



Australian Government

MARH031 Apply knowledge of core Autonomous Surface Vessels (ASV) operations

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.

Application

This unit involves the skills and knowledge required to apply knowledge of core Autonomous Surface Vessels (ASV) operations.

This includes demonstrating knowledge of small vessel operations relevant to ASV; applying principles of ASV communication and navigation; applying safe handling techniques; applying knowledge of data handling and storage, principles of ASV mission planning software, tracking technologies and surface piloting techniques; identifying key working components, conducting safe launch and recovery (LAR), assessing mission data and evaluating ASV mission in a simulated and real-world environment.

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

- ASV Operator
- ASV Technician.

This unit applies to ASV 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

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.

PERFORMANCE CRITERIA

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

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| 1. Demonstrate knowledge of small vessel operations relevant to ASV | 1.1 Key International Regulations for Preventing Collisions at Sea (COLREG) rules are identified |
| | 1.2 Key lessons from historical cases of vessel collision are identified |
| | 1.3 Key buoyage and light symbols are identified |
| | 1.4 Key principles of visual navigation and chart-based navigation are identified |
| 2. Apply safe handling techniques for an ASV | 2.1 Location of safe lifting points and sensitive ('no touch areas') are identified |
| | 2.2 ASV is transitioned from storage to operational area safely |
| | 2.3 Process for initialising, shutting down and recharging ASV is conducted safely |
| | 2.4 Process for data transfer of mission and payload data is conducted according to procedures |
| | 2.5 Process for checking ballast, trim and stability is conducted according to procedures |
| | 2.6 Process for checking watertight integrity is conducted according to procedures |
| 3. Identify key working components of an ASV | 3.1 Communication and navigation systems are identified |
| | 3.2 Power, control and propulsion systems are identified |
| | 3.3 Sensor payloads and data transfer system are identified |
| 4. Demonstrate knowledge of the principles of ASV communication and | 4.1 Key principles of radio frequency (RF) theory are identified |

navigation		
	4.2	Key principles of radar and radar navigation are identified
	4.3	Key principles of advanced global navigation satellite system (GNSS) and automatic identification systems (AIS) are identified
5. Apply knowledge of data handling and storage	5.1	Units of data to be used when conducting ASV operations are explained
	5.2	Application of ‘raw’ and ‘working’ data management is completed according to operational procedures
	5.3	ASV logbooks and metadata records are completed according to operational procedures
	5.4	Data plan and data workflow are produced
	5.5	General principles of data redundancy and security are outlined
6. Apply principles of ASV mission planning software	6.1	Process for loading navigational charts into the mission planning software is outlined
	6.2	Start and end points are set using mission planning software according to operational requirements
	6.3	Mission waypoints and transects are set using mission planning software according to operational requirements
	6.4	Optimal speed control is set using mission planning software according to operational requirements
	6.5	Total mission timing and distance are estimated manually and using mission planning software
	6.6	Mission files are uploaded from mission planning software to the ASV following operating procedures
7. Apply ASV tracking technologies	7.1	ASV is located in visual line of sight (VLOS) using radio link
	7.2	ASV is located beyond visual line of sight (BVLOS) using RF link (point-to-point or satellite)

	7.3	Best practises for focusing ASV search and rescue operations are described
8. Conduct safe launch and recovery (LAR) of an ASV	8.1	Critical factors required for safe launch and recovery systems (LARS) operations are outlined
	8.2	Deck-handling skills and equipment used to support ASV LAR are outlined
	8.3	ASV LAR from a stationary vessel is conducted according to operational procedures
	8.4	ASV LAR from a stationary vessel using a davit is conducted according to operational procedures
9. Apply ASV surface piloting techniques	9.1	Establish remote control of the ASV at the surface
	9.2	ASV piloting to and from the support vessel and around obstacles through the adjustment of course and speed is conducted
10. Conduct assessment of ASV mission data	10.1	Key information within master mission log file and operator logbook are accessed and interpreted
	10.2	Post-mission analysis is conducted to assess the success of the mission relative to payload objectives
	10.3	Vehicle performance analysis is conducted to assess the engineering behaviour of the ASV
11. Plan, conduct and evaluate an ASV mission in a simulated and real-world environment	11.1	ASV mission is designed and planned according to operational requirements
	11.2	ASV mission is conducted following a standard operating procedure in a simulated environment
	11.3	PMA of simulated mission is completed with a post-mission debrief
	11.4	ASV mission is conducted following a standard operating procedure, implementing a simulated

mission into the real-world environment

- 11.5** Post-mission analysis, including vehicle performance analysis, is completed with a post-mission debrief

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>