

# Demonstration of Competency

## Type Rating

### Helicopter

This guide sets out the procedures, techniques and marking criteria for the demonstration of skill required for the issue of a New Zealand type rating in a helicopter.

The guide describes an acceptable means of compliance for use in conjunction with the syllabus prescribed in the appropriate CAA Advisory Circular. Flight instructors are expected to use this guide when conducting the “Type Competency Demonstration”.

Flight instructors conducting type conversion training and the candidate should be familiar with this guide and refer to the competency standards during training.

Where an item is not applicable to the type the instructor will annotate the 24061/21 report form with N/A. Alternatively the demonstration of competency report form CAA 24061/21 is available in word format so that individual operators may modify the form to suit a specific helicopter type e.g. Pneumatics (if not applicable) may be deleted.

#### **Change Notice**

Not applicable – Initial Issue

May 2009

General	3
There are two aspects to the issue of a type rating:	3
Eligibility	3
Conduct of the type competency demonstration	3
Briefing	3
Repeated Exercise	4
Incomplete demonstration	4
Demonstration of competence not achieved	4
Type rating issue	4
Records	5
Assessment of Performance	5
Marking Scale	5
DEMONSTRATION OF COMPETENCY REQUIREMENTS	6
OPERATION OF HELICOPTER SYSTEMS	6
PERFORMANCE AND LIMITATIONS	8
WEIGHT AND BALANCE, LOADING	9
DOCUMENTS AND AIRWORTHINESS	10
PRE-FLIGHT INSPECTION	11
ENGINE STARTING AND RUN-UP	12
TAXIING and HOVER MANOEUVRING	13
TAKE-OFF	14
INTENTIONAL ENGINE SHUTDOWN AND AIR START (Multi-engine only)	15
ENGINE FAILURE (CRUISE FLIGHT)	16
ENGINE FAILURE DURING TAKE-OFF	17
ENGINE FAILURE AFTER TAKE-OFF	18
CRUISING FLIGHT	19
STEEP TURN	20
SETTLING WITH POWER (VORTEX RING STATE ONSET)	21
CIRCUIT	22
APPROACH AND LANDING	23
EMERGENCY PROCEDURES	24

## General

There are **two** aspects to the issue of a type rating:

1. Training, covering **all** applicable aspects of the helicopter type (recorded in the training record, centre section, of CAA form 24061/21); and
2. A final Type Competency Demonstration, which samples the training (recorded in the competency demonstration column, right side, of CAA form 24061/21 and scored 1 - 3).

## Eligibility

In order to be eligible for the Type Competency Demonstration for the issue of a Type Rating - Helicopter the candidate shall provide:

- Proof of identification in the form of a licence or other official document bearing the signature and photograph of the candidate;
- A valid New Zealand Pilot Licence (H), or in the case of a PPL issue flight test a current medical certificate;
- A copy of their training records showing competence certified by a flight instructor in all exercises applicable to the helicopter type; and
- In the case of the first turbine powered aircraft, a Basic Turbine Knowledge examination credit (Subject 64) with the KDR's appropriately addressed.
- For helicopters with a MCTOW greater than 1500 kg a copy of the approved examination showing a 70% pass and evidence that the answers have been corrected to 100%.
- For multi-engine helicopters, have completed an approved course of ground instruction and achieved a 70% pass in the approved examination and had the answers corrected to 100%.

## Conduct of the type competency demonstration

An appropriately type rated and qualified flight instructor shall only conduct the type competency demonstration when the weather will permit safe completion of the required exercises, the helicopter is airworthy, the training records are correctly certified and the candidate's documents, as required by the New Zealand Civil Aviation Rules, are valid.

## Briefing

The flight instructor assessing type competency is required to brief the candidate on the following details:

- The sequence of exercises to be covered. There is no need for the candidate to memorize the sequence, as the instructor will give instructions for each exercise.
- If in doubt -- ask! Candidates who do not clearly understand what they are being asked to do should feel free to ask.
- Who is pilot-in-command? The flight instructor is the pilot-in-command.
- How to transfer control. There should never be any doubt as to who is flying the helicopter, so proper transfer of control through the words "You have control" and "I have control" is expected. A visual check is recommended to verify that the exchange has occurred.
- Ground references. Where is the intended aiming point and landing point?
- Method of simulating emergencies. What method will be used? Oral warning? Practise autorotation profiles? One engine inoperative procedure/method of simulating, observance of power limitations on remaining engine. (Note: Closing down engine(s), turning off magneto switches, closing fuel valves is not recommended).
- The role of the instructor in the event of an actual emergency. Who will fly the helicopter? What assistance is expected from the non-flying pilot?
- Use of checklists. What type of checklists will be used and when?

## Repeated Exercise

An exercise or manoeuvre shall not be repeated unless one of the following conditions applies:

**Incomplete or outcome uncertain:** If the flight instructor determines that an exercise or manoeuvre is incomplete, or the outcome uncertain, the flight instructor may require the candidate to repeat all or portions of an exercise or manoeuvre. When practical, the remaining exercises or manoeuvres should be completed before repeating the questionable one.

**Discontinuance:** Discontinuance of a manoeuvre for valid safety reasons; i.e., a go-around or other procedure necessary to modify the originally planned manoeuvre.

**Misunderstood requests:** Legitimate instances where the candidate did not understand the flight instructor's request to perform a specific manoeuvre.

**Other factors:** Any condition under which the flight instructor was distracted to the point that they could not adequately observe the candidate's performance of the manoeuvre (radio calls, traffic).

**These provisions have been made in the interest of fairness and do not mean that:**

1. Instruction,
  2. Practice, or
  3. The repeating of an unacceptably demonstrated exercise or manoeuvre ,
- is permitted during the final type competency demonstration.

## Incomplete demonstration

If the type competency demonstration cannot be completed owing to circumstances beyond the candidate's control, the subsequent demonstration shall include those flight manoeuvres required to demonstrate the exercises not completed on the original flight.

## Demonstration of competence not achieved

If competence in any exercise during the type competency demonstration is not achieved then the candidate is deemed not yet competent for the issue of the type rating.

The instructor shall annotate the reverse of the training record with details of the further training required.

The instructor shall stop the demonstration and assess the candidate not yet competent if the candidate:

- Displays gross incompetence or dangerous flying; or
- Fails to use proper visual scanning techniques to clear the area before and while performing visual manoeuvres.

## Type rating issue

The instructor shall issue the type rating by endorsing the pilot's logbook when;

- The PPL (H) issue flight test is successfully completed; or
- The candidate has completed a type competency demonstration.

**Note:** The candidate should be advised that the helicopter type will be endorsed on the pilot's licence by submitting to CAA; application form CAA 24061/04, the actual licence, a copy of the type rating training and competency demonstration record (CAA 24061/21) and the fee.

## Records

### In all cases of a type rating issue (other than at the time of a licence issue flight test);

- The instructor shall submit to CAA a copy of the candidate's training and competency demonstration record (CAA 24061/21) available from the CAA website); and
- In the case of the first turbine powered type, a copy of the candidate's Basic Turbine Knowledge examination credit (with KDR's appropriately addressed).
- For helicopters with a MCTOW greater than 1500kg or multi-engine helicopters a copy of the completed approved examination.

### Assessment of Performance

The "Performance Criteria" section of each exercise prescribes the marking criteria. These criteria assume no unusual circumstances. Where variances exist between the owner/operators published Standard Operating Procedures (SOP) and the manufacturer's recommendations, the candidate should follow the SOP and must be able to explain the logic for variances. Consideration shall be given to unavoidable deviations from the published criteria due to weather, traffic or other situations beyond the reasonable control of the candidate. To avoid the need to compensate for such situations, demonstrations should be conducted under normal conditions whenever possible.

### Marking Scale

<p><b>Ideal</b> <b>Score 1</b></p>	<p>Performance is without errors under existing conditions. Helicopter handling is smooth and accurate. Technical skills and knowledge meet a higher than expected level of competency. Behaviour indicates continuous and highly accurate situational awareness. Flight management skills are excellent. Safety of flight is assured.</p>
<p><b>Competent</b> <b>Score 2</b></p>	<p>Performance includes minor errors that are corrected promptly. Helicopter handling is smooth and within specified tolerances. Technical skills and knowledge meet the expected level of competency. Behaviour indicates that situational awareness has been maintained. Flight management skills are effective. Safety of flight is maintained.</p>
<p><b>Not yet competent</b> <small>(requires further training)</small> <b>Score 3</b></p>	<p>Performance includes significant errors that are <u>not</u> recognised or are <u>not</u> corrected promptly. Helicopter handling is rough or includes uncorrected or excessive deviations from specified tolerances. Technical skills and knowledge <u>do not</u> meet an acceptable level of competency. Behaviour indicates lapses in situational awareness that are <u>not</u> identified or corrected. Flight management skills are ineffective. Safety of flight is jeopardised.</p>

# DEMONSTRATION OF COMPETENCY REQUIREMENTS

## OPERATION OF HELICOPTER SYSTEMS

### **Aim**

To determine that the candidate can operate helicopter systems in accordance with the POH/AFM.

### **During training**

The candidate will demonstrate a practical knowledge of the operation of all applicable systems installed on the helicopter and pass an oral examination for helicopters with a MCTOW less than 1500 kg.

For helicopters with a MCTOW greater than 1500 kg or for multi engine helicopters an approved examination is required:

### **During the competency demonstration**

The candidate will demonstrate practical knowledge of the operation of four (instructor to nominate) of the systems installed on the helicopter.

### ***Performance Criteria***

The candidate will operate the helicopter systems in accordance with the POH/AFM

- **Primary flight controls and trims:** Layout of various components and management, safety devices, precautions to be observed in operation, fault finding.
- **Carburettor heat and/or alternate air** (if applicable): Layout of various components and management, precautions to be observed in operation, fault finding.
- **Mixture** (if applicable): Principle of operation, location and purpose of various components, operating procedure, precautions to be observed in operation, fault finding.
- **Fuel:** Grade and specification of fuel, system layout and management, dumping facilities, fuel tank location, capacities, unusable fuel, consumption rates and safety devices, location and purpose of various components, emergency operation, precautions to be observed in operation, fault finding.
- **Oil:** Grade and specification of engine oil, system layout and management, tank capacities and location, safety devices, operating pressures, functional checks, emergency operation, location and purpose of various components, precautions to be observed in operation, fault finding.
- **Hydraulic systems** (if fitted): Grade and specification of fluid, system layout and management, reservoir capacity and location, safety devices, operating pressures, functional checks, emergency operation, location and purpose of various components, precautions to be observed in operation, fault finding and remedial action to be taken in flight.
- **Pneumatic systems** (if fitted): Layout and management, purpose and location of various components, operating pressures, emergency operation, functional checks, safety devices, precautions to be observed in operation, fault finding.
- **Electrical systems and associated instruments:** Layout and management, location and purpose of various components and circuits, functional checks, operating voltages, capacity and number of generators, alternators, inverters and batteries, safety devices, precautions to be observed in operation, emergency operation, fault finding and remedial action to be taken in flight.
- **Landing gear/skids:** Layout and management, location and purpose of various components, functional checks, safety devices, precautions to be observed in operation, fault finding and remedial action to be taken in flight.

- **Rotor/wheel brakes** (if fitted): Layout and management, location and purpose of various components, functional checks, safety devices, precautions to be observed in operation and remedial action to be taken in flight.
- **Avionics:** To include where applicable; cockpit voice recorder (CVR), flight data recording systems (FDR), health and usage monitoring systems (HUMS), flight management systems (FMS), attitude and heading reference system (AHRS), air data computer (ADC), air data inertial reference units (ADIRU/SAARU, radar altimeters, electronic flight information systems (EFIS), primary flight displays (PFD), head up displays (HUD), navigation displays (ND), and/or multi function displays (MFD), fully automated digital engine control (FADEC), engine indicating and crew alerting systems (EICAS/ECAM), terrain awareness warning systems (TAWS), airborne collision avoidance systems (ACAS), and electronic checklists (ECL), purpose and location of various components, precautions to be observed in operation, functional checks, safety devices, emergency operation, fault finding and remedial action to be taken in flight.
- **Auto-pilot:** (if fitted) Operating limitations, location and purpose of main components, operating procedure, safety devices, precautions to be observed in operation, fault finding and remedial action to be taken in flight.
- **Pitot-static system:** Layout and management, location and purpose of various components, safety devices, functional checks, emergency operations, fault finding and remedial action to be taken in flight.
- **Vacuum/pressure system and associated gyroscopic flight instruments:** To include air data computer (if applicable), layout and management, purpose and location of various components, precautions to be observed in operation, functional checks, safety devices, emergency operation, fault finding and remedial action to be taken in flight.
- **Heater and environmental systems:** Layout and management, location and purpose of various components, functional checks, precautions to be observed in operation, safety devices, fault finding.
- **De-icing and anti-icing systems:** Layout and management, purpose and location of various components, precautions to be observed in operation, safety devices, functional checks.
- **Fire extinguisher systems:** Layout and management, location and purpose of various components, fire warning devices, functional checks, action in event of fire, precautions to be taken in operation.
- **Engines:** Operating limitations, location and purpose of various components, operating procedure for starting, ground running, take-off, climb, cruising, landing and shutting down, functional checks, controls, safety devices, accessories, power control and interpretation of power charts, fuel and oil consumption, prevention of icing and fault finding.
- **Rotor systems:** Principle of main and tail rotor operation, location and purpose of various components, operating procedure, safety devices and fault finding.
- **Airframe:** Layout of various components.

## PERFORMANCE AND LIMITATIONS

### Aim

To determine that the candidate has a practical knowledge of the elements related to performance and limitations for the helicopter.

### During training

The candidate will be required to demonstrate practical use of charts, tables and appropriate data to determine performance, including (as applicable) take-off, climb, one engine inoperative (OEI), cruise, endurance and landing.

### During the competency demonstration

Essential performance speeds shall be quoted from memory. Other helicopter performance data may be determined from the POH/AFM or checklists.

### *Performance Criteria*

The candidate will;

1. Have an understanding of (as applicable) the following and be able to derive them from the applicable charts and placards:

- In ground effect (IGE) hover performance;
- Out of ground effect (OGE) hover performance;
- Speed for best rate of climb ( $V_y$ );
- Speed for best angle of climb ( $V_x$ );
- One engine inoperative best rate of climb speed ( $V_{y_{se}}$ );
- Never exceed speed ( $V_{ne}$ );
- Minimum airspeed for flight under IFR ( $V_{mini}$ );
- Maximum landing gear extension speed ( $V_{le}$ );
- Maximum landing gear operating speed ( $V_{lo}$ );
- Take-off safety speed ( $V_{toss}$ );
- Take-off decision point (TDP);
- Landing decision point (LDP).

2. Calculate (as applicable) for the proposed flight:

- The rejected take-off distance;
- The continued take-off distance required to clear a 35 foot obstacle;
- The baulked landing distance;
- The landing distance;
- The back-up distance;
- Time and fuel required to climb to a specified altitude;
- The single-engine rate of climb;
- The available flight time with the fuel load and power settings proposed for the flight;
- Takeoff profiles taking height/velocity curve into account;
- Takeoff and landing profiles for twin Category A performance (clear area and VTOL).

## **WEIGHT AND BALANCE, LOADING**

### **Aim**

To determine that the candidate can correctly load and complete weight and balance calculations for the helicopter.

### **During training**

The candidate will demonstrate:

- Loading and centre of gravity calculations including use of load adjusters, and loading charts, effect of fuel consumption on centre of gravity, effect of movement of crew, passenger or cargo centre of gravity, effect of landing gear retraction on centre of gravity, precautions to be observed in loading and securing of load.
- All normal manoeuvres at MAUW (or as near to as possible). It is recommended that this training requirement is met using correctly distributed and secured ballast and completing a short local flight with a landing at other than the departure aerodrome/heliport (i.e. operating the helicopter).
- The ability to determine a workable weight and balance in the field where computers and other aids are not available.

### **During the competency demonstration**

The candidate will be required to complete accurate computations for a practical load that addresses all or most of the passenger and baggage stations, using actual weights and weight and balance data applicable to the helicopter, including take-off weight, landing weight and the zero fuel weight. If a loading graph or computer is available with the helicopter, it may be utilized.

### ***Performance Criteria***

The candidate will:

- Determine the take-off, landing, and zero fuel weights as well as centres of gravity given a typical load;
- Demonstrate a practical knowledge of how to correct a situation in which the centre of gravity is out of limits and/or a weight limit has been exceeded;
- Explain the effect of various centre of gravity locations on helicopter flight characteristics and handling;
- Demonstrate a practical knowledge of floor loading.

## **DOCUMENTS AND AIRWORTHINESS**

### **Aim**

To determine that the candidate can correctly assess the validity of the required documents to be carried on board and, from these documents, determine that the helicopter is airworthy and released for service.

### **During training**

The candidate will use the helicopter flight manual data to determine take-off and landing performance, operating limitations, procedures to be followed in take-off, climb, cruising and landing.

The candidate will demonstrate an understanding of the height/velocity diagram.

The candidate will demonstrate use of the approved minimum equipment list (MEL) if applicable;

Determine the impact of deferred defects on operations and explain the process for dealing with helicopter un-serviceability's discovered during a flight.

### **During the competency demonstration**

The candidate shall determine the validity of all documents required to be carried on board the helicopter and determine that required maintenance certification has been completed.

### ***Performance Criteria***

The candidate will:

- Determine that the documents required on board are valid;
- Ensure that any conditions or limitations on the technical log can be complied with;
- Determine the number of flying hours before the next service or maintenance task is due;
- Comply with any applicable airworthiness directives (ADs).

## **PRE-FLIGHT INSPECTION**

### **Aim**

To determine that the candidate can complete internal and external checks in accordance with the approved checklist to verify that the helicopter is ready for the intended flight.

### **During training**

The candidate will demonstrate the method of confirming the amount of fuel actually on board either visually or by other credible procedures (e.g. fuel chits, fuel logs).

Explain the components of an effective pre-flight brief in relation to the helicopter type and;

- the requirement to comply with crew instructions and lighted signs
- the location and use of emergency exits, emergency locator transmitter, fire extinguisher;
- smoking limitations;
- use of seat belts;
- action to take in the event of an emergency landing;
- passenger considerations for helicopter evacuation;
- items specific to the helicopter type being used;
- for overwater flight a demonstration of the use of life preservers;
- other items for use in an emergency.

### **During the competency demonstration**

The candidate shall determine that the helicopter is airworthy for the intended flight and check for fuel quantity, proper grade of fuel, fuel contamination and oil levels in accordance with the POH/AFM.

The candidate shall conduct an oral passenger safety briefing. Should the candidate omit the passenger safety briefing the instructor will ask the candidate to provide one.

### ***Performance Criteria***

The candidate will:

- Using an orderly procedure/checklists, inspect the helicopter including those items recommended by the manufacturer;
- Identify and verify switches, circuit breakers/fuses, and spare fuses pertinent to day and night operations;
- Confirm that there is sufficient fuel and oil for the intended flight;
- Identify and verify the location and security of baggage and required equipment;
- Organize and arrange documents and equipment in a manner that makes the items readily available;
- Perform an effective passenger safety briefing.

## **ENGINE STARTING AND RUN-UP**

### **Aim**

To determine that the candidate can complete the engine start, warm-up, run-up, and systems checks in accordance with the POH/AFM to assure readiness for flight.

### **During training**

The candidate will demonstrate a practical knowledge of the elements related to recommended engine starting procedures, including the use of external power source, starting under various atmospheric conditions and the effects of using incorrect starting procedures.

### **During the competency demonstration**

The candidate shall use the checklists provided by the helicopter manufacturer or owner/operator and use the recommended procedures for engine starting, warm-up, run-up and systems checks to determine that the helicopter is airworthy and ready for flight.

The candidate shall take appropriate action with respect to unsatisfactory conditions encountered or specified by the instructor.

### ***Performance Criteria***

The candidate will:

- Use the appropriate checklist provided by the manufacturer or helicopter owner/operator;
- Demonstrate knowledge of recommended starting procedures;
- Take appropriate action with respect to unsatisfactory start conditions;
- Complete the appropriate engine and helicopter systems checks.

## **TAXIING and HOVER MANOEUVRING**

### **Aim**

To determine that the candidate can manoeuvre the helicopter on and/or near the ground.

### **During training**

The candidate will be expected to demonstrate low level and hover manoeuvring including spot turns, sideways, and backwards flight, level decelerations (quick stops).

### **During the competency demonstration**

Provided that traffic permits, the candidate shall taxi along taxiway centrelines where they exist (wheeled helicopters only). For skid equipped helicopters hover taxiing will be demonstrated. While taxiing, the candidate will be expected to confirm the proper functioning of the flight instruments.

### ***Performance Criteria***

The candidate will:

- Perform a brake check (if applicable);
- Use flight controls and brakes (if applicable) correctly;
- Safely manoeuvre the helicopter using appropriate taxiing speeds;
- Confirm the proper functioning of the flight instruments;
- After landing, clear the runway/landing area, complete after landing checks as appropriate and taxi to a suitable parking/refuelling area;
- Demonstrate smooth control at a constant safe hover height while hover manoeuvring and maintaining power within the limits.

## **TAKE-OFF**

### **Aim**

To determine that the candidate can take off using the correct procedure and technique for the actual wind conditions and runway (if applicable).

### **During training**

The candidate shall demonstrate competence in the following take-off procedures (as applicable):

- Normal
- Minimum power (or rolling),
- Maximum performance,
- From a confined area,
- From sloping ground.

### **During the competency demonstration**

The candidate shall demonstrate at least two of the following take-off procedures:

- Normal
- Minimum power (or rolling),
- Maximum performance,
- From a confined area,
- From sloping ground.

### ***Performance Criteria***

The candidate will:

- Complete appropriate checklists;
- Perform a take-off safety briefing;
- Set operating RPM;
- Clear the area, taxi into the take-off position;
- When clear of obstacles, accelerate to and maintain the recommended climb speed (+10/-5 knots); using the correct profile;
- Retract the landing gear after a positive rate of climb is established (if applicable);
- Maintain take-off power to a safe manoeuvring altitude, then set climb power;
- Comply with noise abatement procedures, where applicable;
- Complete appropriate checks.

## **INTENTIONAL ENGINE SHUTDOWN AND AIR START (Multi-engine only)**

### **Aim**

To determine that the candidate can confirm the need for an intentional engine shutdown, complete the engine securing procedure and air start the secured engine.

### **During the competency demonstration**

At an operationally safe height or the manufacturer's recommended minimum height, whichever is higher, the candidate will respond to a scenario presented by the instructor that requires an intentional engine shutdown, without the assistance of an autopilot. The candidate will then shut down the appropriate engine (unless the POH/AFM advises against it) and complete the appropriate checklist(s).

The instructor will require the candidate to restart the secured engine.

### ***Performance Criteria***

The candidate will:

- Analyse the situation as presented by the instructor;
- Shut down the engine by completing all necessary checks in accordance with the appropriate emergency checklist;
- Maintain altitude within +/-100 feet of the assigned altitude;
- Maintain heading within +/-20° initially then 10°;
- Maintain airspeed +10/-5 knots of the recommended airspeed.

### ***Performance Criteria – Decision Making***

The candidate will:

- Take and/or describe appropriate subsequent actions.

### ***Performance Criteria – Engine Out Manoeuvring***

The candidate will:

- Use appropriate bank angles;
- Demonstrate proper power management.

### ***Performance Criteria – Air Start***

The candidate will:

- Restart the secured engine using the appropriate checklist;
- Maintain altitude within +/-100 feet of the assigned altitude.

## **ENGINE FAILURE (CRUISE FLIGHT)**

### **Aim**

To determine that the candidate can maintain control of the helicopter after an engine failure during cruising flight.

### **During the competency demonstration**

At an operationally safe height or the manufacturer's recommended minimum height, whichever is higher, the instructor will simulate an engine failure during straight flight and/or during a medium turn. The candidate will be expected to control the helicopter, carry out an autorotation (single engine), and in the case of a multi-engine helicopter, identify the failed engine, perform the cause checks, and simulate shutting down the failed engine in accordance with the checklist.

### ***Performance Criteria – Helicopter Control***

The candidate will:

- Control the helicopter;
- Recognise the simulated engine failure promptly;
- Maintain directional control within  $\pm 20^\circ$  initially of an assigned heading then  $\pm 10^\circ$  (multi-engine);
- Set the power controls, confirm cruise configuration, and identify and verify the inoperative engine (if applicable);
- Simulate the action required to shut down the failed engine (if applicable);
- Maintain airspeed within  $\pm 10/-5$  knots of the recommended airspeeds;
- Maintain altitude within  $\pm 100$  feet of the assigned altitude (multi-engine);
- In the case of single engine helicopter, carry out the recommended forced landing procedure;
- In the case of a multi-engine helicopter, carry out a (simulated) single engine (OEI) approach and landing at a suitable aerodrome or heliport.

### ***Performance Criteria – Cockpit Checks***

The candidate will:

- Complete engine failure vital action checks from memory;
- Attempt to determine the probable cause of the (simulated) engine failure;
- Complete other necessary checks in accordance with the appropriate emergency checklist(s);
- In the case of a multi-engine helicopter, monitor the operating engine and take appropriate action to keep it within operating limitations.

### ***Performance Criteria – Decision Making***

The candidate will:

- Determine whether or not the engine should be re-started and explain the reason for the decision;
- Take and/or describe appropriate subsequent actions.

## **ENGINE FAILURE DURING TAKE-OFF**

### **Aim**

To determine that the candidate can maintain control of the helicopter following an engine failure during the take-off and carry out the appropriate emergency actions.

### **During the competency demonstration**

At an operationally safe speed the instructor will simulate an engine failure during the take-off before the Critical Decision Point (CDP) and/or an emergency that dictates an aborted take-off as the most desirable option.

### ***Performance Criteria – Helicopter Control***

The candidate will:

- Recognise the simulated engine failure promptly;
- Control the helicopter;
- Enter autorotation (single engine)
- Make the decision as to whether to continue the take off or abort (multi-engine);
- Bring the helicopter to a stop in the area remaining or establish a climb at the appropriate speed (multi-engine).

### ***Performance Criteria – Cockpit Checks***

The candidate will:

- Complete vital action checks from memory;
- Complete engine shutdown checks (if appropriate) and other necessary checks in accordance with the appropriate emergency checklist(s).

### ***Performance Criteria – Decision Making***

The candidate will:

- Make an appropriate decision based on the nature of the simulated emergency;
- Take and/or describe appropriate subsequent actions.

## **ENGINE FAILURE AFTER TAKE-OFF**

### **Aim**

To determine that the candidate can maintain control of the helicopter following an engine failure after take-off (beyond CDP) and carry out the appropriate emergency actions.

### **During the competency demonstration**

At an operationally safe height or the manufacturer's recommended minimum height, whichever is higher, the instructor will simulate an engine failure. The instructor will adjust the power on the simulated inoperative engine (if applicable).

### ***Performance Criteria – Helicopter Control***

The candidate will:

- Recognise the simulated engine failure promptly;
- Control the helicopter;
- Initiate and establish an autorotation to a suitable landing area (single engine);
- Set the power controls, retract the landing gear, and identify and verify the inoperative engine (if applicable);
- Simulate shut down of the failed engine (if applicable);
- Establish speed at the one engine inoperative best rate-of-climb speed ( $V_y$ )  $\pm 10/-5$  knots (if applicable);
- Establish a positive rate of climb, if the multi-engine helicopter is capable;
- Continue the overshoot towards a specified altitude (multi-engine only);
- In the case of a multi-engine helicopter, maintain directional control within  $\pm 20^\circ$  initially then  $\pm 10^\circ$  of assigned heading.

### ***Performance Criteria – Cockpit Checks***

The candidate will:

- Complete engine failure vital action checks from memory;
- Complete engine shutdown checks and other necessary checks in accordance with the appropriate emergency checklist(s);
- In the case of a multi-engine helicopter, monitor the operating engine and take appropriate action to keep the operating engine parameters within limitations.

### ***Performance Criteria – Decision Making***

The candidate will:

- Take and/or describe appropriate subsequent actions.

## **CRUISING FLIGHT**

### **Aim**

To determine that the candidate can establish the helicopter in cruising flight in accordance with the POH/AFM at a normal cruise speed.

### **During the competency demonstration**

The candidate will establish the helicopter in cruise flight in accordance with the performance charts in the POH/AFM, placards displayed in the helicopter, or any other means authorised by the manufacturer.

### ***Performance Criteria***

The candidate will:

- Maintain assigned heading(s)  $\pm 10^\circ$  and altitude  $\pm 100$  feet;
- Achieve the specified cruise airspeed for existing conditions as recommended by the POH/AFM;
- Apply any additional measures recommended by the manufacturer with respect to helicopter configuration or other considerations;
- Confirm cruise performance;
- Complete appropriate cruise checks.

## **STEEP TURN**

### **Aim**

To determine that the candidate can perform a level co-ordinated steep turn.

### **During the competency demonstration**

At an operationally safe height, the candidate will be asked to execute a steep turn through at least 180° at 45° angle of bank.

### ***Performance Criteria***

The candidate will:

- Complete appropriate safety precautions before entering the steep turn;
- Enter a smooth, co-ordinated steep turn with 45° bank;
- Divide attention appropriately between outside visual references and instrument indications;
- Maintain altitude within +/-100 feet;
- Maintain angle of bank within +/-10°;
- Maintain an effective lookout.

## **SETTLING WITH POWER (VORTEX RING STATE ONSET)**

### **Aim**

To determine that the candidate can recognise and recover smoothly from the onset of settling with power and take the correct recovery action.

### **During the competency demonstration**

At an operationally safe height the instructor will ask the candidate to set the conditions required to approach settling with power and instruct the candidate to carry out the recovery either on his command or when the height loss is 500 feet whichever occurs first.

### ***Performance Criteria***

The candidate will:

- Complete appropriate safety precautions and checks before commencing;
- Establish the specified configuration;
- Transition smoothly to a speed and rate of descent that would lead to the development of settling with power;
- Recognise and announce the onset by identifying the first indication yaw, vibration, rate of descent increasing;
- Recover using control application in the proper sequence;
- Return to the climb.

## **CIRCUIT**

### **Aim**

To determine that the candidate can operate the helicopter in the vicinity of an aerodrome or heliport.

### **During the competency demonstration**

The candidate shall demonstrate correct circuit procedures, including departure and joining procedures for the aerodrome(s) or heliport being used.

The candidate shall demonstrate the overshoot procedure (one engine inoperative for multi-engine helicopters) on command by the instructor or as required by ATS.

The ability to comply with ATS clearances or instructions while maintaining separation from other aircraft shall also be demonstrated.

### ***Performance Criteria***

The candidate will:

- Comply with actual ATS clearances or instructions as appropriate;
- Comply with circuit entry and departure procedures;
- Comply with established circuit patterns and speeds;
- Fly an accurate circuit maintaining correct position and separation from other aircraft;
- Correct for wind drift to maintain proper ground track;
- Remain oriented with the runway/landing area in use;
- Maintain circuit altitude (+/-100 feet) and an appropriate airspeed (+/-10 knots);
- Complete appropriate checklists;
- Carry out an overshoot on demand or as operationally required.

## **APPROACH AND LANDING**

### **Aim**

To determine that the candidate can select a suitable touchdown point, approach and land using the correct procedure and technique for the actual wind conditions, surface and available length.

### **During training**

The candidate will be required to demonstrate the following landing procedures:

- Normal approach and landing;
- Steep approach and landing;
- Running (skids) or roll on landing (wheeled);
- Approach and landing in a confined area;
- Demonstrate a landing on sloping ground, within the helicopter's slope limits;
- Consider noise abatement techniques.

### **During the competency demonstration**

The candidate will be required to demonstrate at least two of the following landing procedures:

- Normal approach and landing;
- Steep approach and landing;
- Running (skids) or roll on landing (wheeled);
- Approach and landing in a confined area;
- Demonstrate a landing on sloping ground, within the helicopter's slope limits.

### ***Performance Criteria***

The candidate will:

- Consider the wind conditions, landing surface and obstructions;
- Consider noise abatement techniques;
- Select a suitable touchdown zone and specify a touchdown point;
- Establish the recommended approach and landing configuration;
- Maintain a stabilised approach at the recommended airspeed;
- Transition to the hover or to a run on landing as appropriate;
- Touch-down in the attitude recommended for the type;
- Maintain crosswind correction and directional control throughout the approach and landing roll (wheeled);
- Apply brakes as required (wheeled);
- Complete appropriate checks.

## EMERGENCY PROCEDURES

### Aim

To determine that the candidate can react promptly and correctly to emergencies and systems or equipment malfunctions.

### During training

The candidate will demonstrate knowledge of all relevant emergency procedures or abnormal conditions and actions in the event of forced landing on land or water and use of survival equipment.

### During the competency demonstration

The instructor will assess the candidate's knowledge of any three (3) emergency procedures or abnormal conditions. Assessment may be carried out during any portion of the demonstration.

### Performance Criteria

Assessment will be based on the candidate's ability to analyse simulated or real situations, take appropriate action and follow the appropriate emergency checklists or procedures for the following simulated emergencies/malfunctions:

<ul style="list-style-type: none"><li>• Governor failure (low side)</li><li>• Governor failure (high side)</li><li>• Recovery from low rotor RPM</li><li>• Cabin fire</li><li>• Engine fire</li><li>• Electrical fire</li><li>• Heater overheat</li><li>• Loss of oil pressure</li><li>• Loss of fuel pressure</li><li>• Primary flight display (PFD)</li><li>• Multi function display (MFD)</li><li>• AHRS &amp; ADC failures</li></ul>	<ul style="list-style-type: none"><li>• Electrical malfunctions</li><li>• Landing gear malfunctions</li><li>• Brake failure</li><li>• Carbon monoxide warning</li><li>• Door or panel opening in flight</li><li>• Caution and warning panel emergencies</li><li>• Hydraulic failure/malfunctions</li><li>• Tail rotor malfunctions</li><li>• Incipient ground resonance</li><li>• Incipient dynamic roll-over</li><li>• Any other type-unique emergency</li></ul>
--	---

The candidate will:

- Control the helicopter;
- Recognise the simulated emergency promptly.

### Performance Criteria – Cockpit Checks

The candidate will:

- Complete vital action checks from memory;
- Complete subsequent actions in accordance with the emergency checklist.

### Performance Criteria – Decision Making

The candidate will:

- Take and/or describe appropriate subsequent actions.

**Note:** Most emergency procedures listed above can be examined orally, with “touch checks” carried out by the candidate. It is the sole responsibility of the instructor to determine if helicopter performance, weather conditions and other factors permit the safe conduct of simulated emergencies in flight.