



Australian Government

Assessment Requirements for MEM18061 Maintain/calibrate complex control systems

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MEM18061B Maintain/calibrate complex 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 manuals, specifications, software data, historical trends and diagrams, including pneumatic, electrical, electronic and logic diagrams, as well as program listings and configuration data for control system devices pertaining to the system components and operational data
- consulting with system operators and other relevant personnel with respect to the control loop characteristics and confirming function/malfunction of the system and/or its components and documenting information obtained
- obtaining the necessary work clearances for monitoring and testing of the system
- locating, reading and interpreting in-built fault indicators and error codes and identifying faults/defects in control system and comparing and analysing collated data with the operational specifications of the control system
- observing the operation of control system, confirming function/malfunction of the system and/or its components
- setting up and using test equipment to measure and analyse to ensure correct operation
- connecting field test instruments and monitoring and performing diagnostic checks on selected controls and system
- checking operational characteristics of control devices, signal conversion instruments and final control elements and using fault-finding techniques, including continuity testing and fault isolation for conformance/non-conformance to specifications
- dismantling/assembling and repairing items, including selecting replacement parts from manufacturers'/suppliers' catalogues, spare parts list or data sheets
- performing diagnostic checks and taking corrective action to bring system operation in line with specifications
- setting up test and calibration equipment to align control devices and controllers for optimum performance, configuring the system, and aligning multiple control loops in the correct sequence to specifications
- adjusting and calibrating control system components by setting up and monitoring recording equipment during the tuning phase to identify the effects of adjustment made on the system

- changing system parameters online to meet specified requirements
- operating, adjusting and validating the system performance and returning control systems to service
- completing all service reports according to 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)
- specification of each system component
- relevant data and/or trends
- system components and their function
- procedures for:
 - documenting information
 - obtaining work clearances
 - documenting control system tests and analysis
 - using test equipment
 - testing system configuration, control system components/elements, testing circuits and control lines
 - testing and monitoring the operation of selected controls
 - carrying out diagnostic checks
 - isolating the control system and its components
 - marking serviceable items for repair or replacement
 - dismantling/assembling items for repair or replacement and servicing item(s)
 - adjusting the system to conform to operational specifications
 - calibrating the control system components
 - aligning control devices and configuring the system
 - tuning controllers, multiple control loops and multi-element systems
 - recording signals and data during system tuning operations
 - changing parameters and operating and monitoring a control system
 - making final adjustments to ensure all control system components conform to specifications
 - returning to service and reporting/recording requirements
- reasons for:
 - observing the system in operation
 - selecting the chosen test equipment
 - identifying the adjustments/maintenance to be carried out
 - selecting the chosen diagnostic checks
 - selecting the chosen test and calibration equipment
 - any deviations/variations from specification

- errors indicated by in-built devices
- deviations/variations from specification
- information for the given system, including:
 - all individual/multiple element loop device characteristics
 - controller mode principles
 - testing methods
 - calibration methods
 - adjustment methods
- equipment to be used and reasons for selecting the chosen equipment:
 - required to verify an apparent fault
 - used to test system configuration
 - required to undertake maintenance on item(s)
 - necessary to calibrate the control system components
 - necessary to carry out the alignment of the control devices
 - programming tools and techniques to be used
 - appropriate measuring techniques, tools and equipment
- adjustments/maintenance to be carried out
- diagnostic checks to be applied to the system to ensure correct operation of the system
- fault-finding and performing diagnostic tests to be applied to control devices, signal conversion instruments and final control elements
- causes of verified faults and the action to be taken to return the control system/component to specification
- appropriate replacement parts
- specifications of serviceable item(s)
- diagnostic checks to be carried out
- specifications of the equipment to be calibrated
- alignment specifications
- specifications of the controllers
- correct sequence of tuning
- recording equipment to be used
- adjustments that can be made to control system components
- effects of those adjustments on the calibration of the control system components
- requirements to be achieved by changing system parameters online and level of control to be achieved.

Assessment Conditions

- Assessors must:
 - have vocational competency in maintaining/calibrating complex 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>