



## REGISTERED NATIONAL STANDARD

### UNIT OF COMPETENCY

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| Title:                               |  | Provide marine navigation assistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |              |    |              |  |   |
| TQF Level:                           |  | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Credits: |              | 20 | Release:     |  | 1 |
| National standard code:              |  | NS115-03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |              |    |              |  |   |
| Associated qualification (and code): |  | National certificate in whale watching and swimming guide Level 3 (QR-03-NQ-005-01-0903-24-01)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |          |              |    |              |  |   |
| Approval date:                       |  | 13 June 2024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          | Review date: |    | 13 June 2029 |  |   |
| Purpose:                             |  | This unit standard involves working with tools and equipment used on small marine vessels for navigation within coastal waters.<br>Persons credited with this unit standard are able to demonstrate the following skills and knowledge as an assistant to the skipper of a small boat:<br><div><div>1.</div><div>Knowledge of the local weather;</div></div> <div><div>2.</div><div>Identify and work with navigation charts;</div></div> <div><div>3.</div><div>Use a compass for marine navigation;</div></div> <div><div>4.</div><div>Perform routine navigation calculations;</div></div> <div><div>5.</div><div>Use a range of marine safety equipment and mooring knots</div></div> |          |              |    |              |  |   |

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| <b>Learning Outcome 1<br/>(LO1)</b> | <p>Read a variety of navigation charts.</p> <p>[Range of charts include but not limited to: <i>nautical charts, piloting charts, ocean passage charts, etc.</i>]</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Performance standards</b>        | <p>1.1 A variety of navigation charts are identified;</p> <p>1.2 A range of essential chart symbols are identified and explained:<br/>[Range of symbols include but not restricted to: <i>depth contours, soundings, compass rose, latitude and longitude, navigational aids, obstructions, tidal information, etc.</i>]</p> <p>1.3 The essential tools for chart reading and plotting are described;<br/>[Range of tools include but not restricted to: <i>parallel rulers, dividers: protractor, pencils and erasers</i>]</p> <p>1.4 Explain the meaning of a range of navigation terms<br/>[Range of terms include but not restricted to: <i>bearing, magnetic north, true north, degrees, minutes, etc.</i>]</p> <p>1.5 Identify the main parts of a magnetic compass affixed to a boat;</p> <p>1.6 Determine the course of a trip using a compass and map;</p> <p>1.7 Identify positions on a map using latitude and longitude.</p> |
| <b>Learning Outcome 2<br/>(LO2)</b> | <p>Demonstrate knowledge of navigation calculation involving a range of variables</p> <p>[Range variables must include: <i>speed, distance, and time</i>]</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Performance standards</b>        | <p>2.1 Describe the navigation variables of speed, distance, and time.</p> <p>2.2 Explain the difference between a <i>mile</i> and a <i>nautical mile</i>.</p> <p>2.3 Convert nautical mile into mile and kilometers.</p> <p>2.4 Identify sources of data to make navigation calculations.</p> <p>2.5 Identify the data required to make necessary navigation calculations.</p> <p>2.6 Calculate unknown navigation variables from known data.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Learning Outcome 3<br/>(LO3)</b> | <p>Operate key navigation equipment</p> <p>[Range of equipment includes but not restricted to: <i>Navigation chart, compass, VHF radio, GPS</i>]</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Performance Standards</b>        | <p>3.1 Identify a range of commonly used navigation equipment;</p> <p>3.2 Describe the purposes (functions) of a range of common navigation equipment;</p> <p>3.3 Demonstrate basic operation of a range of common navigation equipment</p> <p>3.4 Demonstrate routine maintenance of common navigation equipment</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

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| <b>Learning Outcome 4<br/>(LO4)</b> | Demonstrate knowledge of the local weather                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Performance standards</b>        | <p>4.1 Describe Tongan traditional ways of predicting weather behaviour;</p> <p>4.2 Identify Tonga's prevailing wind;</p> <p>4.3 Describe Tonga's climate and average weather pattern in terms of rainfall; temperature, and occurrence of extreme events such as cyclones;</p> <p>4.4 Explain a range of commonly used weather terms and describe the weather typically associated with them;<br/>[Range of weather terms include but not restricted to: <i>fronts (warm, cold), lows, highs, isobars, troughs and ridges, clouds and rain symbols</i>]</p> <p>4.5 Explain weather associated with different cloud types;<br/>[Range of cloud type include but not restricted to: <i>cirrus, cumulus, nimbus</i>]</p> <p>4.6 Describe local weather maps in terms of their format and symbols used.</p> <p>4.7 Predict likely changes in the weather by identifying the presence, type, and movement of different fronts.</p> |
| <b>Learning Outcome 5<br/>(LO5)</b> | Demonstrate knowledge of a range of key boating knots.<br>[Range of knots include but not restricted to: <i>bow-line knot, square (reef)-knot, cleat hitch, clove hitch, rolling hitch, two-half hitches, figure-of-eight, single sheet bend, etc.</i> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Performance standards</b>        | <p>5.1 Identify a variety of boating knots;</p> <p>5.2 Demonstrate tying a variety of boating knots;</p> <p>5.3 Describe specific situations in which a variety of knots are used;</p> <p>5.4 Explain why certain knots are used in specific situations;</p> <p>5.5 Describe factors that need to be considered when deciding on the type of knots to use.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Learning Outcome 6<br/>(LO6)</b> | Demonstrate knowledge of how to operate a range of marine safety equipment<br>[Range of equipment include but not restricted to: <i>Life jacket, life-rings, anchor with warp and chain, flare, fire extinguisher, first-aid kit, VHF radio, GPS, EPIRB</i> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Performance standards</b>        | <p>6.1 Identify a variety of marine safety equipment;</p> <p>6.2 Safely obtain safety equipment from storage;</p> <p>6.3 Demonstrate safe operation of marine safety equipment;</p> <p>6.4 Describe workplace procedure for making distress call using VHF radio;</p> <p>6.5 Make distress calls using a VHF radio in accordance with workplace requirements.<br/>[Range of distress situations: <i>injury or death, boat is taking in water/sinking, engine trouble, floating objects/debris</i>]</p>                                                                                                                                                                                                                                                                                                                                                                                                                         |

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| <b>Pre-requisites</b>                    | NS024-04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Co-requisites</b>                     | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Underpinning skills and knowledge</b> | <p>The following knowledge and skills underpin this unit standard:</p> <p><b><u>KNOWLEDGE:</u></b></p> <ol style="list-style-type: none"> <li>1) Marine navigation terminology such as: <i>latitude, longitude, nautical mile, nautical charts, compass, bearing, true north, degrees, minutes, VHF radio, weather, mooring,</i></li> <li>2) Navigation equipment</li> <li>3) Marine safety and safety equipment</li> <li>4) Climate and weather patterns – weather maps and predicting changes based on whether information.</li> <li>5) Boating knots</li> </ol> <p><b><u>SKILLS:</u></b></p> <ol style="list-style-type: none"> <li>1) Marine navigation (traditional) <ul style="list-style-type: none"> <li>○ Steering a boat</li> <li>○ Determining coordinates by interpreting latitudes and longitudes</li> <li>○ Charting using compass</li> <li>○ Navigation calculations</li> </ul> </li> <li>2) Operate navigation equipment: navigation chart, compass, VHF radio, GPS, Beacon (EPIRB)</li> <li>3) Making a variety of distress calls</li> <li>4) Mooring and tying a boat</li> <li>5) Basic weather forecasting and map reading.</li> </ol> |
| <b>Assessment requirements</b>           | <p><b><u>Methods of assessment:</u></b></p> <p>A range of assessment methods should be used to assess students' knowledge and application of skills. These shall include but not restricted to the following:</p> <ol style="list-style-type: none"> <li>1) Direct observation of students performing certain tasks as described below in the <i>context of assessment</i>.</li> <li>2) Written assessments such as: <ol style="list-style-type: none"> <li>(i) Poster or chart making – demonstrating procedures (e.g. maintenance and repair)</li> <li>(ii) Written tests</li> </ol> </li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

- (iii) Student portfolios;
- (iv) Review of workplace attachment reports (e.g. Supervisor/third party reports)
- 3) Oral assessment as in seminar presentations and one-on-one interview
- 4) A combination of all of the above methods. Examples:
  - (i) During an observation assessment, and depending on the skills and knowledge that is being assessed, a students may also be required to give oral responses to questions asked by the assessor to clarify or ascertain skills and knowledge during observation;
  - (ii) Students may be required to also submit written answers or report after an observation assessment (or seminar presentation)

#### **Context of assessment:**

To support student assessment and to ensure they are valid, reliable, flexible, and fair, a training provider is encouraged to make the necessary arrangements to involve the relevant key industry organizations and experts in the planning and delivery of training. Industry organizations and individuals can be engaged in a variety of capacities:

- a) To contribute to the design and implementation of the curriculum and assessment activities;
- b) As trainers, assessors, or assessment moderators;
- c) As hosts for students on workplace attachment;
- d) As supervisors of students on workplace attachment;
- e) Etc.

To show that learners have attained the required competency they will need to **demonstrate** and **apply** their knowledge in the workplace or in an environment that closely resembles the workplace) in relation to:

- a) LO1: To read navigation charts and plot a chart using a compass
- b) LO2: Demonstrate knowledge of navigation calculation involving a range of variables
- c) LO3: Operate key navigation equipment
- d) LO4: Demonstrate knowledge of the local weather
- e) LO5: Demonstrate knowledge of a range of key boating knots.
- f) LO6: Demonstrate knowledge of a range of marine safety equipment

#### **Evidence of competence**

- 1) The assessment of competence and the collection of evidence must be in

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|                                | <p>accordance with local industry and regulatory requirements;</p> <ol style="list-style-type: none"> <li>Evidence must clearly show that knowledge and skills have been acquired to the expected standards of performance</li> <li>All knowledge and skills should be contextualised to current industry practices and technologies;</li> <li>Each LO must be demonstrated on at least TWO occasions.</li> <li>Sources of evidence need to be rich in nature to minimise error in judgment.</li> </ol> <p><b><u>Re-assessment</u></b></p> <p>Candidates of assessment are eligible to <b>three (3)</b> attempts to achieve the required competency within <b>14 days</b> of their first attempt:</p> <ol style="list-style-type: none"> <li>Feedback must be provided to the candidate and sufficient time provided to prepare for re-assessment.</li> <li>The trainer/assessor has the discretion to vary the assessment tasks used in each assessment attempt as long as the: <ol style="list-style-type: none"> <li>same competencies are being assessed;</li> <li>principles of assessment are adhered to.</li> </ol> </li> </ol> <p>Failure to achieve the required competency after <b>three (3)</b> attempts on the exam or specific part of the assessment will require the person studying this Unit to re-enrol for the same Unit.</p> |
| <b>Moderation arrangements</b> | <ol style="list-style-type: none"> <li>Training providers must have their own moderation system approved by TNQAB before accreditation is granted: <ol style="list-style-type: none"> <li>Relevant internal moderation processes are documented;</li> <li>Assessment is planned for each unit, and moderation processes are integrated into such plan</li> </ol> </li> <li>External moderation is conducted by the national qualifications unit of TNQAB for all unit components of national qualifications; <ol style="list-style-type: none"> <li>Samples of assessed activities are submitted for moderation;</li> <li>Moderation (external) forms are available on request from the National qualifications unit of TNQAB.</li> </ol> </li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Resource requirements</b>   | <p><b><u>Human resources:</u></b></p> <ol style="list-style-type: none"> <li>Trainer – meeting established requirements by TNQAB;</li> <li>Skipper (licensed)</li> </ol> <p><b><u>Documents:</u></b></p> <ol style="list-style-type: none"> <li>Compilation of printed (or online) resources relevant to marine</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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|                                           | <p>navigation and safety at the discretion of the course/unit coordinator or trainer;</p> <ol style="list-style-type: none"> <li>2) Navigation charts</li> <li>3) Local weather map.</li> <li>4) Safety briefing procedures</li> <li>5) Checklists: <ol style="list-style-type: none"> <li>(i) Equipment preparation checklist</li> <li>(ii) Vessel safety checklist</li> </ol> </li> </ol> <p><b><u>Equipment and tools:</u></b></p> <ol style="list-style-type: none"> <li>1) Boat (at least 7m) to safely hold 10 people per boat (including skipper/crew)</li> <li>2) Outboard 2 or 4-stroke engine (60 hp)</li> <li>3) Anchor with warp and chain</li> <li>4) VHF radio</li> <li>5) GPS (installed)</li> <li>6) Beacon (<i>EPIRB</i>)</li> <li>7) First-aid kit</li> <li>8) Life jackets (one per person including skipper/crew),</li> <li>9) Life-rings (x2)</li> <li>10) Flares (x6)</li> <li>11) Fire extinguisher</li> <li>12) Boating (mooring) robes 12 – 20 mm (x10)</li> <li>13) Navigation slide ruler (x12)</li> <li>14) Protractors (x 24)</li> <li>15) Calculator (which can calculate navigation data)</li> </ol> |
| <b>Requirements to complete this unit</b> | <p>There are six (6) Learning outcomes and thirty (30) Performance standards to measure competence.</p> <p>To demonstrate competence, the person studying this unit is:</p> <ol style="list-style-type: none"> <li>1. Required to attain an <i>Achieved</i> Grade (Competent) to fulfil the requirements of the Unit standard;</li> <li>2. Eligible to three (3) attempts to achieve the required competency within 14 days of the first attempt.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Important notes</b>                    | <b><u>Notes:</u></b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## and definitions

1. In the event that local legislations and/or regulatory requirements are not available, relevant legislations/regulatory requirements from New Zealand and/or Australian should be used for training;
2. Assessors must comply with the requirements for assessment and moderation of national qualifications.

### Definitions:

1. *Bearing*: an angle (between 0 – 360) measured clockwise from the north direction.
2. *Compass rose*: This refers to a circular diagram that represents the orientation of a navigation chart in relation to true north and magnetic north. It's essential for plotting courses and determining bearings
3. *Depth contours*: These lines indicate changes in water depth and are usually marked in meters or fathoms. The closer the lines are together, the steeper the underwater slope.
4. *Emergency position indicating radio beacon (EPIRB)* is a safety device designed to alert rescue authorities and indicating the location of someone in distress. In the event of an emergency, a transmitter is activated and begins transmitting a distress radio signal, which is used by search-and-rescue teams to quickly locate the emergency and provide assistance and rescue.
5. *Front*: in weather, a 'front' refers to the boundary separating air masses for which several characteristics differ, such as air density, wind, temperature, and humidity.
6. *GPS* stands for Global Position System – a satellite-based navigation system owned by the United States of America.
7. *Latitude and Longitude*: These lines form a grid on the chart, allowing you to pinpoint your exact location.
8. *Magnetic north*: is the direction a compass points as it aligns to the Earth's magnetic field
9. *Mile*: is a unit of distance on land, and is equivalent to about 1.60 km.
10. *Nautical mile* is used to measure distances at sea and in the air, and is slightly longer than a mile. One (1) nautical mile is equivalent to about 1.151 mile.
11. *Navigational Aids*: Symbols representing buoys, beacons, lighthouses, and other aids to navigation are marked on the chart. These aids help sailors navigate safely and avoid hazards.
12. *Obstructions*: Rocks, wrecks, and other underwater hazards are marked on the chart with specific symbols. It's crucial to be aware of these

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|                                | <p>obstructions when planning your course.</p> <p>13. <i>Soundings</i>: These numbers indicate the depth of water at specific points, usually measured in meters or fathoms.</p> <p>14. <i>Tidal Information</i>: Tidal data, including the direction and strength of currents, is often included on nautical charts. This information is essential for navigating in areas with strong tidal influences.</p> <p>15. <i>True north</i>: is the direction that points directly towards the geographic North Pole. True north is a fixed point on the Earth's globe (compare to <i>Magnetic north</i>).</p> <p>16. <i>VHF</i> stands for <i>very high frequency</i> which is <i>a certain region of the electromagnetic spectrum</i> with waves of 30 to 300 megahertz.</p> <p>17. <i>VHF radios</i> refer to radios that operate with VHF radio waves.</p> |
| <b>Public comments on unit</b> | <p>Please contact TNQAB National Qualifications Unit (email <a href="mailto:EnquireNQ@tnqab.to">EnquireNQ@tnqab.to</a> or Telephone 28136) if you like to discuss or suggest changes to the details of this unit.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |