



**Australian Government**

**Assessment Requirements for MARB052  
Apply knowledge of the principles of  
magnetic compass adjusting**

**Release: 1**

# Assessment Requirements for MARB052 Apply knowledge of the principles of magnetic compass adjusting

## 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 on at least one occasion and include:

- explaining methods, procedures, theories and materials needed to identify and adjust compass deviations in a magnetic compass
- explaining the meaning of terms ‘hard’ and ‘soft’ iron, magnetic induction and permeability
- identifying causes of magnetic compass deviation
- outlining the main components of a magnetic compass
- using reference materials, including accessing magnetic models to identify the earth’s forces total (T), horizontal (H), vertical (Z) and dip (inclination), variation (declination) and their annual rates of change and factors effecting temporary changes.

## 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:

- applicable regulatory requirements, including:
  - International Convention for the Safety of Life at Sea (SOLAS)
  - Marine Orders
  - National Standard for Commercial Vessels (NSCV)
- calculations used in relation to flux density and magnetic field strength
- coefficient A deviations, including:
  - asymmetrical induced soft iron
  - errors in calculating the sun’s azimuth, observing time or taking bearings
  - physical misalignment of the magnetic compass, pelorus or gyro
- components of a magnetic compass, including:
  - differences between internally and externally gimballed
  - various fluids used as liquid
  - how the magnets are fitted to the card
  - expansion arrangements
  - internal corrector magnet arrangements on internally gimballed compasses

- definitions, including:
  - flux density (B)
  - intensity of magnetisation (J)
  - magnetic field strength (H)
  - magnetic flux
  - magnetic moment (M)
  - permeability ( $\mu$ )
  - pole strength (m)
  - susceptibility (k)
- induced magnetism and its effects on the magnetic compass, including:
  - directive force at compass
  - induced fields
  - permanent vertical fields at the compass
  - quadrantal deviations
- information sources and reference materials, including:
  - Admiralty charts
  - calculators used for magnetic models, including:
    - the value of the magnetic field elements T, H, Z, variation and dip
- magnets and magnetic fields, including:
  - ferromagnetic materials
  - flinders bar
  - flux density
  - geomagnetic pole
  - hard iron
  - magnetic flux
  - magnetic moment
  - magneto motive force
  - material coercivity and remanence
  - north magnetic pole
  - quadrantal correctors
  - remanence of the material
  - soft iron
  - south magnetic pole
- magnetic compass binnacle accommodating correcting devices, including:
  - athwartships permanent magnets
  - fore and aft permanent magnets
  - quadrantal correctors
  - vertical permanent magnets
  - vertical soft iron corrector (Flinders Bar)
- permanent magnetism, including:

- athwartships force (Q)
- fore and aft force (P)
- vertical force  $\mathcal{Q}$
- ship's magnetism, including:
  - induced magnetism:
    - soft iron rods
    - temporary permanent magnetism
- terrestrial magnetism, including:
  - aclinic line
  - agonic line
  - angle of magnetic dip (inclination)
  - horizontal component of the earth's field (H)
  - isoclinic lines
  - isodynamic line
  - isogonic line
  - magnetic latitude
  - magnetic medium
  - magnetic variation
  - north magnetic pole
  - solar storms
  - south magnetic pole
  - total flux density at the earth's surface (T)
  - true meridian
  - vertical component of the earth's field (Z)
- units of measurement including:
  - ampere per metre (A/m)
  - gamma
  - Gaussian (CGS)
  - MKSA system of units
  - nano-teslas
  - oersted
  - teslas
  - weber.

## 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 where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that replicate workplace conditions.

Resources for assessment must include access to:

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

## **Links**

Companion Volume Implementation Guides are found in VETNet -

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