Title	**Demonstrate knowledge of aerodynamics and aircraft systems for an airline transport pilot licence (helicopter)**		
Level	**6**	**Credits**	**8**

Purpose	People credited with this unit standard are able, for an airline transport pilot licence (helicopter) in accordance with Subject No 50, to demonstrate knowledge of: aeroscience; helicopter rotor disks; helicopter flight; hazardous flight conditions; rotor systems; instruments; integrated flight instrument systems; and warning and recording systems.

Classification	Aviation > Aircraft Operation

Available grade	Achieved

Guidance Information

1 This unit standard is aligned with the relevant parts of the prescribed syllabi of the Civil Aviation Authority of New Zealand (CAA) for Subject No 50 for an airline transport pilot licence (helicopter). Credit will be awarded upon meeting the requirements of the CAA-approved assessment or examination.

2 An airline transport pilot licence permits the holder to conduct aircraft operations as pilot-in-command in an aircraft requiring a co-pilot.

3 Definitions, abbreviations, and acronyms used in this unit standard are to be found in:
- a *Civil Aviation Rules Part 1* on the CAA website at https://www.caa.govt.nz, and
- b *Aeronautical Information Publication (AIP)* published by Aeronautical Information Management (AIM), PO Box 294, Wellington 6140 or on the AIM website at http://www.aip.net.nz.

4 All references to the CAA refer specifically to the Civil Aviation Authority of New Zealand.

5 Industry standards and recommended practices are those set in place by the CAA.

6 Industry texts may include but are not limited to – aircraft flight manuals, CAA Rules, CAA Advisory Circulars, CAA Flight Test Standards Guides, operator exposition.

7 For the purpose of this unit standard, *knowledge* refers to knowledge, understanding, and application of the subject matter.

8 Industry requirements are that the candidate must meet the eligibility requirements of the Civil Aviation Act 1990 and the Civil Aviation Rules Part 61 for an airline transport pilot licence (helicopter).

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of aeroscience in accordance with Subject No 50.

Performance criteria

1.1 Aeroscience concepts are stated, described and defined in accordance with industry texts and standards.

1.2 Aerodynamic theory is described and explained in accordance with industry texts and standards.

1.3 Lift is explained in accordance with industry texts and standards.

1.4 Drag is described and explained in accordance with industry texts and standards.

1.5 Lift/drag ratio is explained in accordance with industry texts and standards.

Outcome 2

Demonstrate knowledge of helicopter rotor disks in accordance with Subject No 50.

Performance criteria

2.1 Terminology is identified and explained in accordance with industry texts and standards.

2.2 Forces acting on a helicopter rotor are explained in accordance with industry texts and standards.

2.3 The anti-torque tail rotor is described and explained in accordance with industry texts and standards.

2.4 Disk control is explained in accordance with industry texts and standards.

Outcome 3

Demonstrate knowledge of helicopter flight in accordance with Subject No 50.

Performance criteria

3.1 Hovering is described and explained in accordance with industry texts and standards.

3.2 Forward flight is described and explained in accordance with industry texts and standards.

3.3 Features of climbing and descending are identified and explained in accordance with industry texts and standards.

3.4 Turning is explained in accordance with industry texts and standards.

3.5 Transitioning to the hover is explained in accordance with industry texts and standards.

3.6 Autorotation is explained in accordance with industry texts and standards.

3.7 Stability is defined and explained in accordance with industry texts and standards.

Outcome 4

Demonstrate knowledge of hazardous flight conditions in accordance with Subject No 50.

Performance criteria

4.1 Retreating blade stall is described and explained in accordance with industry texts and standards.

4.2 Vortex ring state (settling with power) is explained in accordance with industry texts and standards.

4.3 Ground resistance is described in accordance with industry texts and standards.

4.4 Blade sailing is described in accordance with industry texts and standards.

4.5 Dynamic rollover is explained in accordance with industry texts and standards.

4.6 Mast bumping is described in accordance with industry texts and standards.

4.7 Exceeding rotor RPM limits is described in accordance with industry texts and standards.

4.8 Rotor stalls are described in accordance with industry texts and standards.

4.9 Helicopter airframes are described, and relevant functions are explained, in accordance with industry texts and standards.

4.10 Transmission systems are explained in accordance with industry texts and standards.

Outcome 5

Demonstrate knowledge of rotor systems in accordance with Subject No 50.

Performance criteria

5.1 Main rotor systems are described and explained in accordance with industry texts and standards.

5.2 Tail rotor systems are described and explained in accordance with industry texts and standards.

5.3 Automatic flight control systems are explained in accordance with industry texts and standards.

5.4 Hydraulic systems are explained in accordance with industry texts and standards.

5.5 Electrical systems are explained and relevant calculations are demonstrated in accordance with industry texts and standards.

5.6 Environmental control systems are described in accordance with industry texts and standards.

5.7 Ice, rain, and particle protection are described and explained in accordance with industry texts and standards.

Outcome 6

Demonstrate knowledge of instruments in accordance with Subject No 50.

Performance criteria

6.1 Ring laser gyro is described and compared to a regular gyro in accordance with industry texts and standards.

6.2 Air data computer is described and explained in accordance with industry texts and standards.

6.3 Air temperature gauge outputs are defined and compared in accordance with industry texts and standards.

Outcome 7

Demonstrate knowledge of integrated flight instrument systems in accordance with Subject No 50.

Performance criteria

7.1 Flight director is explained and interpreted in accordance with industry texts and standards.

7.2 Electronic flight instrument system (EFIS) is described and explained, and the function of the EFIS control panel is stated, in accordance with industry texts and standards.

7.3 Electronic engine displays are described, explained, and interpreted in accordance with industry texts and standards.

7.4 Flight management system is described and explained in accordance with industry texts and standards.

Outcome 8

Demonstrate knowledge of warning and recording systems in accordance with Subject No 50.

Performance criteria

8.1 Master warning system is explained in accordance with industry texts and standards.

8.2 Altitude alerter system is described and explained in accordance with industry texts and standards.

8.3 Radar altimeter is described and explained in accordance with industry texts and standards.

8.4 Rotor overspeed/underspeed warning is explained in accordance with industry texts and standards.

8.5 Automatic engine data recording system is described and explained in accordance with industry texts and standards.

8.6 Terrain awareness and warning system is described and explained, and warning modes are listed, in accordance with industry texts and standards.

8.7 Aircraft collision avoidance system is described and explained in accordance with industry texts and standards.

8.8 Fire warning and protection systems are described in accordance with industry texts and standards.

8.9 Flight data recorder is described and explained in accordance with industry texts and standards.

8.10 Cockpit voice recorder is described and explained in accordance with industry texts and standards.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	21 January 2011	31 December 2018
Review	2	20 October 2016	31 December 2027
Review	3	28 September 2023	31 December 2027

Consent and Moderation Requirements (CMR) reference	0169

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.