



Australian Government

**Assessment Requirements for MARL056
Demonstrate basic knowledge of marine
control systems and automation**

Release: 1

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Modification History

Release 1. This is the first release of this unit of competency in the MAR Maritime Training Package.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria on at least one occasion and include:

- accessing information and sketching diagrams to interpret and explain testing requirements related to control systems on commercial vessels
- assessing own work outcomes and maintaining knowledge of current codes, standards, regulations and industry practices
- explaining basic principles of marine automation and process control
- identifying and interpreting numerical and graphical information, including schematic diagrams, relevant to control systems on commercial vessels
- identifying and suggesting ways of rectifying faults and malfunctions in control systems on commercial vessels
- identifying methods, procedures and materials needed to operate and maintain control systems on commercial vessels
- imparting knowledge and ideas through verbal, written and visual means
- providing accurate and reliable information
- providing appropriate level of detail in responses
- reading and interpreting written information related to the operation of control systems on commercial vessels.

Knowledge Evidence

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

- basic control engineering, including:
 - fundamentals of automatic control
 - ON-OFF control
 - proportional-integral-derivative (PID) control
 - sequential control
 - various automatic control
- basic electronics, including:
 - basic electronic circuit elements:

- diodes
- integrated circuit (IC) and large-scale integrated circuit (LSIC)
- semiconductor
- thyristor
- electron theory
- electronic control equipment
- flowchart for automatic and control systems
- characteristics and functions of temperature, pressure and viscosity of fuel
- components, including:
 - actuators
 - responders
 - sensors
- concept of 'fail safe' philosophy
- concepts of unmanned machinery space (UMS), and automated monitoring and control of machinery
- control and monitoring of ship machinery
- control loops
- electronics and power electronics, including:
 - amplifiers
 - analogue and DC power supplies
 - cyclo-converters
 - MSI onverters
 - power electronic converters
 - rectifiers
 - stabilisers
 - transistors
- fundamentals of automatic control
- instrument process and control terms
- measurement of process value, including:
 - flow
 - general measurement of processes
 - level, including direct methods and inferential methods
 - pressure
 - temperature, including mechanical and electrical
- mechanical and electrical sensors
- mediums, including:
 - compressed air
 - electric currents
 - electric voltages
 - hydraulic fluids

- ON-OFF control
- pneumatic and electrical instrumentation transmitters
- preparation, operation, fault detection and necessary measures to prevent damage for machinery items and control systems
- principles of:
 - basic electronic circuits
 - basic pneumatic systems and action of pneumatic instruments
 - process control
- relevant industry standards for drawing symbols/layouts for schematic diagrams
- safety and emergency procedures for operation of propulsion plant machinery, including control systems
- safety devices, alarms and monitoring systems
- sensing and transmitting elements
- sequential control
- tests and procedures required to meet UMS requirements
- total bridge control
- transmission of signals, including:
 - controlling elements, including pneumatic
 - transmitters
- various automatic controls
- work health and safety (WHS)/occupational health and safety (OHS) legislation, policies and procedures.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

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.

Practical assessment must occur in a workplace, or realistic simulated workplace, under the normal range of workplace conditions.

Simulations and scenarios may be used where situations cannot be provided in the workplace or may occur only rarely, in particular for situations relating to emergency procedures and adverse weather conditions where assessment would be unsafe, impractical or may lead to environmental damage.

Resources for assessment must include access to:

- applicable documentation, such as legislation, regulations, codes of practice, workplace procedures and operational manuals
- tools, equipment, machinery, materials and relevant personal protective equipment (PPE)

currently used in industry.

Links

Companion Volume implementation guide can be found in VetNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>