Title	**Demonstrate knowledge of the safe operation of small craft in sight of land**		
Level	**3**	**Credits**	**16**

Purpose	This unit standard is intended primarily for operators of small craft. People credited with this unit standard are able to demonstrate knowledge of: the Maritime Transport Act and Maritime Rules; navigational marks; lifesaving and safety equipment; potential causes of fire on board vessels, fire prevention techniques, and fire extinguishers; international distress signals; the magnetic compass; tidal heights, streams, and use of tide tables; small boat handling; weather; pressure systems, forecasting, and data recording; boating accidents, how to avoid accidents, and action to be taken in the event of an accident; search and rescue operations; and ropes and rope work. They are also able to demonstrate and apply knowledge of chartwork and publications, and practical competence in knot tying.

Classification	Maritime > Sea Survival and Sea Safety

Available grade	Achieved

Guidance Information

1 Legislation relevant to this unit standard includes:
Health and Safety at Work Act 2015.
Maritime Transport Act 1994 and subsequent amendments.
Local bylaws as applicable.

2 References
Maritime and Coastguard Agency, UK. *The Ship Captain's Medical Guide*. 23rd Edition, 2019. Available at http://www.gov.uk/government/publications/.
International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA). *System 'A' Maritime Buoyage System*. Saint Germain en Laye: 1977. Available at http://www.iala-aism.org.
International Maritime Organisation. *International Code of Signals*. London: IMO, 2005.
International Maritime Organisation. *International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual*. London: IMO, 2008.

LINZ. *NZ 202, New Zealand Chart Catalogue*, 15th Edition. ISSN 0113-5597. Wellington: Land Information New Zealand, 2001. Updated 2009. Available at http://www.linz.govt.nz/docs/hydro/charts/catalogue/nz202.pdf.
LINZ. *NZ 204, New Zealand Nautical Almanac, 2020/21 Edition.* ISSN 0112-1448. Wellington: Land Information New Zealand, 2020. Available at: www.linz.govt.nz.
Maritime Rules and advisory circulars. Available at http://www.maritimenz.govt.nz.
Order of St John. *The New Zealand First Aid Handbook.* Penguin Group New Zealand, 2015. Available at www.stjohn.org.nz.
Maritime New Zealand. *Radio Handbook. Your Guide to Maritime Communications (Fourth Edition)*. ISBN 0-478-18816-1. Wellington: Maritime New Zealand, 2016. Available at www.maritimenz.govt.nz.
Maritime New Zealand. *New Zealand's Systems of Buoys and Beacons*. Wellington: Maritime New Zealand, 2008. ISBN 0-478-18815-3. Available at http://www.maritimenz.govt.nz.
Standards New Zealand. *NZS 4503: 2005, Hand Operated Fire-fighting Equipment*. Wellington: 2005. Available at http://www.standards.co.nz.
Standards New Zealand. *NZS 5823: 2005, Specification for buoyancy aids and marine safety harnesses and lines*. Wellington: Standards New Zealand, 2005. Available at http://www.standards.co.nz.
UKHO. *Chart BA 5011 (INT 1), Symbols and Abbreviations used on Admiralty Charts*. 4th ed. Taunton: United Kingdom Hydrographic Office, 2008.
Coastguard Boating Education, Scanlan, Mike. *Safety in Small Craft*, 3rd edition 2020. ISBN 978-0-473-51208-8.

3 Definitions

Accepted industry practice refers to safe and sound practices generally accepted by competent persons within the maritime industry.
EPIRB refers to emergency position-indicating radio beacon.
Industry medical practice refers to practices, equipment, first aid procedures generally accepted by the industry and contained in The Ship Captain's Medical Guide, The New Zealand First Aid Handbook, and Cold Water Survival Handbook.
Pleasure craft refers to any vessel that is used exclusively for the owner's pleasure or as the owner's residence and is not offered or used for hire or reward.
Small craft refers to any vessel under 24m in length including pleasure craft.

4 Assessment information

All activities and evidence must be in accordance with accepted industry practice.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of the Maritime Transport Act and Maritime Rules.

Performance criteria

1.1 Duties of the master of a vessel, including responsibilities and authority for safety and compliance, are explained in accordance with section 19 of the Maritime Transport Act.

1.2 Dangerous activities and definition of an offence involving vessels and maritime products are explained in accordance with section 65 of the Maritime Transport Act.

1.3 Collision Prevention Rules are explained in accordance with Pt 22 of the Maritime Rules.

Range 22.3, 22.5-9, 22.11-19, ss.20-31, 22.34-35 and 22.37.

1.4 Navigation Safety Rules are explained in accordance with Pt 91 of the Maritime Rules.

Range 91.2-18 and 91.21.

1.5 Marine Protection Rules under the Maritime Transport Act are explained in relation to discharge of oil, sewage, and garbage.

Outcome 2

Demonstrate knowledge of navigational marks.

Performance criteria

2.1 The international system of buoyage is explained in accordance with the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) System ‘A’ Maritime Buoyage System.

Range IALA region A – in-depth knowledge is required;
may include – IALA region B – lateral marks only.

2.2 The conventional direction of buoyage in NZ is explained in accordance with New Zealand’s System of Buoys and Beacons.

2.3 The meaning and purpose of navigational marks are identified and explained in relation to colours, shapes, topmarks, and lights in accordance with New Zealand’s System of Buoys and Beacons.

Outcome 3

Demonstrate knowledge of lifesaving and safety equipment.

Performance criteria

3.1 The purpose and limitations of personal flotation devices are explained in accordance with NZS 5823.

3.2 The purpose and limitations of life-buoys and their attachments are explained in accordance with NZS 5823.

Range retro-reflective tape, drogue, whistle, light.

3.3 The purpose and limitations of lifesaving and safety equipment are explained in accordance with manufacturer's specifications.

Range includes but is not limited to – safety harnesses, throwing lines, dan-buoys, inflatable life rafts.

Outcome 4

Demonstrate knowledge of potential causes of fire on board vessels, fire prevention techniques, and fire extinguishers.

Performance criteria

4.1 The common locations, causes and prevention of fire on-board vessels are identified and described.

Range locations – machinery space, galley, wheelhouse, accommodation;
causes – electrical, fuel and refuelling, LPG, smoking hazard.

4.2 Purpose, limitations, and servicing requirements for different types of fire extinguishers are explained in accordance with NZS 4503.

Range dry powder, carbon dioxide, Aqueous Film Forming Foam, water extinguishers.

Outcome 5

Demonstrate knowledge of international distress signals.

Performance criteria

5.1 Limitations and effectiveness of international distress signals are described.

5.2 The activation process of manual and float-free EPIRB is described in accordance with manufacturer's specifications.

5.3 Digital Selective Calling is explained in relation to its operation and limitations within New Zealand waters in accordance with the Radio Handbook.

5.4 The activation process of distress pyrotechnics is explained in accordance with manufacturer's specifications.

Range red parachute flares, red hand-held flares, buoyant and hand-held orange smoke signals.

5.5 The meaning and format of radio telephone signals are described in accordance with the Radio Handbook.

Range distress, urgency, safety.

5.6 Uses and limitations of cellular phones in distress situations at sea are described.

Outcome 6

Demonstrate and apply knowledge of chartwork and maritime publications.

Performance criteria

6.1 The principles of Mercator projection as applied to the development of navigational charts are explained.

6.2 Distance between two points is measured on a navigational chart using the Mercator principles.

6.3 Position is plotted and expressed by latitude and longitude.

6.4 A safe course is plotted between two defined points and expressed in terms of true and magnetic bearings.

6.5 Correct use of plotting instruments is demonstrated.

Range includes but is not limited to – dividers, plotter, and/or parallel rule.

6.6 Navigational chart symbols and abbreviations are identified, and their meanings described in accordance with Chart BA 5011.

Range includes but is not limited to – rocks and other hazards, chart datum, depth contours, sea bed type and submerged features, coastline features, light characteristics, magnetic variation data, chart notes and corrections.

6.7 Given positions are plotted and expressed using chartwork techniques and expected time of arrival is determined.

Range must include – latitude, longitude, bearing, distance from a location or charted feature, soundings, methods for fixing positions using hand bearing compass;
may include – transits, clearing bearings.

6.8 The terms course and ground track, and logged speed and speed over ground are explained.

6.9 Purpose, limitations, and precautions when using global positioning system are explained.

Range speed over ground, course over ground waypoints.

6.10 Information contained within maritime publications, including information accessible via the Land Information New Zealand (LINZ) website, in relation to safe navigation is explained.

Range Notices to Mariners, Safety Updates, NZ Nautical Almanac, NZ 202, Chart BA 5011.

Outcome 7

Demonstrate knowledge of the magnetic compass.

Performance criteria

7.1 The Earth's magnetic field is described, and magnetic variation and magnetic anomalies are explained.

7.2 Considerations for siting, maintenance, and care of magnetic and fluxgate compasses are described in accordance with manufacturer's specifications.

7.3 Compass bearings are converted in accordance with the stated current or predicted value at a given time and location.

Range true to magnetic, magnetic to true.

7.4 Magnetic influences within a vessel which may affect a compass are described.

7.5 Deviation and its effect on a magnetic compass, and methods of eliminating and minimising deviations, are explained.

Outcome 8

Demonstrate knowledge of tidal heights, streams, and use of tide tables.

Performance criteria

8.1 Causes of tidal phenomena and the cycle of tides are described.

8.2 Abbreviations and terms associated with tides are described.

Range spring tides, neap tides, height, range, duration, MHWS, MLWS, MHWN, MLWN, chart datum.

8.3 The use of tide tables to find tidal information is demonstrated.

Range high water times, low water times, heights at standard ports.

Outcome 9

Demonstrate knowledge of small boat handling.

Performance criteria

9.1 Factors affecting vessel stability are explained.

Range load distribution, passenger distribution, heel, list, loll and free surface effect, stiffness, tenderness, angle of vanishing stability, change in handling characteristic.

9.2 The importance of bailers and bilge pumps onboard vessels is explained.

9.3 The effects of the rudder, propeller, pivot point, tide and windage on a vessel are explained.

9.4 Correct boat handling techniques are described.

Range stopping and turning in confined spaces utilising transverse thrust and/or prop-walk, coming alongside and springing off, correct use of mooring lines including bow line, stern line, bow spring, stern spring.

9.5 Types and purpose of anchors and ground tackles for vessel type and sizes are identified and explained.

Range anchors may include but are not limited to – Danforth, CQR/Plough, Bruce, Fisherman/Admiralty, Grapnel, SARCA.

9.6 Correct anchoring techniques are described in relation to different types of anchor, anchorage seabed, and the use of chain and warp combinations.

9.7 The selection criteria for suitable anchoring positions are explained.

Range shelter afforded, absence of hazards, depth, effect of tides, weather conditions.

9.8 The principles of safe boat handling in difficult conditions and rough weather are described.

Range conditions – following seas, head-seas, beam-seas; technique – helming, use of speed, engine, drogues, sea-anchors.

9.9 Safe bar crossing strategies and techniques are explained.

9.10 Safe use of small boats including dinghies and tenders is explained.

Range launching, retrieving, dangers of overloading, correct trim, low freeboard, killcords.

9.11 Potential hazards to small craft are described.

Outcome 10

Demonstrate knowledge of weather, pressure systems, forecasting, and data recording.

Performance criteria

10.1 Pressure systems and associated weather conditions are identified and explained from a mean sea level synoptic chart.

Range anticyclones, depressions, cold fronts, warm fronts.

10.2 Wind speed and direction is estimated for New Zealand waters from interpretation of a mean sea level synoptic chart.

10.3 The effects of temperature gradient in relation to the formation of local winds are explained.

Range sea breeze, land breeze.

10.4 The effects of coastal topography in relation to surface winds are explained and meteorological terms are interpreted.

Range funnelling, katabatic winds.

10.5 Sources of New Zealand national and local marine weather forecasts are identified, and terminology is interpreted in accordance with marine meteorology.

Range terminology includes but is not limited to – backing, veering, gusts, knots, sea, swell, anticyclone, high pressure, depression, low pressure, cyclone, tropical depression, cold front, warm front.

10.6 Correct use and interpretation of readings from an aneroid barometer is explained.

Outcome 11

Demonstrate knowledge of boating accidents, how to avoid accidents, and action to be taken in the event of an accident.

Performance criteria

11.1 Responsibilities of the master of a vessel involved in a collision are explained in terms of safety considerations regarding own vessel and crew and other vessel and crew in accordance with Maritime New Zealand accident reporting process and requirements.

11.2 Actions to be taken in the event of grounding of a vessel are explained.

11.3 Prevention of, and subsequent actions in the event of, a “Man Overboard” incident are explained in terms of techniques, equipment to aid the location, approach and recovery of the person.

Range equipment includes but is not limited to – safety harnesses, life rings, dan-buoys, lights, drogues, whistle, retro-reflective tape.

11.4 The prevention of, and actions to be taken in the event of, propulsion engine failures in vessels are explained.

11.5 Causes of, and methods of, controlling leaks in a vessel are described.

11.6 Equipment, techniques, and safety issues associated with towing another vessel are described.

Range the advantages and dangers of spring and/or stretch in the tow line, setting up and adjusting the tow for prevailing sea conditions, trimming the towed vessel.

11.7 Medical care and equipment carried onboard vessels are described in accordance with industry medical practice.

11.8 The hazards of cold water immersion and the cause, prevention, signs and treatment of hypothermia and seasickness are explained in accordance with industry medical practice.

11.9 The dangers of imbibing alcohol when boating are described in accordance with industry medical practice.

11.10 The procedure for obtaining radio medical advice is explained in accordance with the Radio Handbook.

Outcome 12

Demonstrate knowledge of search and rescue operations.

Performance criteria

12.1 The New Zealand search and rescue system is explained in terms of Search and Rescue (SAR) organisation roles, Maritime New Zealand/Rescue Coordination Centre New Zealand, Police, and Coastguard as relevant to vessels operating in sight of land.

12.2 The importance of correct recording of all details which may be used in a search and rescue operation by SAR is explained.

Range EPIRB registration, Maritime Mobile Service Identity (MMSI) number, Call sign, Trip Report, Two-minute forms, emergency contact details.

12.3 The obligations of the master of a vessel to assist persons in distress are stated in accordance with Maritime Transport Act.

12.4 The dangers of abandoning swamped vessels are described.

Outcome 13

Demonstrate knowledge of ropes and rope work, and demonstrate practical competence in knot tying.

Performance criteria

13.1 Materials, properties, and marine applications of commonly used laid and braided rope are identified.

13.2 General care of lines to ensure longevity and minimise the likelihood of failure is described.

13.3 Common knots for marine applications are tied.

Range may include but is not limited to – round turn and two half hitches, bowline, clove hitch, figure of eight knot, reef knot.

13.4 The process of coiling rope and securing to a cleat or bollard is explained.

Planned review date	31 December 2025

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	18 June 2010	31 December 2016
Review	2	15 October 2015	31 December 2022
Review	3	24 September 2020	N/A

Consent and Moderation Requirements (CMR) reference	0054

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact Competenz qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.