



**Australian Government**

# **Assessment Requirements for MEM18060 Maintain, repair control instrumentation - single and multiple loop control systems**

**Release: 1**

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## **Modification History**

Release 1. Supersedes and is equivalent to MEM18060B Maintain, repair control instrumentation – single and multiple loop control systems

## **Performance Evidence**

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting circuit diagrams, specifications, software data, diagrams and drawings, historical trends and documents and obtaining relevant data pertaining to the system components and operational data
- consulting with system operators and other relevant personnel with respect to the control loop and confirming function/ malfunction of the system and/or its components
- checking operational characteristics of the control devices, signal conversion instruments and final control elements for compliance to specifications
- locating, reading and interpreting in-built fault indicators and error codes and identifying faults/defects in control system
- obtaining relevant pneumatic, electrical and electronic circuit diagrams and testing and monitoring control loop for correct operation and recording the responses of the control system
- using fault-finding and diagnostic techniques and procedures throughout the monitoring and testing phase and comparing collected data with the operational specifications of the control system
- dismantling, repairing and reassembling faulty components, including selecting replacement parts from manufacturer/supplier catalogues
- calculating the control loop characteristics for the appropriate system in accordance with specifications
- setting and adjusting the controller modes using appropriate test and calibration equipment
- checking the control instrumentation for correct zero, span and range and making final adjustments, as required and recommissioning the control system
- completing all service reports in accordance with SOPs.

## **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:

- safe work practices and procedures and use of personal protective equipment (PPE)

- mathematical computations, including algebra, exponentials and logarithms, equations, graphs, charts, vectors, complex numbers and Boolean algebra
- relevant data, including information from in-built devices, on the control loop characteristics
- specifications of each system component
- control programming
- supervisory control and data acquisition (SCADA) systems, programmable logic controller (PLC) systems, distributive control systems (DCS) and computer-based systems
- procedures for:
  - documenting/reporting information and control system tests and analysis
  - isolating and testing the control system and its components
  - verifying apparent faults in circuits and/or control system components
  - marking components for repair or replacement
  - dismantling/disassembling components for repair or replacement
  - assembling repaired and/or replacement items
  - calibration of control system components and necessary equipment
  - checking control instruments for zero, span and range
  - making final adjustments to ensure all control system components conform to specification
  - commissioning the control system
- signal transmission, including the principles of operation of the final control element, procedures for calibrating and adjusting the control system
- correct function of the circuits and components within the control loop
- calibration and adjustment methods for the control loop devices
- configuration of the digital control system software
- operational responses and procedures for monitoring and recording test and operational data
- fault-finding and diagnostic techniques throughout the monitoring and testing process
- deviations/variations from specification
- correct maintenance procedures for serviceable item(s)
- adjustments which affect the calibration to control system components
- controller modes and actions
- reporting/recording requirements associated with the commissioning of the control system
- follow-up actions to be undertaken after maintaining/repairing control system instrumentation.

## Assessment Conditions

- Assessors must:
  - have vocational competency in maintaining, repairing control instrumentation – single and multiple loop control systems 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. This must 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.

## Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>