



Australian Government

**AVIW0043 Apply energy requirements and
electrical sources for remotely piloted
aircraft systems**

AVIW0043 Apply energy requirements and electrical sources 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 manage energy sources for remotely piloted aircraft systems (RPAS), in compliance with relevant regulatory requirements of the Civil Aviation Safety Authority (CASA) and national operating standards.

It includes identifying electrical components of RPA and determining RPA electric motor energy and battery needs. It also includes using batteries, calculating battery limitations, determining electromagnetic radiation and using global positioning systems.

This unit incorporates aviation non-technical skill requirements (mental, social and personal-management abilities) related to safety management duties of flight operations personnel, 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 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)

W - Equipment and Systems Operations

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	Identify function of electrical components of RPA	1.1	Understand the function of electrical components of an RPA including redundancy
		1.2	Determine working order of existing RPA equipment and report to relevant persons
		1.3	Identify malfunctions in RPA equipment and determine the consequences of the malfunction
		1.4	Identify remedial actions in the event of RPA failure
2	Determine RPA electric motor energy needs	2.1	Ascertain the current draw through the motor in relation to rotor or propeller diameter or pitch
		2.2	Determine the current draw through the motor in relation to rotor or propeller loads
3	Determine RPA battery requirements for operations	3.1	Understand the characteristics and differences between battery types for RPA
		3.2	Transport and use batteries according to regulatory requirements and work, health and safety procedures
		3.3	Determine trade-off between battery size and flight endurance of an electrically powered RPA
		3.4	Determine RPAS failsafe based on endurance
		3.5	Follow procedures to determine batteries requiring servicing
4	Charge and discharge of batteries	4.1	Charge batteries according to workplace procedures
		4.2	Discharge batteries according to workplace procedures
		4.3	Determine battery capacity and voltages for operations

5	Determine electromagnetic radiation	5.1	Identify the characteristics of radio waves, wave propagation and transmission
		5.2	Identify the factors affecting propagation of radio waves
		5.3	Assess potential of electromagnetic interference with RPA operations
6	Use global positioning system	6.1	Identify the components of a GPS
		6.2	Determine external factors that affect GPS performance

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 AVIW0043 Apply energy requirements and electrical sources for remotely piloted aircraft systems

Performance Evidence

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

- calculating or identifying the endurance for the RPA with designated reserve
- calculating the duration of the flight considering the operational environment, contingencies, relevant abnormal or emergency conditions
- charging, discharging and storing batteries according to regulatory requirements and work, health and safety procedures
- managing inflight operation of RPAS energy source systems to achieve desired profile, range or endurance
- performing pre- and post-flight energy source quality control checks if the energy source is a battery or battery system including:
 - ensuring the batteries are secured to the RPA for the operation
 - ensuring the battery connectors are connected properly and securely for the operation
 - maintaining a battery log for the operation
 - performing battery changes correctly
 - prior to launch, verifying the time available for the flight given the current battery charge
- planning RPAS energy source requirements
- recharging battery including:
 - calculating the time, it would take to use and recharge a battery for a particular operation
 - checking the battery has sufficient charge for storage
 - correctly connecting and disconnecting a battery to the battery charger
 - ensuring the battery charger is setup correctly for the type of battery
 - inspecting the battery to ensure it is safe to be recharged
 - performing battery quality and quantity checks after charging
 - recognising if the battery is unsafe for the operation that it is not used
- recognising deteriorating situations impacting on energy source requirements

- reporting or rectifying problems, faults or malfunctions promptly, in accordance with workplace procedures.

Knowledge Evidence

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

- batteries classified as dangerous goods for air transportation
- battery characteristics used as an energy source for the RPA
- battery limitations
- battery specifications and abbreviations including types, voltage, amperage
- characteristics of radio waves, wave propagation, transmission
- charging and discharging batteries used as an energy source for the RPA
- components of a GPS
- consequences of malfunctions
- electric motor types
- electrical terms
- electromagnetic signal reliability and hazards
- energy sources for remotely piloted aircraft
- equipment redundancy
- factors that affect the performance of global positioning systems
- function of electrical components used in remotely piloted aircraft
- how GPS works including accuracy of different systems
- malfunctions and system back-ups
- radio waves
- remedial actions in the event of failure
- types of batteries.

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
AVIY0053 Manage remote pilot aircraft systems energy source requirements	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>.