



Australian Government

Assessment Requirements for MEA704

Apply avionic modelling for computer-aided engineering

Release: 1

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Modification History

Release 1 - New unit of competency

Performance Evidence

- Evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria under the specified conditions of assessment, and must include:
- investigating the uses of avionic models for hardware, system and software design
- reviewing features, functions and context of avionic modelling
- comparing available software, functions and features
- communicating, participating and negotiating with:
 - stakeholders, team, cross-function support groups and experts
 - appropriate licensed technicians and professionals
- performing modelling using a comprehensive range of techniques, such as:
 - creating and manipulating 3-D entities
 - using library files and adaptations
 - top down system simulation
- comparing available software, functions and features
- creating dimensioned orthographic projections from model
- extracting dimensional properties from model
- using post-processing model for analysis or physical modelling
- modelling avionic component and system hardware and software
- finalising modelling by:
 - completing work
 - gaining approval and commissioning work
 - providing documentation and reports as required
 - obtaining sign-off.

Knowledge Evidence

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

- engineering and market context for avionic component and systems modelling:
 - relative speed compared to traditional methods related to quantities
 - market demand speed, standardisation, quality and flexibility through data
- sustainability implications of modelling: economic, social and environmental

- avionic component models, including:
 - electric motors and electrically operated fluid power actuators
 - printed circuit boards
 - electrical and electronic systems components
 - chain drives, gear sets, pulley and belt drives
 - structural sections for component casings, racks and mounts to the aircraft structure
- avionic systems, including:
 - aircraft electrical power generation and distribution
 - control and indication for mechanical, fluid power and flight control systems
 - aircraft instrument systems
 - radio communication and navigation
 - pulse
 - data communications, including in-flight entertainment
- software functions and features:
 - modelling software
 - model analysis software (e.g. FEA)
 - post-processor, CNC/CAM and rapid prototyping
 - regulations relating to the design of avionic software
- model creation techniques, including:
 - using and manipulating coordinate systems
 - creating 3-D entities, ruled and revolved surfaces
 - creating solids, editing and combining solids
 - manipulating entities and solids
 - library files
 - manipulations of solids and library files
 - three dimensional graphics from models, including rotated views and sections
 - dimensioned orthographic representations from models
 - top down system simulation
 - construction of artwork for printed circuit boards
- typical modelling processes, including:
 - computer modelling
 - post-processing
 - prototyping and model manufacture
- virtual model options, such as automated systems simulation
- physical modelling options, including:
 - post-processing to create NC data files to CNC circuit board assembly
 - rapid prototyping options
- WHS requirements:

- WHS Act and regulation, which recognise that stakeholders in workplace activities include the workforce exposed to worksite conditions, materials and processes of the activity and also recognise the broader community exposed to environmental effects of the activity. Competence in designing for and implementation of the Act, regulations, codes, directives, risk management and standards is required by other units
- relevant standards that give guidance to complying with the WHS Act
- codes of practice, risk assessment and registration requirements
- requirement for licensed technical and professional services
- modelling compared to traditional methods, such as:
 - pen and pencil graphics compared to wire frame, surface and solid models
 - computer animations compared to transparent overlay mobiles to test clearances and motions
 - solid models compared to isometric representations
 - computer library files compared to the use of reference charts and catalogue information
- future developments in modelling and related engineering software:
 - new developments in computer aided engineering
 - dynamic response of models
 - new developments in rapid prototyping and manufacturing
- animations and simulations.

Assessment Conditions

- This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is, the candidate is not in productive work, then a simulated working environment must be used that reflects realistic workplace situations and conditions.
- The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.
- Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.
- Assessment methods must be by direct observation of tasks and include questioning on underpinning knowledge to ensure its correct interpretation and application.
- Assessment may be applied under project related conditions (real or simulated) and require evidence of process.
- Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.
- Assessors must be satisfied that the candidate competently and consistently:
 - review features, functions and context of avionic modelling
 - compare available software, functions and features
 - communicate, participate and negotiate with stakeholders, team, cross-function support groups and experts, appropriate licensed technicians and professionals
 - model using a comprehensive range of techniques

- create dimensioned orthographic projections from model
- extract dimensional properties from model
- post-process model for analysis or physical modelling
- complete work, commission and gain approval, document and report, and obtain sign-off
- identify future developments in modelling.
- Assessment may be in conjunction with assessment of other units of competency where required.
- Assessors must satisfy the requirements of the National Vocational Education and Training Regulator (Australian Skills Quality Authority, or its successors).

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=ce216c9c-04d5-4b3b-9bcf-4e81d0950371>