



Australian Government

**AVIY0101 Apply payload and configuration
management principles for remotely piloted
aircraft systems**

AVIY0101 Apply payload and configuration management principles for remotely piloted aircraft systems

Modification History

Release	Comments
1	This unit of competency was first released in AVI Aviation Training Package Release 12.0.

Application

This unit involves the skills and knowledge required to apply remotely piloted aircraft system payload and configuration management principles in compliance with relevant regulatory requirements of the Civil Aviation Safety Authority (CASA) and national operating standards.

It includes applying mass and balance control to flight planning, identifying constraints affecting load planning and planning an aircraft load. It also includes applying principles of aircraft balance and longitudinal stability to load planning, identifying aircraft structural limitations, and identifying aircraft mass and performance planning safety factors. It also includes determining aircraft mass and speed limitations, calculating launch requirements, calculating climb performance, calculating landing requirements, and determining aircraft buffet boundaries and speeds.

This unit addresses aviation technical skill requirements and physical, mental and task-management abilities related to route planning and navigation duties of flight dispatch personnel and contributes to safe and effective performance in complex aviation operational environments.

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

Work is performed independently or under limited supervision as a single operator or within a team environment.

Licensing/Regulatory Information

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

Pre-requisite unit(s)

No pre-requisite units

Competency field(s)

Y - Aircraft Operation and Traffic Management

Unit sector(s)

Not applicable

Elements and Performance Criteria

Elements		Performance criteria	
Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
1	Apply mass and balance control to flight planning	1.1	Apply components of mass, balance and control to flight planning activities
		1.2	Include mass and control limitations in calculation flight planning
		1.3	Factor in required fuel and payload quantities when calculating mass and balance
		1.4	Calculate aircraft mass centre of gravity (CG) is within aircraft limits and is established for take-off, cruise and fuel economy calculation purposes
		1.5	Minimise ground handling of baggage and cargo through load distribution and loading sequence planning
		1.6	Derive and calculate mass and CG using basic data methods and apply to flight planning calculations
		1.7	Compile comprehensive load sheet according to workplace procedures
2	Identify constraints affecting load planning	2.1	Determine configuration of payload, mass and control limitations
		2.2	Assess aircraft, route, fuel requirements and performance limitation planning factors for potential load planning constraints
		2.3	Identify hazards, assess risks and implement hazard management
		2.4	Identify operator advance index tables and potential impact of mass and fuel minima during seasonal change

		2.5	Assess unusual conditions when advanced allotment tables may be exceeded, the operational impacts and associated contingency planning factors
		2.6	Prioritise load planning constraints and limitations based on regulatory requirements and workplace procedures
3	Plan an aircraft load	3.1	Review aircraft design, mass, launch, landing and zero-fuel weights and apply to load planning activities
		3.2	Identify operational load planning factors affecting a restriction on mass, operational, environmental, equipment, airspace and area of operations and apply to aircraft load planning
		3.3	Summarise aircraft operating mass and passenger mass limits within load planning documentation
		3.4	Review mass of minimum fuel based on ZWF, quantity, fuel type and specific gravity and apply to load planning calculations
		3.5	Determine available payload based on specific conditions affecting a flight
		3.6	Prepare manual load sheet
		3.7	Interpret and automate load sheet
4	Apply principles of aircraft balance and longitudinal stability to load planning	4.1	Identify load planning factors and consider when calculating aircraft performance and load
		4.2	Calculate aircraft point of balance using aircraft data and aircraft balance principles and apply to load planning calculations
5	Identify aircraft structural limitations	5.1	Achieve accurate aircraft balance calculations ensuring aircraft is safely loaded, structural integrity has not been exceeded and load is capable of being restrained

		5.2	Determine fuselage structural limits and mass limitations for loading zones and apply to load planning activities
		5.3	Determine maximum allowable package sizes using aircraft tables
		5.4	Identify methods of restraint and the effect on passengers and crew, damage and CG and apply to load planning activities
		5.5	Determine advantages and limitations of certified and non-certified cargo loads and containers, and methods of load security when calculation aircraft load limitations
6	Identify aircraft mass and performance planning safety factors	6.1	Identify aircraft certification considerations and apply to aircraft mass and performance calculations
		6.2	Identify aircraft certification standards and apply to aircraft mass and performance calculations
		6.3	Identify environmental considerations and apply to aircraft performance calculations
7	Determine aircraft mass and speed limitations	7.1	Determine positive and negative load factor limitations and apply to aircraft performance calculations
		7.2	Determine boundaries of aircraft operating envelope for a specific mass using flight strength diagrams, illustrating effect of wind gusts, margins of speed limits, and turbulence penetration considerations
8	Calculate take-off requirements	8.1	Determine aircraft take-off requirements considering clearways and stop-ways requirements and alternatives to balanced field length methods
		8.2	Calculate critical engine failure speeds, flap positions and reduced thrust take-off stopping distance at critical engine failure speeds
9	Calculate climb performance	9.1	Determine take-off flight path; climb segments, including terrain and obstacle avoidance; and the effects of mass, altitude and temperature

		9.2	Determine en route impacts affecting climb performance and apply to aircraft performance calculations
		9.3	Determine approach and landing requirement planning factors and apply to aircraft performance calculations
10	Calculate landing area requirements	10.1	Determine landing distance requirements
		10.2	Calculate landing distance based on varying environmental conditions, effect of obstacles and braking systems
11	Determine aircraft buffet boundary and speeds	11.1	Identify aircraft buffet characteristics and the effect of variations of a given mass and speed and apply to aircraft performance calculations
		11.2	Calculate permissible buffet for a range of aircraft speeds for combinations of mass and altitude, including safe operating margins

Range of conditions

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

Refer to the AVI Aviation Companion Volume Implementation Guide for non-essential items for this unit of competency.

Assessment Requirements for AVIY0101 Apply payload and configuration management principles for remotely piloted aircraft systems

Performance 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 on at least one occasion and include:

- adapting to differences in equipment and operating environment in accordance with workplace procedures
- applying basic principles of mass and performance limitations
- applying fuel, payload and load considerations while respecting regulatory and company-approved requirements
- applying knowledge of low and high-speed aircraft buffet characteristics and determining speeds at which aircraft buffet is encountered
- applying precautions and required action to minimise, control or eliminate identified hazards
- applying relevant aeronautical knowledge
- calculating aircraft centre of gravity (CG) arithmetically and graphically using practical methods of and within acceptable ranges
- calculating balance mass required given unequal lengths of arm of beam balance and mass of one pan
- calculating CG of fully loaded aircraft with variable passenger and cargo configurations
- calculating moments about aircraft in flight
- calculating point of suspension given unequal mass in the pans of a beam balance and total length of beam
- communicating effectively with others
- completing relevant documentation
- determining maximum permissible take-off and landing mass under variable operating conditions
- determining permissible mass, altitude and temperature limit data using aircraft operating flight manual in varying conditions
- determining take-off and landing area length and speeds using aircraft operations and flight manual in varying configurations and conditions
- developing an International Air Transport Association (IATA) loadsheet based on mass, balance and control components

- establishing and applying aircraft climb performance limitations
- identifying aircraft mass and performance planning safety factors
- identifying and correctly using equipment required to manage aircraft performance and load
- implementing contingency plans
- implementing work health and safety (WHS) procedures and relevant regulations
- 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
- preparing and planning manual and automated load sheets based on all known operational constraints and considerations
- reading, interpreting and following relevant regulations, instructions, procedures, information and signs
- reporting and/or rectifying problems, faults and malfunctions promptly in accordance with workplace procedures
- selecting and using required personal protective equipment (PPE) conforming to industry and WHS standards
- using aircraft flight manual charts and graphs to determine buffet boundaries and safe operating conditions
- using aircraft operating environment envelope chart effectively
- using operator advanced allotment tables to determine typical values for various routes, aircraft and operational needs
- 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:

- aircraft design mass
- critical engine failure speed V1 characteristics
- definition of aircraft moment
- derivation of aircraft data and calculation techniques related to aircraft performance, and load planning factors and considerations

- express terms of speed
- IATA load sheet information requirements and compilation
- IATA numbering scheme for cargo holds
- mass and balance calculations
- maximum payload limitations
- meaning and calculation of take-off safety speed (V2)
- operating mass definitions and application to load planning
- other terminology relevant to aircraft performance calculations not otherwise defined
- principles of balance control
- principles of mass control
- ramp mass or taxi mass
- relevant aircraft mass, balance and control definitions.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that replicate workplace conditions.

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.

Resources for assessment must include access to:

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

Mandatory Workplace Requirements

Assessment of performance evidence may be in a workplace setting or an environment that accurately represents a real workplace.

Unit Mapping Information

Previous Code and Title	Equivalence	Comments
AVIY0032 Apply RPAS payload and configuration management principles	Not equivalent	

Links

Companion volumes, including implementation guides, are found on the national training register - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=4725260a-0af3-4daf-912b-ef1c2f3e5816>.