



Australian Government

Department of Education, Employment and Workplace Relations

**TDMMH1107B USE RADAR AND
OTHER ELECTRONIC NAVIGATIONAL
AIDS TO MAINTAIN SAFE
NAVIGATION WITHIN THE LIMITS OF
RESPONSIBILITY OF A MASTER 5**

Release: 1



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Modification History

Not applicable.

Unit Descriptor

UNIT DESCRIPTOR:

This unit involves the skills and knowledge required of a Master 5 or Skipper 3 to maintain safe navigation of a commercial vessel through the use of radar and other electronic navigational aids. This includes initialisation and operation of radar and other modern navigational systems, interpreting all available navigational data and using it for avoiding collisions and ensuring the safe navigation of the vessel.

Application of the Unit

Application of the unit	The unit has applications in the qualification for a Master 5/Skipper 3 as per relevant sections of Part D of the National Standard for Commercial Vessels (NSCV), i.e. Certificate III in Transport&Distribution (Coastal Maritime Operations - Master 5).
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Licensing/Regulatory Information

Licensing/legislative requirements	The unit is consistent with the relevant sections of State and Territory maritime regulations and NSCV/USL Code for a Master 5/Skipper 3.
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Pre-Requisites

Not applicable.

Employability Skills Information

Not applicable.

Elements and Performance Criteria Pre-Content

<i>Elements describe the essential outcomes of a unit of competency.</i>	<i>Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.</i>
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
. 1 Set up radar and other electronic navigational instruments	. a Radar is initialised and used in accordance with established procedures and manufacturer's instructions to assist in the safe navigation of the vessel b Operational performance and accuracy of the radar is confirmed and appropriate action taken where performance is out of limits c False echoes are detected and discounted
2 Use radar and other electronic navigational instruments	a Radar and GPS/DGPS is operated in accordance with manufacturer's instructions to produce data on the position of other vessels and fixed objects b Data produced by the radar and GPS/DGPS is interpreted and used to assist navigational command decisions, taking into account known limitations and errors associated with the equipment c A radar plot is constructed on a radar plotting sheet using systematic radar observations d Data on the radar plotting sheet is interpreted and analysed to anticipate potential collisions e Information obtained through the analysis of the radar plots is used to make informed command decisions on action needed to

ELEMENT	PERFORMANCE CRITERIA
	avoid collision

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ELEMENT	PERFORMANCE CRITERIA
2 Use radar and other electronic navigational instruments (continued)	f Radar plot is correctly constructed and used to determine avoiding action when necessary g Radar data is used to obtain a position fix for the vessel using electronic bearing lines and variable range markers h Radar bearings are corrected for vessel's heading and compass error as appropriate
3 Maintain navigational records	a Plotting sheets used to analyse navigational situations and to inform command decisions are stored in accordance with company procedures and regulatory requirements b Records of navigational data produced by radar and GPS/DGPS are stored electronically or in hard copy as required by company procedures and regulatory requirements

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Required Skills and Knowledge

REQUIRED KNOWLEDGE

This describes the knowledge required for this unit.

- 1 Relevant sections of State and Territory regulations, NSCV and USL Code dealing with responsibilities of a Master 5
- 2 Terminology and principles of operation of radar and GPS/DGPS typically used on vessels
- 3 The different types of electronic navigational aids, including their features, key applications and operational characteristics
- 4 Procedures for the initialisation and operation of radar, and various other types of electronic navigational aids
- 5 Techniques for the use of relevant electronic navigation systems, including:
 - i GPS and DGPS satellite systems as applied to navigation problems
 - ii integrated navigation systems

REQUIRED KNOWLEDGE

- 6 The limitations and potential errors associated with each type of electronic navigational aid
- 7 Methods for the interpretation and analysis of navigational data produced by radar, and various other types of electronic navigational aids, including due allowance for the limitations and potential errors associated with each type of electronic navigational aid
- 8 Procedures for the use of data generated by radar, and various other types of electronic navigational aids to assist in the safe navigation of the vessel
- 9 Maritime communication techniques when using radar and GPS/DGPS aids to assist in the safe navigation of a vessel
- 10 Typical problems in the use of radar and other electronic navigational systems to aid the navigation and appropriate courses of action and solutions

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REQUIRED SKILLS

This describes the basic skills required for this unit.

- 1 Use verbal communication skills required when using radar to maintain safe navigation on a small vessel of less than 24 m in length
- 2 Read, interpret and apply operating and service manuals and instructions for radar systems and related equipment
- 3 Read and interpret radar displays and indications
- 4 Complete any required operational and servicing records
- 5 Work safely and collaboratively with others when using radar to maintain safe navigation
- 6 Select and use relevant tools and equipment as per instructions
- 7 Recognise faulty radar equipment and take appropriate action as per operating instructions
- 8 Recognise routine problems when using radar to maintain safe navigation and

REQUIRED SKILLS

- take appropriate action
- 9 Adapt to differences in vessels, radar systems and related equipment and operating and servicing procedures
- 10 Operate marine radar systems and equipment on small vessel of less than 24 m in length
- 11 Operate GPS and other electronic navigation systems commonly used on small vessels

Evidence Guide

Evidence Guide

TDMMH1107A USE RADAR AND OTHER ELECTRONIC NAVIGATIONAL AIDS TO MAINTAIN SAFE NAVIGATION WITHIN THE LIMITS OF RESPONSIBILITY OF A MASTER 5

The Evidence Guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

1 Critical aspects of evidence required to demonstrate competency in this unit	Assessment must confirm appropriate knowledge and skills to: - a Initialise and operate radar, GPS/DGPS and other commonly used electronic navigational systems - b Interpret and analyse data generated by radar and GPS/DGPS systems and use it to inform navigational command decisions - c Use data generated by radar and GPS/DGPS systems to fix the position of the vessel - d Use data generated by radar and GPS/DGPS systems to plot the tracks of other vessels - e Identify problems in the use of radar and GPS/DGPS systems and take appropriate action - f Communicate effectively with others when using radar and GPS/DGPS aids to assist in the safe navigation of the vessel
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2 Evidence required for demonstration of consistent performance	- a Performance is demonstrated consistently over a period of time and in a suitable range of contexts - b Consistently applies underpinning knowledge and skills when: 1 using radar and GPS/DGPS to assist in the safe navigation of the vessel 2 identifying and evaluating problems in the use of radar and GPS/DGPS and the navigational data they produce and determining appropriate courses of action 3 identifying and implementing improvements to procedures for the use of radar and GPS/DGPS for the safe navigation of the vessel 4 assessing operational capability of various types of radar and GPS/DGPS aids - c Shows evidence of application of relevant workplace procedures, including: 1 relevant sections of State and Territory marine regulations, NSCV/USL Code 2 vessel's safety management system and procedures (where applicable) 3 OH&S regulations and hazard prevention policies and procedures 4 job procedures and work instructions
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Evidence Guide (continued)

TDMMH1107A USE RADAR AND OTHER ELECTRONIC NAVIGATIONAL AIDSTO MAINTAIN SAFE NAVIGATION WITHIN THE LIMITS OF RESPONSIBILITY OF A MASTER 5

2 Evidence required for demonstration of consistent performance (continued)	5 relevant manufacturer's guidelines relating to the use of electronic navigational aids 6 security procedures when using radar and GPS/DGPS aids - d Action is taken promptly to report and/or rectify problems in the use of radar and GPS/DGPS in accordance with regulatory
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	requirements and company procedures e Work is completed systematically with required attention to detail f Recognises and adapts appropriately to cultural differences in the workplace, including modes of behaviour and interactions among crew and others
3 Context of assessment	a Assessment of competency must comply with the assessment requirements of the relevant maritime regulations b Assessment of this unit must be undertaken within relevant marine authority approved and audited arrangements by a registered training organisation: 1 As a minimum, assessment of knowledge must be conducted through appropriate written/oral examinations, and 2 Appropriate practical assessment must occur: - i at the registered training organisation; and/or - ii on an appropriate working or training vessel
4 Specific resources required for assessment	Access is required to opportunities to: a carry out navigation assignments or exercises using an appropriate electronic navigation simulator over a representative range of navigational incidents; and/or b use radar and GPS/DGPS aids to maintain safe navigation during sea time on the voyage of a commercial or training vessel

Range Statement

Range Statement

TDMMH1107A USE RADAR AND OTHER ELECTRONIC NAVIGATIONAL AIDS TO MAINTAIN SAFE NAVIGATION WITHIN THE LIMITS OF RESPONSIBILITY OF A MASTER 5

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

VARIABLE

SCOPE

1. GENERAL CONTEXT

a. Work must be carried out:	1 in compliance with the relevant sections of State and Territory marine regulations, NSCV and USL Code
b. Work is performed:	1 relatively independently under broad operational requirements, with limited accountability and responsibility for self and others in achieving the prescribed outcomes
c. Work involves:	1 the use of radar and GPS/DGPS to assist the safe navigation of a vessel across a wide and often unpredictable variety of navigational situations. Implementation of operational strategies and procedures for the use of radar and other commonly used electronic navigational systems to maintain the safe navigation of the vessel is required
d. Work requires:	1 judgement in operational functions related to the use of electronic navigational aids to maintain the safe navigation of a commercial vessel

2. WORKSITE ENVIRONMENT

The Range Statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

a Vessel may include:	1 any commercial vessel of less than 24 metres in length
b Radar and GPS/DGPS may be operated to support command navigational decisions:	1 by day or night in both normal and emergency situations 2 under any possible conditions of weather and loading 3 while underway 4 during berthing and unberthing operations 5 while anchoring or mooring
c Equipment may include:	1 radar 2 GPS and DGPS satellite systems as applied to navigation problems 3 integrated navigation systems

Range Statement (continued)

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d The use of radar and GPS/DGPS to assist safe navigation may include:	1 avoidance of collision with another vessel 2 fixing the position of the vessel 3 tracking of other vessels 4 assistance in making of command navigational decisions 5 navigating during search and rescue operations
e Documentation and records may include:	1 relevant maritime regulations 2 operational orders

d The use of

- 1 avoidance of collision with another vessel
- 3 navigational charts
- 4 radar plotting charts
- 5 regulations for preventing collisions at sea
- 6 safety management system plans, procedures, checklists and instructions (where relevant)
- 7 vessel's log
- 8 company procedures for the use of navigational aids
- 9 systems manufacturer's instructions and recommended procedures
- 10 notices and instructions of relevant maritime authorities
- 11 relevant Australian standards

f Applicable legislation, regulations and codes may include:

- 1 regulations for preventing collisions at sea
 - 2 relevant Commonwealth, State and Territory marine and OH&S legislation
- Commonwealth, State and Territory

Unit Sector(s)

Not applicable.

Field

Field MH Navigation

Relationship to other units

Relationship to other units	The unit may be assessed in conjunction with other units that relate to the functions of the occupation(s) concerned.
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