Australian Government

MEA713 Integrate aeronautical fundamentals into an engineering task

Release: 1

MEA713 Integrate aeronautical fundamentals into an engineering task

Modification History

Release 1 - New unit of competency

Application

The unit of competency applies to engineering or related projects requiring aeronautical engineering skills and includes the identification, application and integration of aeronautical fundamentals. It includes identifying task parameters, personal and team function, chain of responsibility and work health and safety (WHS) guidelines. It includes investigation of aircraft structure, power plants and of mechanical, hydraulic, pneumatic and flight control systems and components and aeronautical fundamentals, including structural, power plant and aircraft system methods and processes, workshop techniques, materials, scientific and mathematical principles and computer software. It requires completion of the task in cooperation with the team and documentation of the process and outcomes.

It is suitable for people pursuing paraprofessional careers and qualifications in aeronautical engineering.

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

MEA705	Apply basic scientific principles and techniques in aeronautical engineering situations
MEM23004A	Apply technical mathematics
MEM23007A	Apply calculus to engineering tasks

Competency Field

Aeronautical engineering

Unit Sector

Elements and Performance Criteria

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

1.	Investigate scope of engineering task	1.1	Determine task parameters and context
		1.2	Confirm personal functions and responsibilities, team and support functional group interdependencies and communications
		1.3	Confirm that task and responsibility is appropriate to qualifications and delegations and that appropriate support, including technical and professional assistance, is available when required
		1.4	Determine chain of responsibility for the activity
		1.5	Determine WHS, regulatory requirements, risk management and organisational procedures
2.	Evaluate task for aeronautical fundamentals requirements	2.1	Evaluate methods, processes and workshop techniques required by task
		2.2	Evaluate aeronautical fundamentals required by task
		2.3	Evaluate functions and features of aeronautical components and systems related to the task
		2.4	Evaluate software techniques required for basic programming, analysis and graphics
3.	Integrate aeronautical fundamentals	3.1	Plan the task
		3.2	Communicate, cooperate and negotiate with stakeholders, use systems thinking to address contingencies and constraints, problem solving and decision making and continuous improvement to achieve integration task
		3.3	Integrate aeronautical fundamentals to achieve task objectives
4.	Report results	4.1	Report results of investigation, evaluation and integration
		4.2	Provide documentation, such as diagrams and calculations
		4.3	Provide documentation, such as modification instructions and maintenance manual or manual amendment and other documentation required by configuration management (CM) or integrated

logistic support (ILS) procedures, where applicable

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.

Appropriate technical and professional assistance includes:

- Specific licenses and authorisations required by the relevant airworthiness regulator, CASA or the ADF
- Technical support and advice relating to elements which have intrinsic dangers, for example:
  - high pressure
  - energised fluid vessels
  - high temperatures and heat energy capacity
  - wiring with high current control voltages above extra low voltage
- Professional support for technologies, such as:
  - specialist electric motor drives and controllers
  - specialist materials, plastics, metal alloys and nano materials
- Special processes, foundry, alloy welding, heat treatment, sealing and fastening

WHS, regulatory requirements and enterprise procedures include:

- WHS Acts and regulations
- Relevant standards
- Industry codes of practice
- Risk assessments
- Registration requirements
- Safe work practices
- State and territory regulatory requirements applying to electrical work
- 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

Systems thinking includes:	• The process of developing solutions within the context of an entire system • Recognising that an improvement in one subsystem can adversely affect another subsystem

Continuous improvement implementation:	• Continuous improvement implementation relates to plant, products, processes, systems or services, including design, development, implementation or manufacture, commissioning, operation or delivery and maintenance. Continuous improvement is part of CM and ILS.
	• Improvement processes include techniques, such as:
	  • balanced scorecard
	  • current and future state mapping
	  • measuring performance against benchmarks
	  • process improvement, problem solving and decision making
	  • data management, generation, recording, analysing, storing, use of software
	  • training for improvement systems participation
	  • technical training

Constraints and contingencies include:	• Financial • Organisation procedural or culture • Physical constraints such as limits to resources, limits to site access or logistical limitations • Airworthiness regulatory requirements
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

Unit Mapping Information

Release 1 – new unit based on MEM14083A Apply aeronautical fundamentals to support design and development of engineering projects and MEM23073A Select and apply aeronautical engineering methods, processes and construction techniques – 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