Australian Government

Assessment Requirements for MEM234008 Design plant using computer simulations

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MEM234008A Design plant using computer simulations.

Performance Evidence

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

- interpreting design parameters, performance targets and system variables of plant, equipment or process to be simulated
- advising client based on discipline knowledge, work health and safety (WHS) and regulatory standards
- determining work health and safety (WHS), regulatory and risk management requirements related to plant
- investigating and measuring to confirm the parameters for required design
- investigating faults in existing designs and proposing solutions on at least two occasions
- selecting appropriate simulation model
- modelling, optimising and analysing model sensitivity on at least two occasions
- generating and evaluating solutions using appropriate innovation and creativity for feasibility against design criteria
- designing simulated plant
- communicating, negotiating and reviewing with stakeholders and client throughout the process to obtain agreement on proposal and sign-off on simulated design
- documenting design with files, drawings, specifications and instructions.

Note: Where a volume and/or frequency is not specified, demonstration must be provided at least once.

Knowledge Evidence

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

- design, research and investigation methods
- techniques for:
  - continuous improvement
  - problem-solving and decision-making
  - root cause analysis (RCA) or failure mode and effects analysis (FMEA) or design review based on failure mode (DRBFM), and Pareto analysis

- computer simulation packages
- advantages of design simulation including development time, low cost and minimum resources
- disadvantages of design simulations including level of uncertainty, and cost of making decisions based on invalid simulations
- WHS and regulatory requirements, codes of practice, standards and registration requirements
- simulation applications including:
  - physical simulation using physical objects as analogues of another reality
  - interactive simulation or 'human in the loop' simulations
  - computer architecture simulation
  - training simulation
  - business performance
  - plant or process design
- mathematical models including:
  - linear and non-linear
  - deterministic and stochastic
  - steady-state and dynamic
  - lumped and distributed parameter models
- computer simulation types including:
  - continuous and discrete
  - deterministic and stochastic
  - local or distributed simulations
  - object-oriented physical modelling (OOPM) simulation
- model variable types including:
  - state variables, constants and random variables
  - inputs, outputs and decisions variables
- sensitivity estimation and optimisation
- graphical techniques for visual model building.

Assessment Conditions

- Assessors must:
  - have vocational competency in designing plant using computer simulations at least to the level being assessed with relevant industry knowledge and experience
  - satisfy the assessor requirements in the Standards for Registered Training Organisations 2015 or its replacement and comply with the National Vocational Education and Training Regulator Act 2011, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires.

- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions that cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.
- Conditions for assessment must include access to all tools, equipment, materials and documentation required including relevant workplace procedures, product and manufacturing specifications.
- 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.
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Links

Companion Volume Implementation Guides are available on VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2