



Australian Government

AVIY5023 Operate a multi-engine aeroplane

Release: 1

AVIY5023 Operate a multi-engine aeroplane

Modification History

Release 1. This is the first release of this unit of competency in the AVI Aviation Training Package.

Application

This unit involves the skills and knowledge required to operate a multi-engine aeroplane, in compliance with relevant regulatory requirements of the Civil Aviation Safety Authority and national operating standards.

It includes operating a multi-engine aeroplane in all phases of flight, managing an engine failure/malfunction in flight and managing an engine failure/malfunction after take-off. It also includes performing a rejected take-off, managing an engine failure/malfunction during approach/landing, and conducting a go-around or missed approach with an engine failure.

This unit addresses aviation technical skill requirements (physical, mental and task-management abilities) related to aircraft operational duties of flight crew, and contributes to safe and effective performance in complex aviation operational environments.

Operations are conducted as part of recreational, commercial and military aircraft activities across a variety of operational contexts within the Australian aviation industry.

Work is performed independently or under limited supervision within a single-pilot or multi-crew environment.

Licensing, legislative, regulatory or certification requirements are applicable to this unit.

Use for Defence Aviation is to be in accordance with relevant Defence Orders, Instructions, Publications and Regulations.

Pre-requisite Unit

Not applicable.

Competency Field

Y – Aircraft Operation and Traffic Management

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

1 Operate a multi-engine aeroplane in all phases of flight	1.1	Normal operations of multi-engine aeroplane type on the ground and in flight are conducted in accordance with the aircraft flight manual (AFM), pilot's operating handbook (POH) and company operating procedures
	1.2	Asymmetric operations for all phases of flight are anticipated and contingencies are planned
	1.3	Plan of action is self-briefed or briefed to crew members to ensure safest outcome in asymmetric operations
2 Manage engine failure/malfunction in flight	2.1	Control of aeroplane is maintained and/or regained during implementation of emergency response procedures
	2.2	Failed/malfunctioning engine is identified and confirmed
	2.3	Power set on serviceable engine/s and aeroplane configuration is adjusted to achieve desired aeroplane performance
	2.4	Failed/malfunctioning engine is managed
	2.5	Indicated airspeed is maintained above minimum controllable airspeed (V_{mca})
	2.6	Air traffic control (ATC) or another agency capable of assistance is advised of situation and intentions
	2.7	Recovery or diversion to appropriate aerodrome is evaluated and conducted
3 Manage engine failure/malfunction after take-off	3.1	Engine failure/malfunction is managed after take-off while control of aircraft flight path is maintained
	3.2	Initial climb not less than best engine out angle of climb speed (V_x) or best engine out rate of climb speed (V_y) until clear of obstacles, then V_y is maintained
	3.3	Recovery or diversion to appropriate aerodrome is evaluated and conducted
4 Perform rejected	4.1	Take-off is aborted prior to speed beyond which take-off can no longer be safely aborted (V_1) or at a decision point during

take-off		take-off where abort procedure can be initiated and aeroplane stopped on remaining runway/stopway
	4.2	Power is reduced smoothly and promptly
	4.3	Spoilers, prop fine/reverse, thrust reverse, wheel brakes and other drag and braking devices are activated
	4.4	Positive control is maintained to bring aeroplane to a safe stop
	4.5	Engine failure procedures and/or checklists are initiated and completed
5 Manage engine failure/malfunction during approach/landing	5.1	Control of aeroplane flight path is maintained during implementation of emergency response procedures
	5.2	Engine inoperative approach is performed
	5.3	Decision is made to continue or abort approach/landing
	5.4	Decision height for landing is nominated
	5.5	ATC or other agency capable of providing assistance is advised of situation and intentions
	5.6	Smooth, positively-controlled flight profile is flown, from which a controlled landing could be achieved
	5.7	Positive directional control is maintained and cross-wind corrections are applied during after-landing roll while maintaining centreline within tolerances
	5.8	Spoilers, prop reverse, thrust reversers, wheel brakes, and other drag or braking devices are applied to bring airplane to a safe stop after landing
6 Conduct go-around or missed approach with engine failure	6.1	Engine failure in a multi-engine aeroplane during a go-around or missed approach is identified and confirmed
	6.2	Control of aeroplane flight path is maintained during implementation of emergency response procedures
	6.3	Engine inoperative go-around is performed from decision height

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Unit Mapping Information

This unit replaces and is equivalent to AVIY5023A Operate multi-engine fixed wing aeroplane.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=4725260a-0af3-4daf-912b-ef1c2f3e5816>

Assessment Requirements for AVIY5023 Operate a multi-engine aeroplane

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria on at least one occasion and include:

- adapting to differences in equipment and operating environment in accordance with standard operating procedures
- applying precautions and required action to minimise, control or eliminate identified hazards
- applying relevant aeroplane aeronautical knowledge
- applying relevant air safety practices and regulations
- applying relevant legislation and workplace procedures
- calculating accelerate/stop distance
- calculating fuel flow and true airspeed with one engine inoperative
- calculating initial rate of climb and climb gradient for one engine inoperative after take-off
- calculating point no return (PNR) and equi time point (ETP)/critical point (CP) for one engine inoperative with maximum fuel
- calculating the speed beyond which take-off can no longer be safely aborted (V_1) for any specified take-off conditions
- communicating effectively with others
- completing relevant documentation
- controlling and managing aeroplane during flight with failed engine/s, in accordance with the aircraft flight manual (AFM)/pilot's operating handbook (POH)
- determining if range of aeroplane increases or decreases following an engine failure
- extracting, calculating and applying all performance information applicable to aeroplane
- identifying and correctly using equipment required to operate a multi-engine fixed wing aeroplane
- identifying critical/malfunctioning engine correctly
- identifying, and managing emergency and abnormal situations while maintaining control of the aeroplane
- implementing contingency plans
- implementing work health and safety (WHS)/occupational health and safety (OHS) procedures and relevant regulations
- interpreting and following operational instructions and prioritising work
- maintaining compliance with relevant regulatory requirements
- modifying activities depending on workplace contingencies, situations and environments

- monitoring and anticipating operational problems and hazards and taking appropriate action
- monitoring work activities in terms of planned schedule
- operating electronic communications equipment to required protocol
- reading, interpreting and following relevant regulations, instructions, procedures, information and signs
- reporting and/or rectifying identified problems promptly, in accordance with regulatory requirements and workplace procedures
- selecting and using required personal protective equipment conforming to industry and WHS/OHS standards
- setting local or area barometric pressure adjusted for sea level (QNH) at appropriate stages of flight
- setting priorities and managing workload to ensure safe task completion in the time available
- working collaboratively with others
- working systematically with required attention to detail without injury to self or others, or damage to goods or equipment.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- airspeed limitations including:
 - velocity normal operations – V_{no}
 - velocity acceleration – V_a
 - velocity best angle of climb – V_x
 - velocity best rate of climb – V_y
 - velocity never exceed – V_{ne}
 - maximum flap extended speed – V_{fe}
 - velocity landing gear operations – V_{lo}
 - velocity landing gear extended – V_{le}
 - velocity landing gear down – V_{lo2}
 - maximum crosswind
 - turbulence penetration speed
 - maximum load factor
- conditions that would increase take-off decision speed (V_1)
- emergency airspeeds including:
 - velocity minimum control speed – V_{mca}
 - velocity safe single engine – V_{SSE}
 - engine/s inoperative climb

- approach and final speed
- emergency descent
- best glide range speeds
- emergency procedures for
 - engine failure after take-off
 - engine fire on the ground and airborne
 - engine failure in the cruise
 - waste gate failure
 - propeller/turbine over-speed
- in a Defence context, relevant Defence Orders and Instructions
- markings on airspeed indicator that apply to failed engine operations
- methods of regaining control of an aeroplane with a failed engine that is flying at a speed less than V_{mca}
- normal and crosswind take-off and landing procedures:
 - climb
 - cruise
 - descent procedures including, airspeeds, configurations, method of drift allowance
 - setting of flight instruments
 - abnormal/emergency procedures
- other abnormal or emergency items as contained in the AFM/POH
- performance the aeroplane can achieve after reaching V_y or V_2 during asymmetric flight
- power, flight and configuration requirements that apply to V_{mca}
- relevant sections of Civil Aviation Safety Regulations and Civil Aviation Orders
- relevant WHS/OHS procedures and regulations
- safety implications of asymmetric flight below V_{mca}
- technique and procedure for carrying out a rejected take-off after engine/system/s failure/warnings, including related safety factors
- techniques and procedures used during engine failure on take-off, appropriate reference airspeeds, and specific pilot actions required
- techniques and procedures used to conduct an asymmetric go-around or missed approach during engine failure on take-off, appropriate reference airspeeds, and specific pilot actions required.

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the *Standards for Registered Training Organisations* current at the time of assessment.

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assessment.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Assessment must occur in workplace operational situations. Where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or simulations
- acceptable means of simulation assessment
- applicable documentation including workplace procedures, regulations, codes of practice and operation manuals
- relevant materials, tools, equipment and personal protective equipment currently used in industry.

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