



Australian Government

MARH032 Conduct advanced Autonomous Underwater Vehicles (AUV) operations

Release: 1

MARH032 Conduct advanced Autonomous Underwater Vehicles (AUV) operations

Modification History

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

Application

This unit involves the skills and knowledge required to conduct advanced Autonomous Underwater Vehicles (AUV) operations.

This unit includes applying advanced knowledge of data handling and storage, environmental dynamics when conducting AUV operations and acoustic communication principles; conducting advanced vehicle performance analysis, post-mission analysis; and following operation procedures for planning, execution and analysis.

This unit applies to people working in the maritime industry in the capacity of:

- AUV Operator
- AUV Technician.

This unit applies to AUV operations being conducted in Near Coastal (NC) waters within the limits of the operators AMSA Certificate of Competency.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

MARH030 Apply knowledge of core Autonomous Underwater Vehicles (AUV) operations

MARH034 Demonstrate fundamental knowledge of Autonomous Maritime Systems (AMS) operations

MARH035 Demonstrate fundamental knowledge of Autonomous Maritime Systems (AMS)

Competency Field

H - Navigation

Unit Sector

Maritime Sector

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1. Apply knowledge of data handling and storage

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.1 Units of data to be used when conducting AUV operations are explained

1.2 Application of 'raw' and 'working' data management is completed according to operational procedures

1.3 AUV logbooks and metadata records are completed according to operational procedures

1.4 Data plan and data workflow are produced

1.5 General principles of data redundancy and security are outlined

2. Conduct advanced vehicle performance analysis

2.1 Extraction and storage of AUV engineering data is conducted following a data plan

2.2 Numerical and graphical analysis of AUV engineering data is conducted using nominated software package

2.3 AUV performance is assessed relative to original equipment manufacturer (OEM) standard benchmarks of AUV operation

3. Conduct advanced post-mission analysis

3.1 Extraction and storage of sensor payload data is conducted following a data plan

3.2 Numerical and graphical analysis of sensor data is conducted using nominated software package

3.3 AUV sensor data quality is assessed relative to OEM standard benchmarks of AUV operation

3.4 Anomalies in AUV sensor data is assessed relative to vehicle performance analysis

4. Conduct advanced search and rescue operations for a lost AUV

4.1 AUV location operation with homing is conducted according to operational requirements

4.2 Disabled AUV rescue with remotely operated vehicle is conducted according to operational requirements

- | | | |
|--|------------|---|
| 5. Conduct advanced AUV missions following operations procedures for planning, execution and analysis | 5.1 | AUV mission applying advanced knowledge of acoustic navigation with long baseline (LBL) is conducted |
| | 5.2 | AUV mission applying advanced knowledge of ballasting for a stratified water column is conducted |
| | 5.3 | AUV bathymetry mission applying advanced knowledge of sonar and bottom imaging is conducted |
| | 5.4 | AUV mission in water depth greater than 100 meters is conducted |
| | 5.5 | AUV missions to optimise vertical and horizontal positioning are conducted |
| | 5.6 | AUV mission with advanced target identification is conducted |
| 6. Apply knowledge of environmental dynamics when conducting AUV operations | 6.1 | AUV operations taking into consideration the risks associated with ocean currents and tides are conducted |
| | 6.2 | Surface layer upwelling and downwelling due to wind stress curl and frontal activity and their potential impact on AUV operations is outlined |
| | 6.3 | Varying different seafloor types and the potential impact on AUV operations is outlined |
| 7. Apply knowledge of acoustic communication principles to optimise AUV missions | 7.1 | Fundamentals of sound propagation in water in relation to acoustic communication are outlined |
| | 7.2 | Fundamentals of geometry are applied to the localisation of an AUV using acoustic beacons |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the MAR Maritime Training Package Companion Volume Implementation Guide.

Unit Mapping Information

This is a new unit. No equivalent unit.

Links

Companion Volume Implementation Guides are found in VETNet -

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