

**Attachment 1 to CAAP 5.XX-1(0)**

**Multi-crew Pilot Licence Competency Standards**

## Generic Range of Variables

Range of Variables
<ul style="list-style-type: none"> <li>• Performance standards are to be demonstrated in flight in an aircraft of the appropriate category equipped with dual flight controls and electronic intercommunication between the trainee and the instructor or examiner.</li> <li>• Consistency of performance is achieved when competency is demonstrated on more than one flight.</li> <li>• Flight accuracy tolerances specified in the standards apply under flight conditions from smooth air up to, and including light turbulence.</li> <li>• Where flight conditions exceed light turbulence appropriate allowances as determined by the assessor may be applied to the tolerances specified.</li> <li>• When minimum descent altitudes (MDA) and not below or above heights are specified, the tolerance for straight and level height must be adjusted to (+100 –0 ft) or (+0 –100 ft) as applicable.</li> <li>• Infrequent temporary divergence from specified tolerances is acceptable if the pilot applies <u>controlled corrective action</u><sup>1</sup>.</li> <li>• Units and elements may be assessed separately or in combination with other units and elements that form part of the job function.</li> <li>• Assessment of an aircraft operating standard also includes assessment of the threat and error management and human factors standards applicable to the unit or element.</li> <li>• Standards are to be demonstrated while complying with approved checklists, placards, aircraft flight manuals, operations manuals, standard operating procedures and applicable aviation regulations.</li> <li>• Performance of emergency procedures is demonstrated in flight following simulation of the emergency by the instructor or examiner, except where simulation of the emergency cannot be conducted safely or is impractical.</li> <li>• Assessment should not involve simulation of more than one emergency at a time.</li> <li>• <b>Private pilots</b> should demonstrate that control of the aircraft or procedure is maintained at all times but if the successful outcome is in doubt, corrective action is taken promptly to recover to <u>safe</u><sup>2</sup> flight.</li> <li>• <b>Commercial and air transport pilots</b> should demonstrate that control of the aircraft or procedure is maintained at all times so that the successful outcome is assured.</li> <li>• The following evidence is used to make the assessment: <ul style="list-style-type: none"> <li>◦ The trainee's licence and medical certificate as evidence of identity and authorisation to pilot the aircraft.</li> <li>◦ For all standards, the essential evidence for assessment of a standard is direct observation by an instructor or examiner of the trainee's performance in the specified units and elements, including aircraft operation and threat and error management.</li> <li>◦ Oral and written questioning of underpinning knowledge standards.</li> <li>◦ Completed flight plan, aircraft airworthiness documentation, appropriate maps and charts and aeronautical information.</li> <li>◦ Aircraft operator's completed flight records to support records of direct observation.</li> <li>◦ Completed achievement records for evidence of consistent achievement of all specified units and elements of competency.</li> <li>◦ The trainee's flight training records, including details of training flights and instructors comments, to support assessment of consistent achievement.</li> <li>◦ The trainee's log book for evidence of flight training completed.</li> </ul> </li> <li>• For licence and rating issue: <ul style="list-style-type: none"> <li>◦ Completed application form, including, licence or rating sought, aeronautical experience, CFI recommendation and the result of the flight test.</li> <li>◦ Completed flight test report indicating units and elements completed.</li> <li>◦ Examination results and completed knowledge deficiency reports.</li> <li>◦</li> </ul> </li> </ul>

<sup>1</sup> Timely and coordinated use of controls, without abrupt manoeuvring is made to achieve specified performance.

<sup>2</sup> Means that a manoeuvre or flight is completed without injury to persons, damage to aircraft or breach of aviation safety regulations, while meeting the requirements of the Manual of Standards Part 61

## Terminology Used During Assessment

The following terms are used in the standards to assess competency. The terms used are specifically related to flight activities.

The checks and actions detailed in these definitions are advisory. Approved checklists, placards, Flight Manual/POHs, or Operations Manuals have precedence and must be complied with.

Some definitions and terms that appear in competency standards are underlined; to alert assessors that clarification is available from this table.

Definition or Term	Meaning
Aiming point	The 'aiming point' related to a visual approach and landing of an aircraft, is that point at which a pilot looks, to achieve a predetermined touchdown/termination point.
Aircraft is balanced	The skid ball in the balance indicator is less than a quarter of the ball diameter from the centre.
Aircraft is trimmed/trims aircraft	The aircraft is trimmed within 10 seconds of achieving stabilised and balanced flight, after an attitude, power or configuration change, so that no control input is required in the relevant axis from the pilot to maintain this state.
Airspace cleared	Collision avoidance must always be practiced and a procedure followed to ensure a collision does not occur. This procedure is performed before all turns and manoeuvres. A commonly used technique for this procedure is: <ul style="list-style-type: none"> <li>• When turning left, "Clear right, clear ahead, clear left-turning left" or</li> <li>• When turning right, "Clear left, clear ahead, clear right-turning right".</li> </ul> If an object is closing and remains on a line of constant bearing (stays at the same point on the windscreen), a collision will occur if avoiding action is not taken.
Approach to hover	The process of maintaining a specified track and glide slope at reducing ground speed to a nominated termination point at the hover.
Approved checklist	A checklist derived from information set out in the Flight Manual/POH, placards or other documents provided with the aircraft, necessary to ensure the <u>safe</u> operation of the aircraft
Avoid area	The area delineated on the height-velocity envelope chart in a helicopter or gyroplane flight manual/ POH which shows the parameters within which operations should be avoided.
Closure rate	The apparent speed at which a helicopter or gyroplane moves towards a specified point or object.
Competency standards	The defined competencies required for effective performance in the workplace expressed in outcome terms
Configures aircraft for bad visibility	The aircraft speed and configuration are adjusted to achieve best manoeuvring speed, forward visibility and <u>safety</u> margin above stall speed.
Controlled corrective action	Timely and coordinated use of controls, without abrupt manoeuvring is made to achieve specified performance.
Controlled rate of descent	'Controlled rate of descent' associated with a landing means that the touchdown is without harshness and the successful outcome of the landing is not in doubt.
Controlling ballooning during roundout and bouncing after touchdown	This is achieved if control of the aircraft is maintained by adjusting the attitude of an aircraft without the application of power.
Effect of turbulence	The effect of turbulence must be considered when measuring standards of flying competency. Assessors must evaluate each situation and then apply considered judgement to compensate for variations to the published standards.
Errors	Action or inaction that result in deviation from appropriate intentions.

Evaluation	The process of measuring competency to meet specified outcomes and to provide feedback that ensures achievement of the required competency.
Final approach checklist	The checklist in accordance with the flight manual or company operations manual that is completed on final approach before landing.
Flight environment	The environments internal and external to the aircraft that may affect the outcome of the flight. The aircraft's internal environment may include but is not limited to aircraft attitude and performance, instruments, observations, flight controls, equipment, warning and alerting devices, crewmembers, aircraft position, procedures, publications, checklists and automation. The external environment may include but is not limited to airspace, meteorology, <u>stakeholders</u> and operating culture.
Flight manoeuvre envelope	The area contained within the V-n diagram (speed-load factor) applicable to the aircraft type.
Full panel	Flight instrument array of at least an artificial horizon (AH), stabilised heading indicator, air speed indicator (ASI), vertical speed indicator (VSI), altimeter, turn and balance indicator/turn coordinator and an engine power indicator.
Hand-over/take-over procedure	The process of a pilot in command positively giving control of the aircraft to another pilot or positively assuming control from another pilot and the acknowledgement of this action by the pilot or co-pilot.
Hover helicopter	Means to maintain the helicopter over the hover point at nominated height and heading.
Hover point	Means that point on the surface of the earth over which a nominated part of the helicopter is maintained.
Human factors	Optimising the relationships within systems between people, activities and equipment
Immediate actions	These actions are performed immediately after an engine failure, while maintaining control of the aeroplane, as detailed in the Flight Manual/POH, operations manual or approved checklist. The purpose of these actions is to re-establish engine power.
In ground effect (IGE)	Hovering the helicopter less than 2/3 rotor diameter above a surface that restricts the induced flow.
Judgement	An opinion formed after analysis of relevant information
Leadership*	The ability of the pilot in command to induce the crewmember(s) to use their skills and knowledge to pursue a defined objective.
Lift off	Is the process of lifting the helicopter vertically from the surface to a stabilised hover.
Light on the skids or wheels	Means that with collective pitch (power) applied, and the helicopter still in contact with the ground, any application of cyclic pitch or anti torque pedal will produce a discernible movement by the helicopter
Limited panel	Flight instrument array of at least a magnetic compass, air speed indicator (ASI), vertical speed indicator (VSI), altimeter, turn and balance indicator/turn coordinator and an engine power indicator.
Line up checks	Line up checks are performed before take-off when lined up in the runway or take-off direction. The checks should include: Compass checked and aligned with take-off direction; Engine instruments indicate engine within operating limits.
Manage(ment)*	To plan, direct and control an operation or situation. .
Minimum power speed	Means the speed at which level flight can be maintained with minimum power required.
Mishandled landing	Means to recognise an abnormal landing and recover the aircraft to controlled flight. Often associated with a 'go around'. .

Operational requirements	The effect that weather forecasts, availability and serviceability of radio navigation aids and aerodrome lighting status have on the determination of fuel, holding and alternate aerodrome requirements.
Orientation	To be aware of the position of the aircraft relative to navigation aid or feature, based on the direction and estimated distance of the aircraft from the navigation aid or feature.
Pedal/spot turn	Turning a hovering helicopter about a vertical axis, which passes through a nominated part (normally the mast) of the aircraft.
Pre-descent or navigation turning point checks	These checks are completed as detailed in the Flight Manual/POH, operations manual or approved checklist before descending for approach and landing or operations at low level.
Pre manoeuvre checks	These checks are completed before performing manoeuvres which involve rapid changes of altitude, attitude or heading. The mnemonic "HASELL" may be used as a reminder for this check: H Height is sufficient to safely complete all manoeuvres. A Airframe configuration is appropriate for manoeuvres. S Security of harnesses and loose objects is ensured. E Engine instruments are checked, RPM, mixture, boost pumps and carburettor heat are set as required. Fuel remaining is adequate. L Location is correct, clear of built up areas, controlled airspace and restricted areas. L Maintain lookout before and during manoeuvres.
Pre-stall buffet	The aerodynamic vibration felt in an aircraft when manoeuvring at $C_{LMAX}$ .
Recall items	An item specified in an <u>approved checklist</u> that must be stated and actioned from memory.
Safe (ly)	Means that a manoeuvre or flight is completed without injury to persons, damage to aircraft or breach of aviation safety regulations, while meeting the flight standards specified by the regulator.
Safest outcome	Means that the manoeuvre or flight is completed with minimum damage or injury under the prevailing circumstances.
Shut down checks	These checks are completed as detailed in the Flight Manual/POH, operations manual or approved checklist when committed to a forced landing after an engine failure. The purpose is to isolate fuel and electrical sources that could lead to a fire.
Situation awareness	Monitor and evaluate the <u>flight environment</u> to identify all threats relevant to the <u>safe progress</u> of a flight.
Stake holder	Any person involved with, or affected by the flying operation to be performed.
Standard operating procedures	Any procedure included in the operations manual of an AOC or OC holder.
Stress (ors)	A disturbing physiological or psychological influence on human performance that may impact adversely on the <u>safe</u> conduct of a flight or situation.
Student pilot area limit	In relation to a flight undertaken by a student pilot, means: a traffic pattern; or the area within 10 miles from the aerodrome reference point of the aerodrome from which the flight commenced; or a flight training area associated with the aerodrome from which the flight commenced; the most direct route between the aerodrome from which the flight commenced and a flight training area associated with the aerodrome.
Termination point	The 'termination point' associated with a landing, is the point at which the helicopter terminates the approach to the hover.
Terminate with power (and recover to the hover)	When associated with autorotative flight this term means that the application of collective pitch with engine and rotor RPM coordinated (needles joined) brings the helicopter to a stabilised hover (auto to powered flight).
Threats	Events or hazards whose occurrence is outside the control of the pilot(s) and which may threaten the safety of the flight.

Touchdown point	The 'touchdown point ' associated with a landing, is the point at which the aircraft landing gear first contacts the runway or landing area.
Trouble checks	The checks detailed in the Flight Manual/POH, operations manual or approved checklist that are performed to prepare the engine for a restart after an engine failure.
True horizon/earth's horizon	The reference that is used to measure the pitch and bank attitude of an aircraft.
Undesired aircraft state	Undesired aircraft states are flight crew-induced aircraft position or speed deviations, misapplication of flight controls, or incorrect systems configuration, associated with a reduction in margins of safety
Upset Aircraft State	Upset aircraft state occurs when an aircraft unintentionally exceeds: <ul style="list-style-type: none"> <li>• A pitch angle of 25 degrees nose up</li> <li>• A pitch angle of 10 degrees nose down</li> <li>• A bank angle of more than 45 degrees; or</li> <li>• Flight within these parameters at airspeeds inappropriate for the conditions.</li> </ul>
Violations	Intentional deviations from rules or standards.
Visual cues – Helicopter and Gyroplane	Any visual features or references that are used to determine the position or movement relative to the aiming point, touchdown point, obstacles and, for helicopters, the hover point.
Visual references	'Visual references' associated with hovering means the features within the visual range of the pilot that are used as visual cues to maintain the helicopter over a hover point.
Wings level	Means that a line joining the wing tips is kept parallel to the earth's horizon.
Workplace environment	Any physical environment in which aviation related work is conducted by an aircrew member.

\*Note 1 Leadership

One of the most important qualities that the pilot in command of a multi crew aircraft must possess is leadership.

In this document leadership is defined as 'the ability of the pilot in command to induce the crewmember(s) to use their skills and knowledge to pursue a defined objective'. To ensure standardisation and objectivity, assessors must keep this definition in mind when determining the leadership qualities of a pilot in command or a crewmember.

The Macquarie Dictionary defines the word 'induce' as:

'to lead or move by persuasion or influence, as to some action, state of mind and to bring about, produce or cause etc.'

The term 'pursue a defined objective' is used because the role of a pilot in command is to pursue a defined objective but not necessarily achieve that objective, as changing circumstances may dictate alternative actions and revised objectives to ensure the safe progress of a flight.

A 'defined objective' could be a flight, manoeuvre, procedure or action that is clearly identified and required to be achieved to ensure a safe outcome.

Therefore, in the aviation context, a pilot in command would be deemed competent as a leader when able to consistently cause the crewmember(s) to use their skills, knowledge and behaviour to successfully try to achieve a flight, manoeuvre, procedure or action in an ever-changing environment.

Of course, leadership is not limited to interaction with crewmembers only, but may involve any stakeholder.

\*Note 2 Management

Throughout the Day VFR Syllabus the term 'manage' or 'management' is used. The definition in the syllabus for manage is 'plan, direct and control an operation or situation'. When assessing competency standards that involve management, evidence should be sought to ensure that a plan is developed, implemented (direction) and re evaluated (control), throughout the activity.

The application of this skill when managing an abnormal situation may involve a plan of maintaining control of the aircraft, identifying the problem and determining the action to be taken to reduce or eliminate any threat. Direction may, in the case of a single place aircraft, require self-direction to ensure actions are conducted in accordance with checklist procedures, Approved Flight Manual/POH, SOPs or other acceptable means, or in a multi crew environment, directing other crewmembers as well as participating in those actions. Control would involve monitoring the progress of events to ensure a safe outcome. The last step may require modification of plans and actions.

## Competency Standards – Multi-crew Pilot Licence (MPL)

### Unit A1: Control the Aeroplane on the Ground

**Unit Description:** Skills and knowledge to start and stop an aeroplane engine, perform all safety requirements, to perform pre-taxi functions and manoeuvre the aeroplane on the ground without incident.

Element	Performance Criteria
A1.1 Start and stop engine	<ul style="list-style-type: none"> <li>• Clears aircraft from obstructions, buildings and other aircraft</li> <li>• Clears propeller before start</li> <li>• Starts engine in accordance with Flight Manual/POH including hot and cold starts</li> <li>• Performs after-start checks from memory in accordance with <u>approved checklist</u><sup>3</sup></li> <li>• Manages start and after-start emergencies from memory in accordance with Flight Manual/POH</li> <li>• Shuts down engine in accordance with Flight Manual/POH</li> <li>• Performs after-shutdown checks in accordance with <u>approved checklist</u><sup>4</sup></li> <li>• Exercises propeller care and manages adverse effects of propeller wash</li> <li>• Complies with manufacturer's limitations and reports deviations when appropriate.</li> </ul>
A1.2 Taxi aeroplane	<ul style="list-style-type: none"> <li>• Requests applicable ATC clearances or MBZ/CTAF broadcasts in accordance with AIPs</li> <li>• Confirms serviceability of brakes after park brake release and before taxiing</li> <li>• Interprets and complies with taxiway and other aerodrome markings. <b>Note:</b> In the absence of markings, the aircraft is maintained in the centre of the taxiway and at a <u>safe</u><sup>5</sup> distance from obstacles</li> <li>• Maintains lookout and right-of-way rules and complies with ATC or marshalling instructions when applicable</li> <li>• Adjusts taxi speed to suit aeroplane type, surface conditions, level of congestion, and maintenance of control and to avoid collision with obstacles or other aircraft</li> <li>• Applies flying controls, power and brakes to maintain the aircraft on the taxiway centreline (<math>\pm 1.5</math> metres of centreline) while compensating for wind and surface conditions</li> <li>• Performs instrument checks in a suitable area clear of traffic and other hazards</li> <li>• Ensures final approach path is clear of conflicting traffic on specified or appropriate runway.</li> </ul>

<sup>3</sup> A checklist derived from information set out in the Flight Manual/POH, placards or other documents provided with the aircraft, necessary to ensure the safe operation of the aircraft

<sup>4</sup> A checklist derived from information set out in the Flight Manual/POH, placards or other documents provided with the aircraft, necessary to ensure the safe operation of the aircraft

<sup>5</sup> Means that a manoeuvre or flight is completed without injury to persons, damage to aircraft or breach of aviation safety regulations, while meeting the requirements of the Manual of Standards Part 61.

<b>Range of Variables</b>
<ul style="list-style-type: none"><li>• Single- or multi-engine aircraft</li><li>• Day VFR</li><li>• Sealed, gravel or grass runways and taxiways</li><li>• Aircraft fitted with electrical or mechanical starters</li><li>• Hand-start aircraft not fitted with electrical or mechanical starters</li><li>• Propeller/rotor wash and jet blast</li><li>• Windsocks</li><li>• Simulated abnormal or emergency situations</li><li>• Limitations, such as those imposed by local noise abatement procedures and curfews.</li></ul>
<b>Underpinning Knowledge</b>
<ul style="list-style-type: none"><li>• Describe starter motor limitations</li><li>• Explain the cause and effect of fuel vaporisation on start</li><li>• React appropriately to light and marshalling signals</li><li>• Explain how to exercise propeller care</li><li>• Interpret and react appropriately to aerodrome markings, signals and local procedures</li><li>• Explain actions in the event of brake or tyre failure.</li></ul>

## Unit A2: Take-off Aeroplane

**Unit Description:** Skills and knowledge to complete pre-take-off checks, take-off aeroplane into wind and crosswind, and perform after-take-off checks.

Element	Performance Criteria
A2.1 Carry out pre-take-off procedures	<ul style="list-style-type: none"> <li>• Performs approved pre-take-off checklist</li> <li>• Performs take-off safety brief prior to runway entry</li> <li>• Requests and complies with ATC clearance or broadcast intentions as applicable</li> <li>• Ensures final approach path is clear of conflicting traffic on specified or appropriate runway</li> <li>• Configures aircraft for take-off and lines up on the centreline at appropriate intersection or full length of runway</li> <li>• Aligns aircraft on the centreline of the specified or appropriate runway</li> <li>• Performs approved <u>line-up checks</u>.</li> </ul>
A2.2 Take-off aeroplane	<ul style="list-style-type: none"> <li>• Sets take-off power and confirms engine is operating within limits</li> <li>• Accelerates aircraft along the centreline to the take-off safety speed, allowing for wind</li> <li>• Rotates aircraft to the target climb attitude at approximately 3° per second</li> <li>• <u>Balances aircraft</u><sup>6</sup></li> <li>• Maintains extended centreline of runway or obstacle clearance flight path (<math>\pm 10^\circ</math>)</li> <li>• Maintains nominated climb speed (+5, -0 kts) until clear of obstacles</li> <li>• Retracts undercarriage at a <u>safe</u><sup>7</sup> altitude if applicable</li> <li>• Retracts flap at a <u>safe</u> altitude if applicable</li> <li>• Sets climb power and speed (<math>\pm 5</math> kts) in accordance with manufacturer's time limits or at a <u>safe</u> height</li> <li>• Rejects take-off for abnormalities prior to reaching take-off safety speed.</li> </ul>
A2.3 Take-off aeroplane in a crosswind	<ul style="list-style-type: none"> <li>• Sets take-off power and confirms engine is operating within limits</li> <li>• Accelerates aircraft along the centreline to the take-off safety speed, allowing for wind</li> <li>• Maintains wings level</li> <li>• Rotates aircraft to the target climb attitude at approximately 3° per second</li> <li>• <u>Balances aircraft</u></li> <li>• Maintains extended centreline of runway or obstacle clearance flight path (<math>\pm 10^\circ</math>)</li> <li>• Maintains nominated climb speed (+5, -0 kts) until clear of obstacles</li> <li>• Retracts undercarriage at a safe altitude if applicable</li> <li>• Retracts flap at a safe altitude if applicable</li> <li>• Sets climb power and speed (<math>\pm 5</math> kts) in accordance with manufacturer's time limits or at a <u>safe</u> height</li> <li>• Rejects take-off for abnormalities prior reaching to take-off safety speed.</li> </ul>

<sup>6</sup> The skid ball in the balance indicator is less than a quarter of the ball diameter from the centre.

<sup>7</sup> Means that a manoeuvre or flight is completed without injury to persons, damage to aircraft or breach of aviation safety regulations, while meeting the requirements of the Manual of Standards Part 61.

A2.4 Carry out after-take-off procedures	<ul style="list-style-type: none"> <li>• Performs after-take-off checks in accordance with approved checklist at a <u>safe</u> height</li> <li>• Complies with ATC instructions if applicable</li> <li>• Maintains separation from other aircraft.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Single- or multi-engine aircraft</li> <li>• Day VFR</li> <li>• Sealed, gravel or grass runways and taxiways</li> <li>• Propeller/rotor wash and jet blast</li> <li>• Windsocks</li> <li>• Aircraft operated to crosswind limits, minimum assessment to 70% of maximum crosswind component.</li> <li>• Simulated abnormal or emergency situations</li> <li>• Simulated hazardous weather</li> <li>• Limitations, such as those imposed by local noise abatement procedures and curfews.</li> </ul>	
<b>Underpinning Knowledge</b>	
<ul style="list-style-type: none"> <li>• Calculate crosswind components</li> <li>• Explain factors affecting take-off and initial climb performance</li> <li>• Interpret windsock indications, stating wind direction and speed.</li> </ul>	

## Unit A3: Control Aeroplane in Normal Flight

**Unit Description:** Skills and knowledge to control an aeroplane while climbing, descending and turning, in straight and level flight at slow speeds, and to perform circuits and approaches, while complying with airspace requirements.

Element	Performance Criteria
A3.1 Climb aeroplane	<ul style="list-style-type: none"> <li>• Sets and maintains climb power and attitude to achieve specified climb performance for the following profiles:               <ul style="list-style-type: none"> <li>◦ Maintains IAS for best angle of climb (<math>V_X</math>) (+5, -0 kts)</li> <li>◦ Maintains IAS for best rate of climb (<math>V_Y</math>) (+5, -0 kts)</li> <li>◦ Maintains IAS for cruise climb (<math>\pm 5</math> kts)</li> </ul> </li> <li>• Sets altimeter subscale in accordance with procedures specified in AIPs</li> <li>• Identifies and avoids terrain and traffic <u>threats</u></li> <li>• Anticipates and levels aircraft at nominated altitude (<math>\pm 150</math> ft for PPL, <math>\pm 100</math> ft for CPL)</li> <li>• Maintains heading (<math>\pm 10^\circ</math>)</li> <li>• <u>Trims aircraft</u></li> <li>• <u>Balances aircraft</u></li> <li>• Monitors and reacts appropriately to engine indications and performance</li> <li>• Configures aircraft if applicable.</li> </ul>
A3.2 Maintain straight and level flight	<ul style="list-style-type: none"> <li>• Sets and maintains power and attitude to achieve specified straight and level performance for the following profiles:               <ul style="list-style-type: none"> <li>◦ Straight and level flight at normal cruise</li> <li>◦ Straight and level flight at high-speed cruise</li> <li>◦ Straight and level flight with flap selected</li> </ul> </li> <li>• Maintains heading (<math>\pm 10^\circ</math>)</li> <li>• Maintains altitude (<math>\pm 150</math> ft for PPL, <math>\pm 100</math> ft for CPL)</li> <li>• Maintains IAS (<math>\pm 10</math> kts)</li> <li>• Sets altimeter subscale in accordance with procedures specified in AIPs</li> <li>• Identifies and avoids terrain and traffic <u>threats</u></li> <li>• <u>Balances aircraft</u></li> <li>• <u>Trims aircraft.</u></li> </ul>
A3.3 Descend aeroplane	<ul style="list-style-type: none"> <li>• Sets and maintains power and attitude to achieve specified descent performance during straight flight for the following profiles:               <ul style="list-style-type: none"> <li>◦ Idle power at glide IAS (<math>\pm 10</math> kts)</li> <li>◦ Powered descent at nominated IAS (<math>\pm 10</math> kts) and rate of descent (<math>\pm 150</math> ft/minute)</li> <li>◦ Approach configuration descent at nominated IAS (<math>\pm 10</math> kts) with flap selected and undercarriage down</li> </ul> </li> <li>• Sets altimeter subscale in accordance with procedures specified in AIPs</li> <li>• Identifies and avoids terrain and traffic <u>threats</u></li> <li>• Anticipates specified altitude and levels aircraft at that altitude (<math>\pm 150</math> ft for PPL, <math>\pm 100</math> ft for CPL)</li> <li>• Maintains heading (<math>\pm 10^\circ</math>)</li> <li>• <u>Balances aircraft</u></li> <li>• <u>Trims aircraft</u></li> <li>• Monitors and controls engine temperature</li> <li>• Applies carburettor heat in accordance with Flight Manual/POH when applicable</li> <li>• Maintains traffic clearance ahead and below.</li> </ul>

A3.4 Turn aeroplane	<ul style="list-style-type: none"> <li>• Performs <u>airspace cleared</u> procedure</li> <li>• Sets and maintains power, attitude and angle of bank to achieve specified turn performance to the left and right for the following profiles: <ul style="list-style-type: none"> <li>◦ Level turns (<math>\pm 150</math> ft for PPL, <math>\pm 100</math> ft for CPL)</li> <li>◦ Climbing turn (<math>\pm 5</math> kts, rate one or <math>20^\circ</math> bank <math>\pm 5^\circ</math>)</li> <li>◦ Powered descent turn (<math>\pm 10</math> kts, <math>30^\circ</math> bank <math>\pm 5^\circ</math>)</li> <li>◦ Gliding turn through <math>180^\circ</math> observing height loss (<math>\pm 10</math> kts, <math>30^\circ</math> bank <math>\pm 5^\circ</math>)</li> </ul> </li> <li>• Turns aircraft at varying rates to achieve specified tracks</li> <li>• Manoeuvres aircraft over specified tracks or geographical feature (<math>\pm 10^\circ</math> on exit)</li> <li>• Turns aircraft onto nominated headings using magnetic compass only (<math>\pm 10^\circ</math> on exit)</li> <li>• <u>Balances aircraft</u></li> <li>• <u>Trims aircraft</u> for climbing and descending turns</li> <li>• Applies <u>controlled corrective action</u></li> <li>• Monitors and controls engine temperature.</li> </ul>
A3.5 Control aeroplane at slow speeds	<ul style="list-style-type: none"> <li>• Completes <u>pre-manoeuve checks</u> from memory</li> <li>• Manoeuvres aircraft at minimum clean approach speed (+10, -0 kts).</li> <li>• Manoeuvres aircraft at flapped approach configuration speed (+10, -0 kts)</li> <li>• Observes audible and visual stall warnings and recovers aircraft to controlled flight</li> <li>• Manages the reduced effectiveness of controls</li> <li>• Recovers from slow speed configuration using take-off power to achieve nominated speed in excess of 1.5Vs without loss of height (<math>\pm 10</math> kts, <math>\pm 150</math> ft for PPL, <math>\pm 100</math> ft for CPL)</li> <li>• <u>Balances aircraft</u></li> <li>• <u>Trims aircraft.</u></li> </ul>
A3.6 Perform circuits and approaches	<ul style="list-style-type: none"> <li>• Maintains lookout and traffic separation using a systematic scan technique at a rate determined by traffic density</li> <li>• Monitors and reacts appropriately to engine performance and indications</li> <li>• Tracks upwind along extended runway centreline to 500 ft</li> <li>• Establishes aircraft on crosswind tracking <math>90^\circ</math> to the runway</li> <li>• Establishes aircraft on downwind at circuit height (<math>\pm 100</math> ft) tracking parallel to the runway at a specified distance from the runway</li> <li>• Performs pre-landing checklist</li> <li>• Establishes aircraft on base leg a specified distance from threshold of runway</li> <li>• Commences and controls rate of descent to maintain approach path</li> <li>• Ensures aircraft is aligned with specified or appropriate runway</li> <li>• Establishes aircraft on final approach in approach configuration not below 500 ft AGL</li> <li>• Identifies and selects <u>aiming point</u></li> <li>• Maintains aircraft on extended centreline and coordinates power and attitude to maintain approach slope and speed not less than 1.3Vs to a height of 50 ft</li> <li>• Applies speed allowances for wind gusts when applicable</li> <li>• Maintains speed not below threshold speed +10 kts until commencing flare</li> <li>• Configures aircraft for landing</li> <li>• Performs final approach checklist</li> <li>• Anticipates and allows for wind on all legs of the circuit</li> <li>• <u>Balances aircraft</u></li> <li>• <u>Trims aircraft.</u></li> </ul>

A3.7 Comply with airspace requirements	<ul style="list-style-type: none"> <li>• Explains, using a chart, geographical limits of the designated area</li> <li>• Identifies prominent geographical features using a chart</li> <li>• Identifies the limits of the designated area on the ground</li> <li>• Determines the position of controlled airspace using a chart and geographical features</li> <li>• Identifies and avoids restricted areas and controlled airspace using a chart and geographical features</li> <li>• Completes departure from the circuit area and transits to the designated area without incident</li> <li>• Completes departure from the designated area and transits to the circuit area without incident</li> <li>• Maintains <u>orientation</u><sup>8</sup> by geographical features.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Single- or multi-engine aircraft</li> <li>• Day VFR</li> <li>• Sealed, gravel or grass runways and taxiways</li> <li>• Windsocks</li> <li>• Aircraft operated to crosswind limits, minimum assessment to 70% of maximum crosswind component.</li> <li>• Simulated abnormal or emergency situations</li> <li>• Simulated hazardous weather</li> <li>• Limitations, such as those imposed by local noise abatement procedures and curfews.</li> </ul>	
<b>Underpinning Knowledge</b>	
<ul style="list-style-type: none"> <li>• Explain the primary and secondary effects of controls</li> <li>• Explain the function of stall warning devices fitted to aircraft</li> <li>• Explain the theory and application of best rate and angle of climb</li> <li>• Explain the effects of excessive cooling on engine performance during descent and methods to counter these effects</li> <li>• Explain the use of carburettor heat</li> <li>• Explain the hazards associated with maximum rate descents</li> <li>• Explain the effects of turn on magnetic compass performance</li> <li>• Explain the effects of angle of bank on load factor and stall speed</li> <li>• Explain how induced drag can adversely affect an aircraft at slow speed</li> <li>• Explain the dangers of turbulence and wake turbulence when flying at slow speed.</li> </ul>	

<sup>8</sup> To be aware of the position of the aircraft relative to navigation aid or feature, based on the direction and estimated distance of the aircraft from the navigation aid or feature.

## Unit A4: Land Aeroplane

**Unit Description:** Skills and knowledge to land an aeroplane into wind and crosswind and to perform a mishandled landing when required.

Element	Performance Criteria
A4.1 Land aeroplane	<ul style="list-style-type: none"> <li>Identifies and selects <u>aiming point</u><sup>9</sup></li> <li>Selects power to idle prior to touchdown</li> <li>Flares aircraft at an appropriate height</li> <li>Controls ballooning during flare and bouncing after touchdown by adjustment of attitude without the application of power</li> <li>Touches down at a <u>controlled rate of descent</u><sup>10</sup>, aligned with runway centreline</li> <li>Touches down within 400 ft/120 metres for PPL or 200ft/60 metres for CPL beyond a nominated <u>touchdown point</u></li> <li>Touches down <math>\pm 2</math> metres of centreline</li> <li>Touches down on the main wheels, and the nose is lowered onto the runway without harshness</li> <li>Maintains directional control along the centreline</li> <li>Applies braking to stop the aircraft within landing distance available.</li> <li>Performs after-landing checklist</li> <li>Maintains separation from other traffic.</li> </ul>
A4.2 Land aeroplane in a crosswind	<ul style="list-style-type: none"> <li>Configures aircraft for crosswind landing</li> <li>Tracks aircraft above runway centreline</li> <li>Selects power to idle prior to touchdown</li> <li>Flares aircraft at an appropriate height</li> <li>Controls ballooning during flare and bouncing after touchdown by adjustment of attitude without the application of power</li> <li>Touches down at a <u>controlled rate of descent</u><sup>11</sup>, aligned with runway centreline.</li> <li>Touches down within 400 ft/120 metres for PPL or 200ft/60 metres for CPL beyond a nominated <u>touchdown point</u></li> <li>Touches down <math>\pm 2</math> metres of centreline</li> <li>Prevents wing rise after touchdown</li> <li>Maintains directional control along the centreline</li> <li>Applies braking to stop the aircraft within landing distance available without wheel lockup</li> <li>Performs after-landing checklist.</li> </ul>
A4.3 Perform mishandled landing procedures	<ul style="list-style-type: none"> <li>Recognises when the landing standard cannot be achieved and implements a decision to perform <u>mishandled landing</u><sup>12</sup></li> <li>Controls aeroplane</li> <li>Applies take-off power</li> <li>Controls aircraft direction while airborne and on the ground</li> <li>Lifts off at take-off safety speed or establishes climb attitude if airborne</li> <li>Retracts undercarriage and flap when applicable</li> </ul>

<sup>9</sup> The 'aiming point' related to a visual approach and landing of an aircraft, is that point at which a pilot looks, to achieve a predetermined touchdown point.

<sup>10</sup> 'Controlled rate of descent' associated with a landing means that the touchdown is without harshness and the successful outcome of the landing is not in doubt.

<sup>11</sup> 'Controlled rate of descent' associated with a landing means that the touchdown is without harshness and the successful outcome of the landing is not in doubt.

<sup>12</sup> 'means to recognise an abnormal landing and recover the aircraft to controlled flight. Often associated with a 'go around'

	<ul style="list-style-type: none"><li>• Performs after-take-off checks.</li></ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"><li>• Single- or multi-engine aircraft</li><li>• Day VFR</li><li>• Aircraft with nose wheel or tail wheel</li><li>• Aircraft with or without flaps</li><li>• Aircraft with fixed or retractable undercarriage</li><li>• Sealed, gravel or grass runways and taxiways</li><li>• Propeller/rotor wash and jet blast</li><li>• Windsocks</li><li>• Aircraft operated to crosswind limits, minimum assessment to 70% of maximum crosswind component</li><li>• Limitations, such as those imposed by local noise abatement procedures and curfews.</li></ul>	
<b>Underpinning Knowledge</b>	
<ul style="list-style-type: none"><li>• Recognise and respond to conditions leading to a mishandled landing</li><li>• Calculate landing performance</li><li>• Recall the crosswind limits for the aircraft type flown</li><li>• Calculate crosswind components</li><li>• Interpret windsock indications</li><li>• Explain causes of loss of control of an aircraft on landing.</li></ul>	

## Unit A5: Execute Advanced Manoeuvres and Procedures

**Unit Description:** Skills and knowledge to control an aeroplane by applying advanced manoeuvres and procedures.

Element	Performance Criteria
A5.1 Enter and recover from stall	<p><i>Recognise approach to stall</i></p> <ul style="list-style-type: none"> <li>• Performs <u>pre-manoeuve checks</u></li> <li>• Recognises airframe buffet and control ineffectiveness symptoms and visual and aural stall warning indications while approaching the stall.</li> </ul> <p><i>Stall aircraft</i></p> <ul style="list-style-type: none"> <li>• Stalls aircraft while maintaining <u>balanced flight</u></li> <li>• Observes IAS and control wheel/stick position at point of departure from intended flight path (stall)</li> <li>• Recovers from stall with minimum loss of height</li> <li>• Adjusts aeroplane attitude and power setting to resume normal <u>balanced flight</u> on onset of stall</li> <li>• Recovers from stall using full power</li> <li>• Recovers from stall without power</li> <li>• Recovers from stall during straight and level, climbing, descending and approach configuration flight</li> <li>• Recovers from stall during a turn</li> <li>• Achieves minimum height loss consistent with aircraft type and stall characteristics</li> </ul>
A5.2 Recover from incipient spin	<ul style="list-style-type: none"> <li>• Performs pre-manoeuve checks</li> <li>• Terminates yaw</li> <li>• Adjusts aeroplane attitude and power setting following incipient spin entry (stall with wing drop) and resumes normal <u>balanced flight</u></li> <li>• Recovers at incipient spin stage during a turn and resumes controlled flight</li> <li>• Achieves minimum height loss consistent with aircraft type and stall characteristics</li> </ul>
A5.3 Turn aeroplane steeply	<ul style="list-style-type: none"> <li>• Completes <u>airspace cleared procedure</u></li> <li>• Performs level steep turn of nominated bank angle (45°–60°) without altitude change (<math>\pm 150</math> ft for PPL, <math>\pm 100</math> ft for CPL)</li> <li>• Performs descending steep turn of nominated bank angle (45°–60°) to a nominated heading or geographical feature through a minimum of 500 ft height loss</li> <li>• Exits on specified heading or geographical feature (<math>\pm 10^\circ</math>)</li> <li>• <u>Balances aircraft</u></li> <li>• <u>Trims aircraft</u> for descending steep turn.</li> </ul>

A5.4 Sideslip aeroplane	<p><i>Straight sideslip</i></p> <ul style="list-style-type: none"> <li>• Induces slip to achieve increased rate of descent while maintaining track and airspeed</li> <li>• Adjusts rate of descent by coordinating angle of bank and applied rudder.</li> </ul> <p><i>Sideslipping turn</i></p> <ul style="list-style-type: none"> <li>• Adjusts bank angle to turn through minimum heading change of 90° at constant airspeed using sideslip</li> <li>• Exits on specified heading or geographical feature (<math>\pm 10^\circ</math>)</li> <li>• Recovers from sideslip and returns aeroplane to <u>balanced flight</u>.</li> </ul>
A5.5 Execute short take-off and landing	<p><i>Short take-off</i></p> <ul style="list-style-type: none"> <li>• Calculates take-off and landing performance in accordance with performance chart</li> <li>• Performs pre-take-off checks in accordance with approved checklist</li> <li>• Lines up aeroplane to enable maximum use of runway length</li> <li>• Performs <u>line-up checks</u> in accordance with approved checklist</li> <li>• Applies take-off power before brakes (where fitted) are released</li> <li>• Rotates aeroplane at recommended speed</li> <li>• Sets nominated climb speed appropriate to obstacle clearance requirements</li> <li>• Performs after-take-off checks from memory in accordance with <u>approved checklist</u>.</li> </ul> <p><i>Short landing</i></p> <ul style="list-style-type: none"> <li>• Lands aeroplane at nominated touchdown point (+200 ft/60 metres for PPL, +100 ft/30 metres for CPL) at minimum speed</li> <li>• Controls ballooning during flare and bouncing after touchdown by adjustment of attitude without the application of power</li> <li>• Maintains direction after touchdown</li> <li>• Applies maximum braking without locking up wheels</li> <li>• Stops aircraft within landing distance available</li> <li>• Performs after-landing checks in accordance with <u>approved checklist</u>.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Single- or multi-engine aircraft</li> <li>• Day VFR</li> <li>• Aircraft with nose wheel or tail wheel</li> <li>• Aircraft with or without flaps</li> <li>• Aircraft with fixed or retractable undercarriage</li> <li>• Sealed, gravel or grass runways and taxiways</li> <li>• Propeller/rotor wash and jet blast</li> <li>• Windsocks</li> <li>• Aircraft operated to crosswind limits, minimum assessment to 70% of maximum crosswind component</li> <li>• Limitations, such as those imposed by local noise abatement procedures and curfews.</li> </ul>	

**Underpinning Knowledge**

- Explain the symptoms of the approach to the stall and the stall in the aircraft type flown
- Explain the relationship between angle of attack and the stall
- Explain the effects of weight, 'g-force' and angle of bank on the stall speed
- Explain the potential dangers of unbalanced flight at slow speed
- Explain the principles associated with the position of the stick/control column and the point of stall
- State the symmetrical and rolling 'g-force' limitations of the aircraft being operated
- Explain the effects of a sideslip on aeroplane performance
- Explain the effects of sideslipping an aeroplane on fuel, pitot and flap systems
- Explain take-off and landing performance chart calculations
- Provide an example of when a maximum rate turn should be performed
- Provide an example of when a minimum radius turn should be performed.

## Unit A6: Manage Abnormal Situations

**Unit Description:** Skills and knowledge to accurately assess an abnormal situation and perform immediate actions, configure an aeroplane, select a landing area and land with no injury to personnel or damage to the aeroplane or property, perform a precautionary search and manage other abnormal situations.

Element	Performance Criteria
A6.1 Manage engine failure after take-off	<ul style="list-style-type: none"> <li>• Controls aircraft</li> <li>• Lowers nose to achieve best gliding speed</li> <li>• Selects a landing area within gliding distance</li> <li>• Performs immediate actions in accordance with Flight Manual/POH</li> <li>• Performs emergency procedures in accordance with Flight Manual/POH</li> <li>• Advises ATS or another agency capable of providing assistance of situation and intentions</li> <li>• Briefs passengers about flight situation, brace position and harness security</li> <li>• Lands aeroplane ensuring <u>safest outcome</u>.</li> </ul>
A6.2 Manage engine failure elsewhere in the circuit	<ul style="list-style-type: none"> <li>• Controls aircraft</li> <li>• Performs immediate actions in accordance with Flight Manual/POH</li> <li>• Selects a landing area within gliding distance, on the aerodrome or elsewhere</li> <li>• Performs emergency procedures in accordance with Flight Manual/POH and lands the aeroplane if the engine cannot be restarted</li> <li>• Advises ATS or other agencies capable of providing assistance of situation and intentions</li> <li>• Briefs passengers about flight situation, brace position and harness security</li> <li>• Lands aircraft ensuring <u>safest outcome</u> if an engine restart is not achieved.</li> </ul>
A6.3 Perform forced landing	<ul style="list-style-type: none"> <li>• Controls aircraft</li> <li>• Performs immediate actions in accordance with Flight Manual/POH</li> <li>• Selects landing area within gliding distance</li> <li>• Formulates a plan</li> <li>• Performs all emergency checks in accordance with Flight Manual/POH</li> <li>• Briefs passengers about flight situation, brace position and harness security</li> <li>• Advises ATS or other agencies capable of providing assistance of situation and intentions</li> <li>• Manoeuvres aircraft to selected landing area</li> <li>• Lands aircraft ensuring <u>safest outcome</u> if an engine restart is not achieved</li> <li>• <u>Trims aircraft</u></li> <li>• <u>Balances aircraft</u>.</li> </ul>

A6.4 Conduct precautionary search and landing	<ul style="list-style-type: none"> <li>• Assesses flight circumstances and decides to perform precautionary landing in the time available</li> <li>• Communicates intentions when appropriate</li> <li>• Configures aircraft for reduced visibility manoeuvring if applicable.</li> <li>• Selects landing area and inspects its suitability for landing, ensuring: <ul style="list-style-type: none"> <li>◦ unobstructed approach and overshoot paths</li> <li>◦ landing area length adequate for landing</li> <li>◦ landing area surface suitable for aircraft type and clear of hazards</li> </ul> </li> <li>• Maintains <u>orientation</u> and contact with the landing area.</li> <li>• Lands aircraft.</li> </ul>
A6.5 Manage other abnormal situations	<ul style="list-style-type: none"> <li>• Controls aircraft</li> <li>• Identifies abnormal or emergency situation</li> <li>• Manages or rectifies abnormal or emergency situation in accordance with Flight Manual/POH, standard operating procedures or Company Operations Manual</li> <li>• Performs abnormal and emergency actions in accordance with AIP procedures when applicable</li> <li>• Advises ATS or other agencies capable of providing assistance of situation and intentions.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Single- engine aircraft</li> <li>• Day VFR</li> <li>• Limitations, such as those imposed by local noise abatement procedures and curfews</li> <li>• Simulated manoeuvres that would be terminated by forced landing or ditching may be discontinued when the assessor is satisfied that the landing standard could be achieved</li> <li>• At least one precautionary search to be conducted at an unfamiliar landing area</li> <li>• Decision to land is taken immediately after the need becomes apparent.</li> </ul>	

**Underpinning Knowledge**

- Explain methods of determining the suitability of emergency landing areas
- Explain the advantages of pre briefing actions in the event of an engine failure after take-off when departing from an airfield
- Describe a practical action plan for use in the event of an engine failure after take-off from the aerodrome of operation
- Explain engine failure emergency procedures
- Detail a plan of action to be used in the event of an engine failure in the circuit, other than after take-off
- Recall the height loss during a 180° gliding turn in the aircraft being operated
- Explain the link between autorotation and manoeuvring an aircraft at low airspeeds
- Explain actions to be conducted following a forced landing.

***Partial engine failure***

- Explain the effects of a partial engine failure on aircraft performance with respect to:
  - straight and level flight
  - turning while maintaining level flight
- Describe the hazards associated with turning an aircraft at slow speed, using large angles of bank while maintaining level flight following a partial engine failure after take-off
- Explain what factors should be considered when deciding whether to land immediately or proceed to a more suitable landing area after a partial engine failure
- Precautionary search
- Explain scenarios that may require a precautionary landing
- Detail the bad visibility configuration
- Explain the hazards associated with flying at low level.

## Unit C1: English Communication in the Aviation Environment – Flight Standard

**Unit Description:** Skills and knowledge required to communicate effectively with all stakeholders within a flight operations environment and to ensure messages are clearly understood and responded to appropriately.

Element	Performance Criteria
C1.1 Communicate effectively face to face using clear and precise English	<ul style="list-style-type: none"> <li>• Pronounces words clearly, using an accent that does not cause difficulties in understanding.</li> <li>• Conveys information in clearly structured sentences without confusion or ambiguity.</li> <li>• Uses an extensive vocabulary to accurately communicate on general and technical topics, without excessive use of jargon, slang or colloquial language.</li> <li>• Speaks fluently without long pauses, repetition or excessive false starts.</li> <li>• Responds to communications with actions that demonstrate that the information has been received and understood.</li> <li>• Exchanges information clearly in a variety of situations with both expert and non-expert English speakers while giving and receiving timely and appropriate responses.</li> <li>• Recognises and manages communication errors and/or misunderstandings effectively.</li> <li>• Maintains effective communication with crew members and other personnel in flight and on the ground on operational matters.</li> <li>• Communicates effectively in unfamiliar, stressful or non-standard situations.</li> </ul>
C1.2 Communicate effectively in voice-only R/T communications using standard aviation phraseology	<ul style="list-style-type: none"> <li>• Makes appropriate transmissions using standard aviation phraseology.</li> <li>• Uses plain English effectively when standard phraseology is inadequate.</li> <li>• Receives appropriate responses to transmissions.</li> <li>• Responds to transmissions and takes appropriate action.</li> <li>• Identifies and manages communication errors and/or misunderstandings promptly and effectively.</li> <li>• Seeks clarification in the time available if message is unclear or uncertainty exists.</li> <li>• Reacts appropriately to a variety of regional accents.</li> <li>• Communicates effectively in unexpected, stressful or non standard situations using standard phraseology or plain English.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Includes oral and written communication in English.</li> <li>• Communication standards are demonstrated in flight and related activities on the ground while acting as a pilot in any capacity during communications with crewmembers, ATS and other aircraft.</li> <li>• Situations include disruptions to communication normally encountered in the flight environment including background noise levels, equipment malfunctions and distractions.</li> <li>• In flight communication is conducted in a timely manner consistent with operational <u>safety</u>.</li> <li>• Assessment at an expert level (ICAO Level 6) requires all the criteria of elements C1.1 and C1.2 to be demonstrated consistently in the operational environment and in a range of non-operational situations with only rare occurrences of errors or misunderstandings.</li> <li>• Assessment at an operationally competent level (ICAO Level 4) requires all criteria of element C1.2 to be demonstrated in the operational environment, but occasional loss of fluency, errors and/or misunderstandings are permissible in demonstrating the criteria of element C1.1 providing effective communication is maintained.</li> </ul>	

**Underpinning Knowledge**

- Demonstrate oral and written English vocabulary sufficient to converse on a wide range of common and technical topics.
- Apply English grammatical construction.
- Apply aviation terminology.
- Use standard aviation R/T phraseology.

## Unit C2: Manage Pre and Post Flight Actions– Flight Standard (PPL and CPL)

**Unit Description:** Knowledge and skills to obtain required information and authority, ensure maintenance requirements are met and perform required functions before and after flight and to ensure that the aeroplane meets maintenance and safety requirements prior to flight.

Element	Performance Criteria
C2.1 Complete pre and post flight administration	<p><i>Pre flight</i></p> <ul style="list-style-type: none"> <li>• Obtains, interprets and applies meteorological and NOTAM information</li> <li>• Completes pre-flight planning and documentation in accordance with regulations and/or operations manual</li> <li>• Calculates aeroplane take-off and landing performance in accordance with performance and weight and balance charts</li> <li>• Selects optimum cruise altitude determined by operational, <u>safety</u><sup>13</sup> or efficiency requirements</li> <li>• Interprets maintenance release (Flight Technical Log) and Minimum Equipment List (MEL) and determines aircraft serviceability for proposed flight.</li> </ul> <p><i>Post flight</i></p> <ul style="list-style-type: none"> <li>• Completes flight maintenance release (Flight Technical Log) and flight administration and enters identified unserviceabilities in accordance with regulations and/or operations manual.</li> </ul>
C2.2 Perform pre-flight inspection	<ul style="list-style-type: none"> <li>• Identifies and secures equipment and documentation as required by regulation in the aircraft</li> <li>• Completes internal and external checks in accordance with <u>approved checklist</u></li> <li>• Ensures removal of all aircraft locking devices</li> <li>• Identifies defects or damage to the aircraft that could compromise safety</li> <li>• Certifies Flight Technical Log entering any defects or endorsements to Permissible Unserviceabilities (PUS)</li> <li>• Completes and certifies daily inspection.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Single or multi engine aircraft</li> <li>• Day Visual Flight Rules</li> </ul>	
<b>Underpinning Knowledge</b>	
N/A	

<sup>13</sup> Means that a manoeuvre or flight is completed without injury to persons, damage to aircraft or breach of aviation safety regulations, while meeting the requirements of the Manual of Standards Part 61.

## Unit C3: Operate Radio – Flight Standard (PPL and CPL)

**Unit Description:** Knowledge and skills to operate and manage radiotelephone and intercom equipment under normal and emergency flight conditions.

Element	Performance Criteria
C3.1 Use R/T equipment	<ul style="list-style-type: none"> <li>Ensures serviceability of radiotelephone equipment.</li> <li>Conducts transmission and receipt of R/T messages in accordance with procedures and phraseology detailed in the FROL syllabus and Aeronautical Information Publications (AIP).</li> <li>Maintains a listening watch and responds appropriately to applicable transmissions.</li> <li>Performs loss of radio transmitter or receiver procedures in accordance with AIP, ERS(A), VFR Flight Guide.</li> <li>Conducts emergency and urgency transmissions and procedures in accordance with Enroute Supplement Australia (ERS(A) current edition) and AIP and all messages are reacted to appropriately.</li> </ul>
C3.2 Maintain R/T equipment	<ul style="list-style-type: none"> <li>Performs R/T equipment failure procedures in accordance with Flight Manual/POH</li> <li>Employs fault finding procedures and corrective actions not involving special tools or instruments</li> </ul>
C3.3 Operate transponder	<ul style="list-style-type: none"> <li>Operates and monitors transponder in accordance with AIP during normal, abnormal and emergency operations.</li> </ul>
<b>Range of variables</b>	
<ul style="list-style-type: none"> <li>Single or multi engine aircraft</li> <li>VFR, IFR or simulated IMC</li> <li>Propeller/rotor wash and jet blast noise</li> <li>Up to and including light turbulence</li> </ul>	
<b>Underpinning knowledge</b>	
<ul style="list-style-type: none"> <li>English language</li> <li>To recognise, interpret and react appropriately to light signals</li> </ul>	

## Unit C4: Manage Fuel – Flight Standard (PPL and CPL)

**Unit Description:** Knowledge and skills to determine aircraft fuel requirements and perform the necessary calculations, to refuel the aeroplane and to ensure the fuel system is configured and operated for maximum safety and efficiency in the prevailing flight conditions, and to calculate requirements, configure and make adjustments to achieve best range and best endurance.

Element	Performance Criteria
C4.1 Plan fuel requirements	<ul style="list-style-type: none"> <li>• Determines fuel reserve requirement in accordance with regulations</li> <li>• Ensures fuel allowance is sufficient for operational requirements and applicable abnormal or emergency situations</li> <li>• Calculates total fuel requirement in accordance with regulations.</li> </ul>
C4.2 Manage fuel system	<ul style="list-style-type: none"> <li>• Verifies fuel quantity by visual inspection when possible or other methods appropriate to the aircraft type</li> <li>• Ensures fuel is the correct grade and is free from contamination</li> <li>• Ensures fuel drain cocks closed</li> <li>• Operates fuel system in accordance with Flight Manual/POH</li> <li>• Operates fuel cross feed in accordance with Flight Manual/POH to ensure aircraft balance</li> <li>• Operates fuel pumps and engine controls in accordance with Flight Manual/POH</li> <li>• Configures aircraft to achieve best range and calculates revised range</li> <li>• Configures aircraft to achieve best endurance and calculates revised endurance.</li> </ul>
C4.3 Refuel aircraft	<ul style="list-style-type: none"> <li>• Refuels aircraft in accordance with regulations, Flight Manual/POH, workplace health and safety and local procedures</li> <li>• Ensures all fuel caps are closed and secured</li> <li>• Ensures aircraft is earthed before refuelling.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Day Visual Flight Rules in variable weather conditions</li> <li>• Fuel sources</li> <li>• Fire extinguishers</li> <li>• Locations.</li> </ul>	
<b>Underpinning knowledge</b>	
<ul style="list-style-type: none"> <li>• Health &amp; safety requirements during refuelling</li> <li>• Local procedures for refuelling.</li> </ul>	

## Unit C5: Manage Passengers and Cargo - Flight Standard (PPL and CPL)

**Unit Description:** Skills and knowledge to ensure that passengers are informed, controlled, and that provision has been made for their comfort and well being, and that cargo is managed in accordance with regulations.

Elements	Performance Criteria
C5.1 Brief passengers	<ul style="list-style-type: none"> <li>Briefs passengers before flight and in emergencies in accordance with regulations, and company operations manual</li> <li>Explains and confirms conduct and procedures to avoid contact of personnel or articles with propellers, rotor blades or jet blast</li> <li>Explains procedures to avoid interference with flight controls when applicable</li> <li>Explains and demonstrates the use of seat belts/safety harness</li> <li>Explains and demonstrates use of escape hatches, exits and emergency equipment.</li> </ul>
C5.2 Aid and assist passengers	<ul style="list-style-type: none"> <li>Establishes and maintains clear communications with passengers</li> <li>Provides passenger comfort and well-being within the limits of aircraft <u>safety</u>, controls passengers on the ground and in the air in accordance with regulations, occupational health and safety requirements and operations manual.</li> </ul>
C5.3 Manage cargo	<ul style="list-style-type: none"> <li>Manages loading, unloading and security of cargo throughout flight operations</li> <li>Identifies dangerous goods and applies procedures to ensure <u>safety</u> and security.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>Single or multi engine aircraft</li> <li>Propeller/rotor wash and jet blast</li> <li>Simulated abnormal or emergency situations</li> <li>Real or simulated passengers and cargo.</li> </ul>	
<b>Underpinning Knowledge</b>	
<ul style="list-style-type: none"> <li>Explain your actions in relation to managing passengers during an abnormal or emergency situation</li> <li>Health and safety regulations</li> <li>Local procedures for movement of passengers</li> <li>Security requirements.</li> </ul>	

## Unit C6: Manage Flight – Flight Standard

**Unit Description:** Skills, knowledge and behaviour to plan, direct and control all aspects of a flight.

Element	Performance Criteria
C6.1 Maintain effective lookout	<ul style="list-style-type: none"> <li>Maintains lookout and traffic separation using a systematic scan technique at a rate determined by traffic density, visibility and terrain</li> <li>Maintains radio listening watch and interprets transmissions to determine traffic location and intentions of traffic</li> <li>Performs <u>airspace-cleared</u> procedure before commencing any manoeuvres.</li> </ul>
C6.2 Maintain situation awareness	<ul style="list-style-type: none"> <li>Monitors all aircraft systems using a systematic scan technique</li> <li>Collects information to facilitate ongoing system management</li> <li>Monitors flight environment for deviations from planned operations</li> <li>Collects flight environment information to update planned operations.</li> </ul>
C6.3 Assess situations and make decisions	<ul style="list-style-type: none"> <li>Identifies problems</li> <li>Analyses problems</li> <li>Identifies solutions</li> <li>Assesses solutions and risks</li> <li>Decides on a course of action</li> <li>Communicates plans of action - if appropriate</li> <li>Allocates tasks for action – if appropriate</li> <li>Takes actions to achieve optimum outcomes for the operation</li> <li>Monitors progress against plan</li> <li>Re evaluates plan to achieve optimum outcomes.</li> </ul>
C6.4 Set priorities and manage tasks	<ul style="list-style-type: none"> <li>Organises workload and priorities to ensure completion of all tasks relevant to the safety of the flight</li> <li>Puts the safe and effective operation of the aircraft ahead of competing priorities and demands</li> <li>Plans events and tasks to occur sequentially</li> <li>Anticipates critical events and tasks to ensure completion</li> <li>Uses technology to reduce workload and improve cognitive and manipulative activities</li> <li>Avoids fixation on single actions, tasks or functions.</li> </ul>
C 6.5 Maintain effective communications and interpersonal relationships	<ul style="list-style-type: none"> <li>Establishes and maintains effective and efficient communications and interpersonal relationships with all <u>stakeholders</u> to ensure the <u>safe outcome of the flight</u></li> <li>Defines and explains objectives to applicable/involved <u>stakeholders</u></li> <li>Demonstrates a level of assertiveness that ensures the <u>safe</u> completion of the flight</li> <li>Encourages passengers to participate in and contribute to the <u>safe</u> outcome of the flight.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>All flight and ground operations</li> <li>Interactivity with stakeholders</li> <li>Single or multi engine aircraft.</li> </ul>	
<b>Underpinning Knowledge</b>	
N/A	

## Unit C7: Threat and Error Management – Flight Standard

**Unit Description:** Skills, knowledge and behaviour to recognise and plan, direct and control threats and errors.

Element	Performance Criteria
C7.1 Recognise and manage threats	<ul style="list-style-type: none"> <li>Identifies relevant environmental or operational <u>threats</u> that are likely to affect the <u>safety</u> of the flight</li> <li>Develops and implements countermeasures to manage <u>threats</u></li> <li>Monitors and assesses flight progress to ensure a <u>safe</u> outcome; or modifies actions when a <u>safe</u> outcome is not assured.</li> </ul>
C7.2 Recognise and manage <u>errors</u>	<ul style="list-style-type: none"> <li>Applies <u>checklists</u> and <u>standard operating procedures</u> to prevent aircraft handling, procedural or communication <u>errors</u> and identifies committed <u>errors</u> before <u>safety</u> is affected or aircraft enters an <u>undesired aircraft state</u>.</li> <li>Monitor aircraft systems, flight environment and crewmembers, collects and analyses information to identify potential or actual <u>errors</u></li> <li>Implements countermeasures to prevent <u>errors</u> or takes action in the time available to correct <u>errors</u> before the aircraft enters an <u>undesired aircraft state</u>.</li> </ul>
C7.3 Recognise and manage undesired aircraft state	<ul style="list-style-type: none"> <li>Recognises <u>undesired aircraft state</u></li> <li>Prioritises tasks to ensure management of <u>undesired aircraft state</u></li> <li>Manipulates aircraft controls or systems, or modifies actions or procedures to maintain control of the aircraft and return to normal flight operations, in the time available.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>All flight and ground operations.</li> </ul>	
<b>Underpinning Knowledge</b>	
<ul style="list-style-type: none"> <li>Explain the principles of threat and error management detailing a process to follow to identify and mitigate or control threats and errors during multi crew operations</li> <li>Define undesired aircraft state</li> <li>Give an example of how an undesired aircraft state can develop from an unmanaged threat or error</li> <li>What aspects of multi crew operations can prevent an undesired aircraft state</li> <li>Explain how the use of checklists and standard procedures prevents errors</li> <li>Give an example of a committed error and how action could be taken to ensure safety of flight</li> <li>Explain how prioritising and managing workload can reduce the occurrence of errors</li> <li>Explain how establishing and maintaining interpersonal relationships can ensure safe flight</li> <li>Explain how checklists and standard operating procedures can help to recognise, prevent and/or correct errors.</li> </ul>	

## Unit C8: Navigate Aircraft – Flight Standard

**Unit Description:** To develop the knowledge and skills to plan and conduct a flight to a destination aerodrome, or alternate aerodrome, navigating the aircraft under the VFR. This will include pre-flight planning, compliance with airspace procedures and departure and arrival procedures, and navigation under normal and abnormal conditions.

Element	Performance Criteria
C8.1 Prepare chart and flight plan	<ul style="list-style-type: none"> <li>• Selects and prepares appropriate visual navigation charts suitable for the intended flight</li> <li>• Determines and allows for beginning and end of daylight</li> <li>• Obtains and interprets meteorological forecasts and NOTAMs</li> <li>• Selects a suitable route and altitude considering weather, terrain, airspace, NOTAMs and alternate landing areas</li> <li>• Obtains and analyses operational information that is valid for the intended flight</li> <li>• Determines whether the intended flight can be conducted under the VFR</li> <li>• Completes flight plan to destination and any planned alternates</li> <li>• Provides flight notification for SAR purposes</li> <li>• Calculates fuel requirements in accordance with regulations.</li> </ul>
C8.2 Comply with airspace procedures	<ul style="list-style-type: none"> <li>• Obtains and complies with air traffic clearances</li> <li>• Complies with procedures applicable to airspace classification.</li> </ul>
C8.3 Conduct departure procedures	<ul style="list-style-type: none"> <li>• Performs pre-flight planning and cockpit organisation to ensure charts, documentation and navigational calculator are accessible from the control seat</li> <li>• Intercepts track within five nautical miles of airfield</li> <li>• Calculates ETA for first waypoint</li> <li>• Complies with all departure clearances and instructions</li> <li>• Observes local and published noise abatement requirements and curfews.</li> </ul>
C8.4 Navigate aircraft en route	<ul style="list-style-type: none"> <li>• Maintains a navigation cycle that ensures accurate tracking and applies track correctional technique to re-establish track prior to waypoint or destination</li> <li>• Maintains heading (<math>\pm 10^\circ</math> directional indicator aligned with compass)</li> <li>• Maintains and revises ETAs <math>\pm 2</math> minutes for waypoint or destination</li> <li>• Maintains track <math>\pm 1</math> nm in controlled airspace</li> <li>• Maintains navigation log to monitor tracking, ETAs and fuel status</li> <li>• Monitors fuel consumption and revises fuel reserves (if applicable)</li> <li>• Recognises deteriorating situations and initiates early corrective action</li> <li>• Positively identifies ground fixes by two or more features</li> <li>• Obtains a positive fix at intervals not greater than 30 minutes</li> <li>• Performs <u>pre-descent and turning point checks</u></li> <li>• Maintains awareness of route and destination weather conditions and reacts appropriately to adverse weather changes</li> <li>• Maintains radio communications and listening watch with ATS/ATC</li> <li>• Maintains lookout using a systematic scan technique at a rate determined by traffic density, visibility and terrain</li> <li>• Monitors aircraft systems and engine handling to ensure that the aircraft is operated in accordance with the Flight Manual/POH.</li> </ul>

C8.5 Navigate at low level and in reduced visibility	<ul style="list-style-type: none"> <li>• Maintains aircraft in visual meteorological conditions</li> <li>• Maintains separation from terrain and obstacles, allowing for wind and turbulence (minimum height 500 ft AGL)</li> <li>• <u>Configures aircraft for bad visibility</u></li> <li>• Advises ATS and establishes a SARTIME, if applicable</li> <li>• Fixes position at least once every 30 minutes</li> <li>• Avoids noise-sensitive areas, if applicable.</li> </ul>
C8.6 Perform lost procedure	<ul style="list-style-type: none"> <li>• Configures aircraft to achieve best endurance speed at present or most efficient altitude</li> <li>• Fixes position</li> <li>• Revises plan to either destination or alternate considering weather, terrain and fuel available whilst maintaining reserve (ETA <math>\pm 2</math> minutes)</li> <li>• Maintains minimum height of 500 ft AGL</li> <li>• Uses radio and transponder to request assistance, if applicable</li> <li>• Plans a timely precautionary search and landing if still lost/minimum fuel/darkness.</li> </ul>
C8.7 Perform diversion procedure	<ul style="list-style-type: none"> <li>• Diverts around weather or to an acceptable aerodrome</li> <li>• Revises plan to either destination or alternate considering weather, terrain and fuel available whilst maintaining reserves (ETA <math>\pm 2</math> minutes)</li> <li>• Identifies and plans for CTA, CTR and Prohibited, Restricted and Danger Areas</li> <li>• Selects and maintains most suitable cruising altitude/level (<math>\pm 150</math> ft)</li> <li>• Amends SARWATCH if required</li> <li>• Advises of intention to divert for traffic separation.</li> </ul>
C8.8 Use radio navigation aids	<ul style="list-style-type: none"> <li>• Tunes, identifies and tests all navigation aids before use.</li> <li>• Determines aircraft is within rated coverage of applicable radio navigation aids</li> <li>• Fixes aircraft position and solves aircraft orientation problems using radio navigation aids</li> <li>• Tracks/homes to the ground station</li> <li>• Verifies integrity of GPS signal</li> <li>• Enters and checks waypoint entry into GPS system</li> <li>• Confirms waypoints and fixes from all radio navigation aids with flight plan and identified ground fixes during en route navigation at least once every 60 minutes.</li> </ul>
C8.9 Execute arrival procedures	<ul style="list-style-type: none"> <li>• Obtains aerodrome information from ERS(A), ATIS/ATS and NOTAMs for applicable aerodrome</li> <li>• Obtains and complies with airways clearance requirements or makes broadcasts applicable to the airspace by nominated distance or position in accordance with AIPs</li> <li>• Identifies and avoids all air traffic</li> <li>• Establishes landing direction and airfield serviceability</li> <li>• Enters a circuit at circuit height via published approach points and flies a minimum of three legs of the circuit, except in circumstances when a straight-in approach is acceptable in accordance with AIPs.</li> <li>• Performs a circuit and landing</li> <li>• Cancels SARWATCH</li> <li>• Observes local and published noise abatement requirements and curfews.</li> </ul>

<b>Range of Variables</b>
<ul style="list-style-type: none"><li>• Day VFR</li><li>• Terrain</li><li>• Airspace</li><li>• Simulated weather conditions</li><li>• Simulated abnormal and emergency situations.</li></ul>
<b>Underpinning Knowledge</b>
N/A.

## Unit C9: Manage Flight During Multi-Crew Operations

**Unit Description:** Skills, knowledge and behaviour to plan, direct and control all aspects of a flight in a multi-crew environment as pilot-in-command or crewmember.

Elements	Performance Criteria
C9.1 Operate as a crewmember (Cooperation)	<ul style="list-style-type: none"> <li>• Establishes an atmosphere to encourage open communications.</li> <li>• Listens critically and provides feedback to clarify information.</li> <li>• Applies assertive strategies when working with others.</li> <li>• Presents ideas in a way that shows respect for others.</li> <li>• Conveys information that is appropriate to the receiver.</li> <li>• Considers the condition (capability) of other crewmembers to perform crew duties.</li> <li>• Monitors and appraises crewmember/s' performance.</li> <li>• Interacts with crewmembers in a supportive and constructive way.</li> <li>• Assists other crewmembers in demanding situations.</li> <li>• Motivates and encourages other crewmembers.</li> <li>• Identifies the signs, stages and possible causes of conflict.</li> <li>• Implements strategies to deal with conflict.</li> <li>• Establishes communications that encourage constructive responses to conflict.</li> </ul>
C9.2 Leadership and management	<ul style="list-style-type: none"> <li>• Manages cockpit gradient relative to task.</li> <li>• Ensures that all crewmembers have a clear picture of the objective.</li> <li>• Manages changing priorities and if necessary, re-focus crewmembers to accommodate the changed priorities.</li> <li>• Maintains crewmember/s' commitment to task.</li> <li>• Monitors the crew to ensure that they achieve specified standards of performance.</li> <li>• Corrects individual or crewmembers' deviations from standards.</li> <li>• Clarifies roles and functions.</li> <li>• Establishes and maintains clear, orderly systems.</li> <li>• Sets realistic performance standards.</li> <li>• Monitors outcomes, evaluates and measures performance.</li> <li>• Collects information and identifies key issues and relationships relative to achieving determined roles.</li> <li>• Breaks down goals and establishes courses of action to accomplish specified goals.</li> <li>• Ensures that all crewmembers have role clarity and relevant information to achieve goals.</li> <li>• Allocates sufficient resources and time to complete workload.</li> <li>• Maintains patience and focus when processing large amounts of data or multiple tasks.</li> <li>• Manages time and resources to ensure that work is completed safely and effectively.</li> </ul>

C9.3 Maintain situation awareness during multi-crew operations	<ul style="list-style-type: none"> <li>• Monitors all aircraft systems using a systematic scan technique.</li> <li>• Collects information to facilitate ongoing system management.</li> <li>• Monitors <u>flight environment</u> for deviations from planned operations.</li> <li>• Collects <u>flight environment</u> information to update planned operations.</li> <li>• Reports aircraft systems and <u>flight environment</u> information for analysis.</li> <li>• Analyses aircraft systems and <u>flight environment</u> information to identify actual and potential threats or errors.</li> </ul>
C9.4 Make decisions	<ul style="list-style-type: none"> <li>• Identifies problem's causal factors and reviews these with crewmembers.</li> <li>• Breaks down systematically and logically problems or processes into component parts.</li> <li>• Employs analytical techniques to identify solutions and considers the value and implications of each.</li> <li>• Generates, in the time available, as many solutions as possible amongst crewmembers.</li> <li>• Assesses solutions and risks with other crewmembers.</li> <li>• Decides on a course of action.</li> <li>• Communicates plans of action and directs crewmembers to clearly specified tasks.</li> <li>• Takes actions to achieve optimum outcomes for the operation.</li> <li>• Monitors progress against agreed plan.</li> <li>• Re-evaluates plan in line with changing circumstances and is improvement focused to achieve optimum outcomes.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Day Visual Flight Rules or Instrument Flight Rules.</li> <li>• All flight and ground operations.</li> <li>• Approved simulators.</li> <li>• Variable flight situations.</li> <li>• Simulated problem based scenarios.</li> <li>• Simulated hazardous weather conditions.</li> <li>• Simulated abnormal and emergency situations.</li> <li>• Interaction involving personnel relevant to aviation activities.</li> </ul>	
<b>Underpinning Knowledge</b>	
<ul style="list-style-type: none"> <li>• Explain strategies to maintain situation awareness that ensures the safe operation of a multi-crew aircraft.</li> <li>• All decisions and actions ensure the safe outcome of the flight.</li> <li>• Give examples of physiological and psychological threats to safe flight.</li> </ul>	

### Unit NVFR 3: Operate Aircraft in the Traffic Pattern at Night

**Unit Description:** Skills and knowledge to take-off and land and operate the aircraft safely in the traffic pattern at night.

Elements	Performance Criteria
NVFR 3.1 Taxi at night	<ul style="list-style-type: none"> <li>• Adjusts instrument lighting to provide optimum illumination.</li> <li>• Complies with ATC instructions and safely manoeuvre the aircraft on the ground at night within the approved movement area as defined by aerodrome ground lighting.</li> <li>• Operates aircraft lighting as required.</li> <li>• Confirms function of flight instruments while taxiing.</li> </ul>
NVFR 3.2 Take-off at night	<ul style="list-style-type: none"> <li>• Lines up aircraft up in centre of runway in take-off direction and performs line up checks appropriate to night take-off in accordance with approved checklist.</li> <li>• Executes take-off by reference to flare path/runway lighting and aircraft instruments.</li> <li>• Rotates aircraft at manufacturers recommended speed.</li> <li>• Establishes climb attitude and control aircraft in climb after take-off solely by reference to instruments.</li> <li>• Establishes alignment with runway by visual reference when established on crosswind leg and maintains lookout.</li> <li>• Performs after take-off checks at a safe height.</li> </ul>
NVFR 3.3 Perform circuit and approach at night	<ul style="list-style-type: none"> <li>• Conducts a circuit and approach, controlling the aircraft and maintaining a safe altitude by reference to instruments and positioning aircraft by reference to runway lighting.</li> </ul>
NVFR 3.4 Land at night, with and without the use of aircraft landing lights	<ul style="list-style-type: none"> <li>• Lands aircraft at night with and without landing lights.</li> <li>• Performs after landing checks in accordance with approved checklist.</li> </ul>
NVFR 3.5 Take-off and land at night at an aerodrome remote from ground lighting	<ul style="list-style-type: none"> <li>• Conducts take-off, circuit procedures and lands aircraft at night at an aerodrome remote from any ground lighting which could assist the pilot in maintaining control of the aircraft and uses runway lights for positioning aircraft in circuit.</li> <li>• Confirms aircraft performance and attitude by reference to flight instruments.</li> <li>• Refers to runway lighting to position the aircraft in the circuit and for landing.</li> </ul>
NVFR 3.6 Make baulked approach	<ul style="list-style-type: none"> <li>• Conducts a baulked approach at night from any point on the final approach leg.</li> </ul>

**Range of Variables**

- Visual Flight Rules at night.
- Aircraft fitted with flight instruments including attitude and stabilised heading indicators.
- A method of simulating IMC.
- Suitable aircraft lighting.
- Simulated abnormal or emergency situations.
- Simulated hazardous weather.
- Up to and including light turbulence.

**Underpinning Knowledge**

- Detail normal circuit procedures.
- Explain light signals used in the circuit area at night.
- State the colour and pattern of Permanent Threshold light.
- State the colour and pattern of Runway Threshold Identifications Lights.
- State the colour and pattern of Displaced Threshold lighting.
- State the colour and pattern of Runway Edge Lighting.
- State the colour and pattern of Runway End Lighting.
- State the colour and pattern of Runway Centreline Lighting.
- State the colour and pattern of Obstacle Lighting.
- Describe the method of activating Pilot Activated Aerodrome Lighting (PAL).
- Describe the method of activating Aerodrome Frequency Response Unit (AFRU) with Pilot Activated Aerodrome Lighting (PAL) options.
- State the time that PAL remains illuminated.
- Describe how PAL warns users that the lights are about to extinguish.
- Describe the operations and use of a Visual Approach Slope Indicator (VASI) system.
- Describe the operations and use of a Precision Approach Path Indicator (PAPI) system.
- Identify aerodromes with Standby Power.

## Unit NVFR 6: Management of Emergency Procedures at Night

**Unit Description:** Knowledge and skills to identify abnormal situations at night, perform appropriate actions, manage abnormal situations and select and proceed to the nearest suitable landing area.

Elements	Performance Criteria
NVFR 6.1 Manage engine failure	<ul style="list-style-type: none"> <li>Controls aircraft after engine failure in a single-engine aircraft, performs immediate actions, aircraft is manoeuvred in a safe direction to achieve visual flight and a controlled landing is performed at a suitable landing area.</li> <li>Controls multi-engine aeroplane after failure of an engine, all checks are performed in accordance with the Flight Manual/POH, and if an engine restart is not achieved manages asymmetric flight in accordance with VFR procedures to the nearest suitable aerodrome.</li> </ul> <p><b>Note:</b> Practice of engine failure at night in single and multi-engine aircraft in accordance with Aeronautical Information Publication En Route (AIP ENR) 1.1 paragraph 77.3</p>
NVFR 6.2 Manage radio communication and navigation aid or navigation system failure	<ul style="list-style-type: none"> <li>Identifies radiotelephone and/or navigation aid failure and abnormal procedures are conducted in accordance with Flight Manual/POH, AIP and ERSA emergency procedures</li> </ul>
NVFR 6.3 Manage electrical system failure at night	<ul style="list-style-type: none"> <li>Controls aircraft.</li> <li>Identifies and confirms electrical system failure and performs emergency procedures in accordance with Flight Manual/POH.</li> </ul>
NVFR6.4 Manage electrical /vacuum system failure	<ul style="list-style-type: none"> <li>Identifies and confirms flight instrument electrical or vacuum system failure.</li> <li>Controls aircraft by reference to functioning flight instruments.</li> <li>Performs abnormal procedures in accordance with Flight Manual/POH.</li> </ul>
NVFR6.5 Manage instrument failure	<ul style="list-style-type: none"> <li>Identifies and confirms instrument failure.</li> <li>Controls aircraft by reference to serviceable instruments.</li> <li>Manages failure in accordance with Flight Manual/POH.</li> </ul>
NVFR6.6 Manage hazardous weather conditions	<ul style="list-style-type: none"> <li>Identifies and avoids hazardous weather conditions.</li> <li>Explains procedures for penetration of hazardous weather.</li> </ul>
NVFR6.7 Demonstrate turbulence penetration technique	<ul style="list-style-type: none"> <li>Penetrates turbulence in accordance with Flight Manual/POH procedures.</li> </ul>

<b>Range of Variables</b>
<ul style="list-style-type: none"><li>• Visual Flight Rules at night.</li><li>• Aircraft fitted with flight instruments including attitude and stabilised heading indicators.</li><li>• A method of simulating IMC.</li><li>• Suitable aircraft lighting.</li><li>• Simulated abnormal or emergency situations.</li><li>• Simulated hazardous weather.</li><li>•</li></ul>
<b>Underpinning Knowledge</b>
N/A

## Unit IF 1: Full Instrument Panel Manoeuvres

**Unit Description:** Skills and knowledge to perform all normal flight manoeuvres and recover from unusual attitudes using the full instrument panel.

Elements	Performance Criteria
IF1.1 Determine and monitor serviceability of flight instruments and instrument power sources	<ul style="list-style-type: none"> <li>• Determines serviceability of flight instrument, pilot/static system and instrument power sources in accordance with Flight Manual/POH, before flight.</li> <li>• Performs functional checks of turn, heading and attitude indicators while taxiing.</li> <li>• Monitors flight instrument and instrument power source and reacts appropriately to any warnings, unserviceabilities or erroneous indications.</li> </ul>
IF1.2. Perform manoeuvres using full instrument panel	<ul style="list-style-type: none"> <li>• Interprets and reacts appropriately in the time available to flight instrument indications to achieve and maintain specified flight profiles using <u>full instrument panel</u>.</li> <li>• Sets and maintains power and attitude by reference to <u>full instrument panel</u> to achieve straight and level performance during: <ul style="list-style-type: none"> <li>◦ normal cruise (<math>\pm 100 \text{ ft } \pm 5^\circ \pm 10 \text{ kts}</math> or <math>\pm M.02</math>);</li> <li>◦ in an aeroplane-approach configuration with flap (when fitted) and undercarriage down (<math>\pm 100 \text{ ft } \pm 5^\circ \pm 10 \text{ kts}</math> nominated speed but not below minimum approach speed); or</li> </ul> </li> <li>• Sets and maintains power and attitude by reference to <u>full instrument panel</u> to achieve nominated climb performance (<math>\pm 5^\circ \pm 5 \text{ kts M.01}</math>).</li> <li>• Sets and maintains power and attitude by reference to <u>full instrument panel</u> to achieve nominated descent performance (<math>\pm 5^\circ \pm 10 \text{ kts}</math> or <math>\pm M.02 \pm 150 \text{ feet per minute}</math>).</li> <li>• Sets and maintains power, attitude and bank during climb, descent and straight and level flight by reference to <u>full instrument panel</u> to achieve rate one turns onto a nominated heading (<math>\pm 10^\circ</math> on exit then <math>\pm 5^\circ</math>).</li> <li>• <u>Balances aircraft.</u></li> <li>• <u>Trims aircraft.</u></li> </ul> <p><i>Level aircraft from a climb or descent</i></p> <ul style="list-style-type: none"> <li>• Level aircraft at a nominated altitude (<math>\pm 100 \text{ feet}</math>), from a climb or descent during straight or turning flight.</li> </ul>
IF1.3. Perform steep turns	<ul style="list-style-type: none"> <li>• Sets and maintains power, attitude and bank during level (<math>\pm 150 \text{ feet}</math>) and descending (<math>\pm 10 \text{ kts}</math> or <math>\pm M.02</math>) flight by reference to full instrument panel to achieve a steep turn using a nominated angle of bank between <math>45^\circ</math> and <math>60^\circ</math> (<math>\pm 10^\circ</math>) onto a nominated heading (<math>\pm 10^\circ</math> on exit then <math>\pm 5^\circ</math>).</li> <li>• <u>Balances aircraft.</u></li> </ul>

IF1.4. Recover from unusual attitudes	<ul style="list-style-type: none"> <li>• Identifies uncontrolled flight involving high and low nose attitudes, varying angles of bank and power settings and unbalanced flight and resumes controlled flight by reference to flight instruments using a full instrument panel.</li> <li>• Achieves straight and level attitude without excessive oscillations at the horizon (<math>\pm 250</math> ft of height at which aircraft nose first passed through horizon then <math>\pm 100</math> ft of nominated altitude).</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Single-engine or multi-engine aircraft or approved flight simulators.</li> <li>• Manually flown in multi-crew operations.</li> <li>• Instrument Meteorological Conditions (IMC) or Visual Meteorological Conditions (VMC) with simulated IMC conditions.</li> <li>• Fitted flight instruments suitable for <u>full panel</u> instrument flight.</li> <li>• Up to and including light turbulence.</li> </ul>	
<b>Underpinning Knowledge</b>	
<ul style="list-style-type: none"> <li>• Explain a scan technique appropriate to fitted flight instruments and phase of flight.</li> <li>• State the attitude and power requirements to achieve specified flight profiles.</li> <li>• Recall the instrument failure and warning systems fitted to the aircraft.</li> </ul>	

## Unit IF2: Limited Instrument Panel Manoeuvres

**Unit Description:** Skills and knowledge to perform all normal flight manoeuvres and recover from unusual attitudes using the limited instrument panel during flight under Instrument Flight Rules (IFR) conditions.

Elements	Performance Criteria
IF2.1. Recognise failure of attitude indicator and/or stabilised heading indicator	<ul style="list-style-type: none"> <li>Monitors flight instruments and instrument power sources, recognises warning indicators or erroneous instrument indications and transitions to instrument flight by reference to limited panel flight instruments.</li> </ul>
IF2.2. Perform manoeuvres using limited instrument panel	<ul style="list-style-type: none"> <li>Interprets and reacts appropriately in the time available to flight instrument indications to achieve and maintain specified flight profiles using limited instrument panel.</li> <li>Sets and maintains power and attitude by reference to limited instrument panel to achieve straight and level performance during: <ul style="list-style-type: none"> <li>normal cruise (<math>\pm 200</math> ft <math>\pm 15^\circ</math> <math>\pm 10</math> kts or <math>\pm M.02</math>);</li> <li>in an aeroplane-approach configuration with flap (when fitted) and undercarriage down (<math>\pm 200</math> ft <math>\pm 15^\circ</math> <math>\pm 10</math> kts nominated speed but not below minimum approach speed).</li> </ul> </li> <li>Sets and maintains power and attitude by reference to limited instrument panel to achieve nominated climb performance (<math>\pm 5^\circ</math> <math>\pm 5</math> kts M.01).</li> <li>Sets and maintains power and attitude by reference to limited instrument panel to achieve nominated descent performance (<math>\pm 15^\circ</math> <math>\pm 10</math> kts or <math>\pm M.02</math> <math>\pm 200</math> feet per minute).</li> <li>Sets and maintains power, attitude and bank during climb, descent and straight and level flight by reference to limited instrument panel to achieve rate one turns onto a nominated heading (<math>\pm 20^\circ</math> on exit then <math>\pm 15^\circ</math>).</li> <li><u>Balances aircraft.</u></li> <li><u>Trims aircraft.</u></li> <li>Level aircraft at a nominated altitude (<math>\pm 200</math> feet), from a climb or descent during straight or turning flight.</li> </ul>
IF2.3. Recover from unusual attitudes using limited flight instrument panel	<ul style="list-style-type: none"> <li>Identifies uncontrolled flight involving high and low nose attitudes, varying angles of bank and power settings and unbalanced flight and resumes controlled flight by reference to flight instruments using a limited instrument panel.</li> <li>Achieves straight and level attitude without excessive oscillations at the horizon (<math>\pm 300</math> ft of height at which aircraft nose first passed through horizon then <math>\pm 200</math> ft of nominated altitude).</li> </ul>

<b>Range of Variables</b>
<ul style="list-style-type: none"><li>• Single-engine or multi-engine aircraft or approved flight simulators.</li><li>• Manually flown in multi-crew operations.</li><li>• IMC or VMC with simulated IMC conditions.</li><li>• Fitted flight instruments suitable for limited panel instrument flight.</li><li>• Up to and including light turbulence.</li><li>• During unusual attitude recovery, straight and level flight is achieved when there are no excessive oscillations at the horizon.</li></ul>
<b>Underpinning Knowledge</b>
<ul style="list-style-type: none"><li>• Explain a scan technique appropriate to fitted flight instruments and phase of flight (without attitude or stabilised heading indicators).</li><li>• Recall the performance instrument indications and power requirements to achieve specified flight profiles.</li><li>• State the anti icing and de icing controls/switches fitted to the aircraft type, and when these systems should be operated.</li><li>• Recall the instrument failure and warning systems fitted to the aircraft.</li></ul>

## Unit IF 3: Management and Operational and Fuel Planning

**Unit Description:** Knowledge and skills to plan and make flight notification for an IFR flight using all applicable current operational documents, after obtaining and applying pre-flight briefing information and allowing for operational requirements.

Elements	Performance Criteria
IF3.1 Possess and use current operational documents	<ul style="list-style-type: none"> <li>Ensures all current operational documents applicable to the flight are in the pilot's possession and used for flight planning and management.</li> <li>Possesses a complete set of approved operational documents that are applicable to the flight.</li> <li>Ascertaines currency of operational documents.</li> <li>Stows all documents required for the flight and ensure accessibility to the pilot during flight.</li> <li>Interprets and applies applicable information contained in documents for flight planning and management.</li> </ul>
IF3.2 Obtain meteorological and NOTAM pre-flight briefing	<ul style="list-style-type: none"> <li>Obtains, interprets and applies meteorological, airways facilities, aerodrome and NOTAM information applicable to the flight for planning and conduct of a flight.</li> </ul>
IF3.3 Plan flight	<ul style="list-style-type: none"> <li>Selects and prepares charts suitable for intended flight.</li> <li>Obtains, analyses and applies applicable information is to prepare a flight plan which details tracks, distances, times, altitudes to be flown and fuel requirements to reach destination in accordance with the IFR requirements.</li> <li>Selects and prepares charts suitable for intended flight.</li> <li>Plans route to optimise options in the event of an engine failure.</li> </ul>
IF3.4 Determine operational and fuel requirements	<ul style="list-style-type: none"> <li>Determines duration of flight.</li> <li>Determines alternate, holding and fuel reserve requirement by applying operational requirements due to weather, navigation aid availability and aerodrome lighting in accordance with regulations.</li> <li>Calculates total fuel required in accordance with regulations and Flight Manual/POH.</li> </ul>
IF3.5 Make flight notification	<ul style="list-style-type: none"> <li>Submits completed flight plan to and ensures acceptance by National Aeronautical Information Processing System (NAIPS) at a time adequate to ensure processing of flight plan or at least 30 minutes before flight.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>Approved single-engine or multi-engine aircraft or synthetic training device.</li> <li>IMC or VMC with simulated IMC conditions.</li> <li>Fitted flight instruments suitable for instrument flight.</li> <li>A method of simulating IMC.</li> <li>Autopilot/flight management system (FMS).</li> <li>Simulated icing conditions.</li> <li>Simulated hazardous weather.</li> <li>Up to and including light turbulence.</li> <li>Aircraft performance.</li> </ul>	
<b>Underpinning Knowledge</b>	
<ul style="list-style-type: none"> <li>Explain how a pilot may determine the currency of operational documents.</li> </ul>	

## Unit IF4: Management of Pre- and Post-Flight Actions

**Unit Description:** Knowledge and skills to determine aircraft equipment suitability for IFR flight, perform and certify daily inspection, conduct serviceability test of flight and radio navigation instruments before flight and complete post flight actions.

Elements	Performance Criteria
IF4.1 Determine if aircraft meets requirements for IFR flight	<ul style="list-style-type: none"> <li>Determines that aircraft is equipped for flight in accordance with Instrument Flight Rules and ensure that the flight and navigation instruments, minimum electrical lighting equipment, navigation equipment and any other requirements are fitted to the aircraft and are suitable and acceptable for IFR flight in accordance with regulations.</li> </ul>
IF4.2 Conduct daily inspection	<ul style="list-style-type: none"> <li>Performs a daily inspection of aircraft in accordance with aircraft system of maintenance approved by CASA and certified in accordance with regulations.</li> </ul>
IF4.3 Conduct pre-flight serviceability test of flight and radio navigation instruments	<ul style="list-style-type: none"> <li>Inspects flight instruments and radio navigation aids and confirms serviceable for IFR flight.</li> </ul>
IF4.4 Complete post flight actions	<ul style="list-style-type: none"> <li>Ensures SARWATCH is terminated.</li> <li>Certifies Maintenance Release (Flight Technical Log) if required.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>Approved single-engine or multi-engine aircraft or synthetic training device.</li> <li>IMC or VMC with simulated IMC conditions.</li> <li>Fitted flight instruments suitable for instrument flight.</li> <li>A method of simulating IMC.</li> <li>Autopilot/FMS.</li> <li>Simulated icing conditions.</li> <li>Simulated hazardous weather.</li> <li>Up to and including light turbulence.</li> <li>Aircraft performance.</li> </ul>	
<b>Underpinning Knowledge</b>	
N/A	

## Unit IF5: Compliance with Air Traffic Rules and Procedures

**Unit Description:** Knowledge and skills to communicate and comply with Air Traffic Services (ATS) instructions maintain separation with other air traffic and manage airspace procedures.

Elements	Performance Criteria
IF5.1 Obtain and comply with airspace clearances	<ul style="list-style-type: none"> <li>Obtains air traffic clearances when applicable, prior to entry into the airspace and complies with clearances while operating in that airspace.</li> </ul>
IF5.2 Maintain separation from other traffic	<ul style="list-style-type: none"> <li>Maintains separation from other air traffic in IMC/simulated IMC and during visual approach and departure in accordance with IFR.</li> </ul>
IF5.3 Communicate using radio	<ul style="list-style-type: none"> <li>Maintains two-way communication with ATS and other aircraft in accordance with IFR procedures.</li> </ul>
IF5.4 Use transponder	<ul style="list-style-type: none"> <li>Operates and monitors transponder in accordance with AIP during normal and emergency operations.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>Approved single-engine or multi-engine aircraft or synthetic training device.</li> <li>IMC or VMC with simulated IMC conditions.</li> <li>Fitted flight instruments suitable for instrument flight.</li> <li>Navigation and approach aids appropriate to rating sought.</li> <li>A method of simulating IMC.</li> <li>Autopilot/FMS.</li> <li>Simulated icing conditions.</li> <li>Simulated hazardous weather.</li> <li>Up to and including light turbulence.</li> <li>Aircraft performance.</li> </ul>	
<b>Underpinning Knowledge</b>	
<ul style="list-style-type: none"> <li>For underpinning knowledge applicable to compliance with ATC rules and procedures refer to Units IF 10, 11 and 12 of the instrument rating knowledge requirements in this CAAP.</li> </ul>	

## Unit IF6: Management of Emergency Procedures

**Unit Description:** Skills and knowledge to control the aircraft in IMC, identify abnormal situations, perform appropriate actions, manage abnormal situations and select and proceed to the nearest suitable landing area.

Elements	Performance Criteria
IF6.1 Manage engine failure	<ul style="list-style-type: none"> <li>Controls aeroplane by reference to flight instruments, performs all checks in accordance with Flight Manual/POH for engine failure, manoeuvres in a safe direction to achieve visual flight and performs a controlled landing at a suitable landing area to achieve the safest outcome.</li> <li>Controls multi-engine aeroplane by reference to flight instruments after failure of an engine, performs all checks in accordance with the Flight Manual/POH, Company Operations Manual, and if an engine restart is not achieved, performs asymmetric flight in accordance with IFR procedures to the nearest suitable aerodrome.</li> </ul>
IF6.2 Manage radio communication and navigation aid or navigation system failure	<ul style="list-style-type: none"> <li>Identifies radiotelephone and/or navigation aid failure and performs abnormal procedures in accordance with Flight Manual/POH and Company Operations Manual.</li> <li>Performs AIP and ERSA emergency flight procedures during IFR flight when applicable.</li> </ul>
IF6.3 Manage electrical /vacuum system failure	<ul style="list-style-type: none"> <li>Identifies and confirms flight instrument electrical or vacuum system failure.</li> <li>Controls aircraft by reference to functioning flight instruments.</li> <li>Performs abnormal procedures for flight instrument electrical or vacuum system failure in accordance with Flight Manual/POH.</li> </ul>
IF6.4 Manage instrument failure	<ul style="list-style-type: none"> <li>Identifies and confirms instrument failure.</li> <li>Controls aircraft by reference to serviceable instruments.</li> <li>Manages failure in accordance with Flight Manual/POH.</li> </ul>
IF6.5 Manage hazardous weather conditions	<ul style="list-style-type: none"> <li>Identifies and avoids hazardous weather conditions.</li> <li>Demonstrates and/or explains procedures for penetration of hazardous weather.</li> </ul>
IF6.6 Demonstrate turbulence penetration technique	<ul style="list-style-type: none"> <li>Configures aircraft to comply with turbulence penetration procedures in accordance with Flight Manual/POH.</li> <li>Ensures passenger and crew are restrained in accordance with regulations.</li> <li>Explains and demonstrates procedures for penetrating turbulence.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>Approved single-engine or multi-engine aircraft or synthetic training device.</li> <li>IMC or VMC with simulated IMC conditions.</li> <li>Fitted flight instruments suitable for instrument flight.</li> <li>Navigation and approach aids appropriate to rating sought.</li> <li>A method of simulating IMC.</li> <li>Autopilot/FMS.</li> <li>Simulation of emergency and abnormal procedures.</li> <li>Simulated icing conditions.</li> <li>Simulated hazardous weather.</li> <li>Up to and including light turbulence.</li> <li>Aircraft performance.</li> </ul>	
<b>Underpinning Knowledge</b>	
<ul style="list-style-type: none"> <li>Explain the operational requirements for an aircraft with one engine inoperative.</li> </ul>	

## Unit IF7: Task Management

**Unit Description:** Knowledge and skills to organise documentation and equipment in the cockpit for IFR flight, prioritise and manage flight tasks, navigation and passengers, and when fitted use autopilot in IMC/simulated IMC.

Elements	Performance Criteria
IF7.1 Prioritise tasks	<ul style="list-style-type: none"> <li>Organises flight, navigation, communication and passenger management tasks and sets priorities to ensure that the workload at any phase of flight, allows, in the time available, the pilot to safely manage the flight.</li> </ul>
IF7.2 Use autopilot	<ul style="list-style-type: none"> <li>Engages autopilot and Flight Director System (FDS) to assist flight and navigation tasks when available.</li> <li>Ensures inputs to autopilot are appropriate to the navigation and control requirements of the flight.</li> <li>Monitors autopilot to ensure operation complies with requirements.</li> <li>Disengages autopilot before reverting to manual control of aircraft.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>Approved single-engine or multi-engine aircraft or synthetic training device.</li> <li>IMC or VMC with simulated IMC conditions.</li> <li>Fitted flight instruments suitable for instrument flight.</li> <li>Navigation and approach aids appropriate to rating sought.</li> <li>A method of simulating IMC.</li> <li>Autopilot/FMS.</li> <li>Simulated icing conditions.</li> <li>Simulated hazardous weather.</li> <li>Up to and including light turbulence.</li> <li>Aircraft performance.</li> </ul>	
<b>Underpinning Knowledge</b>	
N/A	

## Unit IF8: Operate the Aircraft at Night During IFR

**Unit Description:** Skills and knowledge to take-off and land and operate the aircraft safely at night under IFR.

Elements	Performance Criteria
IF8.1 Make visual approach under the IFR at night.	<ul style="list-style-type: none"> <li>Descends from cruising altitude/level to not below LSALT, and maintains track until within the circling area of destination aerodrome, with the aerodrome in sight in accordance with instructions in AIP.</li> <li>Descends to circuit height, within the circling area by reference to runway lighting</li> </ul>
IF8.2 Activate PAL lighting.	<ul style="list-style-type: none"> <li>Selects appropriate radiotelephone frequency and activates PAL system when within radio range.</li> <li>Monitors wind indicator lighting to determine end of activation period.</li> </ul>
IF8.3 Take-off and land at night at an aerodrome remote from ground lighting.	<ul style="list-style-type: none"> <li>Performs take-off, circuit procedures and land aircraft at night at an aerodrome remote from any ground lighting which could assist the pilot in maintaining control of the aircraft, using runway lights for positioning aircraft in circuit.</li> <li>Positions the aircraft in the circuit and for landing using runway lighting.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>Approved single-engine or multi-engine aircraft or synthetic training device.</li> <li>IMC or VMC with simulated IMC conditions at night.</li> <li>Fitted flight instruments suitable for instrument flight.</li> <li>Navigation and approach aids appropriate to rating sought.</li> <li>Simulation of emergency and abnormal procedures.</li> <li>Simulated hazardous weather.</li> </ul>	
<b>Underpinning Knowledge</b>	
N/A	

## Unit IF9: Visual Circling Approach

**Unit Description:** Knowledge and skills to determine the visual circling minima for the specified instrument approach and to manoeuvre an aircraft from the minimum descent altitude (MDA) while maintaining ceiling and visibility minima appropriate to circling and visual contact with the landing runway environment, staying within the circling area specified for the aircraft category and remaining at or above the MDA until interception of a position on downwind, base or final leg from which a continuous descent with visual reference to the runway, clear of obstacles may be completed to the runway threshold and land or conduct missed approach.

Elements	Performance Criteria
IF9.1 Determine minima applicable for visual circling for specified instrument approach	<ul style="list-style-type: none"> <li>Determines ceiling and visibility minima for a circling approach appropriate for the instrument approach procedure and category of aircraft being used by reference to applicable instrument approach charts.</li> </ul>
IF9.2 Conduct visual circling procedure following instrument approach, using appropriate visual cues	<ul style="list-style-type: none"> <li><u>Reviews and briefs</u> the circling procedure including: <ul style="list-style-type: none"> <li>position of the runway relative to the aircraft as it will appear to the pilot when approaching minima: and</li> <li>a plan of a circling procedure which maintains obstacle clearance in the circling area.</li> </ul> </li> <li>Manoeuvres an aircraft from the MDA while maintaining ceiling and visibility minima appropriate to circling, and visual contact with the landing runway environment.</li> <li>Maintains aircraft within the circling area specified for the aircraft category.</li> <li>Remains at or above the MDA until interception of a position on downwind, base or final leg from which a continuous descent with visual reference to the runway, clear of obstacles may be completed to the runway threshold.</li> <li>Controls aircraft and maintains altitude limitations by reference to instruments and uses visual cues only for positioning aircraft on approach.</li> </ul>
IF9.3 Conduct missed approach from visual circling	<ul style="list-style-type: none"> <li>Recognises the conditions requiring a missed approach to be initiated.</li> <li>Manoeuvres aircraft to MAPT and conduct a missed approach procedure as detailed on the applicable instrument approach chart.</li> <li>Maintains obstacle clearance in IMC/simulated IMC in accordance with the IFR.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>Approved single-engine or multi-engine aircraft or synthetic training device.</li> <li>IMC or VMC with simulated IMC conditions.</li> <li>Fitted flight instruments suitable for instrument flight.</li> <li>Navigation and approach aids appropriate to rating sought.</li> <li>A method of simulating IMC.</li> <li>Autopilot/FMS.</li> <li>Simulated icing conditions.</li> <li>Simulated hazardous weather.</li> <li>Up to and including light turbulence</li> <li>Aircraft performance.</li> </ul>	
<b>Underpinning Knowledge</b>	
<ul style="list-style-type: none"> <li>State the conditions under which a circling approach must be discontinued and a missed approach initiated.</li> <li>Determine the circling area applicable to the category of aircraft being flown.</li> <li>State when an aircraft may descend below the MDA (day and night).</li> <li>Explain the procedure to conduct a missed approach from any nominated point within a circling area on a specified approach.</li> </ul>	

## Unit IF10: Non-directional Radio Beacon (NDB) Instrument Approach

**Unit Description:** Knowledge and skills to conduct an instrument approach using the non-directional radio beacon (NDB) approach procedure beginning with a descent from a route minimum sector altitude (MSA) or LSALT in compliance with any altitude restrictions on a prescribed track, to the MDA applicable to the aircraft category whilst maintaining obstacle clearance in accordance with instructions in AIP and conducting a published missed approach if visual reference is not achieved by the missed approach point (MAPT) specified for the procedure.

Elements	Performance Criteria
IF10.1 Select approach and determine applicable minima	<ul style="list-style-type: none"> <li>• Selects the current IAL chart for the NDB approach to be flown.</li> <li>• <u>Reviews and briefs:</u> <ul style="list-style-type: none"> <li>◦ whether entry to the approach will be direct or via the holding pattern;</li> <li>◦ minimum altitude (LSALT or MSA) prior to approach entry;</li> <li>◦ tracks, distances, timing and descent limitations for the approach;</li> <li>◦ the approach minima for the aircraft performance category and runway to be used;</li> <li>◦ the conduct of visual circling if required;</li> <li>◦ the missed approach procedure;</li> <li>◦ the holding or diversion action required if visual reference is not established; and</li> <li>◦ fuel availability and latest divert time if required.</li> </ul> </li> </ul>
IF10.2 Monitor aid signal integrity	<ul style="list-style-type: none"> <li>• Tunes and identifies the NDB to be used for the selected approach and monitors the Morse code identification and automatic direction finding equipment (ADF) indications throughout the approach to ensure signal integrity.</li> </ul>
IF10.3 Determine position in relation to navigation aids	<ul style="list-style-type: none"> <li>• Fixes position of the aircraft in relation to the navigation aid using overhead passage or two or more bearings.</li> </ul>
IF10.4 Conduct initial approach	<ul style="list-style-type: none"> <li>• Ensures altimeter is set to the appropriate QNH (altimeter sub-scale setting to obtain elevation or altitude) and conducts the initial approach from a distance of at least 25 nm from the NDB, maintaining the inbound track (<math>\pm 5^\circ</math>) at or above route MSA or LSALT (<math>\pm 100</math> feet <math>\pm 10</math> kts) in accordance with instructions in AIP, using the NDB.</li> </ul>
IF10.5 Conduct holding pattern	<ul style="list-style-type: none"> <li>• Enters the holding pattern at or above LSALT or MSA (<math>\pm 100</math> feet) in accordance with the specified sector entry and performs a holding pattern in accordance with instructions in AIP, using the NDB.</li> </ul>
IF10.6 Conduct instrument approach procedure	<ul style="list-style-type: none"> <li>• Conducts an instrument approach, descending on a specified track (not before <math>\pm 5^\circ</math> of nominated track), complying with any altitude restrictions to not below the MDA (+100 –0 feet) within the tolerances specified in regulations, using the NDB.</li> <li>• Identifies the landing runway and conducts visual circling or runway approach for a landing on the selected runway after establishing visual reference.</li> </ul>
IF10.7 Conduct missed approach procedure	<ul style="list-style-type: none"> <li>• Commences the published missed approach procedure if visual reference is not established before reaching the MAPT, or if any other event specified in AIP requiring the conduct of a missed approach occurs.</li> <li>• Initiates missed approach if operation of the NDB or ADF becomes suspect.</li> <li>• Conducts the missed approach procedure by tracking to the MAPT (<math>\pm 5^\circ</math>) and complying with the published missed approach procedure specified on the IAL chart.</li> </ul>

<b>Range of Variables</b>
<ul style="list-style-type: none"><li>• Approved single-engine or multi-engine aircraft or synthetic training device.</li><li>• IMC or VMC with simulated IMC conditions.</li><li>• Fitted flight instruments suitable for instrument flight.</li><li>• Navigation and approach aids appropriate to rating sought.</li><li>• A method of simulating IMC.</li><li>• Autopilot/FMS.</li><li>• Simulation of emergency and abnormal procedures.</li><li>• Simulated hazardous weather.</li></ul>
<b>Underpinning Knowledge</b>
N/A

## Unit IF11: VHF Omni-directional Radio Range (VOR) Instrument Approach

**Unit Description:** Knowledge and skills to conduct an instrument approach using the VOR approach procedure beginning with a descent from a route MSA or LSALT in compliance with any altitude restrictions on a prescribed track, to the MDA applicable to the aircraft category whilst maintaining obstacle clearance in accordance with instructions in AIP and conducting a published missed approach if visual reference is not achieved by the MAPT for the procedure.

Elements	Performance Criteria
IF11.1 Select approach and determine applicable minima	<ul style="list-style-type: none"> <li>• Selects the current IAL chart for the VOR approach to be flown.</li> <li>• <u>Reviews and briefs:</u> <ul style="list-style-type: none"> <li>◦ whether entry to the approach will be direct or via the holding pattern;</li> <li>◦ minimum altitude (LSALT or MSA) prior to approach entry;</li> <li>◦ tracks, distances, timing and descent limitations for the approach;</li> <li>◦ the approach minima for the aircraft performance category and runway to be used;</li> <li>◦ the conduct of visual circling if required;</li> <li>◦ the missed approach procedure;</li> <li>◦ the holding or diversion action required if visual reference is not established; and</li> <li>◦ fuel availability and latest divert time if required.</li> </ul> </li> </ul>
IF11.2 Monitor aid signal integrity	<ul style="list-style-type: none"> <li>• Tunes and identifies the VOR to be used for the selected approach and monitors the warning flags and CDI indications throughout the approach to ensure signal integrity.</li> <li>• Monitors the VOR signal to ensure correct aid function.</li> </ul>
IF11.3 Determine position in relation to navigation aid	<ul style="list-style-type: none"> <li>• Fixes position of the aircraft in relation to the navigation aid using overhead passage or two or more bearings.</li> </ul>
IF11.4 Conduct initial approach	<ul style="list-style-type: none"> <li>• Ensures altimeter is set to the appropriate QNH and conduct the initial approach from a distance of at least 25 nm from the VOR, maintaining the inbound track at or above route MSA or LSALT in accordance with instructions in AIP, using the VOR.</li> </ul>
IF11.5 Conduct holding pattern	<ul style="list-style-type: none"> <li>• Enters the holding pattern at or above LSALT or MSA in accordance with the specified sector entry and perform a holding pattern in accordance with instructions in AIP, using the VOR.</li> </ul>
IF11.6 Conduct approach procedure	<ul style="list-style-type: none"> <li>• Conducts an instrument approach, descending on a specified track (not before <math>\pm 1/2</math> scale CDI); complying with any altitude restrictions to not below the MDA within the tolerances specified in AIP, using the VOR, including: <ul style="list-style-type: none"> <li>◦ maintaining track (<math>\pm 1/2</math> scale CDI); and</li> <li>◦ avoiding rates of descent in excess of 1000 fpm on final approach.</li> </ul> </li> <li>• Identifies the landing runway and conducts visual circling or runway approach for a landing on the selected runway after establishing visual reference.</li> </ul>
IF11.7 Conduct missed approach procedure	<ul style="list-style-type: none"> <li>• Commences the published missed approach procedure if visual reference is not established before reaching the MAPT, or if any other event specified in AIP requiring the conduct of a missed approach occurs.</li> <li>• Initiates missed approach if operation of the VOR aid or VOR indicator becomes suspect.</li> <li>• Conducts the missed approach procedure by tracking to the MAPT and complying with the published missed approach procedure specified on the IAL chart.</li> </ul>

Elements	Performance Criteria
IF11.8 Conduct missed approach from visual circling	<ul style="list-style-type: none"> <li>• Recognises the conditions requiring a missed approach to be initiated.</li> <li>• Manoeuvres aircraft to MAPT and conducts a missed approach procedure as detailed on the applicable instrument approach chart.</li> <li>• Maintains obstacle clearance in IMC/simulated IMC in accordance with the IFR.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Approved single-engine or multi-engine aircraft or synthetic training device.</li> <li>• Single-pilot or multi-crew.</li> <li>• IMC or VMC with simulated IMC conditions.</li> <li>• Fitted flight instruments suitable for instrument flight.</li> <li>• Navigation and approach aids appropriate to rating sought.</li> <li>• A method of simulating IMC.</li> <li>• Autopilot/FMS.</li> <li>• Simulation of emergency and abnormal procedures.</li> <li>• Simulated icing conditions.</li> <li>• Simulated hazardous weather.</li> </ul>	
<b>Underpinning Knowledge</b>	
N/A	

## Unit IF12: Navigation Using Global Positioning System (GPS)

**Unit Description:** Knowledge and skills to navigate the aircraft by reference to Global Positioning System in IMC in compliance with IFR.

Elements	Performance Criteria
IF12.1 Check GPS receiver operation	<ul style="list-style-type: none"> <li>Confirms operation, settings and indications of receiver including navigation data base currency, signal integrity by accessing appropriate GPS receiver operational modes.</li> </ul>
IF12.2 Enter, retrieve, edit, delete and activate flight plan and waypoints	<ul style="list-style-type: none"> <li>Applies GPS computer functions required to enter, retrieve, edit, delete and activate flight plan and way point information in a GPS.</li> </ul>
IF12.3 Determine position and other relevant navigational information from GPS	<ul style="list-style-type: none"> <li>Interprets the GPS to determine aircraft position and to extract navigation information including estimated time of arrival (ETA), estimated time interval (ETI), ground speed (G/S) and wind velocity (W/V) relevant to the flight.</li> </ul>
IF12.4 Intercept and maintain desired track to selected WPT	<ul style="list-style-type: none"> <li>Uses appropriate function selections for next waypoint.</li> <li>Intercepts and maintains desired track to selected waypoint (WPT) in accordance with tolerances specified in AIP, using the GPS.</li> </ul>
IF12.5 Diversion	<ul style="list-style-type: none"> <li>Diverts from flight planned route and tracks to selected WPT.</li> </ul>
IF12.6 Conduct confidence checks of GPS navigational information	<ul style="list-style-type: none"> <li>Performs GPS confidence checks in accordance with GPS operator's manual.</li> <li>Confirms GPS flight plan track and distances against information shown on current charts and checks GPS position information using any data available from other sources.</li> </ul>
IF12.7 Monitor integrity of GPS navigation	<ul style="list-style-type: none"> <li>Monitors integrity of GPS navigation by reference to Receiver Autonomous Integrity Monitoring (RAIM), recognising the RAIM warnings and messages and takes appropriate action.</li> </ul>
IF12.8 Respond to GPS messages	<ul style="list-style-type: none"> <li>Interprets displayed messages on GPS and reacts appropriately.</li> <li>Retrieves GPS messages as required.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>Visual Flight Rules and instrument flight rules day and night in variable weather conditions.</li> <li>Approved aircraft fitted with flight instruments including attitude and stabilised heading indicators.</li> <li>A method of simulating IMC.</li> <li>Autopilot.</li> <li>Flight Director System.</li> <li>Flight Management system.</li> </ul>	
<b>Underpinning Knowledge</b>	
N/A	

## Unit IF13: GPS/Non-precision Approach

**Unit Description:** Skills and knowledge to conduct a GPS/NPA (non-precision approach) instrument approach from route LSALT, entering the GPS/NPA approach procedure in compliance with any altitude restrictions, tracking via the specified approach way point (WPT), descending in accordance with specified altitude limitations to a straight in or circling MDA, and perform a straight-in or circling approach or conduct a published missed approach if visual reference is not established by the MAPT, using the GPS.

Elements	Performance Criteria
IF13.1 Select approach and determine applicable minima	<ul style="list-style-type: none"> <li>• Selects the current instrument approach (IAL) chart for the GPS/NPA approach to be flown and reviews and briefs the entry to, and conduct of, the instrument approach and missed approach procedure.</li> <li>• Confirms GPS receiver database is current.</li> <li>• Determines the applicable meteorological minima for the approach for the aircraft performance category.</li> <li>• Reviews and brief fuel availability and holding or diversion action required if visual reference is not established.</li> </ul>
IF13.2 Select, retrieve and activate approach from database	<ul style="list-style-type: none"> <li>• Selects the GPS approach for the appropriate runway from the GPS receiver navigation database.</li> <li>• Selects the initial approach fix to be used to transition to the approach procedure, enters the aerodrome QNH in the GPS receiver, and activates the approach.</li> <li>• Performs a confidence check of tracks and distances between the approach WPTs as calculated by the GPS receiver.</li> <li>• Checks course direction indicator (CDI) is selected to GPS as applicable.</li> </ul>
IF13.3 Monitor GPS signal integrity	<ul style="list-style-type: none"> <li>• Checks RAIM availability for the approach and monitors RAIM indications throughout the approach.</li> </ul>
IF13.4 Determine position in relation to navigation aids	<ul style="list-style-type: none"> <li>• Fixes position of the aircraft in relation to the navigation aid using overhead passage or two or more bearings.</li> </ul>
IF13.5 Conduct initial approach	<ul style="list-style-type: none"> <li>• Sets the altimeter to the aerodrome QNH and conducts the initial approach from a distance of at least 25 nm from the GPS/NPA MAPT, maintaining track to the initial approach WPT at or above route MSA or LSALT.</li> </ul>
IF13.6 Conduct holding pattern	<ul style="list-style-type: none"> <li>• Suspends automatic sequencing of the GPS and enters the published holding pattern at the appropriate initial approach WPT using the prescribed sector entry procedure.</li> <li>• Conducts the published holding pattern and resumes automatic sequencing to continue the approach.</li> </ul>
IF13.7 Conduct approach procedure	<ul style="list-style-type: none"> <li>• Conducts the GPS/NPA instrument approach, descending on the specified track to each approach WPT while complying with approach altitude restrictions.</li> <li>• Confirms that the GPS receiver transitions to approach mode no later than the final approach point (FAP) WPT or discontinues approach.</li> <li>• Continues descent to not below the MDA while tracking to the missed approach point (MAPT) WPT within the tolerances specified in AIP.</li> <li>• Identifies the landing runway and conducts straight-in runway approach or visual circling for a landing on the selected runway after establishing visual reference.</li> </ul>

Elements	Performance Criteria
IF13.8 Conduct missed approach procedure	<ul style="list-style-type: none"> <li>• Commences the published missed approach procedure if visual reference is not established before reaching the MAPT or RAIM is lost, or any other event specified in AIP or in the GPS operations manual as requiring conduct of a missed approach occurs.</li> <li>• Conducts the missed approach procedure by tracking to the MAPT, selecting missed approach mode and complying with the published missed approach procedure and tracking to the MAP Holding WPT.</li> <li>• Configures GPS receiver to conduct another approach or to hold or divert as required.</li> </ul>
IF13.9 Conduct missed approach from visual circling	<ul style="list-style-type: none"> <li>• Recognises the conditions requiring a missed approach to be initiated.</li> <li>• Manoeuvres aircraft to MAPT and conducts a missed approach procedure as detailed on the applicable instrument approach chart.</li> <li>• Maintains obstacle clearance in IMC/simulated IMC in accordance with the IFR.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Approved single-engine or multi-engine aircraft or synthetic training device.</li> <li>• Single-pilot or multi-crew.</li> <li>• IMC or VMC with simulated IMC conditions.</li> <li>• Fitted flight instruments suitable for instrument flight.</li> <li>• Navigation and approach aids appropriate to rating sought</li> <li>• A method of simulating IMC.</li> <li>• Autopilot/FMS.</li> <li>• Simulation of emergency and abnormal procedures.</li> <li>• Simulated icing conditions.</li> <li>• Simulated hazardous weather.</li> </ul>	
<b>Underpinning Knowledge</b>	
N/A	

**Unit IF14: Global Positioning System/Non-Precision Approach (GPS/NPA)  
Approach with Vertical Guidance (APV) (Reserved)**

## Unit IF15: ILS Instrument Approach

**Unit Description:** Knowledge and skills to conduct an instrument approach using the instrument landing system (ILS) approach procedure, beginning with a descent from a route MSA or LSALT in compliance with any altitude restrictions to intercept track on the localiser (LLZ) using marker beacons or DME to fix position on the LLZ track, descending by reference to the G/S to the decision altitude (DA) and land or conduct a published missed approach if visual reference is not established by DA or decision height (DH).

Elements	Performance Criteria
IF15.1 Select approach and determine applicable minima	<ul style="list-style-type: none"> <li>• Selects the current IAL chart for the ILS approach to be flown and plans the transition to, and conduct of, the instrument approach and missed approach procedure.</li> <li>• Determines the DA or DH.</li> <li>• <u>Reviews and briefs:</u> <ul style="list-style-type: none"> <li>◦ whether entry to the approach will be direct or via the holding pattern;</li> <li>◦ minimum altitude (LSALT or MSA) prior to approach entry;</li> <li>◦ tracks, distances, timing and descent limitations for the approach;</li> <li>◦ the applicable approach minima for the aircraft performance category and runway to be used;</li> <li>◦ the application of pressure error correction to DA if required;</li> <li>◦ the conduct of visual circling if required;</li> <li>◦ the missed approach procedure;</li> <li>◦ the holding or diversion action required if visual reference is not established; and</li> <li>◦ fuel availability and latest divert time if required.</li> </ul> </li> </ul>
IF15.2 Monitor aid signal integrity	<ul style="list-style-type: none"> <li>• Tunes and identifies the LLZ to be used for the selected approach and monitors the warning flags and CDI indications for both LLZ and glide slope throughout the approach to ensure signal integrity.</li> <li>• Tunes and identifies locator beacon used for initial approach fix.</li> <li>• Tests marker beacon operation and monitors visual and aural indications during approach.</li> <li>• Tunes and identifies DME and monitors distance indications during approach.</li> </ul>
IF15.3 Conduct initial approach	<ul style="list-style-type: none"> <li>• Sets the altimeter to the aerodrome QNH and tracks to the initial approach fix using appropriate tracking aids or radar vectors at or above route MSA or LSALT to intercept the LLZ track.</li> </ul>
IF15.4 Conduct holding pattern	<ul style="list-style-type: none"> <li>• Enters the holding pattern at or above LSALT or MSA in accordance with the specified sector entry and perform a holding pattern in accordance with instructions in AIP, using the LLZ and the other navigation aid used to identify the holding fix.</li> </ul>
IF15.5 Conduct approach procedure	<ul style="list-style-type: none"> <li>• Conducts an ILS approach from the initial approach fix, tracking by reference to the LLZ, descending on the glide slope and using marker beacons or distance measuring equipment (DME) to provide distance indications.</li> <li>• Performs at least one specified altitude check on glide slope and adjusts DA if necessary.</li> <li>• Continues descent on glide slope to the DA as applicable within the tolerances specified in AIP including: <ul style="list-style-type: none"> <li>◦ <math>\pm\frac{1}{2}</math> scale deflection for track and glide slope; able to land from minima without undue manoeuvring; and</li> <li>◦ Identifies the landing runway and conducts straight in runway approach or visual circling for a landing on another runway after establishing visual reference.</li> </ul> </li> </ul>

Elements	Performance Criteria
IF15.6 Conduct missed approach procedure	<ul style="list-style-type: none"> <li>• Commences the published missed approach procedure if visual reference is not established at the DA, or when any other event specified in AIP requiring the conduct of a missed approach occurs.</li> <li>• Conducts the missed approach procedure by tracking to the MAPT and complying with the published missed approach procedure specified on the IAL chart.</li> </ul>
IF15.7 Conduct missed approach from visual circling	<ul style="list-style-type: none"> <li>• Recognises the conditions requiring a missed approach to be initiated.</li> <li>• Manoeuvres aircraft to MAPT and conducts a missed approach procedure as detailed on the applicable instrument approach chart.</li> <li>• Maintains obstacle clearance in IMC/simulated IMC in accordance with the IFR.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Approved single-engine or multi-engine aircraft or flight simulator.</li> <li>• Single-pilot or multi-crew.</li> <li>• IMC or VMC with simulated IMC conditions.</li> <li>• Fitted flight instruments suitable for instrument flight.</li> <li>• Navigation and approach aids appropriate to rating sought.</li> <li>• A method of simulating IMC.</li> <li>• Autopilot/FMS.</li> <li>• Simulation of emergency and abnormal procedures.</li> <li>• Simulated icing conditions.</li> <li>• Simulated hazardous weather.</li> </ul>	
<b>Underpinning Knowledge</b>	
N/A	

## Unit IF16: DME/GPS Arrival

**Unit Description:** Knowledge and skills to conduct a DME or GPS arrival procedure from the LSALT, within a specified sector or on a specified track, descending not below the distance/altitude descent steps specified for the procedure to the MDA applicable to the aircraft category and conducting a published missed approach if visual reference is not achieved by the MAPT, using NDB or VOR for tracking and DME or GPS to provide distance indications.

Elements	Performance Criteria
IF16.1 Select arrival and determine applicable minima	<ul style="list-style-type: none"> <li>• Selects the current IAL chart for the DME or GPS Arrival to be flown and plans the transition to, and conduct of, the visual circling or instrument approach and missed approach procedure.</li> <li>• Determines the MDA.</li> <li>• <u>Reviews and briefs:</u> <ul style="list-style-type: none"> <li>◦ whether entry to the approach will be direct or via the holding pattern;</li> <li>◦ minimum altitude (LSALT or MSA) prior to approach entry;</li> <li>◦ tracks, distances, timing and descent limitations for the arrival;</li> <li>◦ the applicable approach minima for the aircraft performance category and runway to be used;</li> <li>◦ the conduct of visual circling if required;</li> <li>◦ the missed approach procedure;</li> <li>◦ the holding or diversion action required if visual reference is not established; and</li> <li>◦ fuel availability and latest divert time if required.</li> </ul> </li> </ul>
IF16.2 Use appropriate tracking aid and distance information and monitor aid signal integrity	<ul style="list-style-type: none"> <li>• Tunes and identifies the DME or selects the reference GPS WPT to be used for tracking inbound, checks the distance indication and monitors the aid throughout the approach to ensure signal integrity.</li> <li>• Uses DME or GPS to provide distance indications for descent via the distance/altitude steps of the approach.</li> <li>• Ensures RAIM is available if using GPS before descending below LSALT or MSA.</li> </ul>
IF16.3 Conduct initial approach	<ul style="list-style-type: none"> <li>• Sets the altimeter to the aerodrome QNH and conducts the initial approach and maintains at or above route MSA or LSALT until commencing descent not below the specified limiting altitude for the distance/altitude descent steps.</li> </ul>
IF16.4 Conduct approach procedure	<ul style="list-style-type: none"> <li>• Conducts the arrival procedure, descending on the specified track or sector, descending not below the specified distance/altitude descent steps to the MDA within the tolerances specified in AIP.</li> <li>• Complies with applicable tracking and speed restrictions after passing the initial approach fix.</li> <li>• Identifies the landing runway and conducts visual circling or straight in runway approach or for a landing on the selected runway after establishing visual reference.</li> </ul>
IF16.5 Conduct missed approach procedure	<ul style="list-style-type: none"> <li>• Commences the published missed approach procedure if visual reference is not established before reaching the MAPT, or if any other event specified in AIP requiring the conduct of a missed approach occurs.</li> <li>• Conducts the missed approach procedure by tracking to the MAPT (<math>\pm 5^\circ \pm 2\text{nm}</math> arc) and complying with the published missed approach procedure specified on the IAL chart.</li> </ul>
IF16.6 Conduct missed approach from visual circling	<ul style="list-style-type: none"> <li>• Recognises the conditions requiring a missed approach to be initiated.</li> <li>• Manoeuvre aircraft to MAPT and conduct a missed approach procedure as detailed on the applicable instrument approach chart.</li> <li>• Maintains obstacle clearance in IMC/simulated IMC in accordance with the IFR.</li> </ul>

<b>Range of Variables</b>
<ul style="list-style-type: none"><li>• Approved single-engine or multi-engine aircraft or synthetic training device.</li><li>• Single-pilot or multi-crew.</li><li>• IMC or VMC with simulated IMC conditions.</li><li>• Fitted flight instruments suitable for instrument flight.</li><li>• Navigation and approach aids appropriate to rating sought.</li><li>• A method of simulating IMC.</li><li>• Autopilot/FMS.</li><li>• Simulation of emergency and abnormal procedures.</li><li>• Simulated icing conditions</li><li>• Simulated hazardous weather.</li></ul>
<b>Underpinning Knowledge</b>
N/A

## Unit IF18: Perform Standard Arrival Route (STAR)

**Unit Description:** Skills and knowledge to conduct an arrival from an inbound route, tracking via a Standard Arrival Route (STAR) published in AIP, to a position from which an approach and landing can be made at the destination aerodrome.

Elements	Performance Criteria
IF18.1 Conduct arrival using STAR	<ul style="list-style-type: none"> <li>• Selects the current chart for the STAR to be flown and reviews and briefs the entry to, and conduct of, the STAR procedure for the nominated runway.</li> <li>• Manoeuvres the aircraft from an inbound route in accordance with ATC instructions and published STAR procedures, to a fix at or near the destination aerodrome, using radio navigation aids and transition to an approach as instructed by ATC, in accordance with the IFR.</li> <li>• Manoeuvres aircraft within the following tolerances:               <ul style="list-style-type: none"> <li>◦ heading <math>\pm 10^\circ</math>;</li> <li>◦ altitude <math>\pm 100</math> feet;</li> <li>◦ track and radials <math>\pm 5^\circ</math>; and</li> <li>◦ complies with ATC instructions amending STAR procedure.</li> </ul> </li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Approved single-engine or multi-engine aircraft or synthetic training device.</li> <li>• Single-pilot or multi-crew.</li> <li>• IMC or VMC with simulated IMC conditions.</li> <li>• Fitted flight instruments suitable for instrument flight.</li> <li>• Navigation and approach aids appropriate to rating sought.</li> <li>• A method of simulating IMC.</li> <li>• Simulated icing conditions.</li> <li>• Simulated hazardous weather.</li> </ul>	
<b>Underpinning Knowledge</b>	
N/A	

## Unit IF19: Perform Instrument Departure (Single-engine)

**Unit Description:** Skills and knowledge to plan and conduct a departure from an aerodrome without a published instrument departure procedure, intercept track within 5 nm, while maintaining obstacle clearance during climb to LSALT and manage traffic separation using the radiotelephone, in IMC/simulated IMC under the IFR.

Elements	Performance Criteria
IF19.1 Determine applicable standard take-off minima	<ul style="list-style-type: none"> <li>Determines standard take-off minima for a single-engine aeroplane as applicable for the aerodrome using AIP or departure and approach procedures (DAP) East and West.</li> </ul>
IF19.2 Determine obstacle clearance requirements for take-off	<ul style="list-style-type: none"> <li>Plans a departure which ensures that the aircraft can maintain obstacle and terrain clearance after take-off and during the climb to LSALT.</li> <li>Increases the ceiling minima and/or plans a track to ensure terrain clearance when required.</li> </ul>
IF19.3 Take-off and climb to cruising altitude/level under the IFR from an aerodrome which does not have standard instrument departure (SID) and/or standard radar departure (SRD) procedures	<ul style="list-style-type: none"> <li>Takes off and climbs to cruising altitude/level in IMC/simulated IMC from the standard take-off ceiling (300 ft).</li> <li>Intercepts track within 5 nm of the departure aerodrome ensuring obstacle and terrain clearance is maintained below LSALT.</li> <li>Performs all required radio transmissions in accordance with AIP and maintains separation from other traffic.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>Approved single-engine or multi-engine aircraft or synthetic training device.</li> <li>Single-pilot or multi-crew.</li> <li>IMC or VMC with simulated IMC conditions.</li> <li>Fitted flight instruments suitable for instrument flight.</li> <li>Navigation and approach aids appropriate to rating sought.</li> <li>A method of simulating IMC.</li> <li>Simulated icing conditions.</li> <li>Simulated hazardous weather.</li> </ul>	
<b>Underpinning Knowledge</b>	
N/A	

## Unit IF20: Perform Standard Instrument Departure (SID)

**Unit Description:** The skills and knowledge to determine the applicable take-off ceiling and visibility minima, calculate and maintain the obstacle clearance limits for climb during flight to LSALT while on climb to cruising altitude/level and to comply with SID or Standard Radar Departure (SRD) graphic depiction or narrative requirements in IMC/simulated IMC under IFR.

Elements	Performance Criteria
IF20.1 Determine applicable standard take-off minima	<ul style="list-style-type: none"> <li>Determines standard take-off minima for a single-engine aeroplane as applicable for the aerodrome using AIP or DAP East and West (or other approved documents).</li> </ul>
IF20.2 Determine SID and obstacle clearance requirements	<ul style="list-style-type: none"> <li>Determines from aircraft take-off and climb performance charts that obstacle clearance can be maintained in the take-off area and that the minimum design climb gradient of the SID or SRD and any additional specified climb gradients can be met.</li> </ul>
IF20.3 Take-off and climb to cruising level using SID and/or SRD procedure	<ul style="list-style-type: none"> <li><u>Reviews and briefs</u> track and altitude requirements of the SID.</li> <li>Climbs to cruising altitude/level after take-off in IMC/simulated IMC from standard take-off ceiling (300 ft) in accordance with specified tracking and altitude requirements of the SID or SRD procedure.</li> <li>Ensures obstacle and terrain clearance is maintained below LSALT.</li> <li>Performs all required radio transmissions in accordance with AIP.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>Approved single-engine or multi-engine aircraft or synthetic training device.</li> <li>Single-pilot or multi-crew.</li> <li>IMC or VMC with simulated IMC conditions.</li> <li>Fitted flight instruments suitable for instrument flight.</li> <li>Navigation and approach aids appropriate to rating sought.</li> <li>A method of simulating IMC.</li> <li>Simulated icing conditions.</li> <li>Simulated hazardous weather.</li> </ul>	
<b>Underpinning Knowledge</b>	
N/A	

## Unit IF21: Instrument Departure from Aerodrome Without Standard Instrument Departure (SID) or Standard Radar Departure (SRD) - Multi-engine Aeroplane

**Unit Description:** Knowledge and skills to determine the take-off ceiling and visibility minima for a multi-engine aeroplane, calculate and maintain obstacle clearance limits during the climb to LSALT in normal and asymmetric flight, resolve whether a return to the aerodrome of departure is possible in the event of an engine failure or determine a suitable alternative course of action if otherwise, and manage a simulated/actual engine failure in IMC.

Elements	Performance Criteria
IF21.1 Determine applicable standard take-off minima	<ul style="list-style-type: none"> <li>• Determines take-off ceiling and visibility minima for take-off from the aerodrome in a multi-engine aeroplane using AIP or DAP East and West (or other approved documents).</li> <li>• Determines whether an engine failure after take-off in IMC will require a return to the departure aerodrome.</li> <li>• Sets higher take-off minima which will allow the return to be made using an instrument or visual approach in a multi-engine aircraft with an inoperative engine.</li> </ul>
IF21.2 Determine obstacle clearance requirements for take-off including compliance in event of engine failure	<ul style="list-style-type: none"> <li>• Plans a departure which ensures the aircraft can maintain obstacle and terrain clearance after take-off and during climb to LSALT in the event of an engine failure.</li> </ul>
IF21.3 Take-off and climb to cruising altitude/level under the IFR from an aerodrome which does not have SID and/or SRD procedures	<ul style="list-style-type: none"> <li>• Takes off and climbs to cruising altitude/level in IMC/simulated IMC from the standard take-off ceiling applicable to the aircraft type and performance.</li> <li>• Intercepts track within 5 nm of the departure aerodrome, ensuring obstacle and terrain clearance is maintained below LSALT.</li> <li>• Performs all required radio transmissions in accordance with AIP and maintain separation from other traffic.</li> </ul>
IF21.4 Manage engine failure after take-off	<ul style="list-style-type: none"> <li>• Controls aircraft, identifies and confirms engine failure and manages simulated engine failure after take-off in simulated IMC from 300 feet to the following tolerances: <ul style="list-style-type: none"> <li>◦ maintains heading (<math>\pm 20^\circ</math> initially then <math>\pm 5^\circ</math>, from datum heading);</li> <li>◦ maintains initial climb not less than best single-engine angle of climb speed (<math>V_{xse}</math>) or best single-engine rate of climb speed (<math>V_{yse}</math> (+5 -0 kts) until clear of obstacles, then <math>V_{yse}</math> (<math>\pm 5</math> kts <math>\pm M.01</math>); and</li> <li>◦ decides to continue climb or return to aerodrome.</li> </ul> </li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Approved single-engine or multi-engine aircraft or synthetic training device.</li> <li>• Single-pilot or multi-crew.</li> <li>• IMC or VMC with simulated IMC conditions.</li> <li>• Fitted flight instruments suitable for instrument flight.</li> <li>• Navigation and approach aids appropriate to rating sought.</li> <li>• A method of simulating IMC.</li> <li>• Simulation of emergency and abnormal procedures.</li> <li>• Simulated icing conditions.</li> <li>• Simulated hazardous weather.</li> </ul>	
<b>Underpinning Knowledge</b>	
N/A	

## Unit IF22: Standard Instrument Departure Using a SID or SRD - Multi-engine Aeroplane

**Unit Description:** The skills and knowledge to determine the applicable take-off ceiling and visibility minima, calculate and maintain the obstacle clearance limits for climb during normal and asymmetric flight to LSALT while on climb to cruising altitude/level and complying with SID or SRD graphic depiction or narrative requirements in IMC/simulated IMC under IFR.

Elements	Performance Criteria
IF22.1 Determine applicable standard take-off minima	<ul style="list-style-type: none"> <li>Determines take-off ceiling and visibility minima for take-off from the aerodrome by interpreting AIP or DAP East and West (or other approved documents).</li> <li>Determines whether an engine failure after take-off in IMC will require a return to the departure aerodrome and if a return is required, selects a higher take-off minima which will allow the return to be made using an instrument or visual approach.</li> </ul>
IF22.2 Determine obstacle clearance requirements for take-off	<ul style="list-style-type: none"> <li>Determines from aircraft take-off and climb performance charts that obstacle clearance can be maintained in the take-off area and that the minimum design climb gradient of the SID or SRD and any additional specified gradients can be met and procedure is able to ensure obstacle and terrain clearance in the event of an engine failure.</li> </ul>
IF22.3 Take-off and climb to cruising level using SID and/or SRD procedure	<ul style="list-style-type: none"> <li>Climbs to cruising altitude/level in IMC/simulated IMC from standard take-off ceiling (300 ft) in accordance with specified tracking and altitude requirements of the SID or SRD procedure after take-off.</li> <li>Ensures obstacle and terrain clearance is maintained below LSALT.</li> <li>Performs all required radio transmissions in accordance with AIP.</li> </ul>
IF22.4 Manage engine failure after take-off	<ul style="list-style-type: none"> <li>Controls aircraft, identifies and confirms engine failure and manages simulated engine failure after take-off in simulated IMC from 300 feet to the following tolerances: <ul style="list-style-type: none"> <li>maintains heading (<math>\pm 20^\circ</math> initially then <math>\pm 5^\circ</math>, from datum heading);</li> <li>maintains initial climb not less than best single-engine angle of climb speed (VXSE) or best single-engine rate of climb speed VYSE (+5 -0 kts) until clear of obstacles, then VYSE (<math>\pm 5</math> kts); and</li> <li>level flight (<math>\pm 100</math> ft and <math>-0 +100</math> ft at minima).</li> </ul> </li> <li>Decides to continue climb or return to aerodrome.</li> </ul>

### Range of Variables

- Approved single-engine or multi-engine aircraft or synthetic training device.
- Single-pilot or multi-crew.
- IMC or VMC with simulated IMC conditions.
- Fitted flight instruments suitable for instrument flight.
- Navigation and approach aids appropriate to rating sought.
- A method of simulating IMC.
- Autopilot/FMS.
- Simulation of emergency and abnormal procedures.
- Simulated icing conditions.
- Simulated hazardous weather.

### Underpinning Knowledge

N/A

## Unit IF25: Instrument Approach and Missed Approach Multi-engine Aeroplane with Simulated Engine Failure

**Unit Description:** Skills and knowledge to conduct an instrument approach and published missed approach and maintain control an aeroplane during asymmetric flight in IMC/simulated IMC under the IFR.

Elements	Performance Criteria
IF25.1 Simulate engine failure during instrument approach procedure	<ul style="list-style-type: none"> <li>• Identifies and confirms a simulated engine failure during an instrument approach in a multi-engine aircraft and controls the aircraft.</li> <li>• Performs one engine inoperative procedures in accordance with the Flight Manual/POH, Company Operations Manual.</li> <li>• Performs the one engine inoperative instrument approach within the tolerances specified in AIP and the following tolerances:               <ul style="list-style-type: none"> <li>◦ Maintains track (<math>\pm 1/2</math> scale CDI-<math>\pm 5^\circ</math>);</li> <li>◦ heading <math>\pm 20^\circ</math> initially then <math>\pm 5^\circ</math> from datum;</li> <li>◦ IAS +5-0 kts) VYSE (best single-engine rate of climb speed), then <math>\pm 10</math> kts or M.02; and</li> <li>◦ height <math>\pm 100</math> ft; at MDA +100 –0 ft.</li> </ul> </li> </ul>
IF25.2 Conduct missed approach with simulated engine failure	<ul style="list-style-type: none"> <li>• Identifies and confirms a simulated engine failure in a multi-engine aircraft during a missed approach and controls the aircraft.</li> <li>• Performs, with one engine inoperative the published missed approach from the MAPT in accordance with Flight Manual/POH, Company Operations Manual to the following tolerances:               <ul style="list-style-type: none"> <li>◦ heading <math>\pm 20^\circ</math> initially then <math>\pm 5^\circ</math> from datum;</li> <li>◦ IAS +5-0 kts) VYSE, then <math>\pm 10</math> kts or M.02; and</li> <li>◦ height <math>\pm 100</math> ft; at MDA +100 –0 ft.</li> </ul> </li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Approved single-engine or multi-engine aircraft or synthetic training device.</li> <li>• Single-pilot or multi-crew.</li> <li>• IMC or VMC with simulated IMC conditions.</li> <li>• Fitted flight instruments suitable for instrument flight.</li> <li>• Navigation and approach aids appropriate to rating sought.</li> <li>• A method of simulating IMC.</li> <li>• Autopilot/FMS.</li> <li>• Simulation of emergency and abnormal procedures.</li> <li>• Simulated icing conditions.</li> <li>• Simulated hazardous weather.</li> </ul>	

**Underpinning Knowledge**

- Failed Engine Operations.
- Define VMCA.
- State the minimum control speed airborne (VMCA3 and VMCA2) for the aircraft.
- Explain the safety implications of asymmetric flight below VMCA.
- Explain the power, flight and configuration requirements that apply to VMCA.
- Identify the critical engine.
- Explain the methods of regaining control of an aircraft with a failed engine that is flying at a speed less than VMCA.
- Calculate  $V_1$  for any specified take-off conditions.
- State the conditions that would increase or decrease  $V_1$ .
- Explain what performance the aircraft can achieve after reaching  $V_2$  during asymmetric flight.
- Calculate initial rate of climb and climb gradient for one engine inoperative after take-off for specified conditions.
- Explain markings on the air speed indicator that apply to failed engine operations.
- Calculate fuel flow and true air speed with one engine inoperative for specified conditions.
- Determine if the range of the aircraft increases or decreases following an engine failure.
- Calculate point of no return (PNR) for one engine inoperative with maximum fuel (CPL and ATPL).
- Calculate equi time point (ETP) for one engine inoperative with maximum fuel (CPL and ATPL).

## Unit IF26: Multi-engine Aeroplane

**Unit Description:** Skills and knowledge to operate a multi-engine aeroplane.

Elements	Performance Criteria
IF26.1 Obtain, interpret, calculate and apply normal and abnormal flight performance information	<ul style="list-style-type: none"> <li>Obtains approved flight performance information from Flight Manual/POH, interprets information and applies to calculate aircraft take-off and landing weight, centre of gravity and take-off and landing performance.</li> <li>Obtains approved flight performance information from Flight Manual/POH, interprets information, applies to the phase of flight and calculates aircraft performance during normal flight operations.</li> <li>Applies performance information to calculate fuel requirements.</li> <li>Obtains approved flight performance information from Flight Manual/POH, interprets information, applies to failed engine(s) operations during any phase of flight and calculates aircraft performance.</li> </ul>
IF26.2 Operate aeroplane in normal flight	<ul style="list-style-type: none"> <li>Controls multi-engine aircraft in all phases of normal flight to the appropriate standards specified for a private or commercial aeroplane pilot in Manual of Standards-Pilot Licensing.</li> <li>Operates all aircraft systems, equipment and engines in accordance with Flight Manual/POH.</li> </ul>
IF26.3 Manage abnormal or emergency flight operations	<ul style="list-style-type: none"> <li>Identifies and confirms any abnormal or emergency situation.</li> <li>Controls aeroplane.</li> <li>Performs appropriate abnormal or emergency procedures in accordance with Flight Manual/POH and published procedures.</li> <li>Advises ATC/other stations of present situation, intentions and assistance required.</li> </ul>
IF26.4 Manage engine failure(s) in multi-engine aircraft	<ul style="list-style-type: none"> <li>Self briefs or briefs crew members stating a plan of action that will ensure the safest outcome in the event of an engine failure.</li> <li>Maintains control of aeroplane, identifies and confirms failed engine(s) and shuts down failed engine(s) following engine failure during any phase of flight, in accordance with Flight Manual/POH.</li> <li>Operates aircraft in accordance with Flight Manual/POH during flight with failed engine(s).</li> </ul> <p><i>Engine failure in flight (sequence of actions may be varied)</i></p> <ul style="list-style-type: none"> <li>Sets power on serviceable engine/s to ensure desired aircraft performance.</li> <li>Configures aircraft to achieve minimum drag.</li> <li>Controls aircraft without sideslip (1/2 ball out towards the lowered wing) or <u>balances aircraft</u> when applicable.</li> <li>Maintains indicated air speed at or above VMCA.</li> <li>Climbs aircraft at <math>V_{YSE}</math> if applicable.</li> <li>Lands aircraft at nearest appropriate landing area.</li> </ul> <p><i>Rejected take-off</i></p> <ul style="list-style-type: none"> <li>Recognises and identifies cause for rejecting take-off.</li> <li>Decides to reject take-off.</li> <li>Controls aircraft and maintains aircraft on runway.</li> <li>Closes throttle(s) on serviceable engine(s).</li> <li>Applies braking and other fitted retardation devices and stops aircraft in runway distance available.</li> <li>Performs engine shutdown or non normal procedures in accordance with Flight Manual/POH or company operations manual.</li> </ul> <p><i>Engine failure after take-off</i></p> <ul style="list-style-type: none"> <li>Controls aircraft.</li> </ul>

Elements	Performance Criteria
	<ul style="list-style-type: none"> <li>• Ensures maximum take-off power applied to serviceable engine(s).</li> <li>• Identifies and confirms failed engine(s).</li> <li>• Feathers propeller (as applicable) and shuts down failed engine in accordance with Flight Manual/POH.</li> <li>• Configures aircraft to achieve minimum drag.</li> <li>• Controls aircraft without sideslip (1/2 ball out towards the lowered wing) or balances aircraft when applicable.</li> <li>• Maintains aircraft at or above VMCA (minimum control airspeed airborne).</li> <li>• Climbs aircraft at <math>V_{YSE}</math>.</li> <li>• Lands aircraft at nearest appropriate landing area.</li> </ul> <p><i>Manages engine failure after take-off below VTOSS (take-off safely speed)- aircraft will not accelerate or climb</i></p> <ul style="list-style-type: none"> <li>• Sets power as required to manoeuvre aircraft to most suitable area to land.</li> </ul> <p><i>Perform overshoot from <u>visual committal height</u></i></p> <ul style="list-style-type: none"> <li>• Determines visual committal height (consider 300 ft AGL).</li> <li>• Initiates go around at or above visual committal height.</li> <li>• Controls aircraft.</li> <li>• Applies maximum take-off power.</li> <li>• Configures aircraft to achieve minimum drag.</li> <li>• Maintains <math>V_{YSE}</math> or greater.</li> <li>• Climbs to circuit height.</li> <li>• Re assesses situation for landing.</li> </ul> <p><i>Below visual committal height.</i></p> <ul style="list-style-type: none"> <li>• Controls aircraft.</li> <li>• Lands aircraft.</li> </ul>

## Unit TR 1: Pre-flight Procedures

**Unit Description:** Skills and knowledge to complete the necessary pre-flight tasks to prepare the aircraft for flight in accordance with Flight Manual/POH.

Elements	Performance Criteria
TR1.1 Conduct pre-flight Inspection	<ul style="list-style-type: none"> <li>• Completes external and internal pre-flight inspections in accordance with Flight Manual/POH or company operations manual and determines serviceability of aircraft in accordance with published specifications.</li> <li>• Interprets and complies with Minimum Equipment List requirements.</li> <li>• Uses approved checklists in accordance with Flight Manual/POH or company operations manual.</li> <li>• Coordinates with ground crew to ensure clearances prior to operating any aircraft controls, doors and hatches whenever personnel may be adversely affected.</li> <li>• Ensures removal of all aircraft locking devices.</li> <li>• Operates aircraft systems in accordance with Flight Manual/POH, approved checklist or company operations manual.</li> <li>• Determines that the aircraft is airworthy for flight and takes corrective action in the event of discrepancies.</li> <li>• Inspects the general area around the aircraft and identifies and eliminates hazards to the safety of the aircraft and personnel.</li> </ul>
TR1.2 Extract pre-flight performance data	<ul style="list-style-type: none"> <li>• Extracts and interprets approved flight performance information from Flight Manual/POH/FMS.</li> <li>• Determines the following:               <ul style="list-style-type: none"> <li>◦ aircraft take-off weight, zero fuel weight, landing weight and centre of gravity;</li> <li>◦ aircraft take-off performance;</li> <li>◦ aircraft performance for all phases of flight;</li> <li>◦ aircraft performance applicable to abnormal operations; and</li> <li>◦ aircraft performance for engine inoperative operations during all phases of flight.</li> </ul> </li> <li>• Sets flight instrumentation in accordance with company operations manual (ie airspeed bugs, headings etc).</li> </ul>
TR1.3 Start engine(s)	<ul style="list-style-type: none"> <li>• Starts engine(s) in accordance with Flight Manual/POH, including the following:               <ul style="list-style-type: none"> <li>◦ use of Auxiliary Power Unit (APU) or alternative starting sources when applicable;</li> <li>◦ various atmospheric conditions;</li> <li>◦ normal and non-normal starting limitations;</li> <li>◦ actions in the event of a malfunction; and</li> <li>◦ complies with starter limitations.</li> </ul> </li> <li>• Complies with ground safety procedures during the before start, start and after start phases.</li> <li>• Utilises the appropriate ground crew during the start procedures, when appropriate.</li> <li>• Completes all items of the start procedures in accordance with the approved checklist during before start, start and after start phases.</li> <li>• Manages occurrences where specific instructions or checklist items are not published.</li> </ul>

TR1.4 Taxi Aircraft	<ul style="list-style-type: none"> <li>• Requests ATC clearances or makes mandatory air traffic broadcast in accordance with AIP.</li> <li>• Pushes back or powers back aircraft safely in accordance with specified procedures.</li> <li>• Confirms serviceability of brakes, after park brake release and before taxiing.</li> <li>• Divides attention appropriately between inside and outside the flight deck, to ensure maintenance of control while taxiing and completion of cockpit procedures and checklists in accordance with company operations manual.</li> <li>• Checks instrument in a suitable area clear of traffic and other hazards.</li> <li>• Interprets and complies with taxiway, lighting and other aerodrome and <b>marine markings</b>.</li> </ul> <p><i><b>Note:</b> In the absence of markings, the aircraft is maintained in the centre of the taxi way and at a safe distance from obstacles.</i></p> <ul style="list-style-type: none"> <li>• Maintains lookout and right of way rules and complies with any ATC or marshalling instructions when applicable.</li> <li>• Adjusts taxi speed to suit aeroplane type, surface conditions, congestion, and maintenance of control; and avoids collision with personnel, obstacles or other aircraft.</li> <li>• Applies flying controls, power and brakes to maintain the aircraft on the taxi way centre line (<math>\pm 1.5</math> metres of centre line) whilst compensating for wind and surface conditions.</li> </ul>
TR1.5 Conduct pre take-off checks	<ul style="list-style-type: none"> <li>• Performs pre take-off checklist in accordance with Flight Manual/POH or company operations manual and confirms all systems are within normal operating range.</li> <li>• Confirms aircraft configuration is safe for take-off.</li> <li>• Confirms critical airspeeds (airspeeds/V speeds) are set and/or displayed in accordance with Flight Manual/POH or company operations manual.</li> <li>• Confirms flight director, autopilot controls and navigation and communication equipment set in accordance with Flight Manual/POH or company operations manual.</li> <li>• Performs pre-take-off briefing in accordance with company operations manual, including: <ul style="list-style-type: none"> <li>◦ departure procedures; and</li> <li>◦ actions in the event of non-normal or emergency situations.</li> </ul> </li> <li>• Obtains and interprets the take-off and departure clearance issued by ATC.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Day and night Visual Flight Rules or Instrument Flight Rules.</li> <li>• Approved multi-engine multi-crew aeroplane fitted with piston, diesel, turbine or turbine propeller engines.</li> <li>• Approved flight simulator.</li> <li>• Single-engine aircraft specified by CASA for type rating.</li> <li>• Aerodromes.</li> <li>• Sealed, gravel or grass surfaces.</li> <li>• Simulated abnormal or emergency situations.</li> <li>• Simulated hazardous weather.</li> <li>• Up to and including light turbulence.</li> </ul>	
<b>Underpinning Knowledge</b>	
N/A	

## Unit TR 2: Take-off and Departure Procedures

**Unit Description:** Skills and knowledge to carryout take-off and departure procedures as pilot-in-command of a multi-crew aircraft during visual, instrument and night conditions in normal and non-normal and emergency situations in accordance with Flight Manual/POH.

Elements	Performance Criteria
TR2.1 Conduct normal and crosswind take-off	<ul style="list-style-type: none"> <li>• Identifies and avoids any surface conditions, obstructions, aircraft cleared for land and hold short operations (LAHSO), or other hazards that might hinder a safe take-off.</li> <li>• Verifies and applies correction for the existing wind component to the take-off performance.</li> <li>• Completes required checks prior to starting take-off to verify the expected engine performance.</li> <li>• Completes all pre-take-off checks as specified in the approved checklist.</li> <li>• Aligns aircraft on the centreline of the specified or appropriate runway.</li> <li>• Controls aircraft to maintain longitudinal alignment on the centreline of the runway prior to initiating and during the take-off and climb <math>\pm 5^\circ</math> of desired heading except for curved departure.</li> <li>• Sets and adjusts engine controls in accordance with the manufacturer's recommendations.</li> <li>• Monitors engine controls, settings and instruments during take-off to ensure all predetermined parameters are maintained.</li> <li>• Adjusts the controls to set the desired pitch attitude at the predetermined airspeed/V-speed to attain the desired performance for the applicable take-off segment.</li> <li>• Performs the required pitch changes at the specified airspeed /V-speed and as appropriate performs or calls for and verifies the accomplishment of the following in accordance with the tolerances specified in the Flight Manual/POH:               <ul style="list-style-type: none"> <li>◦ Gear and flap retractions;</li> <li>◦ Power adjustments; and</li> <li>◦ Other pilot activities peculiar to the aircraft type.</li> </ul> </li> <li>• Complies with the applicable noise abatement and wake turbulence procedures as required.</li> <li>• Calls for and verifies the completion of the appropriate checklist items.</li> <li>• Maintains the climb segment airspeed/V-speeds <math>\pm 5</math> kts of specified airspeed.</li> </ul>
TR2.2 Conduct Instrument take-off	<ul style="list-style-type: none"> <li>• Determines the minimum visibility required for an instrument departure applicable to the aircraft type.</li> <li>• Considers and plans for operational factors that could adversely affect the <u>safety</u> of the manoeuvre including:               <ul style="list-style-type: none"> <li>◦ Take-off configuration warning systems or other aircraft characteristics;</li> <li>◦ Runway length;</li> <li>◦ Surface conditions;</li> <li>◦ Wind;</li> <li>◦ Wake turbulence;</li> <li>◦ Obstacles;</li> <li>◦ Engine failure procedures throughout each segment; and</li> <li>◦ Other factors pertinent to the aircraft or airfield.</li> </ul> </li> <li>• Aligns aircraft on the centreline of the specified or appropriate runway.</li> <li>• Completes and confirms the appropriate checklist items to ensure the aircraft</li> </ul>

Elements	Performance Criteria
	<p>systems applicable to the instrument take-off are operating correctly.</p> <ul style="list-style-type: none"> <li>• Sets applicable radios and flight instruments to the desired setting prior to initiating the take-off.</li> <li>• Sets and adjusts engine controls in accordance with the manufacturer's recommendations.</li> <li>• Controls aircraft to maintain longitudinal alignment on the centreline of the runway prior to initiating and during the take-off and climb <math>\pm 5^\circ</math> of desired heading.</li> <li>• Transitions from visual meteorological conditions to actual or simulated instrument meteorological conditions without loss of control of the aircraft.</li> <li>• Maintains the appropriate climb attitude.</li> <li>• Complies with the appropriate airspeeds/V-speeds and climb segment airspeeds <math>\pm 5</math> kts.</li> <li>• Complies with ATC clearances and instructions.</li> </ul>
TR2.3 Manage engine failure during take-off	<ul style="list-style-type: none"> <li>• Considers and plans for operational factors that could adversely affect the <u>safety</u> of the manoeuvre including: <ul style="list-style-type: none"> <li>◦ Take-off configuration warning systems or other aircraft characteristics;</li> <li>◦ Runway length;</li> <li>◦ Surface conditions;</li> <li>◦ Wind;</li> <li>◦ Wake turbulence;</li> <li>◦ Obstacles;</li> <li>◦ Engine failure procedures throughout each segment; and</li> <li>◦ Other factors pertinent to the aircraft or airfield.</li> </ul> </li> <li>• Completes required checks prior to starting take-off to verify the expected engine performance.</li> <li>• Completes all pre-take-off checks as specified in the approved checklist.</li> <li>• Aligns aircraft on the runway centreline.</li> <li>• Controls aircraft to maintain longitudinal alignment on the centreline of the runway prior to initiating and during the take-off and climb <math>\pm 5^\circ</math> of desired heading, except for curved departure.</li> <li>• Sets and adjusts engine controls in accordance with the manufacturer's recommendations.</li> </ul> <p><i>Failure at or after <math>V_1</math></i></p> <ul style="list-style-type: none"> <li>• Continues the take-off and performs the required pitch changes at the specified airspeed /V-speed +5 kts and as appropriate performs or calls for and verifies the accomplishment of the following in accordance with the tolerances specified in the Flight Manual/POH: <ul style="list-style-type: none"> <li>◦ Gear and flap retractions;</li> <li>◦ Power adjustments; and</li> <li>◦ Other pilot activities peculiar to the aircraft type.</li> </ul> </li> <li>• Complies with obstacle clearance departure procedure.</li> </ul>
TR2.4 Perform rejected take-off	<ul style="list-style-type: none"> <li>• Considers and plans for operational factors that could adversely affect the safety of the manoeuvre including: <ul style="list-style-type: none"> <li>◦ Take-off configuration warning systems or other aircraft characteristics;</li> <li>◦ Runway length;</li> <li>◦ Surface conditions;</li> <li>◦ Wind;</li> <li>◦ Obstructions; and</li> </ul> </li> </ul>

Elements	Performance Criteria
	<ul style="list-style-type: none"> <li>◦ Aircraft cleared for LAHSO.</li> <li>• Completes all pre-take-off checks as specified in the approved checklist.</li> <li>• Aligns aircraft on the runway centreline.</li> <li>• Sets and adjusts engine controls in accordance with the manufacturer's recommendations.</li> <li>• Controls aircraft to maintain longitudinal alignment on the centreline of the runway</li> <li>• Aborts the take-off prior to <math>V_1</math> or at a point during the take-off where the abort procedure can be initiated and the aircraft stopped on the remaining runway/stopway.</li> <li>• Reduces power smoothly and promptly.</li> <li>• Activates spoilers, prop reverse, thrust reverse, wheel brakes and other drag and braking devices as appropriate in accordance with the Flight Manual/POH maintaining positive control in a manner to bring the aircraft to a safe stop.</li> <li>• Initiates and completes appropriate engine failure or other procedures and/or checklists as specified in the Flight Manual/POH.</li> </ul>
TR2.5 Conduct departure procedure	<ul style="list-style-type: none"> <li>• Prepares current and appropriate navigation publications for the proposed flight.</li> <li>• Selects and uses the appropriate communications frequencies, and selects and identifies the navigation aids associated with the proposed flight.</li> <li>• Performs appropriate checklist items from approved checklist.</li> <li>• Establishes communications with ATC, using proper phraseology.</li> <li>• Complies in a timely manner, with all instructions and airspace restrictions.</li> <li>• Demonstrates/describes two way radio communications failure procedures.</li> <li>• Intercepts all courses, radials and bearings to ensure compliance with specified tracking procedures or route clearance or as directed by ATC.</li> <li>• Maintains the appropriate airspeed within <math>\pm 10</math> knots, headings within <math>\pm 10^\circ</math> altitude within <math>\pm 100</math> ft and tracks all courses, radials or bearings to the beginning of the enroute phase.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Day and night Visual Flight Rules or Instrument Flight Rules.</li> <li>• Approved multi-engine multi-crew aeroplane fitted with piston, diesel, turbine or turbine propeller engines.</li> <li>• Single-engine aircraft specified by CASA for type rating.</li> <li>• Approved flight simulator.</li> <li>• Aerodromes.</li> <li>• Sealed, gravel or grass surfaces.</li> <li>• Simulated abnormal or emergency situations.</li> <li>• Simulated hazardous weather.</li> <li>• Up to and including light turbulence.</li> <li>• Engine failure during take-off (VFR and IFR pilots).</li> <li>• For a rejected take-off, the simulated engine failure should occur before reaching 50% VMCA.</li> <li>• For aircraft with published <math>V_1</math>, VR and/or <math>V_2</math> speeds the failure of the most critical engine should be simulated at a point: <ul style="list-style-type: none"> <li>◦ after <math>V_1</math> and prior to <math>V_2</math> if in the opinion of the examiner it is appropriate under the prevailing conditions; or</li> <li>◦ as close as possible after <math>V_1</math> when <math>V_1</math> and <math>V_2</math> or <math>V_1</math> and VR are identical.</li> <li>◦ For aircraft for which no <math>V_1</math>, VR and/or <math>V_2</math> speeds are published the failure of the most critical engine should be simulated at a point after reaching a minimum of VYSE and if accomplished in the aircraft at an altitude not lower than 500 ft AGL</li> </ul> </li> </ul>	

**Underpinning Knowledge**

- Normal and crosswind take-off.
  - Explain normal and crosswind take-offs and climbs procedures including, airspeeds configurations, method of drift allowance, setting of flight instruments and non-normal/emergency procedures.
- Instrument take-off (IFR pilots only)*
- Explain instrument take-off procedures including minimum take-off visibility requirements, crew coordination and briefing procedure, setting of flight instruments and non-normal/emergency procedures.
- Engine failure during take-off*
- Explain the procedures used during engine failure on take-off, the appropriate reference airspeeds, and the specific pilot actions required.
- Rejected take-off*
- Explain the technique and procedure for carrying out a rejected take-off after engine/system(s) failure/warnings, including related safety factors.
- Departure procedures*
- Explain the departure procedures, En Route Low and High altitude charts, STARs and related pilot/controller responsibilities.

## Unit TR 3: In-flight Procedures

**Unit Description:** Skills and knowledge to operate as pilot-in-command of a multi-crew aircraft during visual, instrument and night conditions in normal and non-normal of emergency situations in accordance with Flight Manual/POH.

Elements	Performance Criteria
TR3.1 Conduct steep turns	<ul style="list-style-type: none"> <li>• Completes air space cleared procedure.</li> <li>• Performs level steep turn of nominated bank angle (<math>45^{\circ}</math>-<math>60^{\circ} \pm 5^{\circ}</math>) and speed (<math>\pm 10</math> kts) without altitude change (<math>\pm 100</math> ft).</li> <li>• Performs descending steep turn of nominated bank angle (<math>45^{\circ}</math>-<math>60^{\circ} \pm 5^{\circ}</math>) at a nominated speed (<math>\pm 10</math> kts) to a nominated heading or geographical feature through a minimum of 500 ft height loss.</li> <li>• Exits on specified heading or geographical feature (<math>\pm 10^{\circ}</math>).</li> <li>• <u>Balances aircraft.</u></li> <li>• Trims aircraft prior to commencing turn.</li> </ul>
TR3.2 Recover from approach to stall and developed stall	<p><i>Recognise approach to stall</i></p> <ul style="list-style-type: none"> <li>• Performs pre-maneuvre checks.</li> <li>• Recognises airframe buffet and control ineffectiveness symptoms and visual and aural stall warning devices while approaching the stall.</li> </ul> <p><i>Recover aircraft before stall entry</i></p> <ul style="list-style-type: none"> <li>• Recognises the approach to the stall during any phase of flight and adjusts attitude and power settings to resume normal balanced flight before stall entry.</li> </ul> <p><i>Stall aircraft</i></p> <ul style="list-style-type: none"> <li>• Stalls aircraft while maintaining <u>balanced flight</u>.</li> <li>• Observes control column/stick position at point of departure from intended flight path (stall).</li> </ul> <p><i>Recover from stall with minimum loss of height</i></p> <ul style="list-style-type: none"> <li>• Adjusts aeroplane stick position to unstall wing and power setting to resume normal balanced flight on onset of stall.</li> <li>• Recovers from stall using full power.</li> <li>• Recovers from stall during straight and level, climbing descending, and approach configuration flight.</li> <li>• Recovers from stall during a turn.</li> <li>• <u>Balances aircraft.</u></li> <li>• Achieves minimum height loss consistent with aircraft type and stall characteristics.</li> </ul>
TR3.3 Manage engine failure in flight and restart engine	<ul style="list-style-type: none"> <li>• Following an engine(s) failure, controls aircraft to the following tolerances:</li> <li>• Heading <math>\pm 20^{\circ}</math> initially then <math>\pm 5^{\circ}</math>;</li> <li>• Altitude <math>\pm 100</math> ft at engine(s) inoperative ceiling or lower altitude;</li> <li>• Indicated air speed (IAS) <math>\pm 10</math> knots of nominated airspeed.</li> <li>• Adjusts power to maintain nominated performance and reduces drag when appropriate.</li> <li>• <u>Trims aircraft.</u></li> <li>• Identifies and confirms failed engine(s) in accordance with Flight Manual/POH or company operations manual.</li> <li>• Shuts down failed engine(s) in accordance with Flight Manual/POH.</li> <li>• Determines nearest appropriate airfield for engine inoperative landing.</li> <li>• Analyses engine(s) failure and decides if engine restart is appropriate.</li> <li>• Restarts engine(s) in accordance with Flight Manual/POH if appropriate.</li> </ul>

Elements	Performance Criteria
TR3.4 Manage specific aircraft flight characteristics (when applicable)	<ul style="list-style-type: none"> <li>• Identifies specific aircraft flight characteristic applicable to aircraft type.</li> <li>• Controls aircraft and manages specific aircraft flight characteristics in accordance with the Flight Manual/POH or manufacturer's recommendations while complying with any aircraft limitations.</li> </ul>
TR3.5 Recover from unusual attitudes	<ul style="list-style-type: none"> <li>• Identifies nose-high or nose-low unusual attitude flight condition.</li> <li>• Recovers from nose-low or nose-high unusual attitudes by adjusting pitch, bank and power to resume controlled and balanced flight.</li> <li>• Applies controlled corrective action while maintaining aircraft performance within limits.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Day and night Visual Flight Rules or Instrument Flight Rules.</li> <li>• Approved multi-engine multi-crew aeroplane fitted with piston, diesel, turbine or turbine propeller engines.</li> <li>• Single-engine aircraft specified by CASA for type rating.</li> <li>• Flight simulator.</li> <li>• Aerodromes.</li> <li>• Sealed, gravel or grass surfaces.</li> <li>• Simulated abnormal or emergency situations.</li> <li>• Simulated hazardous weather.</li> <li>• Up to and including light turbulence.</li> <li>• Approach to stalls.</li> <li>• Three approaches to stall are required as follows: <ul style="list-style-type: none"> <li>◦ One in take-off configuration (except where the aircraft uses only zero flap take-off configuration) or approach configuration;</li> <li>◦ One in a clean configuration; and</li> <li>◦ One in a landing configuration.</li> </ul> </li> <li>• One of these approaches to a stall accomplished while in a turn using a bank angle of 15 to 30°.</li> <li>• Engine failure in propeller aircraft including turbo props.</li> <li>• Demonstrate the feathering of one propeller in any multi-engine aircraft, which can safely be feathered and unfeathered while in flight: <ul style="list-style-type: none"> <li>◦ In multi-engine jet aircraft;</li> <li>◦ Shutdown and a restarted one engine in flight;</li> <li>◦ Feathering or shutdown only performed under conditions and altitudes not lower than 3000 feet and in a position where a safe landing can be made at an established airport in the event difficulty is encountered in unfeathering the propeller or restarting the engine;</li> <li>◦ Below 3000 ft AGL, simulated engine failure will be performed by setting the engine controls to simulate zero thrust;</li> <li>◦ In Simulator; and</li> <li>◦ Feathering, shutdown restart and unfeathering procedures may be performed in conjunction with any procedure or manoeuvre and at any locations and altitudes at the discretion of the examiner.</li> </ul> </li> </ul>	

**Underpinning Knowledge**

- Steep Turns.
- Explain the principles of steep turns in general and those factors applicable to the aircraft type:
- Performance.
- Wing loading.
- Angle of bank.
- Consideration of the relationship of Mach number and IAS at altitude.
- Stall speed.
- Pitch and power requirements.
- Overbanking tendencies.
- Approaches to Stalls.
- Explain the factors which influence stall characteristics in general and applicable to the aircraft type including:
  - Use of various drag configurations;
  - Power settings;
  - Pitch attitudes;
  - Weights; and
  - Angle of bank.
- Explain procedures for resuming normal flight following a stall.
- Engine failure.
- Explain the flight characteristics and controllability associated with manoeuvring with engine/s inoperative applicable to the specific aircraft type.
- Specific flight characteristics.
- Explain the specific flight characteristics appropriate to the aircraft type for example Dutch roll, effects of icing etc.
- Recovery from unusual attitudes.
- Explain the techniques for recovery from unusual attitudes.

## Unit TR 4: Approach to Land and Land Procedures

**Unit Description:** Skills and knowledge to conduct an approach and landing in a multi-crew aircraft into wind and cross wind during normal and non normal operations.

Elements	Performance Criteria
TR4.1 Conduct normal and crosswind approach and landings	<ul style="list-style-type: none"> <li>• Selects aiming point.</li> <li>• Establishes the approach and landing configuration appropriate for the runway and meteorological conditions, adjusting the engine controls as required.</li> <li>• Maintains a ground track that ensures the desired traffic pattern will be flown, taking into account any obstructions and ATC instructions.</li> <li>• Verifies existing wind conditions, making corrections for drift to maintain a precise ground track.</li> <li>• Maintains a stabilised approach with the specified airspeed/V-speed <math>\pm 5</math> knots.</li> <li>• Completes a smooth positively controlled transition from final approach to touchdown.</li> <li>• Touches down in the touchdown area specified in the company operations manual or within 1500 ft (450 metres) beyond a nominated touchdown point when not specified in the company operations manual.</li> <li>• Maintains directional control and crosswind correction during the after landing roll.</li> <li>• Activates spoilers, prop reverse, thrust reverse, wheel brakes and any other drag/braking devices as appropriate to bring the aircraft to a safe stop within the landing distance available.</li> <li>• Completes after landing checklist in accordance with company operations manual or POH/Flight Manual.</li> </ul>
TR4.2 Conduct approach and landing with simulated engine failure	<ul style="list-style-type: none"> <li>• Maintains positive aircraft control as recommended by the manufacturer to maintain coordinated flight, aircraft trimmed.</li> <li>• Sets engine controls and reduces drag as necessary.</li> <li>• Verifies the inoperative engine/s.</li> <li>• Maintains the operating engine/s within acceptable operating limits.</li> <li>• Follows the prescribed aircraft checklist and verifies the procedures for securing the inoperative engine/s.</li> <li>• Proceeds to nearest suitable airfield.</li> <li>• Maintains the following tolerances prior to beginning the final approach segment: <ul style="list-style-type: none"> <li>◦ Heading <math>\pm 5^\circ</math> of desired heading;</li> <li>◦ Airspeed <math>\pm 10</math> kts of nominated airspeed;</li> <li>◦ Altitude <math>\pm 100</math> feet of nominated altitude; and</li> <li>◦ Tracks radials, tracks, courses and bearings.</li> </ul> </li> <li>• Establishes the approach and landing configuration appropriate for the runway and meteorological conditions, adjusting the engine controls as required.</li> <li>• Maintains a stabilised approach with the desired airspeed/V-speed <math>\pm 5</math> knots.</li> <li>• Completes a smooth positively controlled transition from final approach to touchdown.</li> <li>• Touches down in the touchdown area specified in the company operations manual or within 1500 ft (450 metres) beyond a nominated touchdown point when not specified in a company operations manual.</li> <li>• Maintains directional control and crosswind correction during the after landing roll.</li> <li>• Activates spoilers, prop reverse, thrust reverse, wheel brakes and any other drag/braking devices as appropriate to bring the aircraft to a safe stop within the landing distance available.</li> <li>• Completes after landing checklist items in accordance with the company operations manual or POH/Flight Manual.</li> </ul>

Elements	Performance Criteria
TR4.3 Conduct go around procedure	<ul style="list-style-type: none"> <li>• Decides in the time available to reject the landing for actual or simulated circumstances, notifying ATC at an appropriate time when the safety of flight is assured.</li> <li>• Sets the specified power setting for the flight condition and establishes a pitch attitude necessary to achieve the desired performance.</li> <li>• Retracts the wing flaps/drag devices and landing gear if appropriate, in the correct sequence and at a safe altitude, establishes a positive rate of climb and the appropriate airspeed/V-speed within <math>\pm 5</math> knots.</li> <li>• Trims the aircraft as necessary and maintains the correct ground track during the rejected landing procedure.</li> <li>• Completes the appropriate checklist in accordance with company operations manual or POH/Flight Manual.</li> </ul> <p><i>Perform overshoot from visual committal height</i></p> <ul style="list-style-type: none"> <li>• Determines visual committal height (consider 300 feet AGL).</li> <li>• Initiates go around at or above visual committal height.</li> <li>• Controls aircraft.</li> <li>• Applies maximum take-off power.</li> <li>• Configures aircraft to achieve minimum drag.</li> <li>• Maintains VYSE or greater.</li> <li>• Climbs to circuit height.</li> <li>• Re assesses situation for landing.</li> </ul>
TR4.4 Conduct a flapless landing or non-standard flap landing	<ul style="list-style-type: none"> <li>• Selects a runway with sufficient Landing Distance Available for the zero flap or partial flap condition.</li> <li>• Maintains airspeed/V-speed for the approach and landing (<math>\pm 5</math> kts).</li> <li>• Maintains the correct pitch attitude and flight path for the configuration, gross weight, surface winds and other applicable operational considerations.</li> <li>• Touches down in the touchdown area specified in the company operations manual or within 1500 ft (450 metres) beyond a nominated touchdown point when not specified in the company operations manual.</li> <li>• Controls aircraft direction after touchdown.</li> <li>• Activates spoilers, prop reverse, thrust reverse, wheel brakes and any other drag/braking devices as appropriate to bring the aircraft to a safe stop within the landing distance available.</li> <li>• Completes after landing checklist items in accordance with the company operations manual or POH/Flight Manual.</li> </ul>

**Range of Variables**

- Day and night Visual Flight Rules or Instrument Flight Rules.
- Approved multi-engine multi-crew aeroplane fitted with piston, diesel, turbine or turbine propeller engines.
- Single-engine aircraft specified by the Civil Aviation Safety Authority (CASA) for type rating.
- Flight simulator.
- Aerodromes.
- Sealed, gravel or grass surfaces.
- Simulated abnormal or emergency situations.
- Simulated hazardous weather.
- Up to and including light turbulence.
- Landing and approach to landing procedures.
- Perform at least three landings with one to a full stop. These landings include the types listed in landing and approach procedures including a combination where appropriate crosswind and landing from a precision approach or landing with a simulated engine failure.
- Approach and landing with a (simulated) engine failure-multi-engine aeroplane.
- In aircraft with three engines, the applicant must follow a procedure (if approved) that approximates the loss of two engines, the centre and one of the outboard engines. In other multi-engine aircraft the applicant must follow a procedure, which simulates the loss of 50% of available engines, the loss being simulated on one side of the aircraft.
- Go around procedure (rejected landing).
- The rejected landing may be combined with visual flight or instrument, circling or missed approach procedures, but instrument conditions are not be simulated below 200 ft. This procedure should be initiated not below 50 feet above the runway and over the runway threshold.
- Landing from a no-flap or a non-standard flap approach.
- This procedure need not be demonstrated for a particular aircraft if CASA has determined that the probability of flap extension failure on that type of aircraft is extremely remote due to system design.

**Underpinning Knowledge**

- Normal and crosswind approaches and landings.
- Explain normal and crosswind approaches and landing procedures including:
  - recommended approach angles;
  - airspeeds, V-speeds
  - configurations,
  - performance limitations;
  - wake turbulence;
  - land and hold short operations (LAHSO);
  - safety factors; appropriate to the aircraft;
- Approach and landing with a (simulated) engine failure-multi-engine aeroplane.
- Explain the flight characteristics and controllability associated with manoeuvring to a landing with an engine(s) inoperative or simulated inoperative including the applicable emergency procedures specified by the manufacturer.
- Aircraft configurations and airspeed/V-speed.

*Rejected landing*

- Explain the rejected landing procedure including:
  - Conditions that dictate a rejected landing
  - The importance of a timely decision
  - LAHSO considerations
  - Correct airspeed/V-speeds
  - Applicable undercarriage, flap and speed schedule for aircraft clean up.

- Explain landing from a no flap or a non-standard flap approach
- Explain the factors which affect the characteristics of an aircraft when full or partial flaps, leading edge flaps, and any other similar devices become inoperative including:
  - Effect on aircraft handling.
  - Extracts critical airspeeds/V-speeds (including tyre rotation limits).
  - Calculates Landing Distance Required.

## Unit TR 5: Normal Systems Operations

**Unit Description:** Skills and knowledge to operate as pilot-in-command of a multi-crew aircraft during visual, instrument and night conditions and operate the aircraft systems, sub-systems (equipment) and devices accordance with Flight Manual/POH and company operations manual.

Elements	Performance Criteria
TR5.1 Operate aircraft systems during normal flight	<ul style="list-style-type: none"> <li>• Operates the aircraft systems, sub-systems (equipment), and devices applicable to the aircraft type in accordance with POH/Flight Manual and company operations manual including:               <ul style="list-style-type: none"> <li>◦ engine;</li> <li>◦ fuel system;</li> <li>◦ electrical system;</li> <li>◦ hydraulic system;</li> <li>◦ environment and pressurisation systems;</li> <li>◦ fire detection and extinguishing systems;</li> <li>◦ navigation and avionics systems;</li> <li>◦ automatic flight control system, electronic flight instrument system, and related subsystems;</li> <li>◦ flight control systems;</li> <li>◦ anti-ice and de-ice systems;</li> <li>◦ aircraft and personal emergency equipment; and</li> <li>◦ other systems, subsystems and devices specific to the type of aircraft, including make, model and series.</li> </ul> </li> <li>• Completes immediate action items and checklist/s as appropriate to the system.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Day and night Visual Flight Rules or Instrument Flight Rules.</li> <li>• Approved multi-engine multi-crew aeroplane fitted with piston, diesel, turbine or turbine propeller engines.</li> <li>• Single-engine aircraft specified by CASA for type rating.</li> <li>• Approved flight simulator.</li> <li>• Aerodromes.</li> <li>• Sealed, gravel or grass surfaces.</li> <li>• Simulated abnormal or emergency situations.</li> <li>• Simulated hazardous weather.</li> <li>• Up to and including light turbulence.</li> </ul>	
<b>Underpinning Knowledge</b>	
<ul style="list-style-type: none"> <li>• Normal systems operating procedures.</li> <li>• Explain the normal system operating procedures of the aircraft systems, subsystems and devices used to operate the specific aircraft type including:               <ul style="list-style-type: none"> <li>◦ The use of published scans and checklists;</li> <li>◦ Immediate action items;</li> <li>◦ Warnings; and</li> <li>◦ Limitations.</li> </ul> </li> </ul>	

## Unit TR 6: Non-normal and Emergency Procedures

**Unit Description:** Skills and knowledge to operate as pilot-in-command of a multi-crew aircraft during visual, instrument and night conditions in non normal and emergency situations in accordance with Flight Manual/POH and company operations manual.

Elements	Performance Criteria
TR6.1 Manage non-normal and emergency procedures	<ul style="list-style-type: none"> <li>• Controls aircraft.</li> <li>• Identifies and confirms non-normal or emergency situations.</li> <li>• States from memory and performs recall items in accordance with Flight Manual/POH or company operations manual.</li> <li>• Performs appropriate non-normal or emergency procedures in accordance with Flight Manual/POH and published procedures, including:               <ul style="list-style-type: none"> <li>◦ emergency descent;</li> <li>◦ in-flight fire and smoke elimination procedures;</li> <li>◦ rapid depressurisation;</li> <li>◦ emergency evacuation; and</li> <li>◦ other emergencies as specified in aircraft flight manual.</li> </ul> </li> <li>• Demonstrates or explains the location and operation of all emergency exits, escape slides or ropes and safety equipment in accordance with POH/ Flight Manual, company operations manual or equipment manufacturer's manuals.</li> <li>• Recognises symptoms of crew incapacitation, assumes and maintains control of the aircraft and provides appropriate assistance to the incapacitated crewmember.</li> <li>• Operates all aircraft systems in accordance with Flight Manual/POH and company operations manual.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Day and night Visual Flight Rules or Instrument Flight Rules.</li> <li>• Approved multi-engine multi-crew aeroplane fitted with piston, diesel, turbine or turbine propeller engines.</li> <li>• Single-engine aircraft specified by CASA for type rating.</li> <li>• Approved flight simulator.</li> <li>• Aerodromes.</li> <li>• Sealed, gravel or grass surfaces.</li> <li>• Simulated abnormal or emergency situations.</li> <li>• Simulated hazardous weather.</li> <li>• Up to and including light turbulence.</li> </ul>	
<b>Underpinning Knowledge</b>	
<ul style="list-style-type: none"> <li>• Emergency procedures.</li> <li>• Explain the emergency procedures relating to the aircraft type including:               <ul style="list-style-type: none"> <li>◦ Immediate action items;</li> <li>◦ Warnings;</li> <li>◦ Limitations; and</li> <li>◦ Checklists and crew procedures.</li> </ul> </li> <li>• Recall Phase one actions without error.</li> </ul>	

## Unit TR 7: Post Flight Procedures

**Unit Description:** Skills and knowledge to operate as pilot-in-command of a multi-crew aircraft after landing in day and night conditions in accordance with Flight Manual/POH.

Elements	Performance Criteria
TR7.1 Complete after landing procedures	<ul style="list-style-type: none"> <li>• Complies with after landing/taxi/ramp procedures appropriate to the aircraft type.</li> <li>• Maintains appropriate spacing from other aircraft, obstructions and persons.</li> <li>• Maintains desired track and speed.</li> <li>• Complies with instructions issued by ATC.</li> <li>• Complies with runway threshold lines, localiser and glide slope critical areas, and other surface control markings and lighting during ground operations.</li> <li>• Completes the applicable checklist items and specified procedures in accordance with the approved checklist/POH.</li> <li>• Maintains lookout and aircraft control during taxi operations.</li> </ul>
TR7.2 Park and secure aircraft	<ul style="list-style-type: none"> <li>• Performs parking procedures in accordance with POH/Flight Manual or company operations manual...</li> <li>• Secures the aircraft in accordance with manufacturer's specifications or company operations manual.</li> <li>• Complete aircraft technical log and maintenance records.</li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>• Day and night Visual Flight Rules or Instrument Flight Rules.</li> <li>• Approved multi-engine multi-crew aeroplane fitted with piston, diesel, turbine or turbine propeller engines.</li> <li>• Single-engine aircraft specified by CASA for type rating.</li> <li>• Approved flight simulator.</li> <li>• Aerodromes.</li> <li>• Sealed, gravel or grass surfaces.</li> <li>• Simulated abnormal or emergency situations.</li> <li>• Simulated hazardous weather.</li> <li>• Up to and including light turbulence.</li> </ul>	
<b>Underpinning Knowledge</b>	
N/A	

## Unit TR 8: Upset Aircraft Recovery Management - Large Aircraft

**Unit Description:** Knowledge and skills to identify unintentional upset aircraft state in a large aircraft and to recover to controlled flight during visual or instrument flight conditions.

Elements	Performance Criteria
TR8.1. Identify upset aircraft state	<ul style="list-style-type: none"> <li>Recognises and interprets aircraft attitudes or bank angles, warning devices and instrument and airspeed indications that represent an <u>upset aircraft state</u>.</li> <li>Identifies <u>upset aircraft state</u>.</li> </ul>
TR8.2. Recover from upset aircraft state	<ul style="list-style-type: none"> <li>Confirms upset aircraft state.</li> <li>Disengages autopilot and auto-throttle.</li> <li>Adjusts aircraft configuration when appropriate.</li> <li>Recovers aircraft from upset aircraft state to controlled flight using techniques specified in Flight Manual/POH, company operations manual or other approved sources, including recovery from: <ul style="list-style-type: none"> <li>Stalls;</li> <li>Aircraft nose attitudes exceeding 25 above the horizon;</li> <li>Aircraft nose attitude exceeding 10 degrees below the horizon;</li> <li>Angles of bank exceeding 45 degrees;</li> <li>Low nose attitude and high airspeeds; and</li> <li>Recovers aircraft within structural and airspeed limitations.</li> </ul> </li> </ul>
<b>Range of Variables</b>	
<ul style="list-style-type: none"> <li>Large single and multi-engine aircraft.</li> <li>Approved flight simulators.</li> <li>Visual and instrument flight.</li> </ul>	
<b>Underpinning Knowledge</b>	
<ul style="list-style-type: none"> <li>Give examples of how potential, kinetic and chemical energy relate to an aircraft in flight.</li> <li>Explain how energy states are manipulated to generate aerodynamic forces that allow an aircraft to be manoeuvred.</li> <li>State the unintended flight conditions of pitch, bank and airspeed that describe upset aircraft state.</li> <li>Explain the physical symptoms that may or may not be evident in a stall.</li> <li>Explain the stall recovery technique during any nominated phase of flight applicable to the aircraft type being flown.</li> <li>Explain the upset recovery techniques applicable to the aircraft being flown for the following nose attitudes and angle of bank: <ul style="list-style-type: none"> <li>Nose high low airspeed;</li> <li>Nose high low airspeed, bank angle exceeding 45 degrees;</li> <li>Nose low high airspeed aircraft banked; and</li> <li>Nose low, aircraft at VMO /MMO.</li> </ul> </li> <li>Explain why harsh application of flight controls should be avoided during upset aircraft recovery procedures.</li> <li>Explain the statement that 'Full cyclic application of flight controls at airspeeds below manoeuvre speed (VA) may not ensure structural protection for an aircraft.'</li> </ul>	