, altitudes and headings;

(b) ensure helicopter is balanced and trimmed (if applicable).

2.3 H5.3 – Descend helicopter

(a) set and maintain power and attitude to achieve cruise descending flight on a constant heading at a nominated rate of descent;

(b) set appropriate altimeter settings;

(c) identify and avoid terrain and aircraft traffic;

(d) ensure helicopter is balanced and trimmed (if applicable).

2.4 H5.4 – Turn helicopter

(a) perform airspace cleared procedure;

(b) set and maintain power, attitude and bank to achieve specified turn performance to the left and to the right, onto specific headings or geographical features for the following:

(i) level turns;

(ii) climbing turn, rate 1 or with 20° bank angle;

(iii) powered descending turn with 30° bank angle;

(c) turn helicopter onto specified headings using the magnetic compass;

(d) manoeuvre the helicopter over specified ground tracks;

(e) ensure helicopter is balanced and trimmed (if applicable).

2.5 H5.5 – Perform circuits and approaches

(a) plan and conduct descent;

(b) join traffic pattern;

(c) maintain a safe separation from other traffic joining, departing or in the traffic pattern;

(d) track upwind on extended centreline to 500 ft;

(e) adjust circuit to ensure spacing with preceding traffic;

(f) establish the helicopter on cross-wind tracking 90° to the runway;

(g) establish the helicopter on downwind at circuit height tracking parallel to the runway at a specified distance from the runway;

(h) perform pre-landing checks;

(i) establish aircraft on base leg a specified distance from helicopter landing site;

(j) commence and control rate of descent to maintain approach path;

(k) ensure helicopter is aligned with specified or appropriate runway when applicable;

(l) establish helicopter on final approach in approach configuration not below 500 ft AGL;

(m) select termination point;

(n) maintain closure rate to the termination point;

(o) maintain helicopter on extended centreline, approach slope and approach speed;

(p) adjust speed to compensate for wind gusts;

(q) complete final approach checks;

(r) ensure helicopter is balanced and trimmed (as applicable);

(s) complete approach at the termination point.

2.6 **H5.6 – Comply with airspace requirements**

(a) use a chart and identify the geographical limits of the designated area;

(b) with reference to a suitable chart, identify prominent geographical features;

(c) describe the position of controlled airspace using a suitable chart and geographical features;

(d) identify and avoid restricted areas and controlled airspace using a chart and geographical features when applicable;

(e) complete departure from the circuit area and transits to the designated area without incident;

(f) complete departure from the designated area and transits to the circuit area without incident;

(g) maintain orientation by geographical features with the aid of a suitable map.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) helicopter with dual controls and electronic intercom;

(c) day VFR;

(d) aerodromes and helicopter landing sites;

(e) obstructions and personnel (simulated);

(f) various wind conditions (may be simulated).

4 Underpinning knowledge of the following:

(a) primary and secondary effects of helicopter controls;

(b) vortex ring state;

(c) circuit operations;

(d) managing non-normal and emergencies in the circuit area;

(e) wind shear, turbulence and wake turbulence;

(f) helicopter instruments and monitoring helicopter performance.

H6 Control helicopter during advanced manoeuvres

1 Unit description

This unit describes the skills and knowledge required to control a helicopter during advanced manoeuvres and procedures.

2 Elements and performance criteria

2.1 H6.1 – Turn helicopter steeply

(a) complete airspace cleared procedure;

(b) perform steep turns (45º) onto a nominated heading or geographical feature as follows:

(i) maintaining altitude;

(ii) descending through a minimum descent of 500 ft;

(iii) in balance.

2.2 H6.2 – Perform autorotative flight

(a) enter and maintain autorotative flight at a nominated speed in balanced flight for the following profiles:

(i) straight descent at nominated heading and manufacturer's recommended speed;

(ii) turning descent through 180˚ and 360˚ using up to 45˚ angle of bank;

(iii) best range speed and minimum descent rate speed;

(b) maintain RRPM within limitations during autorotative flight;

(c) perform power recovery as follows:

(i) anticipate and comply with nominated minimum descent altitude;

(ii) ensure engine RPM and RRPM 'needles' are rejoined prior to the setting of climb power;

(iii) set climb power;

(iv) control yaw;

(v) set climb speed;

(d) perform power termination as follows:

(i) maintain RRPM within limitations;

(ii) ensure throttle(s) is at 100% (or the equivalent terminology) prior to the commencement of the flare;

(iii) commence flare at appropriate height for the prevailing conditions and reduce ground speed and rate of descent;

(iv) controls attitude to achieve a decreasing closure rate and reducing rate of descent;

(v) control yaw, engine and RRPM;

(vi) terminate the helicopter to a hover or hover taxi within tolerances of termination point without lateral or rearward movement;

(e) perform autorotative landing as follows:

(i) commence flare at appropriate height for the prevailing conditions and reduce ground speed and rate of descent;

(ii) control RRPM;

(iii) select and maintain helicopter at the hover attitude without lateral or rearward movement;

(iv) control touchdown rate;

(v) control yaw;

(vi) land helicopter with zero or minimum run-on speed within tolerances of nominated touchdown point without lateral or rearward movement.

2.3 **H6.3 – Land on, and lift off from, sloping ground**

2.3.1 Land on sloping ground:

(a) plan and conduct a slope landing in accordance with the wind and slope limits specified for the helicopter (if stated);

(b) use the appropriate slope landing technique relevant to the helicopter as follows:

(i) make adjustments using the controls in response to wind, surface and applicable limitations;

(ii) maintain RRPM within limits;

(iii) apply an appropriate rate of descent whilst maintaining a constant heading and preventing all drift during all the phases of land on;

(iv) control the roll rate of the helicopter following first contact;

(v) maintain the helicopter's position on the slope while lowering collective and centralising the cyclic;

(c) ensure security of the helicopter on the sloping surface prior to reducing rotor RPM.

2.3.2 Lift off from sloping ground:

(a) plan and conduct a lift-off from sloping ground in accordance with the wind and slope limits of the helicopter;

(b) use the appropriate slope lift-off technique for the helicopter as follows:

(i) make adjustments using the controls in response to wind, surface and applicable limitations;

(ii) maintain RRPM within limits;

(iii) apply an appropriate rate of climb while maintaining a constant heading and preventing all drift during all the phases of lift-off;

(iv) control the roll rate of the rotorcraft during lift-off;

(c) establish a stable hover above the lift off position clear of all obstacles.

2.4 **H6.4 – Land, take off and manoeuvre in a confined area**

2.4.1 Land in confined area:

(a) plan and conduct a confined area landing in accordance with the limitations for the helicopter;

(b) confirm helicopter performance, which includes power checks as applicable;

(c) inspect confined area and determine a plan, including an appropriate approach and departure path;

(d) intercept and maintain approach path to the termination point;

(e) operate the helicopter within its limitations;

(f) land at a suitable landing and lift-off area.

2.4.2 Take off from confined area:

(a) plan a take-off from a confined area in accordance with the limitations for the helicopter;

(b) calculate and confirm the helicopter's take-off performance is adequate for the confined area;

(c) determine an appropriate abort point;

(d) identify all obstacles on the departure patch and a possible abort path in the confined area;

(e) conduct take-off and departure from the confined area and remain clear of obstacles with a margin that is applicable to the operation;

(f) operate the helicopter within its limitations.

2.4.3 Manoeuvre in a confined area:

(a) plan for manoeuvring in a confined area in accordance with the limitations for the helicopter;

(b) confirm the helicopter's performance, which includes power checks as applicable;

(c) identify all obstacles in the confined area;

(d) manoeuvre the helicopter in the confined area while remaining clear of obstacles;

(e) operate the helicopter within its limitations.

2.5 **H6.5 – Execute limited power take-off, approach and landing**

2.5.1 Limited power take-off:

(a) confirm the helicopter's performance using its performance charts;

(b) apply maximum, or nominated, power, while maintaining optimum RRPM;

(c) accelerate helicopter at an appropriate rate;

(d) recognise and control translational lift effect;

(e) maintain direction of departure path then balance when appropriate;

(f) establish and maintain climb;

(g) identify and avoid obstacles.

2.5.2 Limited power approach and landing:

(a) confirm the helicopter's performance using its performance charts;

(b) confirm the landing area available is sufficient for a safe limited power approach and landing;

(c) determine an appropriate plan for approach, which includes the nomination of a suitable touchdown point;

(d) intercept the planned approach path appropriate for the performance of the helicopter in the prevailing conditions;

(e) manage the helicopter's airspeed with the optimum RRPM appropriate to the power available and landing environment;

(f) identify and avoid obstacles;

(g) maintain effective translational lift until touchdown is assured;

(h) maintain balance and direction of approach path;

(i) touchdown on the nominated touchdown point;

(j) control the helicopter on the ground.

2.6 **H6.6 – Land on, and take-off, from a pinnacle or ridgeline (CPL only)**

2.6.1 Land on pinnacle or ridgeline:

(a) plan a pinnacle or ridgeline landing in accordance with the limitations of the helicopter;

(b) confirm the helicopter's performance, which includes power checks as applicable;

(c) inspect the ridgeline or pinnacle as applicable, and determine a plan including an appropriate approach and departure path;

(d) assess the local environment conditions for effects of the terrain on wind and turbulence;

(e) intercept and maintain the approach path to the termination point;

(f) operate the helicopter within its limitations and set optimum RPM;

(g) maintain effective translational lift until touchdown is assured;

(h) terminate to a hover over the selected landing and lift-off area;

(i) touchdown on nominated touchdown point;

(j) control the helicopter on the ground.

2.6.2 Take off from pinnacle or ridgeline:

(a) plan a take-off from in a pinnacle or ridgeline in accordance with the limitations of the helicopter;

(b) calculate and confirm the helicopter's take-off performance is adequate for the departure;

(c) determine an appropriate abort point (if applicable);

(d) identify all obstacles on the departure patch and proposed abort path for the pinnacle or ridgeline (if applicable);

(e) conduct take-off and departure from the pinnacle or ridgeline remaining clear of obstacles with a margin that is applicable to the operation;

(f) operate the helicopter within its limitations.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day VFR;

(c) where applicable:

(i) confined helicopter landing site;

(ii) terrain with sloping ground;

(iii) terrain with a pinnacle or ridgeline;

(d) simulated abnormal and emergency situations;

(e) simulated hazardous or marginal weather;

(f) for PPL, autorotative landings may be replaced by a power termination.

4 Underpinning knowledge of the following:

(a) cross-wind and rotor control limits for the helicopter;

(b) helicopter performance limitations;

(c) local weather conditions;

(d) typical hazards and risks associated with conducting advanced manoeuvres and identify precautions and procedures to control the risks;

(e) instructions, procedures and information that is relevant to executing advanced manoeuvres and procedures.

H7 Manage abnormal situations and emergencies – helicopter

1 Unit description

This unit describes the skills and knowledge required to manage abnormal and emergency situations in helicopters.

2 Elements and performance criteria

2.1 H7.1 – Manage forced landing from level flight

(a) identify engine failure correctly and maintain control of helicopter;

(b) establish and maintain helicopter in autorotative flight;

(c) maintain balance;

(d) control RRPM within limitations;

(e) select suitable landing area;

(f) position helicopter to land in selected area;

(g) make appropriate radio transmissions (if time permits);

(h) perform emergency checks;

(i) brief passengers as appropriate;

(j) perform autorotative landing and secure helicopter.

2.2 H7.2 – Manage engine failure during take-off and on final approach

(a) identify engine failure correctly and maintain control of helicopter;

(b) establish and maintain helicopter in autorotative flight;

(c) maintain skids parallel to direction of travel;

(d) perform autorotative landing or power termination and secure helicopter.

2.3 H7.3 – Manage engine failure during hover or hover taxi

2.3.1 During hover:

(a) correctly identify engine failure;

(b) control yaw and drift;

(c) perform controlled touchdown.

2.3.2 During hover taxi:

(a) correctly identify engine failure;

(b) control yaw and drift;

(c) maintain skids parallel to direction of travel;

(d) perform controlled touchdown;

(e) control ground-slide.

2.4 H7.4 – Manage tail rotor malfunctions

2.4.1 During flight:

(a) correctly identify tail rotor malfunction;

(b) maintain control of the helicopter;

(c) select a suitable landing area;

(d) manoeuvre helicopter to a position where the safest landing is assured;

(e) land the helicopter.

2.4.2 During hover:

(a) correctly identify tail rotor malfunction;

(b) maintain control of the helicopter;

(c) select a suitable landing area;

(d) land the helicopter.

2.5 **H7.5 – Manage jammed flight control systems**

(a) correctly identify when controls are jammed;

(b) locate and remove any objects that are causing the jam;

(c) maintain control of the helicopter and rectify the malfunction, if appropriate;

(d) manoeuvre the helicopter to the safest landing area available.

2.6 **H7.6 – Manage helicopter systems malfunctions**

(a) maintain control of the helicopter;

(b) identify and confirm the system malfunction;

(c) manage the malfunction appropriately;

(d) where appropriate, isolate the system;

(e) perform emergency procedures.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) helicopter with dual controls and electronic intercom;

(c) day VFR;

(d) aerodromes and helicopter landing sites;

(e) obstructions and personnel (simulated);

(f) various wind conditions (can be simulated).

4 Underpinning knowledge of the following:

(a) emergency procedures;

(b) applicable system malfunctions;

(c) managing system malfunctions;

(d) prioritising tasks when managing malfunctions;

(e) the following key hazards including, for each, the typical causal factors and contributing operational situations, avoidance and recognition of symptoms and recovery techniques:

(i) vortex ring state;

(ii) ground resonance;

(iii) loss of tail rotor effectiveness (LTE);

(iv) low ‘g’ and mast bumping;

(v) overpitching or low RRPM – rotor stall;

(vi) retreating blade stall;

(vii) recirculation;

(viii) dynamic rollover;

(f) the impact of high gross weight and high density altitude on key hazards;

(g) threat and error management as follows:

(i) flight planning to avoid hazardous flight regimes;

(ii) techniques for how to avoid a potentially hazardous situation developing whilst in flight.

TR-SEH Type rating – single-engine helicopter

1 Unit description

This unit describes the skills and knowledge required to operate a type-rated single-engine helicopter.

2 Elements and performance criteria

2.1 TR-SEH.1 – Control helicopter on the ground

2.1.1 For all helicopters:

(a) prepare for start as follows:

(i) using an orderly procedure with checklists, inspect and prepare the helicopter, including those items recommended by the manufacturer, for a flight;

(ii) identify and verify switches, circuit breakers, fuses, and spare fuses pertinent to day and night operations;

(iii) confirm that there is sufficient fuel and oil for the intended flight;

(iv) identify and verify the required equipment for the flight is on-board and serviceable;

(v) ensure security of baggage and required equipment;

(vi) organise and arrange documents and equipment that will need to be accessed in flight in a manner that makes the items readily available;

(vii) perform an effective passenger safety briefing (if type capable of carrying passengers);

(b) conduct engine start and rotor engagement as follows:

(i) ensure helicopter is located in a suitable location for starting engine and rotors;

(ii) use the appropriate checklist provided by the helicopter manufacturer or owner or operator;

(iii) calculate and confirm sufficient power margin available for the proposed flight;

(iv) demonstrate knowledge of recommended starting procedures;

(v) take appropriate action with respect to unsatisfactory start conditions;

(vi) complete the appropriate engine and helicopter systems checks;

(c) taxiing and hover manoeuvring as follows:

(i) carry out pre-take-off checks;

(ii) set flight controls correctly to prepare for the lift-off transition to the hover at the location;

(iii) use correct flight and power control techniques to lift helicopter off the surface to a stable hover at the appropriate hover height for the helicopter;

(iv) confirm the proper functioning of the flight controls and confirm centre of gravity and power required to hover are within limits;

(v) trim helicopter where applicable;

(vi) demonstrate smooth control at a constant safe hover height while hover manoeuvring and maintaining power and RRPM within the limits;

(vii) maintain helicopter in flight over a nominated hover point at a nominated height and heading in cross-wind and tailwind;

(viii) transition from static hover to forward, sideways and backwards flight and terminate this movement over a nominated hover point;

(ix) turn helicopter around a the mast while maintaining a constant height at a constant rate of turn using anti-torque pedals;

(x) turn helicopter around a nominated point on or forward of the nose or on or aft of the tail while maintaining a constant height and specified rate of movement around the point;

(xi) apply controlled corrective action to maintain a constant rate of turn and to counter the effects of wind;

(xii) adjust air transit ground speed to suit helicopter type, traffic conditions, congestion, and maintenance of control and to avoid collision with obstacles or other aircraft.

2.1.2 For a helicopter with wheel landing gear, be able to do the following:

(a) select and maintain correct disk attitude and power required to initiate forwards movement of the helicopter on the surface;

(b) check and confirm the proper functioning of the wheel brake system;

(c) select and maintain correct disk attitude and power required to ground taxi and manoeuvre the helicopter on appropriate surfaces (wet and dry) at a safe speed in headwind, cross-wind and tailwind conditions;

(d) control the helicopter smoothly while ground taxiing and manoeuvring the helicopter with turns at a constant and safe rate of turn while maintaining an appropriate disk attitude and power setting;

(e) apply smooth and controlled actions to terminate at a nominated holding or parking point under different wind and surface conditions.

2.2 **TR-SEH.2 – Conduct take-off to departure**

2.2.1 Manage normal take-off to departure as follows:

(a) using approved technique and documented procedures perform a take-off, either from the ground or hover, and transition to forward flight and:

(i) complete appropriate checklists;

(ii) perform a take-off safety briefing (this may be carried out prior to lift off to the hover if necessitated by location);

(iii) ensure operating RPM within limits;

(iv) clear the area, taxi into the take-off position;

(v) transition to forward flight and through translational lift using correct techniques;

(b) accelerate to and maintain the recommended or nominated climb speed using the correct profile:

(i) outside of the Height-Velocity (H-V) avoid curve;

(ii) ensure obstacle avoidance;

(iii) retract the landing gear after a positive rate of climb is established (if applicable);

(iv) maintain correct power and attitude for the profile and IAS to be flown;

(v) comply with noise abatement procedures, where applicable;

(vi) complete appropriate checks.

2.2.2 Manage engine failure during take-off to departure as follows:

(a) self-brief, or brief crew members, stating a plan of action that will ensure the safest outcome in the event of an engine failure;

(b) maintain RRPM within the prescribed limits and control of the helicopter;

(c) perform autorotation to power termination or touchdown, as applicable;

(d) at the appropriate time, complete the engine failure shutdown checklist.

2.3 **TR-SEH.3 – Control helicopter in normal flight**

Set power and maintain attitude to establish and maintain the following manoeuvres with the helicopter in balanced flight and trimmed (as applicable) within prescribed tolerances as follows:

(a) straight and level:

(i) straight and level flight at normal cruise;

(ii) maintains heading;

(iii) maintains nominated altitude;

(b) straight climbs and descents:

(i) maintain IAS for best angle of climb (V_X);

(ii) maintain IAS for best rate of climb (V_Y);

(iii) maintain IAS for cruise climb;

(iv) maintain IAS for cruise descent;

(v) maintain correct power setting as applicable to the rotorcraft;

(vi) maintain heading;

(c) turn onto specific headings (using magnetic compass) or geographical feature within the flight tolerances for the following:

(i) level turn;

(ii) climbing turn, rate 1 or 20° bank;

(iii) powered descending turn, 30° bank.

2.4 **TR-SEH.4 – Control helicopter during advanced manoeuvres**

(a) perform steep turns (45º) within the flight tolerances as follows:

(i) level turn altitude;

(ii) exit on specified heading or geographical feature;

(b) perform autorotative flight:

(i) enter and maintain autorotative flight at nominated speed in balanced flight for the following profiles:

(A) descend at nominated heading and manufacturer's recommended speed;

(B) conduct 180˚ autorotations using up to 45˚ angle of bank;

(C) autorotative flight at best range speed and minimum descent rate speed;

(D) maintain RRPM within limitations;

(c) perform landing or power termination as applicable;

(d) perform power termination:

(i) maintain RRPM within limitations;

(ii) commence flare at appropriate height for the prevailing conditions and reduce ground speed and rate of descent;

(iii) control attitude to achieve a decreasing closure rate and reducing rate of descent;

(iv) control yaw, engine and RRPM;

(v) terminate the helicopter to a hover or hover taxi within tolerances of termination point without lateral or rearward drift;

(e) perform autorotative landing:

(i) commence flare at appropriate height for the prevailing conditions and reduces ground speed and rate of descent;

(ii) control RRPM;

(iii) select and maintain helicopter at the hover attitude without lateral or backward movement;

(iv) control touchdown rate;

(v) control yaw;

(vi) land helicopter with zero or minimum run-on speed within tolerances of nominated touchdown point without lateral or backward drift.

2.5 **TR-SEH.5 – Manage abnormal and emergency conditions**

(a) manage engine failure using the correct technique and applying the applicable checklists, procedures and planning during the following:

(i) hover and hover taxi;

(ii) take-off and departure;

(iii) cruise flight;

(iv) approach and landing;

(b) manage control malfunction as follows:

(i) identify tail rotor malfunction during flight and take appropriate action following required checklists and procedures;

(ii) select and manoeuvre helicopter to the safest landing area within area of regard;

(iii) identify jammed primary controls, carry out manoeuvres to safely remediate the problem, and land at a suitable location for the following:

(A) jammed pedals;

(B) jammed or limited cyclic or collective;

(c) manage system malfunctions by identifying critical system malfunction during flight and take appropriate action following required checklists and procedures for:

(i) hydraulic system emergencies (if applicable);

(ii) electrical system emergencies;

(iii) clutch system emergencies (if applicable);

(iv) engine governing system emergencies;

(d) perform recovery from the following (if applicable):

(i) vortex ring condition;

(ii) loss of tail rotor effectiveness;

(iii) low 'g' and mast bumping;

(e) control helicopter throughout, and manoeuvre the helicopter to the safest landing area available.

2.6 **TR-SEH.6 – Conduct a descent and arrival to an aerodrome**

(a) plan and conduct descent;

(b) join traffic pattern;

(c) maintain a safe separation from other traffic joining, departing or in the traffic pattern.

2.7 **TR-SEH.7 – Fly a full circuit pattern**

(a) perform a full circuit pattern (5 legs) within the tolerances specified for the relevant flight path;

(b) manage engine failure in the circuit:

(i) maintain control of the aircraft;

(ii) perform recall actions correctly;

(iii) select a suitable landing area within gliding distance, on the aerodrome or elsewhere;

(iv) perform emergency procedures correctly and land the aircraft if the engine cannot be restarted;

(v) advise ATS or other agencies capable of providing assistance of situation and intentions;

(vi) brief passengers about flight situation, brace position and harness security;

(vii) land aircraft ensuring safest outcome if an engine restart is not achieved.

2.8 **TR-SEH.8 – Conduct a landing**

Perform the following while operating within the limitations prescribed in the RFM:

(i) land on, and lift off from, sloping ground;

(ii) land, take off and manoeuvre in a confined area;

(iii) limited power approach and landing and take-off;

(iv) land and take-off from a pinnacle or ridgeline.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day VFR;

(c) single-engine helicopter with dual controls, electronic intercom and dual control brakes, if fitted;

(d) aerodromes or HLS;

(e) sealed, gravel or grass surfaces;

(f) limitations, such as those imposed by local noise abatement procedures and curfews;

(g) operational hazards, which may include variable surfaces, loose objects, personnel, birds and propeller wash, rotor wash and jet blast;

(h) simulated abnormal and emergency situations;

(i) simulated hazardous weather.

4 Underpinning knowledge of the following:

(a) general aircraft data;

(b) make, type and model of helicopter, designation of engines, take-off and rated power;

(c) stated airspeed limitations including, but not limited to: V_{NE} (at varying AUW and density altitudes) V_H, configuration airspeed limits V_{LO}, V_{TURB}, maximum cross-wind;

(d) low speed wind limits;

(e) RRPM limits (Power ON and Power OFF);

(f) engine, transmission and any other stated limits in the RFM;

(g) slope landing limitations (if available);

(h) emergency procedures for the following:

(i) engine failure in the hover;

(ii) taxiing;

(iii) during transitions before and after take-off;

(iv) in the cruise;

(v) on final approach before and after landing;

(vi) engine fire on the ground and airborne;

(vii) electrical fire on the ground and airborne;

(viii) cabin fire in flight;

(i) N1, torque split indications;

(j) identify malfunctioning governor in flight and manage the related engine;

(k) corrective action to be taken when engine run-up or run-down has been diagnosed;

(l) the following weight and balance topics:

(i) weight, balance and performance;

(ii) permissible take-off weight;

(iii) maximum gross weight, landing weight, ramp weight and zero fuel weight;

(iv) centre of gravity position for any specified conditions;

(v) centre of gravity limitations;

(vi) appropriate charts to determine centre of gravity;

(vii) calculated centre of gravity position and confirm it is within limits;

(m) the following take-off and landing topics:

(i) continuing and rejected take-off distances;

(ii) take-off decision point;

(iii) landing decision point;

(n) climb performance, hover out of ground effect and height–velocity diagram charts;

(o) failed engine operations;

(p) the following aircraft systems:

(i) fuel system;

(ii) hydraulic system;

(iii) electrical system;

(iv) oil system;

(v) stability augmentation, AFCS and FDS (as applicable);

(vi) anti-icing and de-icing systems (as applicable);

(vii) heating and ventilation systems;

(viii) pitot and static system;

(ix) fire extinguisher system (as applicable);

(x) engine systems;

(xi) transmission and rotor systems;

(xii) display systems (as applicable);

(xiii) undercarriage system (fixed or retractable as applicable);

(q) the following key hazards including, for each, the typical causal factors and contributing operational situations, avoidance and recognition of symptoms and recovery techniques:

(i) vortex ring state;

(ii) ground resonance;

(iii) loss of tail rotor effectiveness (LTE);

(iv) low ‘g’ and mast bumping;

(v) overpitching or low RRPM – rotor stall;

(vi) retreating blade stall;

(vii) recirculation;

(viii) dynamic rollover.

TR-MEH Type rating – multi-engine helicopter

1 Unit description

This unit describes the skills and knowledge required to operate a multi-engine helicopter.

2 Elements and performance criteria

2.1 TR-MEH.1 – Control helicopter on the ground

2.1.1 For all helicopters:

(a) prepare for start as follows:

(i) using an orderly procedure with checklists, inspect and prepare the helicopter, including those items recommended by the manufacturer, for a flight;

(ii) identify and verify switches, circuit breakers, fuses, and spare fuses pertinent to day and night operations;

(iii) confirm that there is sufficient fuel and oil for the intended flight;

(iv) identify and verify the required equipment for the flight is on-board and serviceable;

(v) ensure security of baggage and required equipment;

(vi) organise and arrange documents and equipment that will need to be accessed in flight in a manner that makes the items readily available;

(vii) perform an effective passenger safety briefing (if type capable of carrying passengers);

(b) conduct engine start and rotor engagement as follows:

(i) ensure helicopter is located in a suitable location for starting engine and rotors;

(ii) use the appropriate checklist provided by the helicopter manufacturer or owner or operator;

(iii) calculate and confirm sufficient power margin available for the proposed flight;

(iv) demonstrate knowledge of recommended starting procedures;

(v) take appropriate action with respect to unsatisfactory start conditions;

(vi) complete the appropriate engine and helicopter systems checks;

(c) taxiing and hover manoeuvring as follows:

(i) carry out pre-take-off checks;

(ii) set flight controls correctly to prepare for the lift-off transition to the hover at the location;

(iii) use correct flight and power control techniques to lift helicopter off the surface to a stable hover at the appropriate hover height for the helicopter;

(iv) confirm the proper functioning of the flight controls and confirm centre of gravity and power required to hover are within limits;

(v) trim helicopter where applicable;

(vi) demonstrate smooth control at a constant safe hover height while hover manoeuvring and maintaining power and RRPM within the limits;

(vii) maintain helicopter in flight over a nominated hover point at a nominated height and heading in cross-wind and tailwind;

(viii) transition from static hover to forward, sideways and backwards flight and terminate this movement over a nominated hover point;

(ix) turn helicopter around a the mast while maintaining a constant height at a constant rate of turn using anti-torque pedals;

(x) turn helicopter around a nominated point on or forward of the nose or on or aft of the tail while maintaining a constant height and specified rate of movement around the point;

(xi) apply controlled corrective action to maintain a constant rate of turn and to counter the effects of wind;

(xii) adjust air transit ground speed to suit helicopter type, traffic conditions, congestion, and maintenance of control and to avoid collision with obstacles or other aircraft.

2.1.2 For a helicopter with wheel landing gear, be able to do the following:

(a) select and maintain correct disk attitude and power required to initiate forwards movement of the helicopter on the surface;

(b) check and confirm the proper functioning of the wheel brake system;

(c) select and maintain correct disk attitude and power required to ground taxi and manoeuvre the helicopter on appropriate surfaces (wet and dry) at a safe speed in headwind, cross-wind and tailwind conditions;

(d) control the helicopter smoothly while ground taxiing and manoeuvring the helicopter with turns at a constant and safe rate of turn while maintaining an appropriate disk attitude and power setting;

(e) apply smooth and controlled actions to terminate at a nominated holding or parking point under different wind and surface conditions.

2.2 **TR-MEH.2 – Conduct take-off to departure**

2.2.1 Manage normal take-off to departure as follows:

(a) using approved technique and documented procedures perform a take-off, either from the ground or hover, and transition to forward flight and:

(i) complete appropriate checklists;

(ii) perform a take-off safety briefing (this may be carried out prior to lift off to the hover if necessitated by location);

(iii) ensure operating RPM within limits;

(iv) clear the area, taxi into the take-off position;

(v) transition to forward flight and through translational lift using correct techniques;

(b) accelerate to and maintain the recommended or nominated climb using the correct profile:

(i) outside of the Height-Velocity (H-V) avoid curve;

(ii) ensure obstacle avoidance;

(iii) retract the landing gear after a positive rate of climb is established (if applicable);

(iv) maintain correct power and attitude for the profile and IAS to be flown;

(v) comply with noise abatement procedures, where applicable;

(vi) complete appropriate checks.

2.2.2 Manage engine failure during take-off to departure as follows:

(a) self-brief, or brief crew members, stating a plan of action that will ensure the safest outcome in the event of an engine failure;

(b) maintain RRPM within the prescribed limits and control of the helicopter;

(c) correctly identify and confirm the failed engine(s) and at the appropriate time, complete the engine failure shutdown checklist for the following situations:

(i) engine failure prior to reaching take-off decision point:

(A) conduct the rejected take-off procedure in accordance with AFM and POH;

(B) apply the appropriate power within the AFM limits for the configuration being flown;

(C) perform a controlled landing in the rejected take-off distance available;

(ii) engine failure after take-off:

(A) maintain control of the helicopter;

(B) set maximum contingency power on serviceable engine;

(C) accelerate to V_{TOSS} (if applicable);

(D) identify and confirm failed engine;

(E) at the appropriate time, complete the engine failure shutdown checklist;

(F) climb multi-engine helicopter not below V_{YSE};

(G) land helicopter at nearest appropriate landing area.

2.3 **TR-MEH.3 – Control helicopter in normal flight**

Set power and maintain attitude to establish and maintain the following manoeuvres with the helicopter in balanced flight and trimmed (as applicable) within prescribed tolerances as follows:

(a) straight and level:

(i) straight and level flight at normal cruise;

(ii) maintains heading;

(iii) maintains nominated altitude;

(b) straight climbs and descents:

(i) maintain IAS for best angle of climb (V_X);

(ii) maintain IAS for best rate of climb (V_Y);

(iii) maintain IAS for cruise climb;

(iv) maintain IAS for cruise descent;

(v) maintain correct power setting as applicable to the rotorcraft;

(vi) maintain heading;

(c) turn onto specific headings (using magnetic compass) or geographical feature within the flight tolerances for the following:

(i) level turn

(ii) climbing turn, rate 1 or 20° bank;

(iii) powered descending turn, 30° bank.

2.4 **TR-MEH.4 – Control helicopter during advanced manoeuvres**

(a) perform steep turns (45º) within the flight tolerances as follows:

(i) level turn altitude;

(ii) exits on specified heading or geographical feature;

(b) perform autorotative flight:

(i) enters and maintains autorotative flight at nominated speed in balanced flight for the following profiles:

(A) descend at nominated heading and manufacturer's recommended speed;

(B) conduct 180º autorotations using up to 45º angle of bank;

(C) autorotative flight at best range speed and minimum descent rate speed;

(D) maintains RRPM within limitations;

(c) perform power termination:

(i) maintain RRPM within limitations;

(ii) ensure throttle(s) is at 100% (or the equivalent terminology) prior to the commencement of the flare;

(iii) commence flare at appropriate height for the prevailing conditions and reduce ground speed and rate of descent;

(iv) control attitude to achieve a decreasing closure rate and reducing rate of descent;

(v) control yaw, engine and RRPM;

(vi) terminate the helicopter to a hover or hover taxi within tolerances of termination point without lateral or rearward drift.

2.5 **TR-MEH.5 – Manage abnormal and emergency conditions**

(a) manage engine failure, using the correct technique and applying the applicable checklists, procedures and planning manages engine failure during the following:

(i) hover and hover taxi;

(ii) take-off and departure;

(iii) cruise flight;

(iv) approach and landing;

(b) manage control malfunction as follows:

(i) identify tail rotor malfunction during flight and take appropriate action following required checklists and procedures;

(ii) select and manoeuvre helicopter to the safest landing area within area of regard;

(iii) identify jammed primary controls, carry out manoeuvres to safely remediate the problem, and land at a suitable location for the following:

(A) jammed pedals;

(B) jammed or limited cyclic or collective;

(c) manage system malfunctions by identifying critical system malfunction during flight and take appropriate action following required checklists and procedures for the following:

(i) hydraulic system emergencies (if applicable);

(ii) electrical system emergencies;

(iii) clutch system emergencies (if applicable);

(iv) engine governing system emergencies;

(d) perform recovery from the following (if applicable):

(i) vortex ring condition;

(ii) loss of tail rotor effectiveness;

(iii) low 'g' and mast bumping;

(e) control helicopter throughout and manoeuvres helicopter to the safest landing area available.

2.6 **TR-MEH.6 – Conduct a descent and arrival to an aerodrome**

(a) plan and conduct descent;

(b) join traffic pattern;

(c) maintain a safe separation from other traffic joining, departing or in the traffic pattern.

2.7 **TR-MEH.7 – Fly a full circuit pattern**

(a) perform a full circuit pattern (5 legs) within the tolerances specified for the relevant flight path;

(b) manage engine failure in the circuit:

(i) maintain control of the aircraft;

(ii) perform recall actions correctly;

(iii) select a suitable landing area within gliding distance, on the aerodrome or elsewhere;

(iv) perform emergency procedures correctly and land the aircraft if the engine cannot be restarted;

(v) advise ATS or other agencies capable of providing assistance of situation and intentions;

(vi) brief passengers about flight situation, brace position and harness security;

(vii) land aircraft ensuring safest outcome if an engine restart is not achieved.

2.8 **TR-MEH.8 – Conduct a landing**

Perform the following while operating within the limitations prescribed in the RFM:

(i) land on, and lift off from, sloping ground;

(ii) land, take off and manoeuvre in a confined area;

(iii) limited power approach and landing and take-off;

(iv) land and take-off from a pinnacle or ridgeline (CPL).

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day VFR;

(c) approved multi-engine helicopter with dual controls, electronic intercom and dual control brakes, if fitted;

(d) aerodromes or HLS;

(e) sealed, gravel or grass surfaces;

(f) limitations, such as those imposed by local noise abatement procedures and curfews;

(g) operational hazards, which may include variable surfaces, loose objects, personnel, birds and propeller wash, rotor wash and jet blast;

(h) simulated abnormal and emergency situations;

(i) flight crew incapacitation (multi-crew operations);

(j) simulated hazardous weather.

4 Underpinning knowledge of the following:

(a) general aircraft data;

(b) make, type and model of helicopter, designation of engines, take-off and rated power;

(c) stated airspeed limitations including, but not limited to, V_{NE} (at varying AUW and density altitudes) V_H, configuration airspeed limits V_{LO}, V_{TURB}, maximum cross-wind;

(d) low speed wind limits;

(e) RRPM limits (Power ON and Power OFF);

(f) engine, transmission and any other stated limits in the RFM;

(g) slope landing limitations (if available);

(h) emergency procedures for the following:

(i) engine failure in the hover;

(ii) taxiing;

(iii) during transitions before and after take-off;

(iv) in the cruise;

(v) on final approach before and after landing;

(vi) engine fire on the ground and airborne;

(vii) electrical fire on the ground and airborne;

(viii) cabin fire in flight;

(i) N1, torque split indications;

(j) identify malfunctioning governor in flight and manage the related engine;

(k) corrective action to be taken when engine run-up or run-down has been diagnosed;

(l) the following weight and balance topics:

(i) weight, balance and performance;

(ii) permissible take-off weight;

(iii) maximum gross weight, landing weight, ramp weight and zero fuel weight;

(iv) centre of gravity position for any specified conditions;

(v) centre of gravity limitations;

(vi) appropriate charts to determine centre of gravity;

(vii) calculated centre of gravity position and confirm it is within limits;

(m) the following take-off and landing topics:

(i) continuing and rejected take-off distances;

(ii) take-off decision point;

(iii) landing decision point;

(n) climb performance, hover out of ground effect and height-velocity diagram charts;

(o) failed engine operations;

(p) initial rate of climb and climb gradient for 1 engine inoperative for specified conditions;

(q) range of the aircraft increases or decreases following an engine failure;

(r) PNR for 1 engine inoperative (CPL and ATPL);

(s) ETP for 1 engine inoperative (CPL and ATPL);

(t) the following aircraft systems:

(i) fuel system;

(ii) hydraulic system;

(iii) electrical system;

(iv) oil system;

(v) stability augmentation, AFCS and FDS (as applicable);

(vi) anti-icing and de-icing systems (as applicable);

(vii) heating and ventilation systems;

(viii) pitot and static system;

(ix) fire extinguisher system (as applicable);

(x) engine systems;

(xi) transmission and rotor systems;

(xii) display systems (as applicable);

(xiii) undercarriage system (fixed or retractable as applicable);

(u) the following key hazards including, for each, the typical causal factors and contributing operational situations, avoidance and recognition of symptoms and recovery techniques:

(i) vortex ring state;

(ii) ground resonance;

(iii) loss of tail rotor effectiveness (LTE);

(iv) low ‘g’ and mast bumping;

(v) overpitching or low RRPM – rotor stall;

(vi) retreating blade stall;

(vii) recirculation;

(viii) dynamic rollover.

FR-SEH Single-engine helicopter flight review

1 Unit description

This unit describes the standards required for a single-engine helicopter class rating and a single-engine helicopter type rating flight review.

2 Elements and performance criteria

2.1 FR-SEHC.1 – Conduct flight

(a) start, lift-off, hover and taxi helicopter ready for take-off;

(b) perform a normal take-off and departure;

(c) perform general handling manoeuvres, including the following:

(i) perform steep turns through at least 360°;

(ii) conduct low flying at 500 ft AGL and perform a reversal turn;

(d) perform circuit rejoin and at least 1 full circuit pattern;

(e) perform a missed approach;

(f) perform hover, taxi, take-off, approach and landing in a cross-wind if conditions permit;

(g) conduct operations on sloping ground and in confined areas (where possible).

2.2 FR-SEAHC.2 – Manage aircraft systems

(a) ensure sufficient fuel is loaded and fuel consumption is monitored and managed throughout the flight;

(b) manage the aircraft fuel system;

(c) manage all other aircraft systems.

2.3 FR-SEHC.3 – Navigation (optional)

(a) plan flight of at least 3 legs and submit flight plan in accordance with AIP;

(b) conduct a departure;

(c) navigate en route using visual and instrument navigation systems;

(d) perform diversion procedure;

(e) demonstrate lost procedure;

(f) conduct arrival.

2.4 FR-SEHC.4 – Airspace

(a) comply with airspace procedures and requirements;

(b) operate aircraft radio and conform to standard radio procedures.

2.5 FR-SEHC.5 – Instrument flying (optional)

(a) perform basic flight manoeuvres using full instrument panel;

(b) recover from upset situations and unusual aircraft attitudes to straight and level flight;

(c) perform checks and monitor system for serviceability.

2.6 FR-SEHC.6 – Manage non-normal and emergency conditions

(a) perform autorotation to touchdown or power termination;

(b) manage simulated engine failure during hover or hover taxi;

(c) manage aircraft system malfunctions other than engine failure;

(d) manage hydraulic system failure;

(e) perform recovery from the following (if applicable):

(i) vortex ring condition;

(ii) loss of tail rotor effectiveness;

(iii) low ‘g’ and mast bumping;

(f) manage loss of tail rotor control for the following:

(i) forward flight;

(ii) hover.

2.7 **FR-SEHC.7 – Non-technical skills**

(a) recognise and manage threats and errors during pre-flight planning and in-flight;

(b) maintain effective lookout and situational awareness;

(c) assess situations and make appropriate decisions;

(d) set priorities and manage tasks;

(e) maintain effective communication with stakeholders;

(f) communicate effectively using aeronautical radio.

2.8 **FR-SEHC.8 – Manage passengers and cargo**

(a) conduct pre-flight and in-flight safety briefings to ensure passengers are familiar with safety procedures, emergency equipment, exits and operational requirements;

(b) manage cargo.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) simulated conditions can be used;

(c) for FR-SEH.5 – *instrument flying*, simulated or actual instrument conditions;

(d) for FR-SEH.6 – *manage non-normal and emergency conditions*, performance criteria are limited according to the type of aircraft being used.

4 Underpinning knowledge of the following:

(a) privileges, limitations and responsibilities of the licences, ratings and endorsements the applicant holds;

(b) flight review requirements;

(c) obtaining, interpreting and applying meteorological and aeronautical information;

(d) navigation and flight planning for day VFR operations;

(e) diversion and lost procedures;

(f) weight and balance and aircraft performance;

(g) operation of systems fitted to the aircraft that is used in the flight review;

(h) extracting and applying aircraft performance data for the aircraft that is used in the flight review;

(i) limitations applicable to the rotorcraft being flown for the flight review;

(j) airspace requirements and procedures;

(k) helicopter landing sites;

(l) manage cargo and passengers;

(m) hazard identification and risk management;

(n) low inertia characteristics;

(o) for each of the following, the typical causal factors and contributing operational situations, avoidance and recognition of symptoms and recovery techniques:

(i) vortex ring generation;

(ii) ground resonance;

(iii) loss of tail rotor effectiveness;

(iv) low ‘g’ and mast bumping;

(v) overpitching/low RRPM – rotor stall;

(vi) retreating blade stall;

(vii) recirculation;

(viii) dynamic rollover;

(p) non-normal and emergency procedures, including full and partial failures;

(q) local operating procedures;

(r) hazardous weather;

(s) airworthiness requirements;

(t) reporting requirements;

(u) ERSA normal and emergency procedures;

(v) current and recently changed legislation and procedures that are relevant to the applicant’s licences, ratings and endorsements.

FR-MEHT Multi-engine helicopter type rating flight review

1 Unit description

This unit describes the standards required for a multi-engine helicopter type rating flight review.

2 Elements and performance criteria

2.1 FR-MEHT.1 – Conduct flight

(a) start, lift-off, hover and taxi helicopter ready for take-off;

(b) perform a normal take-off and departure;

(c) perform general handling manoeuvres, including the following:

(i) perform steep turns through at least 360°;

(ii) conduct low flying at 500 ft AGL and perform a reversal turn;

(d) perform circuit rejoin and at least 1 full circuit pattern;

(e) perform hover, taxi, take-off, approach and landing in a cross-wind if conditions permit;

(f) conduct operations on sloping ground and in confined areas (if possible).

2.2 FR-MEHT.2 – Manage aircraft systems

(a) ensure sufficient fuel is loaded and fuel consumption is monitored and managed throughout the flight;

(b) manage the aircraft fuel system;

(c) manage all other aircraft systems.

2.3 FR-MEHT.3 – Navigation (optional)

(a) plan flight of at least 3 legs and submit flight plan in accordance with AIP;

(b) conduct a departure;

(c) navigate en route using visual and instrument navigation systems;

(d) perform diversion procedure;

(e) conduct arrival.

2.4 FR-MEHT.4 – Airspace

(a) comply with airspace procedures and requirements;

(b) operate aircraft radio and conform to standard radio procedures.

2.5 FR-MEHT.5 – Instrument flying

(a) perform basic flight manoeuvres using full instrument panel;

(b) recover from upset situations and unusual aircraft attitudes to straight and level flight;

(c) perform checks and monitor system for serviceability.

2.6 FR-MEHT.6 – Manage non-normal and emergency conditions

(a) perform autorotation to power termination;

(b) manage simulated engine failures during departure and approach manoeuvres, to the applicable rotorcraft category standard;

(c) perform a single-engine missed approach;

(d) manage aircraft system malfunctions other than engine failure;

(e) perform recovery from the following (if applicable):

(i) vortex ring condition;

(ii) loss of tail rotor effectiveness;

(iii) low ‘g’ and mast bumping;

(f) manage loss of tail rotor control for the following:

(i) forward flight;

(ii) hover.

2.7 **FR-MEHT.7 – Non-technical skills**

(a) recognise and manage threats and errors during pre-flight planning and in-flight;

(b) maintain effective lookout and situational awareness;

(c) assess situations and make appropriate decisions;

(d) set priorities and manage tasks;

(e) maintain effective communication with stakeholders;

(f) communicate effectively using aeronautical radio.

2.8 **FR-MEHT.8 – Manage passengers and cargo**

(a) conduct pre-flight and in-flight safety briefings to ensure passengers are familiar with safety procedures, emergency equipment, exits and operational requirements;

(b) manage cargo.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) simulated conditions can be used;

(c) for FR- MEHT.5 – *instrument flying*, simulated or actual instrument conditions.

4 Underpinning knowledge of the following:

(a) privileges, limitations and responsibilities of the licences, ratings and endorsements the applicant holds;

(b) flight review requirements;

(c) obtaining, interpreting and applying meteorological and aeronautical information;

(d) navigation and flight planning for day VFR operations;

(e) weight and balance and aircraft performance;

(f) operation of systems fitted to the aircraft that is used in the flight review;

(g) extracting and applying aircraft performance data for the aircraft that is used in the flight review;

(h) limitations applicable to the rotorcraft being flown for the flight review;

(i) airspace requirements and procedures;

(j) helicopter landing sites;

(k) manage cargo and passengers;

(l) hazard identification and risk management;

(m) low inertia characteristics;

(n) for each of the following, the typical causal factors and contributing operational situations, avoidance and recognition of symptoms and recovery techniques:

(i) vortex ring generation;

(ii) ground resonance;

(iii) loss of tail rotor effectiveness;

(iv) low ‘g’ and mast bumping;

(v) overpitching/low RRPM – rotor stall;

(vi) retreating blade stall;

(vii) recirculation;

(viii) dynamic rollover;

(o) non-normal and emergency procedures, including full and partial failures;

(p) local operating procedures;

(q) hazardous weather;

(r) airworthiness requirements;

(s) reporting requirements;

(t) ERSA normal and emergency procedures;

(u) current and recently changed legislation and procedures that are relevant to the applicant's licences, ratings and endorsements.

GYROPLANE CATEGORY

GSE Single-engine gyroplane

1 Unit description

This unit describes the skills and knowledge required to operate a single-engine gyroplane aircraft.

2 Elements and performance criteria

2.1 GSE.1 – Control gyroplane on the ground

(a) prepare for start:

(i) determine take-off distance and obstacle clearance;

(ii) using an orderly procedure with checklists, inspect and prepare the gyroplane, including those items recommended by the manufacturer, for flight;

(iii) identify and verify switches, circuit breakers, fuses, and spare fuses pertinent to day and night operations;

(iv) confirm that there is sufficient fuel and oil for the intended flight;

(v) identify and verify the required equipment for the flight is on board and serviceable;

(vi) ensure baggage and required equipment are secured;

(vii) organise, stow and arrange documents and equipment that will need to be accessed during the flight to make them readily available;

(viii) perform an effective passenger safety briefing;

(b) conduct engine start:

(i) ensure gyroplane is located in a suitable location clear of obstructions and building for starting engine;

(ii) use the appropriate checklist provided by the gyroplane manufacturer to perform pre-start checks;

(iii) ensure propeller area clear prior to start;

(iv) demonstrate knowledge of recommended starting procedures;

(v) demonstrates hot and cold engine starts in accordance with appropriate checklists;

(vi) manage emergencies in accordance with appropriate checklists;

(vii) complete engine and gyroplane systems after-start checks;

(viii) engine warm-up conducted in accordance with appropriate checklist (if applicable);

(ix) control gyroplane movement during and after engine start;

(c) conduct pre-rotation:

(i) position gyroplane with safe rotor clearance from obstructions;

(ii) operate rotor brake (if fitted) in accordance with appropriate checklist;

(iii) spin up rotor in accordance with appropriate checklist;

(iv) prevent blade flap;

(v) understand the correct action in the event of blade flap;

(vi) maintain rotor disc position within published limits during pre-rotation and ground manoeuvring;

(d) taxi gyroplane:

(i) obtain taxi clearance (if required);

(ii) check and confirm proper functioning of the wheel brake system;

(iii) taxi gyroplane in accordance with prevailing aerodrome conditions;

(iv) comply with taxiway and other aerodrome markings, right-of-way rules and other as appropriate;

(v) follow marshalling instructions where applicable;

(vi) anticipate and allow for effects of prevailing weather conditions;
(vii) operate engine on ground and exercise rotor care;
(viii) maintain safe rotor clearance from obstructions;
(ix) adjust taxi speed to suit gyroplane type, surface conditions, and avoid collision with obstacles, other aircraft or persons;
(x) coordinate taxi speed and rotor disc position to control RRPM and prevent blade flap;
(xi) use correct action in the event of blade flap;

(e) take-off gyroplane:
(i) carry out pre-take-off procedures:
(ii) perform run up and pre-take-off checks in accordance using the aircraft checklist;
(iii) self-brief after take-off emergency actions;
(iv) perform pre-rotation in accordance with approved procedure;
(v) line up gyroplane on runway centreline in take-off direction;
(vi) perform line-up checks in accordance with aircraft checklist;
(vii) apply throttle to accelerate gyroplane and achieve flying RRPM;
(viii) maintain runway direction;
(ix) prevent rotor flap;
(x) compensate for engine torque roll;
(xi) achieve desired RRPM for flight not later than minimum power speed;
(xii) use throttle and controls to balance gyroplane on main gear at recommended speed;
(xiii) apply take off power after rotation;
(xiv) maintain climb speed at best angle or best rate;
(xv) maintain flight path on runway extended centreline as required;
(xvi) use applicable noise abatement and wake turbulence procedures as applicable;
(xvii) reduce take-off power to climb power;
(xviii) balance gyroplane;
(xix) carry out after take-off procedures;
(xx) perform after take-off checks by memory recall;
(xxi) conduct short-field take-off;
(xxii) conduct soft-field take-off;
(xxiii) conduct normal take-off;

(f) take off gyroplane in a cross-wind:
(i) apply competencies for take-off gyroplane;
(ii) ensure cross-wind component within manufacturer's limitations;
(iii) configure gyroplane for cross-wind take-off;
(iv) initial lift-off on downwind wheel.

2.2 GSE.2 – Control gyroplane in normal flight

(a) climb gyroplane:
(i) clear airspace above;
(ii) set and maintain climb power and attitude (cyclic pitch);
(iii) demonstrate best angle of climb (V_x);
(iv) demonstrate best rate of climb (V_y);
(v) demonstrate normal climb;
(vi) balance gyroplane;
(vii) trim gyroplane, if applicable;
(viii) maintain power as altitude is increased;
(ix) demonstrates straight climb;

(b) straight and level flight:
  (i) perform normal cruise in straight and level flight;
  (ii) perform high speed cruise in straight and level flight;
  (iii) perform maximum range cruise in straight and level;
  (iv) perform maximum endurance cruise in straight and level flight;
  (v) maintain altitude;
  (vi) maintain desired speed;
  (vii) balance gyroplane;
  (viii) trim gyroplane, if applicable;

(c) descend gyroplane:
  (i) set and maintain power and attitude to achieve normal descent performance during straight flight;
  (ii) set and idle power and attitude to achieve descent at glide speed;
  (iii) set and maintain power and attitude to achieve powered descent at nominated approach configuration and speed;
  (iv) balance gyroplane;
  (v) trim gyroplane, if applicable;
  (vi) monitor and control engine temperature;
  (vii) apply carburettor heat when applicable;
  (viii) maintain traffic clearance ahead and below.

(d) turn gyroplane:
  (i) perform airspace cleared procedure;
  (ii) set and maintain power, attitude and angle of bank to achieve specified turn performance;
  (iii) turn gyroplane at varying rates to achieve specified tracks;
  (iv) turn gyroplane onto specified headings or geographical feature;
  (v) balance gyroplane;
  (vi) trim gyroplane, if applicable;
  (vii) monitor and control engine temperature;
  (viii) turn gyroplane at various airspeeds;
  (ix) perform climbing turns at normal climb speed;
  (x) perform climbing turns at best angle speed;
  (xi) perform climbing turn at best rate speed;
  (xii) perform descending turn at normal descent speed
  (xiii) perform descending turn at glide speed and configuration;
  (xiv) perform descending turn in approach and landing configuration;

(e) recover gyroplane from flight behind the power curve:
  (i) perform airspace cleared procedure;
  (ii) maintain minimum altitude 1,000 ft AGL when manoeuvring below minimum level flight speed;
  (iii) maintain forward speed not less than 20 kts below minimum level flight speed;
  (iv) avoid rapid application of cyclic pitch;
  (v) maintain nominated heading;
  (vi) avoid loss of directional control;
  (vii) balance gyroplane;
  (viii) recover gyroplane from flight below minimal flight speed;
  (ix) coordinate use of throttle and cyclic to increase airspeed above minimum level flight speed;

(x) regain level flight by nominated altitude;

(f) turn gyroplane steeply:
  (i) visually clear air space;
  (ii) performs level steep turn at nominated bank angle without altitude change;
  (iii) maintains airspeed;
  (iv) perform descending steep turn at nominated bank angle and speed to a nominated heading or geographical feature through a minimum of 500 ft;
  (v) exit on specified heading or geographical feature;
  (vi) balance gyroplane;

(g) sideslip gyroplane:
  (i) perform pre-manoeuvre checks;
  (ii) perform side slip while maintaining speed and track;
  (iii) perform side slip in a turn while maintaining speed;
  (iv) recover from sideslip and balanced flight re-established;

(h) conduct circuits:
  (i) maintain lookout and traffic separation;
  (ii) conduct normal circuit:
    (A) maintain extended centreline on upwind leg;
    (B) allow for wind effect on all legs of the circuit;
    (C) adjust downwind spacing;
    (D) perform pre-landing checks;
    (E) maintain desired speed;
    (F) adjust base turning point according to prevailing wind conditions;
    (G) adjust base turning point according to traffic conditions or overshoots from base;
    (H) adjust height on base to be established on final approach not below 500 ft AGL;
    (I) identify and maintain aiming point on final approach;
    (J) perform final approach checklist actions;
    (K) control airspeed;
    (L) land gyroplane;

(i) land gyroplane:
  (i) conduct normal landing;
  (ii) conduct short-field landing;
  (iii) conduct soft-field landing;
  (iv) identify and select aiming point;
  (v) control power requirements;
  (vi) control the effect of cross-wind;
  (vii) flare gyroplane at appropriate height;
  (viii) take appropriate action to control ballooning;
  (ix) take appropriate action to control any bouncing after touchdown;
  (x) touchdown within flight tolerances;
  (xi) perform after landing checklist actions;

(j) perform missed landing:
  (i) recognise when the landing standard cannot be achieved;
  (ii) makes a timely decision to perform missed landing;
  (iii) apply take-off power and controls pitch attitude;
  (iv) lift off at lift-off speed or establish climb attitude if airborne;
  (v) avoid wake turbulence;

(vi) complete after take-off checks.

2.3 **GSE.3 – Manage abnormal situations**

(a) manage engine failure after take-off:
  (i) control gyroplane;
  (ii) establish and maintain best gliding speed;
  (iii) select suitable landing area;
  (iv) perform recall actions as time permits;
  (v) brief passengers on pilot's intentions, brace position and harness security, as time permits;
  (vi) land gyroplane to achieve safest outcome;

(b) perform forced landing (complete or partial power failure):
  (i) maintain control of gyroplane;
  (ii) perform recall actions;
  (iii) select landing area within gliding distance;
  (iv) formulate plan;
  (v) perform all emergency checks;
  (vi) brief passengers on pilot's intentions, brace position and harness security;
  (vii) declare a Mayday advising ATC, or any agency capable of providing assistance, of your situation and intentions;
  (viii) land gyroplane ensuring safest outcome if engine restart not achieved;

(c) conduct precautionary search and landing:
  (i) assess flight circumstances and decide to perform precautionary landing in the time available;
  (ii) declare a PAN and communicates intentions;
  (iii) configure gyroplane for reduced visibility manoeuvring, if applicable;
  (iv) select landing area and inspect suitability for landing ensuring;
    (A) unobstructed approach and overshoot paths;
    (B) landing area length adequate for landing;
    (C) landing area surface clear of hazards and suitable for gyroplane type;

(d) manage adverse aerodynamic situations:
  (i) explain causes and effect of, and avoidance and recovery actions of pilot induced oscillation (PIO);
  (ii) explain causes and effect of Gust Induced Oscillation (GIO);
  (iii) explain the causes and effects of power pushover and negative 'g';
  (iv) explain causes and avoidance of loss of directional control;
  (v) explain causes and effects of and recall actions in the event of ground resonance;
  (vi) identify presence of dynamic rollover conditions and maintain control of gyroplane.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day VFR;

(c) approved gyroplane with dual controls, electronic intercom and dual control brakes, if fitted;

(d) aerodromes or landing areas;

(e) sealed, gravel or grass surfaces;

(f) wake, orographic or 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) the fuel system and causes and effects of fuel vaporisation;

(b) rotor spin-up procedures;

(c) the effects of wind on rotor blades;

(d) performing weight and balance calculations;

(e) loading within specified limitations;

(f) dynamic rollover and ground resonance;

(g) gyroplane operational and starter motor limitations;

(h) all gyroplane limitations;

(i) aerodrome markings;

(j) light and marshalling signals;

(k) calculating take-off performance;

(l) calculating cross-wind components;

(m) factors affecting take-off performance;

(n) factors affecting initial climb performance;

(o) principles of aerodynamics;

(p) function and primary and secondary effects of controls;

(q) theory and application of best rate and angle of climb;

(r) forces and moments in straight and level and climbing flight;

(s) relationship of attitude and power to trim;

(t) use of trim controls;

(u) forces acting on a gyroplane during descent;

(v) effects of excessive cooling on engine performance during descent and methods to counter these effects;

(w) use of carburettor heat (if fitted to the gyroplane);

(x) hazards during maximum-rate descents;

(y) forces acting on a gyroplane in a turn;

(z) effects of turn on magnetic compass performance;

(za) effect of angle of bank on load factor and stall speed;

(zb) dangers of turbulence and wake turbulence when flying at slow speed;

(zc) circuit patterns and procedures;

(zd) dangers of wind shear, turbulence and wake turbulence;

(ze) aerodrome light signals;

(zf) aircraft systems;

(zg) aircraft performance;

(zh) aircraft weight and balance;

(zi) contents of the flight manual or POH;

(zj) day VFR flight rules;

(zk) relevant sections of the AIP;

(zl) effects of ‘g forces’ during turns;

(zm) effects of induced drag;

(zn) effects of a sideslip on gyroplane performance;

(zo) effects of sideslipping on gyroplane fuel and pitot systems;

(zp) calculating take-off and landing performance;

(zq) ground hazards associated with minimum ground roll and soft-surface operations;

(zr) principles of maximum rate and minimum radius turns;

(zs) precautionary search procedures;

(zt) causes of and corrective actions to manage adverse aerodynamic situations.

POWERED LIFT CATEGORY (RESERVED)

AIRSHIP CATEGORY (RESERVED)

GLIDER CATEGORY

PPF-G Perform pre- and post-flight actions and procedures gliders

1 Unit description

This unit describes the skills and knowledge required for a person to conduct pre- and post-flight actions and procedures for a glider.

2 Elements and performance criteria

2.1 **PPF.1 – Pre-flight actions and procedures**

(a) complete all required pre-flight administration documentation;

(b) obtain, interpret and apply information contained in the required pre-flight operational documentation, including but not limited to:

(i) maintenance release;

(ii) weather forecasts;

(iii) local observations;

(iv) NOTAMs;

(v) ERSA;

(vi) AIP;

(c) identify special aerodrome procedures;

(d) identify all relevant radio and navigation aid facilities to be used during the flight (if applicable);

(e) determine the suitability of the current and forecast weather conditions for the proposed flight;

(f) using the aircraft documents, calculate the following for a given set of environmental and operational conditions:

(i) weight and balance;

(g) determine whether the aircraft is serviceable for the proposed flight.

2.2 **PPF.2 – Perform pre-fight inspection**

(a) identify and secure equipment and documentation that is required for the flight;

(b) complete an internal and external check of the aircraft;

(c) identify all defects or damage to the aircraft;

(d) report to and seek advice from qualified personnel to determine the action required in relation to any identified defects or damage;

(e) ensure all aircraft locking and securing devices, covers and bungs are removed and stowed securely;

(f) certify the aircraft flight technical log entering any defects or endorsements to permissible unserviceabilities, as appropriate;

(g) complete and certify the daily inspection (if authorised to do so).

2.3 **PPF.3 – Post-flight actions and procedures**

(a) conduct post-flight inspection and secure the aircraft (if applicable);

(b) complete all required post-flight administration documentation.

3 Range of variables

Activities are performed in accordance with published procedures.

4 Underpinning knowledge of the following:

(a) standard operating procedures for the glider;

(b) airworthiness requirements applicable to the glider;

(c) local weather patterns;

(d) local aerodrome requirements.

G1 Control glider on the ground

1 Unit description

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

2 Elements and performance criteria

2.1 G1.1 – Before flight actions

(a) assess weather conditions as being suitable for flight;

(b) determine glider weight and balance is within limits;

(c) demonstrate an ability to assemble glider;

(d) determine ballast requirements;

(e) perform external pre-flight actions;

(f) perform internal pre-flight actions;

(g) determine launch mechanism is correctly connected.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) windsock located on aerodrome;

(c) sufficient wind that requires control adjustment (can be simulated);

(d) hazardous weather (can be simulated);

(e) day VFR conditions;

(f) local area operational limitations such as aerodrome curfews (can be simulated).

4 Underpinning knowledge of the following:

(a) published regulations and published procedures relating to the ground operation of aircraft;

(b) typical glider aircraft systems;

(c) typical glider launch systems;

(d) typical aircraft performance characteristics of gliders and the effects of local weather conditions on performance;

(e) aircraft weight and balance and the how to calculate aircraft centre of gravity;

(f) the contents of the flight manual and pilot operating handbook for the aircraft being flown;

(g) the environmental conditions that represent VMC;

(h) propeller wash, rotor wash and jet blast and how they affect gliders;

(i) the day VFR flight rules;

(j) the meaning of aerodrome markings, signals and local procedures;

(k) the actions to be taken in the event of a brake or tyre or steering failure;

(l) the relevant sections of the AIP.

G2 Take-off glider

1 Unit description

This unit describes the skills and knowledge required to perform a take-off in a glider.

2 Elements and performance criteria

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

(a) identify and apply airspeeds, configurations, and emergency and abnormal procedures for normal and cross-wind take-offs;

(b) work out in advance a plan of action to ensure the safest outcome in the event of abnormal operations;

(c) verify and correctly apply correction for the existing wind component to the take-off performance;

(d) perform and ensure all pre-take-off and line-up checks required by the aircraft checklist items are completed in a timely manner;

(e) align the airplane on the runway centreline.

2.2 G2.2 – Take-off glider

(a) apply the controls correctly to maintain longitudinal alignment on the centreline of the runway, if appropriate, prior to initiating and during the take-off;

(b) monitor settings, and instruments during take-off to ensure all predetermined parameters are maintained;

(c) adjust the controls to attain the desired pitch attitude at the predetermined airspeed to attain the desired performance;

(d) perform the take-off using winch and towed glider equipment applying the required control inputs as appropriate in a smooth, coordinated manner;

(e) trim the glider accurately maintaining balanced flight;

(f) perform and verify the completion of, gear and flap retractions (as applicable) and other required pilot-related activities at the required airspeed within tolerances;

(g) maintain desired flight path as required.

2.3 G2.3 – Take-off glider in a cross-wind

(a) perform a take-off in a glider allowing for cross-wind;

(b) maintain runway centreline and extended centreline.

2.4 G2.4 – Carryout after take-off procedures

2.4.1 The person must be able to demonstrate the following:

(a) verify the completion of the appropriate after take-off checklist items in a timely manner;

(b) maintain the appropriate climb segment at the nominated heading and airspeed.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) towed take-off;

(c) winch launch;

(d) aircraft with or without flaps;

(e) sealed, gravel or grass runways and taxiways;

(f) windsock located on aerodrome;

(g) simulated hazardous weather;

(h) day VFR conditions;

(i) for take-off in cross-wind, the cross-wind component must be at least 70% of the maximum permitted for the type of aeroplane being flown;

(j) local area operational limitations such as noise abatement and aerodrome curfews.

4 Underpinning knowledge of the following:

(a) hand signals;

(b) tow aircraft signals;

(c) obtaining or calculating the cross-wind and down or up wind components;

(d) the 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 chart to identify safe areas for engine-failure purposes and noise-abatement considerations.

G3 Control glider in normal flight

1 Unit description

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

2 Elements and performance criteria

2.1 G3.1 – Climb glider

(a) operate and monitor all aircraft systems when commencing, during, and completing a climbing flight manoeuvre;

(b) for the following climbing manoeuvres select attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, apply smooth, coordinated control inputs to achieve the required flight tolerances as applicable to the normal climb manoeuvre.

2.2 G3.2 – Maintain straight flight

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

(b) for the following straight manoeuvres selects attitude and configuration as required for the flight path, balance and trim the glider accurately, apply smooth, coordinated control inputs to achieve the required flight tolerances as applicable to the manoeuvre:

(i) at slow speed;

(ii) at normal cruise;

(iii) at high-speed;

(iv) at maximum range;

(v) at maximum endurance;

(vi) with flap selected.

2.3 G3.3 – Descend glider

(a) operate and monitor all aircraft systems during descending flight manoeuvres;

(b) for the following descending manoeuvres select attitude and configuration as required for the flight path, balance and trim the glider accurately, apply smooth, coordinated control inputs to achieve the required flight tolerances as applicable to the manoeuvre:

(i) glide;

(ii) approach configuration descent (flap and gear).

2.4 G3.4 – Turn glider

2.4.1 The person must be able to demonstrate her or his ability to do the following:

(a) operate and monitor all aircraft systems during turning flight manoeuvres;

(b) for the following turning manoeuvres select attitude and configuration as required for the flight path, balance and trim the aeroplane accurately, apply smooth, coordinated control inputs to achieve the required flight tolerances as applicable to the manoeuvre:

(i) level turns;

(ii) climbing turn;

(iii) descending turn.

2.5 G3.5 – Control glider at slow speeds

(a) operate and monitor all aircraft systems when operating the glider at slow speed;

(b) for the following climbing manoeuvres select, attitude and configuration as required for the flight path, balance and trim the glider accurately, apply smooth, coordinated control inputs to achieve the required flight tolerances as applicable to the manoeuvre:

(i) minimum approach speed with flaps retracted;

(ii) minimum approach speed in approach configuration;

(iii) observe visual stall warnings and recover aeroplane to controlled flight;

(iv) recognise and respond positively to reduced effectiveness of controls during slow flight manoeuvres;

(v) transition from slow speed configuration to achieve nominated speed in excess of 1.5 V_S.

2.6 **G3.6 – Perform circuits and approaches**

(a) operate and monitor all aircraft systems when operating the glider in the circuit;

(b) perform a circuit pattern (4 legs) by balancing, trimming the aeroplane accurately while applying smooth, coordinated control inputs to achieve the required flight tolerances specified for the relevant flight path flown during traffic pattern manoeuvres as follows:

(i) establish and maintain cross-wind leg tracking 90° to the runway;

(ii) establish and maintain downwind leg tracking parallel to and at a specified distance from the runway at circuit height;

(iii) establish base leg tracking 90° to the runway at a specified distance from the runway threshold;

(c) establish the approach and landing configuration appropriate for the runway and meteorological conditions 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) align and maintain aircraft on final approach flight path with specified or appropriate runway;

(iv) set and maintain approach configuration;

(v) identify and maintain aiming point;

(vi) maintain a stabilised approach angle at the nominated airspeed to the round-out height;

(vii) verify existing wind conditions, make proper correction for drift, and maintain a precise ground track;

(viii) apply speed allowances for wind gusts;

(ix) configure glider for landing;

(d) maintain separation and position in the circuit with reference to other aircraft traffic in the circuit area.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) aircraft with fixed or retractable undercarriage;

(c) aircraft with or without flaps;

(d) simulated hazardous weather;

(e) day VFR conditions;

(f) local area airspace limitations.

4 Underpinning knowledge of the following:

(a) the primary effects of controls;

(b) the secondary effects of controls;

(c) the stall warning devices;

(d) aircraft systems;

(e) aircraft performance;

(f) aircraft weight and balance;

(g) contents of the flight manual and POH;

(h) environmental conditions that represent VMC;

(i) day VFR flight rules;

(j) relevant sections of the AIP.

G4 Land glider

1 Unit description

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

2 Elements and performance criteria

2.1 **G4.1 – Land glider**

(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 and bouncing;

(ii) touchdown at a controlled rate of descent, in specified touchdown zone within tolerances;

(iii) touchdown aligned with the centreline within tolerances;

(c) maintain positive directional control and cross-wind correction during the after-landing roll;

(d) use drag or braking devices, as applicable, in such a manner to bring the airplane to a safe stop;

(e) complete the applicable after-landing checklist items in a timely manner.

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

(a) verify existing wind conditions, make proper correction for drift, and maintain a precise ground track;

(b) configure the glider for the cross-wind conditions;

(c) control the glider 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 an 'outlanding'**

(a) recognise the conditions when an outlanding must be executed;

(b) the decision to execute an outlanding is made and executed when it is safe to do so;

(c) obstacles are identified and avoided;

(d) suitable field is identified and inspected from a safe height;

(e) wind direction is established;

(f) glider is manoeuvred for a safe landing.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) aircraft with fixed or retractable undercarriage;

(c) aircraft with or without flaps;

(d) sealed, gravel or grass runways and taxiways;

(e) windsock located on aerodrome;

(f) simulated hazardous weather;

(g) day VFR conditions;

(h) for land aeroplane in cross-wind, the cross-wind component must be at least 70% of the maximum permitted for the type of aeroplane being flown;

(i) local area operational limitations such aerodrome curfews.

4 Underpinning knowledge of the following:

(a) typical glider systems;

(b) glider performance;

(c) glider limitations;

(d) glider weight and balance;

(e) contents of the flight manual and POH;

(f) environmental conditions that represent VMC;

(g) day VFR flight rules;

(h) propeller wash, rotor wash and jet blast;

(i) relevant sections of the AIP.

G5 Glider advanced manoeuvres

1 Unit description

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

2 Elements and performance criteria

2.1 G5.1 – Enter and recover from stall

(a) perform pre-manoeuvre checks for stalling;

(b) recognise stall signs and symptoms;

(c) control the glider by applying the required pitch, roll and yaw inputs as appropriate in a smooth, coordinated manner, trims aeroplane accurately to enter and recover from the following manoeuvres:

(i) where initial symptoms of a stall become evident;

(ii) stall under the following conditions:

(A) straight and level flight;

(B) climbing;

(C) descending;

(D) approach to land configuration;

(E) turning;

(d) when executing the recovery for each of the stall manoeuvres mentioned in paragraph (c), adjust the aeroplane's attitude to resume normal balanced flight on advent of stall, applicable to glider type;

(e) during stall recovery:

(i) reduce angle of attack to unstall the wings;

(ii) achieve height loss that is appropriate for the type of glider and commensurate with available altitude (simulated ground-base height may be set).

2.2 G5.2 – Recover from spin at the incipient phase

(a) perform spin pre-manoeuvre checks;

(b) recognise symptoms of spin at the incipient phase;

(c) use the glider's attitude controls to enter a spin and recover at the incipient phase from the following flight conditions:

(i) straight and level flight;

(ii) climbing;

(iii) turning;

(d) use correct recovery technique to regain straight and level flight with height loss commensurate with the available altitude (simulated ground-base height may be set).

2.3 G5.3 – Recover from spiral dive

(a) perform spiral dive pre-manoeuvre checks;

(b) recognise a spiral dive and symptoms;

(c) use the glider's attitude controls to execute a spiral dive manoeuvre from the following flight conditions and, using correct recovery technique, regain straight and level flight with height loss commensurate available altitude (simulated ground-base height may be simulated).

2.4 G5.4 – Turn glider steeply

(a) pre-manoeuvre checks for steep turning;

(b) steep level turn using a nominated bank angle, ending on a nominated heading or geographical feature, without altitude change;

(c) steep descending turn using a nominated bank angle, ending on a nominated heading or geographical feature ending on a nominated altitude;

(d) awareness of higher stall speed in turns is demonstrated;

(e) glider operating limits are not exceeded.

2.5 **G5.5 – Maximum performance turning**

(a) perform maximum rate turn as following:

(i) maximum bank angle attained;

(ii) maximum speed attained;

(iii) maximum allowable G limit attained;

(iv) maintain lookout during turn;

(b) perform minimum radius turn as following:

(i) maximum bank angle attained;

(ii) maximum allowable G limit attained;

(iii) maintain look-out during the turn.

2.6 **G5.6 – Sideslip glider (where flight manual permits)**

(a) straight sideslip:

(i) induce slip to achieve increased rate of descent while maintaining track and airspeed;

(ii) adjust rate of descent by coordinating angle of bank and applied rudder;

(b) sideslipping turn:

(i) adjust bank angle to turn through minimum heading change of 90° at constant airspeed using sideslip;

(ii) exit on specified heading or geographical feature within tolerance;

(c) recover from sideslip and returns glider to balanced flight.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) glider with fixed or retractable undercarriage;

(c) aircraft with or without flaps;

(d) sealed, gravel or grass runways and taxiways;

(e) windsock located on aerodrome;

(f) simulated hazardous weather;

(g) day VFR conditions;

(h) local area operational limitations such as aerodrome curfews.

4 Underpinning knowledge of the following:

(a) typical glider aircraft systems;

(b) aircraft performance;

(c) aircraft weight and balance;

(d) contents of the flight manual and POH;

(e) environmental conditions that represent VMC;

(f) day VFR flight rules;

(g) relevant sections of the AIP;

(h) hazards of unbalanced flight.

G6 Manage abnormal situations – gliders

1 Unit description

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

2 Elements and performance criteria

2.1 G6.1 – Manage winch launch equipment failure – take-off (simulated)

(a) correctly identify a winch and towed take-off emergencies during and after take-off;

(b) apply the highest priority to taking action to control the glider;

(c) perform recall actions in accordance with AFM;

(d) perform emergency actions as far as time permits;

(e) manoeuvre the glider to achieve the safest possible outcome.

2.2 G6.2 – Perform forced landing (simulated)

(a) after a simulated emergency has occurred, without prior indications, carry out the following:

(i) perform immediate actions;

(ii) select most suitable landing area within gliding distance;

(iii) formulate a plan;

(iv) perform all emergency procedures;

(v) establish optimal gliding flight path to a landing on the selected landing area.

2.3 G6.5 – Manage other abnormal situations (simulated)

(a) correctly identify the situation and maintain safe control of the aeroplane at all times;

(b) abnormal and emergency situations are managed in accordance with relevant emergency procedures and regulatory requirements;

(c) appropriate emergency procedures are followed while maintaining control of the aeroplane;

(d) identify and conduct flight with an unreliable airspeed indication.

2.4 G6.6 – Recover from unusual flight attitudes

(a) identify nose-high or nose-low unusual attitude flight condition;

(b) recover from nose-low or nose-high unusual attitudes by adjusting pitch and bank 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) day VFR conditions.

4 Underpinning knowledge of the following:

(a) collision avoidance precautions and procedures;

(b) forced landing procedure;

(c) aircraft performance in a glide (straight and turning);

(d) hazard of slideslip at low altitude;

(e) contents of the flight manual and POH;

(f) passenger control;

(g) VMC;

(h) low flying hazards.

G7 Navigation – gliders

1 Unit description

This unit describes the skills and knowledge required to conduct a cross-country flight in a glider using visual references and dead reckoning.

2 Elements and performance criteria

2.1 G7.1 – Conduct cross-country flight

(a) prepare for a cross-country flight that terminates at the departure aerodrome;

(b) maintain a navigation cycle that ensures accurate tracking and apply track correctional technique to re-establish track prior to waypoint or destination;

(c) maintain heading to achieve a nominated track;

(d) maintain and revises ETAs (±2 minutes) for waypoint or destination;

(e) navigate en route using dead reckining;

(f) navigate using accepted map reading techniques;

(g) maintain navigation log to monitor tracking and ETAs;

(h) use appropriate technique obtains a positive fix at suitable intervals;

(i) maintain awareness of route and destination weather and reacts appropriately to changing weather conditions;

(j) configure glider as required for environmental and operational conditions, including the following:

(i) turbulence;

(ii) reduced visibility;

(iii) low cloud base;

(iv) maximum range.

2.2 G7.2 – Perform diversion procedure

(a) make timely decision to divert;

(b) identify an acceptable alternate landing site;

(c) revises plan considering weather, terrain, airspace and available height.

2.3 G7.3 – Execute arrival procedures

(a) determine landing site;

(b) conduct arrival;

(c) cancel SARWATCH.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) visual flight rules;

(c) different terrain;

(d) simulated weather conditions;

(e) carriage of dangerous goods.

4 Underpinning knowledge of the following:

(a) 1:60 rule;

(b) basic navigation map reading;

(c) aeronautical charts.

DESIGN FEATURE ENDORSEMENT

DFE1 Tail wheel aeroplane

1 Unit description

This unit describes the skills and knowledge required to safely operate an aeroplane fitted with tail wheel undercarriage.

2 Elements and performance criteria

2.1 DFE1.1 – Taxi tail-wheel aeroplane

(a) taxi a tail-wheel aeroplane in the prevailing aerodrome and surface conditions and weather;

(b) operate engine on the ground and exercise propeller care;

(c) perform brake checks;

(d) perform flight instrument checks while taxiing;

(e) maintain forward visibility;

(f) maintain aeroplane within the taxiway limits;

(g) anticipate and manage ground slope;

(h) use minimum power to achieve desired performance and exercise propeller care;

(i) adjust taxi speed to suit aeroplane type, surface conditions, congestion, maintain control and avoid collision with obstacles, and other aircraft;

(j) interpret and comply with taxiway and other aerodrome markings or, in the absence of markings, the aircraft is maintained in the centre of the taxiway and at a safe distance from obstacles;

(k) compensate for effects of wind velocity and high engine power using aircraft controls.

2.2 DFE1.2 – Take-off tail wheel aeroplane

(a) perform pre-take-off checks correctly;

(b) line up aircraft in the centre of the runway in take-off direction and completes line-up checks in accordance with approved checklist;

(c) apply take-off power fully, maintain aircraft aligned with centre of runway and maintain wings level;

(d) raise tail to achieve minimum drag, ensuring the propeller is clear of the surface;

(e) control yaw;

(f) rotate at manufacturer’s recommended speed to achieve planned climb performance;

(g) adjust heading to maintain track along extended runway centreline;

(h) configure aircraft for nominated climb profile and track on runway centreline;

(i) perform after take-off checks from memory;

(j) perform take-off into wind and cross-wind take-off.

2.3 DFE1.3 – Land tail wheel aeroplane

(a) select and identify aiming point;

(b) land aeroplane at a controlled rate of descent, aligned with and above the runway centreline, within a specified area beyond a nominated touchdown point, without drift, maintaining directional control, and stop within the available runway length;

(c) minimise and control ballooning and bouncing;

(d) land aeroplane in the following profiles:

(i) main wheels and tail wheel simultaneously (3-point landing);

(ii) wheel landing (main wheels only on touchdown);

(iii) flapless landing;

(e) perform after-landing checks correctly.

2.4 **DFE1.4 – Short take-off and landing**

(a) for short take-off, demonstrate the following:

(i) calculate take-off performance;

(ii) perform pre- and after-take-off, line-up and after-landing checks;

(iii) line up aeroplane to use maximum runway length;

(iv) apply take-off power fully before brakes (where fitted) are released and rotate aeroplane at manufacturer's recommended speed;

(v) set nominated climb speed appropriate to obstacle clearance requirements;

(b) for short landing, demonstrate the following;

(i) calculate landing performance;

(ii) land the aeroplane at the nominated touchdown point at minimum speed and apply maximum braking;

(iii) touchdown simultaneously on main wheels and tail wheel;

(iv) control the direction of the aeroplane on the ground;

(v) stop aeroplane within calculated landing distance;

(vi) perform after-landing checks correctly.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day VFR;

(c) approved aircraft fitted with tail wheel undercarriage;

(d) aircraft with fixed or retractable undercarriage;

(e) cross-wind, headwind or tailwind to the limits of the aircraft type;

(f) sealed, gravel or grass runways;

(g) simulated abnormal and emergency situations.

4 Underpinning knowledge of the following:

(a) cross-wind limits for the aircraft type flown;

(b) ability to calculate cross-wind components;

(c) windsock indication interpretation;

(d) take-off and landing performance;

(e) take-off weight and centre of gravity calculation;

(f) centre of gravity limitations;

(g) gyroscopic effect during take-off;

(h) slipstream effect during take-off;

(i) direction of induced yaw when aircraft tail is raised;

(j) causes of loss of control of a tail wheel aeroplane on landing.

DFE2 Retractable undercarriage

1 Unit description

This unit describes the skills and knowledge required to operate an aircraft fitted with retractable undercarriage in normal and abnormal or emergency conditions.

2 Elements and performance criteria

2.1 DF2.1 – Retractable undercarriage in normal flight

(a) retract undercarriage;

(b) establish a positive rate of climb before selecting undercarriage up;

(c) identify undercarriage selector and select undercarriage up;

(d) confirm undercarriage is in transit;

(e) confirm undercarriage is in the retracted and locked position by reference to undercarriage position indicators;

(f) comply with undercarriage speed limitations (V_{LO});

(g) lower undercarriage;

(h) comply with undercarriage lowering speed limits (V_{LE});

(i) identify undercarriage selector and select undercarriage down;

(j) confirm undercarriage is in transit;

(k) confirm undercarriage is in the lowered and locked position by reference to undercarriage position indicators.

2.2 DFE2.2 – Manage abnormal and emergency procedures applicable to retractable undercarriage

(a) identify abnormal operation of undercarriage;

(b) control aircraft;

(c) manage abnormal or emergency operation of undercarriage to achieve a safe flight outcome.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day VFR;

(c) approved aircraft fitted with tail wheel or conventional undercarriage;

(d) aircraft with or without flaps;

(e) aircraft with retractable undercarriage;

(f) cross-wind, headwind or tailwind to the limits of the aircraft type;

(g) sealed, gravel or grass runways;

(h) simulated abnormal and emergency situations;

4 Underpinning knowledge of the following:

(a) source of power that operates the undercarriage;

(b) cockpit indications for undercarriage down and locked;

(c) cockpit indications for undercarriage retracted;

(d) cockpit indications when undercarriage is in transit;

(e) conditions that will cause the undercarriage warning horn to sound;

(f) how the landing gear doors are opened and closed;

(g) method of preventing retraction of the undercarriage on the ground;

(h) maximum undercarriage extension speed (V_{LE});

(i) maximum undercarriage operating speed (V_{LO});

(j) how long the undercarriage takes to extend and retract;

(k) emergency procedures to extend and lock the undercarriage down.

DFE3 Manual propeller pitch control

1 Unit description

This unit describes the skills and knowledge required to control an aircraft and operate a propeller fitted with a manual propeller pitch control on the ground and in flight during normal and abnormal and emergency situations.

2 Elements and performance criteria

2.1 DFE3.1 – Perform pre-flight and pre-take-off checks for manual propeller pitch control

(a) perform propeller pre-flight checks ensuring the serviceability of the following:
  (i) propeller;
  (ii) spinner (when fitted);
  (iii) backing plate;

(b) CSU control rods and cables are checked to confirm they are intact and secure (when visible);

(c) perform propeller pre-take-off checks, including the following:
  (i) oil temperature and pressure within limits;
  (ii) function of propeller pitch control at specified RPM;
  (iii) function of propeller feather system when applicable.

2.2 DFE3.2 – Operate manual propeller pitch control during ground and flight operations

(a) operates manual propeller pitch control on the ground within the limitations and conditions specified in AFM and POH, ensuring:
  (i) idle RPM within limits;
  (ii) propeller RPM responds appropriately to throttle;
  (iii) engine RPM is within limitations when take-off power is set;

(b) operates manual propeller pitch control in flight within the limitations and conditions specified in AFM and POH and:
  (i) sets RPM is set as required;
  (ii) monitors RPM remains within specified limits;
  (iii) synchronises engine RPM using propeller control on multi-engine aircraft;
  (iv) avoids oil congelation in cold weather operations by cycling engine RPM.

2.3 DFE3.3 – Manage abnormal and emergency procedures for a manual propeller pitch control

(a) identifies abnormal or emergency operations of manual propeller pitch control or CSU;

(b) maintains control of engine RPM;

(c) performs appropriate abnormal or emergency procedures;

(d) feathers and unfeathers propeller.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day VFR in variable weather conditions;

(c) approved aircraft fitted with tail wheel or conventional undercarriage;

(d) single- and multi-engine aircraft;

(e) piston or diesel engine;

(f) featherable or non-featherable propeller;

(g) CSU with or without counterweights;

(h) simulated abnormal and emergency situations;

(i) simulated hazardous weather.

4 Underpinning knowledge of the following:

(a) effects of loss of oil pressure to the CSU;

(b) effects of loss of oil pressure on the pitch of the propeller (if applicable);

(c) effects of counterweights on engine RPM (when applicable);

(d) the function of oil pressure on the CSU fitted to the aircraft;

(e) the function of the fine and coarse pitch stops;

(f) the effect that failure of the fine pitch stops may cause in the aircraft type flown;

(g) the effects of the use of carburettor heat on an aircraft fitted with a CSU;

(h) propeller over-speed in an aircraft fitted with a CSU;

(i) indications of engine ice in an engine fitted with a CSU;

(j) indications that carburettor ice has been cleared in an engine fitted with a CSU;

(k) effects on manifold pressure of reducing engine RPM in a normally aspirated engine below full throttle height.

DFE4 Gas turbine engine

1 Unit description

This unit describes the skills and knowledge required to operate a gas turbine powered aircraft on the ground and in the air during normal and abnormal operations.

2 Elements and performance criteria

2.1 **DFE4.1 – Start and stop gas turbine engine**

Perform pre-start and after-start checks.

2.2 **DFE4.2 – Starts and stops engine**

Comply with manufacturer's limitations and report deviations when appropriate.

2.3 **DFE4.3 – Operate gas turbine engine on the ground and in the air**

(a) extract, interpret and apply engine performance and limitations information;

(b) manage gas turbine engine on the ground and in the air.

2.4 **DFE4.4 – Manage abnormal and emergency actions applicable to gas turbine engine**

(a) identify and confirm abnormal or emergency situation affecting a gas turbine engine;

(b) control aircraft;

(c) perform abnormal or emergency rectification or shutdown action.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day VFR in variable weather conditions;

(c) approved aircraft fitted with gas turbine engine(s);

(d) variable temperatures and environmental conditions.

4 Underpinning knowledge of the following:

(a) the make and model of the engine applicable to the aircraft flown;

(b) where the make and model of the engine are found;

(c) major characteristics of the engine;

(d) purpose of the engine air intake system;

(e) purpose of inlet guide vanes in a gas turbine engine;

(f) method of measuring thrust (power) of the engine being used;

(g) main components of all gas turbine engines;

(h) principles of operation of a centrifugal compressor;

(i) principles of operation of an axial flow compressor;

(j) principles of operation of a bypass fan engine;

(k) primary method of preventing air leakage between a compressor and engine internal compartments in a gas turbine engine;

(l) purpose of the stator blades in an axial flow compressor;

(m) specific purpose of the stator blade at the last stage of a gas turbine engine;

(n) uses of bleed air on the engine being operating;

(o) the section of a gas turbine engine bleed air is normally taken;

(p) consequences of a bleed air valve being stuck open;

(q) the detrimental effects that may occur when starting a turbine engine using a battery with voltage below the minimum specified in AFM or POH;

(r) what damage could be caused by a slow or hung start;

(s) instrument indications and physical symptoms of a hung start;

(t) hung start procedure;

(u) hot start procedure;

(v) likely cause and damage caused by a ‘hot start’;

(w) engine instrument indications and physical symptoms of a compressor stall;

(x) the automatic devices in a gas turbine engine designed to control compressor stalls;

(y) likely cause of a compressor stall;

(z) clearing a compressor stall and re-establishing normal engine operations;

(za) engine instrument indications and physical symptoms of a compressor surge;

(zb) location of the sensor for engine temperature measurement in the engine that is being operated;

(zc) the advantages and disadvantages of single shaft turbine engines;

(zd) for single shaft turbo-prop engines:

(i) the cause of shaft bowing and prevention procedure;

(ii) calculated single red line EGT indications;

(iii) compensated EGT indications;

(ze) the turbine stage that N1 RPM is measured from;

(zf) the turbine stage that N2 RPM is measured from;

(zg) causes of a low N1 reading;

(zh) actions in the event of a low N1 reading;

(zi) possible causes of a low N2 reading;

(zj) actions in the event of a low N2 reading;

(zk) how the power from the N1 turbine is transferred to thrust or SHP;

(zl) possible effects on the performance of a gas turbine engine if:

(i) the compressor is damaged;

(ii) the intake is partially blocked;

(iii) the intake is damaged;

(iv) the turbine has overheated;

(zm) the duty cycle of the start system;

(zn) the maximum transient TOT or EGT and time limit on start for the applicable engine;

(zo) the engine oil type and capacity;

(zp) indications that would be expected when engine anti-icing or de-icing system is operated;

(zq) location of fire warning sensors (as applicable);

(zr) operation of cockpit fire alert systems (as applicable);

(zs) method of arming or selecting and firing contents of the fire extinguisher(s) (as applicable).

DFE5 Multi-engine centreline thrust aeroplane

1 Unit description

This unit describes the skills and knowledge required to operate a multi-engine centreline thrust aeroplane.

2 Elements and performance criteria

2.1 DFE5.1 – Extract, interpret, calculate and apply normal and abnormal flight performance information

(a) extract approved flight performance information from AFM or POH, interpret information and apply to:

(i) calculate aircraft take-off and landing weight, centre of gravity and take-off and landing performance; and

(ii) the phase of flight and calculate aircraft performance during normal flight operations; and

(iii) failed engine(s) operations during any phase of flight and calculate aircraft performance; and

(b) apply performance information to calculate fuel requirements; and

(c) apply performance information to calculate range and endurance at any stage of a flight following a failure of 1 or more of the following:

(i) forward engine;

(ii) rear engine.

2.2 DFE5.2 – Operate multi-engine centreline thrust aeroplane in normal flight

(a) control aeroplane in all phases of normal flight;

(b) operate all aircraft systems, equipment and engines.

2.3 DFE5.3 – Manage abnormal or emergency flight operations in multi-engine centreline thrust aeroplane

(a) identify and confirm abnormal or emergency situation;

(b) control aeroplane;

(c) perform appropriate abnormal or emergency procedures;

(d) advise ATS or other agencies capable of assistance of situation and intentions.

2.4 DFE5.4 – Manage engine failure(s) in multi-engine centreline thrust aeroplane

(a) self-brief or brief crew members stating a plan of action that will ensure the safest outcome in the event of an engine failure;

(b) maintain control of aeroplane, identify and confirm failed engine and shut down failed engine following engine failure during any phase of flight;

(c) operate aircraft during flight with failed engine for the following:

(i) engine failure in flight (sequence of actions may be varied);

(A) set power on serviceable engine(s) to ensure desired aircraft performance;

(B) configure aircraft to achieve minimum drag;

(C) climb aircraft at V_{YSE} if applicable;

(D) land aircraft at nearest appropriate landing area;

(ii) engine failure after take-off:

(A) control aircraft;

(B) ensure maximum take-off power applied to serviceable engine;

(C) identify failed engine and confirms failure;

(D) feather propeller (as applicable) and shut down failed engine;

(E) configure aircraft to achieve minimum drag;

(F) climb aircraft at V_{YSE};

(G) land aircraft at nearest appropriate landing area;

(iii) manage engine failure after take-off below V_{TOSS} – aircraft will not accelerate or climb:

(A) set power as required to manoeuvre aircraft to most suitable area to land;

(B) perform overshoot from visual committal height;

(C) determine visual committal height;

(D) initiate go-around at or above visual committal height;

(E) control aircraft;

(F) apply take-off power;

(G) configure aircraft to achieve minimum drag;

(H) maintain V_{YSE} or greater;

(I) climb to circuit height;

(J) re-assess situation for landing;

(iv) below visual committal height:

(A) control aircraft;

(B) land aircraft.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day VFR;

(c) approved multi-engine centreline thrust aeroplane with dual controls, electronic intercom and dual control brakes;

(d) aerodromes;

(e) sealed, gravel or grass surfaces;

(f) simulated abnormal and emergency situations;

(g) simulated hazardous weather.

4 Underpinning knowledge of the following:

(a) general aircraft data;

(b) airspeed and load limitations;

(c) normal and emergency procedures;

(d) fuel system;

(e) hydraulic system;

(f) electrical system;

(g) oil system;

(h) autopilot;

(i) anti-icing and de-icing systems;

(j) heating, ventilation and pressurisation systems;

(k) pitot and static system;

(l) suction system;

(m) oxygen system;

(n) fire extinguisher system;

(o) engines;

(p) weight, balance and performance;

(q) abnormal and emergency operations.

DFE6 Pressurisation system

1 Unit description

This unit describes the skills and knowledge required to operate an aircraft that is fitted with a pressurisation system during normal, abnormal and emergency flight.

2 Elements and performance criteria

2.1 DFE6.1 – Operate and monitor aircraft pressurisation system

(a) conduct pre-flight serviceability check of flight crew supplementary oxygen system, confirming normal contents, flow and operation of oxygen system;

(b) activate and operate pressurisation system, ensuring appropriate selection of switches and circuit breakers;

(c) confirm pressurisation system is operating normally before reaching 10,000 ft;

(d) confirm the integrity of the pressurisation system when passing 10,000 ft, and identify an appropriate pressure differential between cabin and outside air pressure;

(e) confirm cabin altitude and cabin differential pressure are appropriate and constant during cruise;

(f) monitor and react appropriately to instrument indications, physiological symptoms and crew member's advice during multi-crew operations to ensure normal operation of the pressurisation system;

(g) ensure the aircraft is de-pressurised before opening doors on the ground.

2.2 DFE6.2 – Manage pressurisation system during abnormal and emergency situations

(a) identify abnormal or emergency situation involving aircraft pressurisation system, including rapid and slow decompression;

(b) perform abnormal or emergency procedures;

(c) monitor cabin altitude and differential pressure, identify any discrepancies and manually control the aircraft pressurisation system when appropriate;

(d) monitor physiological condition of self, crew members and passengers to identify signs of hypoxia, barotrauma or other physiological hazards associated with pressurisation failure;

(e) ensure the use of emergency oxygen by crew members and passengers when cabin altitude is greater than 10,000 ft;

(f) advise ATC of flight situation, action taken by pilot in command and any requirements.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) VFR or IFR in variable weather conditions;

(c) approved aircraft fitted with pressurisation system;

(d) variable temperatures and environmental conditions;

(e) simulated abnormal and emergency situations.

4 Underpinning knowledge of the following:

(a) pressurisation failure warning indications fitted to the aircraft type flown;

(b) the cabin pressure at which the cabin pressurisation warning light illuminates;

(c) conditions that will cause a pressurisation failure indicator to activate;

(d) functions of bleed air with respect to an aircraft pressurisation system;

(e) how bleed air pressure and temperature are controlled (modified) to meet cabin pressurisation and temperature requirements;

(f) procedure for manual control of cabin pressurisation applicable to the aircraft type flown;

(g) what a pressure differential gauge indicates to a pilot with respect to a pressurisation system;

(h) maximum pressure differential for the aircraft type flown;

(i) symptoms that may indicate an outflow valve failure;

(j) power source that operates (controls) the outflow valve;

(k) the effect of an outflow valve that is stuck open on an aircraft climbing above 10,000 ft and explain the hazards associated with this situation;

(l) minimum and maximum rates of change of cabin air pressure;

(m) indications that would be expected in a pressurised aircraft if the outflow valve were stuck closed during descent;

(n) how the automatic depressurisation system operates after landing;

(o) times of useful consciousness without oxygen at:

(i) 10,000 ft;

(ii) 20,000 ft;

(iii) 25,000 ft;

(iv) 30,000 ft;

(p) physiological symptoms of hypoxia;

(q) physical hazards that could occur during a rapid decompression;

(r) physiological hazards that could occur following a rapid decompression;

(s) the cabin altitude above which supplementary oxygen must be used by crew and passengers.

DFE7 Floating hull

1 Unit description

This unit describes the skills and knowledge required to operate an aircraft that has a floating hull on the water and in the air during normal and abnormal operations.

2 Elements and performance criteria

2.1 DFE7.1 – Extract, interpret, calculate and apply flight performance information

(a) extract approved flight performance information from AFM or POH, interpret the information and apply the information to:

(i) calculate aircraft take-off and landing weight and take-off and landing performance; and

(ii) calculate aircraft performance during normal flight operations; and

(iii) determine meteorological conditions, tide state, current flow and water state; and

(b) use the information to plan water operations.

2.2 DFE7.2 – Conduct pre-flight inspection of floating hull aircraft

(a) conduct pre-flight inspection in accordance with AFM or POH, and identifies and determines availability and serviceability of equipment required for marine operations ensuring:

(i) serviceability of aircraft;

(ii) suitability and serviceability of equipment carried for amphibious aircraft type and flight circumstances;

(b) ensure hull and floats do not contain excessive water;

(c) ensure removal of all aircraft locking devices;

(d) inspect mooring lines, bumpers, anchors, life jackets and rafts for condition and stowage when appropriate.

2.3 DFE7.3 – Operate floating hull aircraft on water

(a) conduct pre-flight passenger briefing, including fitment and use of personal flotation devices, evacuation procedures and water survival procedures;

(b) start and stop engines on the water and maintains control of the aircraft;

(c) disconnect and manoeuvre aircraft from a mooring without assistance, while maintaining control of the aircraft and passengers;

(d) obtain taxi clearance when required, and taxis (manoeuvres) aircraft on the water to a nominated position, anticipating and allowing for prevailing conditions and traffic while maintaining control of the aircraft;

(e) conduct displacement and step taxiing and ploughing turns to a nominated position, avoiding traffic and obstacles while maintaining control of the aircraft within the sea state and wind limitations of the aircraft;

(f) sail aircraft, using engine power, flight controls, keel surfaces and wind velocity to manoeuvre the aircraft fore and aft and laterally to a nominated position;

(g) ensure suitability of area and safely moors, dock and beach aircraft with and without assistance.

2.4 DFE7.4 – Ensure suitability of take-off area and take-off floating hull aircraft from water

(a) select a take-off path into wind, adequate to comply with take-off distance requirements, clear of traffic and obstructions, and ensure a climb-out path clear of obstacles;

(b) self-brief or brief crew about departure procedures and action in the event of engine failure after take-off;

(c) perform pre-take-off, engine run-up, line-up and after-take-off checks;

(d) retract water rudder, apply take-off power, maintain aircraft aligned with take-off direction, maintain wings level, position elevator to maintain the nose in the planing attitude until the

step position is achieved, and adjust nose attitude to maintain the aircraft on the step until lift-off occurs;

(e) avoid porpoising;

(f) accelerate aircraft to climb speed and establishes climb;

(g) perform after take-off checks.

2.5 **DFE7.5 – Operate floating hull aircraft during all phases of flight**

(a) control aircraft in all phases of normal and abnormal flight to the appropriate standards specified for a private or commercial aeroplane pilot in this MOS;

(b) manoeuvre aircraft safely below 500 ft AGL over specified tracks after take-off and during approach for landing;

(c) operate all aircraft systems, equipment and engines correctly;

(d) operate all aircraft systems, equipment and engines correctly;

(e) assess landing area and weather conditions and formulates a plan to ensure a safe landing on water;

(f) land aircraft at a controlled rate of descent, aligned with and above the landing direction, within a specified area, without drift, maintaining directional control and wings level and stopping within the available landing area;

(g) minimise and controls ballooning and bouncing;

(h) perform after-landing checks correctly.

2.6 **DFE7.6 – Ensure suitability of landing area, plan landing and land floating hull aircraft on water**

(a) assess landing area and weather conditions and formulate a plan to ensure a safe landing on water;

(b) land aircraft at a controlled rate of descent, aligned with and above the landing direction, within a specified area, without drift, maintaining directional control and wings level and stopping within the available landing area;

(c) minimise and control ballooning and bouncing;

(d) perform after-landing checks correctly.

2.7 **DFE7.7 – Manage abnormal or emergency situations in floating hull aircraft**

(a) identify and confirm abnormal or emergency situation;

(b) control aircraft;

(c) perform abnormal or emergency procedures correctly.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day VFR;

(c) cross-wind, headwind and tailwind to the limits of the aircraft;

(d) approved floating hull aircraft;

(e) salt and fresh waterways;

(f) variable sea states;

(g) confined waterways;

(h) variable marine traffic;

(i) maritime regulations and procedures;

(j) limitations, such as those imposed by local noise abatement procedures or curfews;

(k) simulated abnormal and emergency situations;

(l) simulated hazardous weather.

4 Underpinning knowledge of the following:

(a) differences between a seaplane, floatplane, flying boat (floating hull) and amphibious aircraft;

(b) aircraft performance with respect to:

(i) design features for seaplanes, floatplanes and floating hulls; and

(ii) the differences between an aircraft that is fitted with the feature and the same type of aircraft that doesn't have the feature;

(c) how to interpret Beaufort scale readings and ascertain wind velocity;

(d) how movement of the centre of buoyancy affects aircraft manoeuvrability on the water;

(e) how the centre of resistance to lateral motion affects the operation of a seaplane;

(f) why water rudders are not used for take-off;

(g) how to extract information from maritime tide chart and determine the tide height and state at any specified place or time;

(h) how the centre of buoyancy can be varied when an aircraft is on the water;

(i) how movement of the centre of resistance affects aircraft manoeuvrability on the water;

(j) function of a ventral fin on a seaplane;

(k) function of float struts and bracing wires;

(l) the requirements that apply to floats with regard to minimum number of water-tight compartments and capability of supporting the aircraft weight when compartments are flooded;

(m) the method of detecting water inside a hull or float and how to remove the water;

(n) the function of the 'step' at the bottom of a float or hull;

(o) the position of the nose attitude and the 'feel' that indicates the aircraft is planning on the step;

(p) hazards associated with excessive swells.

DFE8 Floatplane and amphibious aircraft

1 Unit description

This unit describes the skills and knowledge required to operate an amphibious aircraft on the water and land during normal and abnormal operations.

2 Elements and performance criteria

2.1 DFE8.1 – Extract, interpret, calculate and apply flight performance information

(a) extract approved flight performance information from AFM or POH, interpret the information and apply the information to:

(i) calculate amphibious aircraft take-off and landing weight, and take-off and landing performance; and

(ii) the phase of flight and calculate amphibious aircraft performance during normal flight operations;

(b) determine meteorological conditions, tide state, current flow and water state;

(c) use the information described in subparagraphs (a) and (b) to plan water operations using an amphibious aircraft;

2.2 DFE8.2 – Conduct pre-flight inspection of amphibious aircraft

(a) conduct pre-flight inspection in accordance with AFM or POH, identify and determine availability and serviceability of equipment required for marine operations ensuring:

(i) serviceability of aircraft;

(ii) suitability and serviceability of equipment carried for amphibious aircraft type and flight circumstances;

(b) ensure hull and floats do not contain excessive water;

(c) ensure removal of all aircraft locking devices;

(d) inspect mooring lines, bumpers, anchors, life jackets and rafts for condition and stowage when appropriate.

2.3 DFE8.3 – Operate amphibious aircraft during all phases of flight

(a) operate single- or multi-engine floatplane or floating hull amphibious aircraft during all phases of normal and abnormal flight, on the water and the land, to the standards specified for a private or commercial pilot in this MOS for aeroplane class ratings;

(b) land amphibious aircraft on water with undercarriage retracted;

(c) land amphibious aircraft on land with undercarriage extended;

(d) extend undercarriage in water when transiting to land (beaching);

(e) retract undercarriage in water after taxiing from land to water;

(f) operate all amphibious aircraft systems, equipment and engines.

2.4 DFE8.4 – Manage abnormal or emergency situations in amphibious aircraft

(a) identify and confirm abnormal or emergency situation;

(b) maintain control of aircraft;

(c) manage or rectify abnormal or emergency situation;

(d) perform abnormal and emergency actions when applicable;

(e) perform failed engine procedures in accordance with standards specified in class or type rating requirements.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day VFR;

(c) cross-wind, headwind and tailwind to the limits of the aircraft;

(d) approved floating hull aircraft;

(e) salt and fresh waterways;

(f) variable sea states;

(g) confined waterways;

(h) variable marine traffic;

(i) maritime regulations and procedures;

(j) limitations, such as those imposed by local noise abatement procedures or curfews;

(k) simulated abnormal and emergency situations;

(l) simulated hazardous weather.

4 Underpinning knowledge of the following:

(a) differences between a seaplane, floatplane, flying boat (floating hull) and amphibious aircraft;

(b) aircraft performance with respect to:

(i) design features for seaplanes, floatplanes and floating hulls; and

(ii) the differences between an aircraft that is fitted with the feature and the same type of aircraft that doesn't have the feature;

(c) how to interpret Beaufort scale readings and ascertain wind velocity;

(d) how movement of the centre of buoyancy affects amphibious aircraft manoeuvrability on the water;

(e) how the centre of resistance to lateral motion affects the operation of an amphibious aircraft;

(f) why water rudders are not used for take-off;

(g) the type of undercarriage position indicators fitted to the aircraft, and the method of indicating undercarriage retracted;

(h) the method of emergency lowering of the undercarriage;

(i) how to extract information from maritime tide chart and determine the tide height and state at any specified place or time;

(j) how the centre of buoyancy can be varied when an amphibious aircraft is on the water;

(k) how movement of the centre of resistance affects amphibious aircraft manoeuvrability on the water;

(l) functions of a ventral fin on an amphibious aircraft;

(m) the function of float struts, spreader bars and bracing wires;

(n) requirements that apply to floats with regard to minimum number of water-tight compartments and capability of supporting the amphibious aircraft weight when compartments are flooded;

(o) method of detecting water inside a float and how to remove the water;

(p) function of the 'step' at the bottom of a float or hull;

(q) hazards associated with excessive swells.

DFE9 Helicopter float alighting gear

1 Unit description

This unit describes the skills and knowledge required to operate a helicopter fitted with float alighting gear on land and water.

2 Elements and performance criteria

2.1 DFE9.1 – Conduct pre-flight inspection of float alighting gear

(a) conduct pre-flight inspection of helicopter and float alighting gear;

(b) confirm fitment, inflation, condition and security of float alighting gear;

(c) ensure removal of all aircraft locking devices.

2.2 DFE9.2 – Start and stop engine on water

(a) perform all checklists and emergency procedures associated with starting and stopping an engine and rotors;

(b) perform free-floating start-up (as permitted by AFM or POH) and moored start-up and shutdown;

(c) start and stop engine and rotors correctly;

(d) identify abnormal or emergency situations on start or shutdown and manages correctly.

2.3 DFE9.3 – Taxi helicopter on water

(a) manoeuvre helicopter without incident on water over a prescribed track while allowing for prevailing conditions;

(b) comply with approved marshalling signals.

2.4 DFE9.4 – Take-off helicopter from a solid surface and from water

(a) perform pre-take-off checks and after-take-off checks correctly;

(b) perform take-off, transition and climb from a solid surface;

(c) perform take-off, transition and climb from water.

2.5 DFE9.5 – Operate helicopter fitted with float alighting gear in normal flight

(a) operate helicopter fitted with float alighting gear in normal flight in accordance with standards for helicopter specified in this MOS;

(b) manage reduced aircraft performance in float configuration.

2.6 DFE9.6 – Land on float alighting gear on land and on water

(a) identify aiming point, touchdown point and any alignment features;

(b) land helicopter without harshness onto a nominated touchdown point from hovering flight without longitudinal, lateral, yawing or rolling movements;

(c) ensure no aft movement when landing on water;

(d) ensure landing area on a solid surface is clear of protuberances and sharp objects;

(e) ensure helicopter is securely on the surface prior to fully lowering collective;

(f) perform after-landing checks;

(g) for a mishandled landing – implement a decision in the time available to initiate a mishandled landing to the hover when the landing standard cannot be achieved.

2.7 DFE9.7 – Manage abnormal or emergency actions in helicopter fitted with float alighting gear

(a) identify abnormal or emergency situation;

(b) control helicopter;

(c) perform abnormal or emergency procedures correctly.

3 Range of variables

(a) activities are performed in accordance with published procedures;

(b) day VFR in variable weather conditions;

(c) cross-wind, headwind and tailwind to the limits of the aircraft;

(d) approved helicopter fitted with float alighting gear;

(e) helicopter landing sites;

(f) salt and fresh waterways;

(g) variable sea states;

(h) confined waterways;

(i) variable marine traffic;

(j) maritime regulations and procedures;

(k) limitations, such as those imposed by local noise abatement procedures or curfews;

(l) simulated abnormal and emergency situations;

(m) simulated hazardous weather.

4 Underpinning knowledge of the following:

(a) maximum inflation pressure of the float alighting gear;

(b) maximum operating altitude permitted with float alighting gear fitted;

(c) maxim wave height permitted for float alighting gear operations in the helicopter type flown;

(d) how to calculate the maximum inflation pressure for the flotation devices;

(e) take-off distance required with the float configuration;

(f) the maximum wind speed for 360° pivot turns;

(g) hazards associated with a landing that is performed with a partially deflated float;

(h) avoidance measures for dynamic rollover;

(i) avoidance measures for ground resonance.