



**Australian Government**

# **MEA721 Evaluate aircraft hydro-mechanical systems**

**Release: 1**

# MEA721 Evaluate aircraft hydro-mechanical systems

## Modification History

Release 1 - New unit of competency

## Application

This unit of competency applies to hydraulic power, landing gear, fuel storage and distribution, water and waste, and mechanical systems and their components. It involves evaluation of systems and components for compliance with design and performance standards and with airworthiness regulatory requirements within both civil and military environments.

Also covered is documentation of the evaluation process within management systems, such as configuration management (CM) and integrated logistic support (ILS).

It is suitable for people working as paraprofessionals within aircraft design teams, within the engineering departments of aircraft maintenance organisations or employed within Continuing Airworthiness Management Organisations (CAMOs) and Approved Engineering Organisations (AEOs), and for those pursuing qualifications or careers in those fields.

This unit is used in workplaces that operate under the airworthiness regulatory systems of the Australian Defence Force (ADF) and the Civil Aviation Safety Authority (CASA).

## Pre-requisite Unit

MEA710	Apply aeronautical system design techniques
MEM23004A	Apply technical mathematics
MEM23007A	Apply calculus to engineering tasks

## Competency Field

## Unit Sector

## Elements and Performance Criteria

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

1.	Prepare to evaluate aircraft	1.1	Confirm and apply safe working practices relating to hydraulic, fuel and mechanical systems
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hydro-mechanical system	1.2	Determine parameters and context of applications and purpose of evaluation
	1.3	Confirm personal functions and responsibilities, team and support functional group interdependencies and communications
	1.4	Confirm that tasks and responsibilities are appropriate to qualifications and delegations and that appropriate support, including technical and professional assistance, is available
	1.5	Determine chain of responsibility for the activity evaluation, reporting arrangements and timelines
	1.6	Identify work health and safety (WHS) and regulatory requirements with particular emphasis on safety, codes of practice, performance requirements and standards, including airworthiness regulatory requirements for hydro-mechanical systems, risk management and organisational procedures
	2. Identify principles and techniques required for evaluation of aircraft hydro-mechanical system	2.1
2.2		Review aircraft hydro-mechanical system design and layout requirements and techniques
2.3		Identify system electrical control power requirements and interfaces with other systems
3. Evaluate aircraft hydro-mechanical system applications	3.1	Evaluate proposed modifications to aircraft hydro-mechanical systems and system components
	3.2	Evaluate aircraft hydro-mechanical system and system component maintenance requirements
	3.3	Evaluate aircraft hydro-mechanical system and system component reliability and defect history
	3.4	Evaluate proposed component substitutions
	3.5	Evaluate application for compliance with WHS Acts, regulations, codes, directives and standards/specifications, including those related to risk management
4. Report results	4.1	Report results of scoping, principles and techniques identification and evaluation of applications

- 4.2 Provide documentation, such as system schematics, software, wiring diagrams and data required by CM and/or ILS, and as required for compliance with airworthiness regulations

## Foundation Skills

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

## Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

### **Aircraft hydro-mechanical systems include:**

- Hydraulic pressure generation and distribution
- Landing gear retraction
- Brake and anti-skid
- Nose wheel steering
- Door operation and locking including integral stairs
- Fuel distribution and management including single point refuelling
- Water and waste
- Interfaces with other aircraft systems and with electrical and instrument systems

### **Aircraft hydro-mechanical system components include:**

- Hydraulic pumps
- Filters
- Valves
- Accumulators
- Actuators
- Plumbing
- Reservoirs
- Shock struts
- Brake units
- Anti-skid units
- Door locking mechanisms
- Fuel valves
- Fuel plumbing
- Fuel tanks other than integral tanks
- Mechanical linkages, cables and hardware

**Standards and guidance material include:**

- Sensors
- Indicators, lights and switches
- ADF AAP7001.054 Airworthiness Design Requirements Manual
- FAR Part 23 Airworthiness Standards for Airplanes in the Normal, Utility, Aerobatic or Commuter Categories
- FAR Part 25 Airworthiness Standards for Airplanes in the Transport Category
- FAR Part 27 Airworthiness Standards for Rotorcraft in the Normal Category
- FAR Part 29 Airworthiness Standards for Rotorcraft in the Transport Category
- EASA CS-23 Certification Specifications for Aeroplanes in the Normal, Utility, Aerobatic or Commuter Categories
- EASA CS-25 Certification Specifications for Airplanes in the Transport Category
- EASA CS-27 Certification Specifications for Rotorcraft in the Normal Category
- EASA CS-29 Certification Specifications for Rotorcraft in the Transport Category
- CASA AC21.16(0) Approval of material, parts, processes and appliances
- CASA AC21.145(0) Manufacture of parts during the course of maintenance
- CASA AC21.601(0) Australian Technical Standards Order Authorisation
- CASA CAAP35-7(0) Design approval of modifications and repairs
- CASA AC 21-99 Aircraft Wiring and Bonding
- FAA AC 43-13-1B Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair

**Configuration management (CM)**

- CM is a process for control and documentation of the design and development process and for the management of system, component and software throughout the service life

**Integrated logistic support (ILS)**

- ILS is an integrated approach to the management of logistic disciplines originally developed for the management of military systems from design concept to final disposal at life-of-type. It covers:
  - reliability engineering, maintainability engineering and maintenance planning
  - supply and support
  - support and test equipment

- manpower and personnel
  - training and training support
  - technical data and publications
  - computer resources support
  - facilities
  - packaging, handling, storage and transportation
  - design interface
- Appropriate technical and professional assistance includes:**
- Assistance from individuals with CASA maintenance certification licenses or those with supervisory authorisations in the ADF regulatory system
  - Professional support from engineers employed within:
    - organisations with CASA continuing airworthiness management or maintenance approvals
    - approved engineering organisations under the ADF regulatory system
  - Engineers employed within organisations recognised by overseas airworthiness organisations
- WHS, regulatory requirements and enterprise procedures include:**
- WHS Acts and regulations
  - Relevant standards
  - Industry codes of practice
  - Risk assessments
  - Registration requirements
  - Safe work practices
  - Civil Aviation Safety Regulations (CASRs)
  - AAP7001.053 ADF Technical Airworthiness Management Manual
  - Overseas airworthiness authorities, where applicable, e.g. Federal Aviation Administration, Transport Canada, European Aviation Safety Agency

## Unit Mapping Information

Release 1 – new unit based on MEM23084A Apply scientific principles and techniques in aeronautical engineering situations and MEM23095A Apply aeronautical system design principles and techniques in aeronautical engineering situations – units not equivalent

## Links

Companion Volume implementation guides are found in VETNet - <https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>