Australian Government

AVIY0032 Apply RPAS payload and configuration management principles

Release: 1

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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 manage unmanned aerial vehicle (UAV) performance and load 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 (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, legislative, regulatory or certification requirements are applicable to this unit.

Pre-requisite Unit

Not applicable.

Competency Field

H – Route Planning and Navigation

Unit Sector

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** Components of mass, balance and control are considered and applied in flight planning activities
	1.2 Mass and control limitations are included in flight planning calculations
	1.3 Required fuel and payload quantities, including minimum fuel reserves, maximum allowable payloads and fuel quantity limitations, are considered when calculating mass and balance
	1.4 Calculated aircraft mass centre of gravity (CG) is within aircraft limits and is established for take-off, cruise and fuel economy calculation purposes
	1.5 Ground handling of baggage and cargo is minimised through load distribution and loading sequence planning
	1.6 Mass and CG is derived and calculated using basic data methods and is applied to flight planning calculations
	1.7 Comprehensive load sheet is compiled that includes all required flight performance and load planning data
2 Identify constraints affecting load planning	**2.1** Configuration of payload, mass and control limitations are considered
	2.2 Aircraft, route, fuel required, and performance limitation planning factors are assessed for potential constraints to load planning activities
	2.3 Hazards are identified, risks assessed, and hazard management implemented
	2.4 Operator advance index tables and potential impact of mass and fuel minima during seasonal change are identified and considered
	2.5 Unusual conditions when advanced allotment tables may be exceeded, the operational impacts and associated contingency planning factors are considered
	2.6 Load planning constraints and limitations are prioritised

		based on operational and regulatory requirements
3	**Plan an aircraft load**	**3.1** Aircraft design and mass, launch, landing and zero-fuel weights (ZFW) are reviewed and applied to load planning activities
		3.2 Operational load planning factors affecting a restriction on mass, operational (phase of flight), environmental, equipment, airspace and area of operations are considered and applied as required to aircraft load planning
		3.3 Aircraft operating mass and passengers mass limits are summarised within load planning documentation
		3.4 Mass of minimum fuel based on ZFW, quantity, fuel type and specific gravity (including fuel quantity conversions) are reviewed and applied to load planning calculations
		3.5 Available payload based on specific conditions affecting a flight, including maximum take-off weight (MTOW), regulated take-off weight (RTOW), minimum fuel and taxi fuel requirements, are determined
		3.6 Manual load sheet, including payload location and last-minute changes, is prepared
		3.7 Load sheet, including payload location and last-minute changes, is interpreted and automated
4	**Apply principles of aircraft balance and longitudinal stability to load planning**	**4.1** Load planning factors, including balance, CG (variations), balance on the ground, principles of lift and centre of pressure, mean aerodynamic chord (MAC) and functions of stabilisers, are identified and considered when calculating aircraft performance and load
		4.2 Aircraft point of balance is calculated using aircraft data and aircraft balance principles, and is applied to load planning calculations
5	**Identify aircraft structural limitations**	**5.1** Satisfactory aircraft balance calculations are achieved ensuring aircraft is safely loaded, structural integrity has not been exceeded and load is capable of being satisfactorily restrained
		5.2 Fuselage structural limits over, forward and aft of the wing, and mass limitations for associated loading zones are considered and applied to load planning activities

		5.3	Maximum allowable package sizes are determined using aircraft tables
		5.4	Methods of restraint and the effect on passengers and crew, damage and CG, including principles of inertia and forces applied to load, are considered and applied to load planning activities
		5.5	Advantages and limitations of certified and non-certified cargo loads and containers, and methods of load security are considered when calculating aircraft load limitations
6	**Identify aircraft mass and performance planning safety factors**	**6.1**	Aircraft certification considerations, including structural strength, loads, speed limitations, operating environment, performance capability, landing area lengths and terrain, are considered and applied to aircraft mass and performance calculations
		6.2	Aircraft certification standards, including categories, state/territory-based variations, operating mass or CG never exceeding limits, and aircraft flight manual restrictions are considered and applied to aircraft mass and performance calculations
		6.3	Environmental considerations, including certified aircraft operating envelope, pressurisation capabilities, system limitations and aircraft flight manual envelope charts, are considered and applied to aircraft performance calculations
7	**Determine aircraft mass and speed limitations**	**7.1**	Positive and negative load factor limitations, including normal and ultimate (structural), speed limitations and differing express terms of speed, are considered and applied to aircraft performance calculations
		7.2	Boundaries of aircraft operating envelope for a specific mass are determined using flight strength diagrams, illustrating effect of wind gusts, margins of speed limits, and turbulence penetration considerations
8	**Calculate take-off requirements**	**8.1**	Take-off requirements are determined considering clearways and stop-ways requirements and alternatives to balanced field length methods
		8.2	Critical engine failure speeds, flap positions and reduced thrust take-off stopping distance at critical engine failure speeds is calculated
9	**Calculate climb**	**9.1**	Take-off flight path; climb segments, including terrain

	performance	and obstacle avoidance; and the effects of mass, altitude and temperature; are determined
		9.2 En route considerations affecting climb performance, such as take-off mass, en route alternate selection and terrain, are considered and applied to aircraft performance calculations
		9.3 Approach and landing requirement planning factors, including terrain and obstacle avoidance, and effects of mass, altitude and temperature, are considered and applied to aircraft performance calculations
10	**Calculate landing area requirements**	**10.1** Landing distance requirements are determined, including effect of aircraft configuration, available stopping distance, and effects of marginal conditions
		10.2 Landing distance based on varying environmental conditions, effect of obstacles and braking systems is calculated
11	**Determine aircraft buffet boundary and speeds**	**11.1** Aircraft buffet characteristics, and the effect of variations of a given mass and speed are identified and applied to aircraft performance calculations
		11.2 Permissible buffet for a range of aircraft speeds for combinations of mass and altitude, including safe operating margins, is calculated

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

No equivalent unit.

Links

AVI Training Package Companion Volume Implementation Guide available on VET Net: - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=4725260a-0af3-4daf-912b-ef1c2f3e5816