



Australian Government

MARB051 Apply elements of magnetic compass adjusting

Release: 1

MARB051 Apply elements of magnetic compass adjusting

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 elements of magnetic compass adjusting.

This unit includes preparing for work, inspecting compass, analysing records, determining deviations, adjusting a magnetic compass and completing documentation.

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

- Compass Adjuster for vessels less than and equal to 45 metres in length.

Work is performed under limited supervision and applies to those responsible for adjusting a magnetic compass in the work environment and who are responsible for their own work.

Licensing/Regulatory Information

This unit is one of the requirements to obtain certification as a Compass Adjuster as defined in Marine Order 27.

To undertake this unit of competency a person must hold at least a:

- certificate of competency that permits a person to command a vessel less than 24 metres (Masters < 24 m Near Coastal (NC)) or an equivalent certificate as a Master recognised by Australian Maritime Safety Authority (AMSA), or
- a current compass adjuster licence issued by a state or territory or AMSA for those vessels.

Pre-requisite Unit

MARB052 Apply knowledge of the principles of magnetic compass adjusting

Competency Field

B - Equipment Checking and Maintenance

Unit Sector

Maritime

Elements and Performance Criteria

ELEMENTS

PERFORMANCE CRITERIA

Elements describe the essential outcomes

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

1 Prepare for work

- 1.1 Job requirements are identified from specifications and information provided by the ship's Master or nominated representative
- 1.2 Ship is embarked safely in accordance with International Convention for the Safety of Life at Sea (SOLAS) and Marine Order requirements
- 1.3 Appropriate personal protective equipment (PPE) is selected in accordance with ship work health and safety (WHS)/occupational health and safety (OHS) requirements
- 1.4 Ship is confirmed as being in its 'normal seagoing condition' in accordance with standard operating procedures
- 1.5 Movable magnetic materials in the locality of the compass are removed or secured in accordance with workplace procedures
- 1.6 Magnetic equipment is secured in its 'normal seagoing position' before beginning adjustments in accordance with workplace procedures

2 Inspect compass

- 2.1 Physical inspection of the compass and binnacle is conducted to determine suitability of compass and binnacle to carry out an adjustment satisfactorily in accordance with manufacturer's specifications and workplace procedures
- 2.2 Appropriate tools, equipment and techniques are used to inspect compass in accordance with job requirements
- 2.3 Inventory of any correctors already fitted is recorded in ships Safety Management System (SMS) records and/or compass deviation book in accordance with workplace procedures

3 Analyse records

- 3.1 Ship's compass deviation book and/or records are examined to determine if any changes have been made to correctors since the last compass adjustment in

		accordance with workplace procedures
	3.2	Ship's compass deviation book and/or records are examined to determine recent performance of the compass in accordance with workplace procedures
4 Determine deviations and adjust magnetic compass	4.1	Compass deviation errors are determined using procedures outlined in the tentative method of adjustment and the analysis method of adjustment
	4.2	Compass is adjusted using procedures outlined in the tentative method of adjustment and the analysis method of adjustment
	4.3	Final swing is performed, and residual deviations are recorded in accordance with tentative method of adjustment and the analysis method of adjustment
5 Complete documentation	5.1	A table or curve of deviation from observations taken on principle cardinal and intercardinal headings is produced and the position of correctors and residual coefficients is recorded in accordance with workplace procedures
	5.2	Outcome of the compass adjustment is confirmed with the Master in accordance with job requirements
	5.3	Ship is disembarked safely in accordance with SOLAS and Marine Order requirements

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 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>

Assessment Requirements for MARB051 Apply elements of magnetic compass adjusting

Modification History

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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 on at least one of occasion and include:

- adjusting a magnetic compass onboard a variety of commercial vessels less than or equal to 45 metres on at least eight (8) separate occasions and must include:
 - two (2) swings in a simulated environment, and
 - six (6) swings onboard commercial vessels and must include:
 - two (2) swings on a compass card of a diameter 75 millimetres
 - two (2) swings on a compass card of a diameter 100 millimetres
 - two (2) swings on a compass card of a diameter 125 millimetres or over
- Or:
- eight (8) swings onboard a variety of commercial vessels:
 - two (2) swings on a compass card of a diameter 75 millimetres
 - two (2) swings on a compass card of a diameter 100 millimetres
 - two (2) swings on a compass card of a diameter 125 millimetres or over
- adjusting deviations from coefficients
- analysing the ship's compass deviation book and records to determine causes of irregular deviations and determining measures for their removal
- ascertaining the magnetic bearing of a distant object and/or magnetic heading to determine compass deviation
- assessing the safe distances of electronic equipment in the vicinity of the compass
- checking accuracy of instruments used in connection with compasses
- communicating with the Master to ensure ship is swung appropriately and when required in accordance with compass adjustment requirements
- determining deviations due to coefficients A, B, C D and E as appropriate
- taking a bearing, using and testing a pelorus and an azimuth mirror
- using methods of swinging a ship to obtain a table of deviations
- using the analysis method of adjustment and the tentative method of adjustment to adjust a magnetic compass
- using the appropriate equipment, methods and basic calculations for finding and compensating compass deviations

- using vertical force instrument (VFI) correctly and accurately.

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:

- analysis method of adjustment and the tentative method of adjustment, including:
 - process to be followed when adjusting a compass using the analysis method of adjustment and the tentative method of adjustment
 - rationale for using the analysis method of adjustment, including:
 - following collision, grounding, stranding, fire of appreciable size, or struck by lightning
 - following large structural changes to the hull or the superstructure
 - when a ship is new
 - when the ship resumes service after having been laid up for a considerable time
 - rationale for using the tentative method of adjustment, including:
 - after changing any correctors during the voyage
 - after the carriage of cargoes of a magnetic nature and/or loaded/unloaded by electro-magnetic cranes
 - when a ship is at the magnetic equator, to observe deviations and correct permanent coefficient B
 - when a ship is operating in an area remote from the last place of swinging
 - when readjustment to the full compensation is done
- basic calculations which can be used when adjusting a compass
- basic method of detecting mechanical errors in a liquid magnetic compass
- basic methods for finding and compensating for deviations due to coefficients A, B, C, D and E
- basic methods used for taking a bearing, using and testing a pelorus and azimuth mirror for any error
- bearings and headings, including:
 - compass heading
 - magnetic bearing of a distant object
 - magnetic heading
 - principle headings (cardinal and intercardinal)
 - true bearings
- how to produce a curve or table of deviation from observations on the principle headings
- movable magnetic materials, including process for securing or removing materials
- planning for a compass adjustment, including:
 - job requirements and specifications
 - personal protective equipment (PPE)
 - time allowed to complete compass adjustment

- process for:
 - determining that a ship is in its 'normal seagoing' condition
 - physically inspecting a compass and binnacle
 - securing magnetic equipment in 'normal seagoing' conditions
 - swinging a ship
- rules to be followed when placing correctors
- safe distances of electronic equipment to the compass
- ship's compass deviation book and records, including:
 - how a compass deviation book can be used to identify causes of irregular magnetic compass deviation
 - how compass deviation book is used to record outcome of the magnetic compass adjustment
- tools and equipment used to inspect and adjust a compass, including:
 - permanent and soft iron correctors
 - VFI
- transmitting magnetic compass bowls and repeaters
- various coefficients resulting from vessel magnetism, including:
 - A, B, C, D, E, F, G, H K and J
 - basic calculations for coefficient A, B, C, D and E to determine deviation on any particular heading
 - limitations and practicalities of adjusting a compass using A, B, C, D and E coefficients
- work health and safety (WHS)/occupational health and safety (OHS) workplace procedures, including:
 - embarking and disembarking from a ship safely
 - manufacturer's specifications
 - Marine Order and International Convention for the Safety of Life at Sea (SOLAS), including requirements of a safely rigged pilot ladder
 - PPE requirements.

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.

Practical assessment must include at least eight (8) practical swings onboard a variety of commercial vessels less than or equal to 45 metres in length.

A qualified Compass Adjuster as defined in Marine Orders and/or qualified assessor must accompany and supervise a person undertaking practical assessments onboard a vessel.

All swings must be recorded in a training log, signed by a qualified Compass Adjuster and verified by a qualified assessor.

Resources for assessment must include access to:

- applicable documentation, such as legislation, regulations, codes of practice, workplace procedures, ships deviation book and operational manuals
- compass adjusting tools, equipment and materials currently used in industry.

Links

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