Australian Government

Department of Education, Employment and Workplace Relations

PUAOPE009C Navigate in an aquatic environment

Revision Number: 2

ISC INDUSTRY SKILLS COUNCILS
Creating Australia's Future

PUAOPE009C Navigate in an aquatic environment

Modification History

Release	TP version	Comments
2	PUA12 V1	Layout adjusted.
1	PUA00 V8.1	Primary release on TGA.

Unit Descriptor

This unit covers the competency required to navigate in an aquatic environment including inland rivers, lakes, dams, surf zones and oceans, using a range of navigation equipment and techniques while undertaking search and rescue.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Application of the Unit

The application of this unit in the workplace covers a range of open or closed water situations where a vessel (of varying sizes) is required to navigate.

The unit typically applies to personnel from emergency services and/or volunteer organisations or organisations where surveillance and rescue operations in open water are required.

The unit applies in an aquatic search and rescue operation to locate a vessel in distress under a variety of environmental conditions by day and at night.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a Unit of Competency.	Performance Criteria describe the required performance needed to demonstrate achievement of the element. Where **_bold italicised_** text is used, further information is detailed in the Range Statement. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. **Determine current location, destination and resources**	1.1 Incident location and task information are obtained from vessel in distress or enterprise base station.
	1.2 Relevant *maps*/*charts*, electronic navigation aids and *navigation equipment* are prepared and *made ready for use.*
	1.3 Drift, leeway and tidal influences are identified and recorded.
	1.4 Current location and estimated destination of vessel in distress are plotted on a chart using coastal *navigational techniques* within *accepted tolerances.*
2. **Determine and plan a safe route/course**	2.1 Operational plan is compiled, including intercept and rendezvous chart work.
	2.2 All plots are recorded on a chart allowing for variables and weather conditions in accordance with organisational standard operating procedures.
	2.3 Rescue vessel's speeds within the sea and weather conditions are estimated and allowances are made to provide an estimated time of arrival.
	2.4 Hazards en-route to the incident area are researched to determine a safe route/course.
3. **Navigate to destination**	3.1 Route/course is checked, monitored and maintained using navigational aids and *alternate route*/*course* is plotted if required.
	3.2 Helmsman is instructed to follow planned route/course, and crew look outs are instructed to report any sightings, including other marine traffic.
	3.3 Regular fixes are continued to determine rescue vessel's position relative to the planned route.
	3.4 Search and rescue patterns are initiated if required within the incident area where distressed vessel or survivors are believed to now be located.
	3.5 En-route and arrival position reporting information is communicated to enterprise base in accordance with organisational policies and *procedures.*
4. **Return to home port**	4.1 Course to return to home port with distressed vessel in tow or with survivors aboard is set, on resolution of incident requirements.
	4.2 Navigational techniques are used to ensure a safe and timely return to home port or alternate port as instructed by state/territory authorities.
5. **Complete post navigational activities**	5.1 Navigation or nominated *reports* are completed in accordance with organisational policies and procedures.

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ELEMENT	PERFORMANCE CRITERIA
	5.2 Navigational equipment is recovered, reset, updated and serviced according to operational standards and manufacturers' specifications.

Required Skills and Knowledge

This describes the essential skills and knowledge and their level, required for this unit.

Required Skills

- communicate effectively non-verbally (use hand signals, write instructions)
- communicate effectively verbally
- identify natural and cultural features for transport modes
- interpret cartographic symbology including contour lines, scale, magnetic variation information
- interpret route/course and arrival information
- observe situational environment (scan, pick up on physical cues)
- operate a radio system
- operate an intercom system
- operate appropriate sized rescue vessel
- operate chart plotter
- operate global positioning system (GPS)
- operate RADAR
- operate RDF
- operate satellite phones from search and rescue authority
- solve problems
- use navigation aids

Required Knowledge

- cartographic information
- chart features (date of map/chart, legend/AUS5011, contours/depth, scale/latitude and longitude, north point/compass rose, grid references/position fixes, latitude and longitude, magnetic variation, contour intervals, datum information)
- chart symbols
- coastal navigation techniques
- course planning techniques and calculations
- latitude and longitude plotting
- local knowledge of area en-route and at the incident scene
- map and chart types
- methods for determining current position

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the Performance Criteria, Required Skills and Knowledge, the Range Statement and the Assessment Guidelines for this Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit	Assessment must confirm the ability to: • plot a navigation route maintaining accuracy within accepted tolerances when following a route • maintain positional awareness. • effectively react to changes in the operating environment necessitating re-planning a course. **Consistency in performance** Competency should be demonstrated over time in a range of actual or simulated workplace environments that include a variety of conditions, seas, winds, weather and visibility.
Context of and specific resources for assessment	**Context of assessment** Competency should be assessed in an actual incident, exercise or simulation or series of tasks using electronic aids. As navigation of rescue operations is usually undertaken in adverse weather and sea conditions assessment must cover the environmental conditions covered in the Range Statement. **Specific resources for assessment** Access is required to: • equipment used in operational navigation is essential • rescue vessel fitted with RADAR • GPS chart plotters • communications room • operations centre with trained staff
Method of assessment	In a public safety environment assessment is usually conducted via direct observation in a training environment or in the workplace via subject matter supervision and/or mentoring, which is typically recorded in a competency workbook. Assessment is completed using appropriately qualified assessors who select the most appropriate method of assessment. Assessment may occur in an operational environment or in an industry-approved simulated work environment. Forms of assessment that are typically used include: • direct observation

- interviewing the candidate
- journals and workplace documentation
- third party reports from supervisors
- written or oral questions

Range Statement

The Range Statement relates to the Unit of Competency as a whole. It allows for different work environments and situations that may affect performance. **Bold italicised** wording in the Performance Criteria is detailed below.

Maps/charts may include:	• Aerial photographs • Cadastral maps • Local authority maps • Marine navigational charts • Orthophoto maps • Satellite imagery • Street directories • Topographic maps
Navigation equipment may include:	• Area plotters • Chart plotters • Communications equipment • Computers • Deviation card • Douglas protractor • Geographical information systems (GIS) • GPS • Hand held compass • Interface with auto pilot • Magnetic compasses • Navigator's Log Book • Parallel rulers • Pencil and rubbers • Planimeters • Protractors • RADAR • Romers • Scale rules • Sliding rulers • Vessels compass • Watch/stopwatch • Writing equipment
Making charts, navigational aids and equipment ready for use may include:	• Delineating search areas to incorporate set and drift • Identifying hazards (reefs, bars, shallow water, rocks) • Planning intercept and rendezvous courses • Plotting incident location (latitude and longitude)
Navigational techniques may	• Bearings and reciprocal bearings

include:	• Deviation and variation magnetic conversions • GPS way points • Grid and latitude/longitude position fixing • Intercept and rendezvous courses • Plotting • RADAR use • Route time calculations • Running fixes • Set and drift allowances • Transits
Accepted tolerance may include:	• Fuel carried • Prevailing weather and environmental conditions • Vessel category and distance
Alternate route/course strategies may include:	• Changing route to suit sea conditions, state of tide, and areas which contain hazards to safe navigation • Dispatching additional vessels • Transferring those injured to helicopter rescue at an appropriate location more suited to the time restraints that may exist • Using vessels in the local area
Organisational arrival procedures include:	• Condition of survivors and the need for first aid and movement to health care professionals updates and situational reports (SITREPs) • Confirmation of timely, safe arrival appropriate to the incident/task • Determining existence of hazards such as proximity to rocks and shallow water, trailing lines, broken rigging, anchored or drifting
Reporting requirements may include:	• Assessing safety procedures utilised • Attending and providing input to debrief • Back at home port • Completing incident report, radio logs records and vessel logs including fuel used and lost/damage report • Completing operational tasks • Disseminating debriefing report • Position reports as per organisation's standard operating procedures • Pre-departure briefing • SITREPs on arrival and regular updates thereafter or immediately on the occurrence of a further event

Unit Sector(s)

Not applicable.