



Australian Government

**Assessment Requirements for MARF058
Apply knowledge of Autonomous
Underwater Vehicles (AUV) technical
management**

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 and include:

- completing numerical and graphical analysis of Autonomous Underwater Vehicle (AUV) technical operation data to assess performance against AUV benchmarks
- following operational procedures
- planning, executing and analysing six diagnostic AUV missions in Near Coastal (NC) waters, including a minimum of:
 - one mission that is conducted using faulty navigation involving doppler velocity logger (DVL) and inertial navigation systems (INS)
 - one mission that is conducted using faulty control
 - one mission that is conducted using a faulty long baseline (LBL) array
 - one mission that is conducted using poor ballast
 - one mission that is conducted using untuned proportional-integral-derivative (PID) control
- completing a post-mission analysis and vehicle performance analysis which includes a diagnostic report for each mission.

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:

- AUV calibrations, including:
 - INS
 - pitch-fin control
 - rudder-fin control
- battery technology, including:
 - battery maintenance
 - process for assessing battery performance
 - process for logging battery performance
- diagnostic missions to identify problems and improve performance, including:

- identify navigation issues involving DVL and INS
- identifying control issues
- identifying faulty LBL array
- improving ballast
- tuning PID control
- using ultrashort baseline (USBL) to aid navigation during dives
- design principles and process for executing diagnostic AUV missions
- ground fault detection procedures
- process for completing technical post-mission analysis and vehicle performance analysis for reporting of diagnostic missions
- technical diagnosis of AUV systems, including:
 - acoustic communication systems
 - AUV networks
 - AUV security
 - AUV internal state and decision-making processes
 - electromagnetic (EM) and radio frequency (RF) communications
- use of graphical and numerical analysis to inform technical post-mission analysis and vehicle performance analysis.

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.

Assessment must occur in workplace operational situations, and where this is not appropriate, assessment must occur in simulated workplace operational situations that replicate workplace conditions.

Simulated workplace may be used to augment real-world operational situations and does not replace real-world operations in prescribed water conditions.

Resources for assessment must include access to:

- applicable documentation such as workplace procedures, regulations, codes of practice, operation manuals, manufacturer instructions and procedures
- tools, equipment, machinery, materials and relevant personal protective equipment (PPE) currently used in industry, including:
 - AUV aligned with the required size and class that a seafarer will need to operate
 - AUV with minimum depth rating of 100 m and INS
 - water conditions consistent with mission requirements as outlined in this unit of

competency and must include access to water in excess of 100 m, high energy tidal waters and permanently stratified waters.

Links

Companion Volume Implementation Guides are found in VETNet -

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