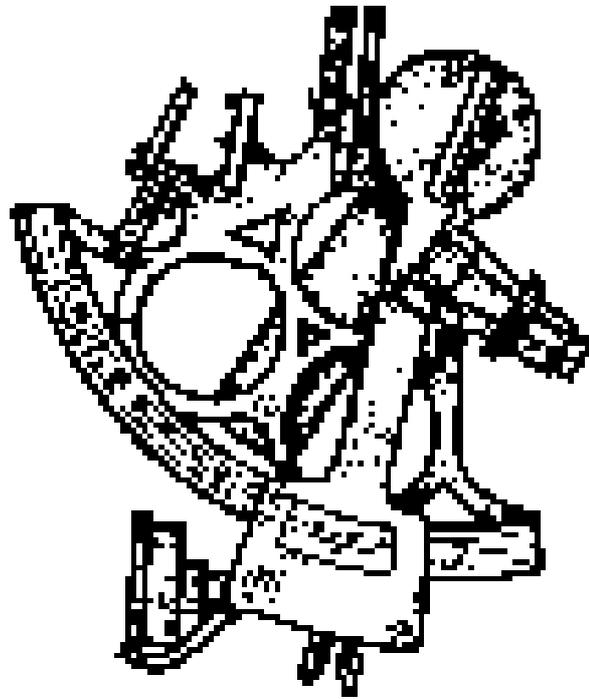


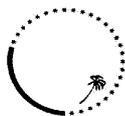
NAUTICAL KNOWLEDGE

FOR PACIFIC ISLAND MARINERS

**RESTRICTED CLASS 6 - MASTER/ENGINEER
SPC O21B**



TRAINER'S GUIDE



SECRETARIAT OF THE PACIFIC COMMUNITY



GOVERNMENT OF TAIWAN/ROC

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GENERAL INFORMATION

1. Introduction

This Trainer's Guide has been designed to assist trainers who are delivering and assessing the Nautical Knowledge module (SPC 021B) of the Restricted Class 6 Master/Engineer course for mariners in the Pacific region. It is a guide to the learning outcomes that need to be delivered, along with suggested assessment methods and assessment criteria (evidence). It is to be used in conjunction with the Nautical Knowledge Learner's Guide as well as suggested reference resource material listed in the Course Information section of this guide.

The Nautical Knowledge module has been designed and is intended for the skippers of small boats, generally less than 15 meters in length and operating in near coastal waters. The content of the module has been modeled on the Nautical Knowledge module (SPC 021) of the Class 6 Master/Engineer course developed by the Maritime Regional Programme, Secretariat of the Pacific Community. It has been modified to meet the requirements of small-boat skippers in Pacific Island countries and territories generally operating in inshore or near coastal waters. Compliance with local regulations should be sought before the module is offered.

The intention is that the resources provide a generic module for Pacific Island countries and territories when delivering the country-specific Restricted Class 6 Master/Engineer course. The wide variety of boats and types of operations in the Pacific Island region means local priorities will be different and that needs to be reflected in the delivery methodology.

2. Programme development

The resources were produced with financial support from the Government of Taiwan/ROC and compiled by Grant Carnie, Manager of Fishing & Maritime Programmes, Australian Fisheries Academy, Adelaide, South Australia.

They were developed through consultation with staff of the Fisheries Training Section, Coastal Fisheries Programme, Secretariat of the Pacific Community and regional experts on fishing and maritime training. Resources from Australia and New Zealand, SPC training materials and valuable resource material such as the *Australian Boating Manual* by Captain Dick Gandy were used as a guideline in developing materials that were relevant to small-boat operators in the Pacific Island region.

COURSE INFORMATION

1. Module name

Nautical Knowledge SPC 021B.

2. Prerequisites

A Safety certificate and some sea time are the prerequisites for the Class 6 Master/Engineer certificate (Full or Restricted). Refer to local regulations for any specific country requirements.

3. Course duration

Two weeks (at the discretion of the course provider).

4. Assessment

Assessment methods are suggested in the document for each element of competence, however assessors may feel other combinations are also appropriate. Wherever possible, practical demonstration and assessment should be used although this is subject to available resources. With oral and written assessments (when practical assessment is not appropriate or possible), a decision needs to be made in regard to the language or other difficulties a candidate may encounter.

Assessment should be conducted separately for each section as it is completed and the result recorded. This will allow for flexibility in delivery and give a person initially unsuccessful or absent the opportunity to be reassessed only on the section they have not completed.

5. Recognition of Prior Learning (RPL)

RPL is an integral part of any competency-based system of training and assessment and should be used where appropriate to assess competence within the Nautical Knowledge module. Similarly recognition should be given to an approved certificate, covering the same content, that has been obtained through another training provider.

6. Resources

The resources required to successfully deliver appropriate training and assessment for the Nautical Knowledge module are varied and successful delivery can be accomplished without some resources. However, the Nautical Knowledge module should very much a hands-on course and every effort will need to be made to simulate real conditions.

Ideally, the provider will have access to a training vessel or be able to use a commercial vessel so that much of the training and assessment can be very practically focussed. For economical and geographical reasons, this is not always possible, however, the most successful results will require the greatest practical focus possible.

Resources that may be used include:

- Classroom with desks
- Overhead projector
- Overhead transparencies
- Whiteboard
- TV and video
- Appropriate training videos
- Training vessel
- Charts and navigational accessories (e.g. parallel rulers, dividers, etc)

Recommended trainer's reference material:

- *Australian Boating Manual* by Captain Dick Gandy
- *Learner's Guide of the Nautical Knowledge module SPC 021B*

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1. VESSEL MANOEUVRING & HANDLING

Learning Outcomes	Method of Assessment	Assessment Criteria (Evidence)
<p>1.1 Manoeuvring of a small power driven boat and understanding manoeuvring characteristics with regards to</p> <ul style="list-style-type: none"> • Different hull types • Different engine types • Rudder responses • Transverse thrust • Single and twin propulsion 	<ol style="list-style-type: none"> 1. Oral and written and/or 2. Practical demonstration 	<p>Able to explain and describe (with diagrams if applicable) or practically demonstrate</p> <ul style="list-style-type: none"> • Different manoeuvring characteristics of displacement and planing hulls, single and twin hulls • Different manoeuvring characteristics of inboard and outboard engines • Stopping distance of small boats • Response to rudder movements at various speeds • Transverse thrust of a propeller (right & left hand rotation) • Single and twin propeller propulsion
<p>1.2 Manoeuvring a small boat under various external conditions</p> <ul style="list-style-type: none"> • Tidal streams and currents • Confined waters • Poor visibility • Heavy weather conditions • Close proximity to large vessels 	<ol style="list-style-type: none"> 1. Oral and written and/or 2. Practical demonstration 	<p>Able to explain and describe (with diagrams if applicable) or practically demonstrate</p> <ul style="list-style-type: none"> • Effects of current and tide when manoeuvring • Turning short around • Manoeuvring in poor visibility • The dangers of a following sea (broaching and pooping) • Squat and vessel interaction

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1. VESSEL MANOEUVRING & HANDLING

Learning Outcomes	Method of Assessment	Assessment Criteria (Evidence)
<p>1.3 Manoeuvring a small boat to anchor and weigh anchor</p> <ul style="list-style-type: none"> • Selecting a suitable anchorage • Preparing anchoring gear (sea & ground) • Letting go the anchor • Procedures while at anchor • Weighing anchor 	<ol style="list-style-type: none"> 1. Oral and written and/or 2. Practical Demonstration 	<p>Able to explain and describe (with diagrams if applicable) or practically demonstrate</p> <ul style="list-style-type: none"> • Selection of a suitable anchorage • Different types of anchors • Preparation of anchor (sea & ground), including utilising available resources to rig a jury sea anchor • Setting both sea & ground anchors • Procedures to observe while at anchor • Retrieving both sea & ground anchors
<p>1.4 Berthing and unberthing a small boat under various wind conditions</p> <ul style="list-style-type: none"> • Berthing a single & twin screw vessel • Unberthing a single & twin screw vessel • Allowances for wind 	<ol style="list-style-type: none"> 1. Oral and written and/or 2. Practical Demonstration 	<p>Able to explain and describe (with diagrams if applicable) or practically demonstrate</p> <ul style="list-style-type: none"> • The procedures for berthing a single propeller boat port and starboard side to the wharf • The procedures for unberthing a single propeller boat port and starboard side to the wharf • The procedures for berthing and unberthing a twin propeller boat • Unberthing a vessel with an onshore wind
<p>1.5 Towing another vessel or being towed</p> <ul style="list-style-type: none"> • Considerations when preparing for a tow • Towing in heavy weather • Towing in confined waters 	<ol style="list-style-type: none"> 1. Oral and written and/or 2. Practical Demonstration 	<p>Able to explain and describe (with diagrams if applicable) or practically demonstrate</p> <ul style="list-style-type: none"> • Considerations when connecting a tow • Measures to apply when towing in bad weather • How to tow in confined waters

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2. EMERGENCY PROCEDURES

Learning Outcomes	Method of Assessment	Assessment Criteria (Evidence)
<p>2.1 Taking correct action in the event of a collision with another boat</p> <ul style="list-style-type: none"> • Minimising impact • Imminent collision • After collision • Legal requirements 	<p>1. Oral and written</p>	<p>Able to explain and describe (with diagrams if applicable)</p> <ul style="list-style-type: none"> • Method to lessen impact • Warnings and action in an imminent collision situation • Procedure if one boat is embedded in another • Procedures immediately after collision with regard to your own boat and the other boat • Reporting procedures
<p>2.2 Taking correct action in the event of a grounding</p> <ul style="list-style-type: none"> • Immediate response • Regards to the boat's and crew's safety • Procedures whilst aground • Reporting procedures 	<p>1. Oral and written</p>	<p>Able to explain and describe (with diagrams if applicable)</p> <ul style="list-style-type: none"> • Immediate response including stopping engine/s, alarm procedures, checks of crew & hull, and taking soundings • Procedures whilst aground including check of tide movement, prevention of boat swinging, and bracing of vessel if tide is falling • Who to inform • When an urgency or distress signal may be required

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2. EMERGENCY PROCEDURES

Learning Outcomes	Method of Assessment	Assessment Criteria (Evidence)
<p>2.3 Taking correct action to refloat a grounded boat</p> <ul style="list-style-type: none"> • Methods to reduce draft • Methods to pull a boat free including assistance of another boat, and the use of the grounded boat's anchor to haul the vessel free 	<p>1. Oral and written</p>	<p>Able to explain and describe (with diagrams if applicable)</p> <ul style="list-style-type: none"> • Methods to reduce draft • Methods to free a small boat aground with assistance from another boat • Method to haul the boat free using anchor/s
<p>2.4 Handling a partially disabled small boat with damage to the rudder or propeller</p> <ul style="list-style-type: none"> • Dangers that a partially disabled small boat may face • Method to handle a disabled small boat in shallow water • Methods to handle a disabled small boat in the open sea in both calm , and in rough conditions • Methods to return to port if the propeller is lost • Methods to rig a jury rudder system 	<p>1. Oral and written and/or</p> <p>2. Practical Demonstration</p>	<p>Able to explain and describe (with diagrams if applicable) or practically demonstrate</p> <ul style="list-style-type: none"> • Dangers that exist due to partial disablement (running aground, risk of collision, risk of being swamped or capsized) • Options available while attempting repairs in shallow water (ground anchor) • Options available while attempting repairs in open water in calm conditions (drift), and in rough conditions (setting a sea anchor, use of oil) • Methods to rig a jury rudder system (makeshift rudder & tiller, or using a sea anchor astern)

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2. EMERGENCY PROCEDURES

Learning Outcomes	Method of Assessment	Assessment Criteria (Evidence)
<p>2.5 Taking action in the event of a person falling overboard including</p> <ul style="list-style-type: none"> • Procedures to follow if a person falls overboard • The types of turns used to return to the person overboard • Retrieving person overboard • Steps to take if you fail to find the person 	<ol style="list-style-type: none"> 1. Oral and written and/or 2. Practical Demonstration 	<p>Able to explain and describe (with diagrams if applicable) or practically demonstrate</p> <ul style="list-style-type: none"> • Procedures if a person falls overboard (raising alarm, side to turn boat, GPS fix if available, throwing a flotation device, keeping the person in sight) • The types of turns to return to the person overboard (Y turn, double turn, Williamson turn) • Procedure to retrieve person overboard (the approach and retrieval, and the safety procedures if another crew member needs to go into the water to rescue the person) • Procedures if unable to find the person in the water including who to notify, the urgency radio signal, and the expanding square and sector search patterns (see 2.6)
<p>2.6 Understand the obligation to assist other boats in distress</p> <ul style="list-style-type: none"> • How distress messages can be received • Obligation to assist in a distress situation • Occasions when a boat may be relieved of its obligation • Procedures on responding to a distress • Search patterns 	<ol style="list-style-type: none"> 1. Oral and written 	<p>Able to explain and describe (with diagrams if applicable)</p> <ul style="list-style-type: none"> • Ways a boat may receive a distress signal (visually or from a radio) • A boat's obligation to respond to a vessel in distress • Occasions when a boat may be relieved of obligation to assist Procedures in responding (30 sec delay for coast station to respond, with visual sighting inform coast station & proceed to area) • Search patterns (expanding square and sector search)

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2. EMERGENCY PROCEDURES

Learning Outcomes	Method of Assessment	Assessment Criteria (Evidence)
<p>2.7 Understand the principles of stability applicable to the safe operation of a small fishing boat</p> <ul style="list-style-type: none"> • Principle of stability • Freeboard and draft and their relationship to a boat's stability • Trim and the importance of correct trim • Centre of gravity and its effect on a small boat's stability • Free surface effect and its effect on a small boat's stability • How to reduce free surface effect • Causes relating to a small boat capsizing 	<ol style="list-style-type: none"> 1. Oral and written and/or 2. Practical Demonstration 	<p>Able to explain and describe (with diagrams if applicable) or practically demonstrate a knowledge of</p> <ul style="list-style-type: none"> • The principle of stability • Freeboard and draft and how they effect the stability of a small boat • Trim and the effect it has on the stability of a small boat • Centre of gravity and the effect it has on the stability of a small boat • Free surface effect and the effect it has on the stability of a small boat • Methods to reduce free surface effect (tanks full or empty, bilge dry, scuppers open to allow free drainage of deck water) • How a small boat may capsize due to incorrect stability (high centre of gravity, free surface effect, inadequate freeboard, scuppers not kept open)

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3. MARINE LEGISLATION

Learning Outcomes	Method of Assessment	Assessment Criteria (Evidence)
<p>3.1 Comply with the legislative requirements in the country for small boats</p> <ul style="list-style-type: none"> • Registration and certificate requirements • Safety equipment required • Manning certification requirements • Reporting of intended journeys, use of radios, rules applying to boats within harbors 	<p>1. Oral and written</p>	<p>Able to explain and describe (with diagrams if applicable)</p> <ul style="list-style-type: none"> • Registration requirements for small boats in the country • Certificates required by Ministry of Transport or relevant regulatory authority for small boats • Requirements regarding display of registration • Safety equipment required to be carried on a small boat Correct storage on board of safety equipment • Certificates required by crew on a small boats and engine horsepower limits and period of validity of certificates • Requirements with regard to reporting of intending journeys • Legislation regarding use of radios • Rules applying to boats within harbors

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3. MARINE LEGISLATION

Learning Outcomes	Method of Assessment	Assessment Criteria (Evidence)
<p>3.2 Comply with the requirements and regulations regarding marine pollution</p> <ul style="list-style-type: none"> • Examples of marine pollutants, particularly with regard to a small boat • Requirements for the disposal of garbage and other materials at sea • Pollution prevention from small boats • When <u>may</u> pollutants be disposed of at sea 	<p>1. Oral and written</p>	<p>Able to explain and describe (with diagrams if applicable)</p> <ul style="list-style-type: none"> • Some common pollutants that may be carried on a small vessel (particularly a small fishing boats) • The requirements and at sea limits of disposal of garbage and other materials • Methods to prevent pollution from small boats including refueling procedures • When it <u>may</u> be allowed to dispose of pollutants at sea (disposing of gear or discharging a <u>small</u> amount of oil to save a vessel in severe danger and/or in dangerous weather conditions)

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4. WEATHER WATCHKEEPING

Learning Outcomes	Method of Assessment	Assessment Criteria (Evidence)
4.1 Source weather reports and warnings	1. Oral and written and/or 2. Practical Demonstration	Able to explain and describe (with diagrams if applicable) or practically demonstrate a knowledge of <ul style="list-style-type: none"> • Where to source weather information • Source (frequency & location) of coast radio station local weather reports and warnings for the country and area navigated
4.2 Understand and interpret a synoptic chart	1. Oral and written and/or 2. Practical Demonstration	Able to explain and describe (with diagrams if applicable) or practically demonstrate a knowledge of <ul style="list-style-type: none"> • The basic information on a synoptic chart and interpret that information
4.3 Understand the weather patterns around the country and waters navigated	1. Oral and written and/or 2. Practical Demonstration	Able to explain and describe (with diagrams if applicable) or practically demonstrate a knowledge of <ul style="list-style-type: none"> • Types of cloud and the types of weather that can be expected with each in the country • Wind directions and movements and the weather that can be expected with each in the country • General weather patterns in the country

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4. WEATHER WATCHKEEPING

Learning Outcomes	Method of Assessment	Assessment Criteria (Evidence)
4.4 Understanding the basic principles, warning signs and correct actions to take in regard to a Tropical Revolving Storm (cyclone)	<ol style="list-style-type: none">1. Oral and written and/or2. Practical Demonstration	Able to explain and describe (with diagrams if applicable) or practically demonstrate a knowledge of <ul style="list-style-type: none">• Development and general movement of a cyclone in the SW Pacific region• Warnings of an approaching cyclone including radio warnings, barometric pressure movement, wind direction & strength change, cloud type, swell, and atmospheric clarity• Actions in the vicinity of a cyclone

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5. WATCHKEEPING

Learning Outcomes	Method of Assessment	Assessment Criteria (Evidence)
<p>5.1 Understanding the basics of the International Regulations for the Prevention of Collision at Sea (COLREGS)</p> <ul style="list-style-type: none"> • Steering and sailing rules • Lights and shapes • Sound signals • Distress signals 	<ol style="list-style-type: none"> 1. Oral and written and/or 2. Practical Demonstration 	<p>Able to explain and describe (with diagrams if applicable) or practically demonstrate a knowledge of</p> <ul style="list-style-type: none"> • Look out obligations, safe speed, risk of collision, action to avoid collision, head on & crossing situation rules, action of give way and stand on vessels • The lights & shapes that a small vessel must carry or may encounter • Color and arc of visibility of the main navigation lights • Sound signals that a small vessel may encounter • Signals that a vessel in distress can use
<p>5.2 Keeping a safe navigation watch</p> <ul style="list-style-type: none"> • Application of the COLREGS • Principles of keeping a good watch 	<ol style="list-style-type: none"> 1. Oral and written and/or 2. Practical Demonstration 	<p>Able to explain and describe (with diagrams if applicable) or practically demonstrate a knowledge of</p> <ul style="list-style-type: none"> • The three processes – identifying the threat of collision, establishing which vessel has right of way, and taking the correct action • Keeping a good watch by maintaining a lookout, monitoring other traffic, own vessel and the environment, making alterations of course & speed in time, using correct lights, shapes & sound signals, and avoiding possible collision situations. • The dangers of navigating near large vessels when they are underway

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6. VESSEL CONSTRUCTION

Learning Outcomes	Method of Assessment	Assessment Criteria (Evidence)
<p>6.1 Understand the parts of small vessels</p> <ul style="list-style-type: none"> • Basic parts of a small boat • Terms used relating to the hull • Types of hulls 	<p>1. Oral and written</p>	<p>Able to explain and describe (with diagrams if applicable)</p> <ul style="list-style-type: none"> • The parts of a hull (bow, stern, keel, bilge) • The meaning of starboard, port, beam & abeam, amidships, aft, forward, port & starboard quarter and bow • Various types of hulls (displacement & planing, round bilge, single & multi chine)
<p>6.2 Understand the various construction materials available and the advantages and disadvantages of each</p>	<p>1. Oral and written</p>	<p>Able to explain and describe (with diagrams if applicable)</p> <ul style="list-style-type: none"> • The common construction materials available (aluminium, steel, timber, fibreglass (GRP), ferrocement) • The advantages and disadvantages of the various construction materials • The use of sacrificial anodes to protect various metals
<p>6.3 Maintain watertight integrity of a small boat</p> <ul style="list-style-type: none"> • Basic principles of watertight integrity • Methods to maintain watertight integrity 	<p>1. Oral and written</p>	<p>Able to explain and describe (with diagrams if applicable)</p> <ul style="list-style-type: none"> • Areas that effect the water tight integrity of a small boat including hatches, watertight bulkheads, water inlets & discharge ports, portholes, watertight doors, scuppers • How to maintain a small boat's watertight integrity – checking for weld cracks, keeping hatch & door seals in good order and closed when not in use, watertight compartments of the original design are retained, scuppers are kept free

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7. ROPE WORK

Learning Outcomes	Method of Assessment	Assessment Criteria (Evidence)
7.1 Identify types of rope in common use on small boats <ul style="list-style-type: none"> Materials that rope is made from and their characteristics, advantages and disadvantages Measuring rope Breaking strain and Safe Working Load (SWL) 	1. Oral and written	Able to explain and describe (with diagrams if applicable) <ul style="list-style-type: none"> The three main materials that rope is made from (natural fibre, synthetics, and wire) and the characteristics, advantages and disadvantages of each How to measure the thickness of rope The breaking strain of rope and how to work out the SWL of fibre rope
7.2 Caring and maintaining rope	1. Oral and written and/or 2. Practical Demonstration	Able to explain and describe (with diagrams if applicable) or practically demonstrate a knowledge of <ul style="list-style-type: none"> Causes of damage to rope Ways to maintain rope in good order Correct coiling methods for rope
7.3 Handling rope safely	1. Oral and written and/or 2. Practical Demonstration	Able to explain and describe (with diagrams if applicable) or practically demonstrate <ul style="list-style-type: none"> Precautions and safe practices when using rope
7.4 Tying knots, bends & hitches used on small boats <ul style="list-style-type: none"> General terms Common knots, bends & hitches used on small boats Uses for each knot, bend & hitch 	1. Practical demonstration	Able to practically demonstrate <ul style="list-style-type: none"> The three general classifications of knots (knots, hitches & bends) and different uses of each The tying of a range of knots that the assessor feels are relevant General uses for each knot

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8. NAVIGATION

Learning Outcomes	Method of Assessment	Assessment Criteria (Evidence)
8.1 Interpreting the information available on navigation charts	1. Practical Demonstration	Able to practically demonstrate <ul style="list-style-type: none"> • A knowledge of the information on a chart <ul style="list-style-type: none"> ➢ Number and title ➢ Scale ➢ Depth and depth contours ➢ Common symbols & abbreviations
8.2 Use and understand latitude and longitude to plot a position on a chart	1. Practical Demonstration	Able to practically demonstrate (by diagram if necessary) <ul style="list-style-type: none"> • A knowledge of how the latitude scale is constructed • A knowledge of how the longitude scale is constructed • Fixing a position on a chart from a given latitude and longitude (obtained by various means e.g. a GPS fix) • Obtaining a latitude and longitude of a position on a chart (e.g. for waypoint navigation, 8.8)
8.3 Measuring distance on a chart <ul style="list-style-type: none"> • Correct scale to use • Speed, time and distance calculations 	1. Practical Demonstration	Able to practically demonstrate <ul style="list-style-type: none"> • Measuring distance on a chart using the correct scale (latitude) • Calculating speed, time and distance using the correct formula (Distance = Speed X Time)
8.4 Setting a course and taking a bearing <ul style="list-style-type: none"> • Understanding of the compass rose on a chart • Setting a course • Taking a bearing 	1. Practical Demonstration	Able to practically demonstrate <ul style="list-style-type: none"> • Laying off a course on a chart using the compass rose and a parallel ruler • Plotting a bearing on a chart using the compass rose and a parallel ruler

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8. NAVIGATION

Learning Outcomes	Method of Assessment	Assessment Criteria (Evidence)
8.5 Navigating a small boat using <ul style="list-style-type: none"> • Transit bearings • Beam bearings • Doubling the angle on the bow 	1. Practical Demonstration	Able to practically demonstrate <ul style="list-style-type: none"> • Obtaining a position line by transit bearing • Calculating the time to change course by use of a beam bearing
8.6 Extracting times and heights of high and low water from tide tables	1. Practical Demonstration	Able to practically demonstrate a knowledge of (with diagrams if applicable) <ul style="list-style-type: none"> • Terminology used in tide information <ul style="list-style-type: none"> ➢ Charted depths ➢ High and low water ➢ Height of tide ➢ Drying height • Finding times and heights of high and low water from tide tables
8.7 Steering and obtaining bearings using a magnetic compass <ul style="list-style-type: none"> • True north • Magnetic north • Variation • Causes of errors (other than variation) in the magnetic compass 	1. Practical Demonstration	Able to practically demonstrate (with diagrams if applicable) or describe <ul style="list-style-type: none"> • an understanding of the difference between true and magnetic north • allowing for magnetic variation • steering a course using a magnetic compass • taking a bearing of an object using a magnetic compass • effect on compass accuracy of metallic objects near the compass

Restricted Class 6 Nautical Knowledge - SPC 021B

8. NAVIGATION

Learning Outcomes	Method of Assessment	Assessment Criteria (Evidence)
<p>8.8 Navigating a small boat using a GPS</p> <ul style="list-style-type: none"> • Basic principles of the GPS system • Taking a position from a GPS • Waypoint Navigation • Person overboard button • Causes of errors in a GPS 	<ol style="list-style-type: none"> 1. Oral and written and/or 2. Practical Demonstration 	<p>Able to explain and describe (with diagrams if applicable) or practically demonstrate a knowledge of</p> <ul style="list-style-type: none"> • The basic principles of the GPS system (the use of satellites to send radio signals) • Correctly turning on the GPS • Taking a boat's position from a GPS and fixing the position on the chart • Waypoint navigation including manually entering a waypoint position or saving a position using the save function, and using the calculated bearing and distance to steer to the waypoint position • The MOB (man overboard) function • Causes of errors in a GPS