



Australian Government

**Assessment Requirements for MEM29009
Prepare, configure and test collaborative
robots for industrial operations**

Release: 1

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Modification History

Not applicable.

Performance Evidence

There must be evidence the candidate has demonstrated the ability to:

- research latest technology developments in regard to collaborative robots within own area of responsibility
- assess at least two proposed workspaces for suitability for collaborative robot operations
- establish the hardware features, specifications and system requirements of at least two collaborative robots
- select and prepare materials and components to set up a collaborative robot for at least two separate required tasks
- configure a collaborative robot for at least two tasks or job runs including:
 - establishing safety and other limits appropriate to the task, space and manufacturer's instructions
 - preparing materials and space for collaborative robot tasks
 - programming robot movements,
 - configuring machine vision and other sensors
 - establishing required robot data reporting and PLC and networking interfaces
- troubleshoot faults in collaborative robot configuration and operation
- troubleshoot collaborative robot onboard data processing, file transfer, and network connections
- apply safety practices while configuring and working with collaborative robot
- report on work completion in the required format.

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

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- shared space risks for collaborative robot operations including:
 - uneven floor surfaces for mobile collaborative robots
 - routing or guarding to ensure employees and others cannot intrude into the shared space outside of collaborative robot safety sensing limits
 - electrical interference hazards
 - fail-safe space assessment in the event of robot fault or stoppage
 - other shared space risks unique to the workplace

- features of robots that make the robot collaborative including features associated with:
 - collaborative arm robots
 - track/transverse movement robots
 - mobile robots
- collaborative robot hardware components and features including:
 - sensors
 - onboard networking devices
 - human-machine interfaces
 - electrical, hydraulic and pneumatic actuators and servos
 - motors
 - vision systems
 - end effectors
 - switches and emergency stops,
 - contamination protection and guarding
 - power supply and cables
- typical functions, operations and limitations of different collaborative robots including:
 - vision system principles
 - robot mechanics
 - data acquisition, processing and transfer
- interfacing of collaborative robots with humans including:
 - safety features including sensors, protective stops, guarding and insulation, and fail-safe processes
 - manual programming/teaching, e.g., how collaborative robots interact with manufacturing execution system (MES)
- workplace safety requirements and work health and safety (WHS) legislation relevant to the working environment and the task being undertaken
- standards, codes and regulations relevant to working with collaborative robots and the activities being undertaken
- manufacturer's specifications, workplace procedures and other relevant technical information relating to working with collaborative robots
- differences between collaborative robots and traditional industrial robots
- uses of collaborative robots in the manufacturing sector
- machine learning in relation to collaborative robots
- troubleshooting processes and techniques relevant to collaborative robots
- techniques used for training a collaborative robot through guided movements and task demonstration
- operating within own scope of role and when to seek assistance, including input, or hand off to others when working with collaborative robots.
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Assessment Conditions

- Assessors must:
 - have vocational competency in preparing, configuring and testing collaborative robots for industrial operations 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.
- There must be 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 found in VETNet -

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