



Australian Government

Department of Education, Employment and Workplace Relations

PUADEFDV001B Dive using selfcontained underwater breathing apparatus in open water to 30 metres

Release: 1

PUADEFDV001B Dive using self-contained underwater breathing apparatus in open water to 30 metres

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor

This unit covers the competency required to dive using self contained underwater breathing apparatus (SCUBA) in an open water environment to a depth of 30 metres. The unit includes planning the dive (including using **decompression tables**); selecting, inspecting and fitting **equipment; entry to the water** from a range of **platforms**; conducting descent to, and servicing time at, the required depth; the ascent (including using **decompression techniques**); exiting from the water to the original platform; and removing and refurbishing equipment.

During the dive, divers must demonstrate situational awareness of their position and orientation, their equipment (including depth, time and air gauges), and other divers. They must be able to communicate (verbally by radio and non-verbally through signalling methods), to navigate underwater, and to manage the range of **surface and sub-surface hazards** inherent to diving.

The unit also covers divers' ability to perceive, both in themselves and others, the **signs and symptoms of diving induced medical problems**, and to take necessary corrective action/s; and to appropriately react to, and manage, a range of **individual and group contingencies/emergencies**.

Note: This Unit of Competency has been aligned with the existing standards of the Australian Diver Accreditation Scheme (ADAS). This Unit of Competency relates, in part, to the minimum standard for a diver using SCUBA to a depth of 30 metres. ADAS refers to this as 'restricted'. Further experience is required to gain an ADAS 'unrestricted' rating. Tables for both of these ADAS ratings are provided in the Evidence Guide. All information was correct at the time of development of this Unit of Competency; however, any diver seeking ADAS accreditation should consult ADAS and not rely only on the information contained in this unit.

Application of the Unit

Application of the Unit

The application of this unit in the workplace - the environments, complexities and situations involved - will be written during Phase II of the Review of the PUA00 Public Safety Training Package. This text will be useful for the purposes of job descriptions, recruitment advice or job analysis; where possible, it will not be too job specific to allow other industries to import it into other Training Packages, where feasible.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Prerequisite Unit/s

HLTFA1A Apply basic first aid

Employability Skills Information

Employability Skills

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 Required Skills and Knowledge and/or the Range Statement. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Plan a decompression dive	1.1 Dive plan is constructed using decompression tables 1.2 Dive plan is discussed and cleared, as necessary, by the supervisor
2. Select, inspect and fit equipment	2.1 Equipment is selected, inspected for serviceability, fitted and tested if required 2.2 Any unserviceable equipment is quarantined and defects are reported according to organisational procedures 2.3 Independent check of fit and function of equipment by a diver's attendant or dive supervisor is ensured
3. Enter and exit the water	3.1 Markers are positioned in the water to identify the presence of divers 3.2 Water is entered from sea-borne and land-borne platforms 3.3 An in-water leak test is conducted at the surface to ensure the integrity and functionality of the equipment 3.4 In-water checks are conducted 3.5 Buoyancy is adjusted to commence the dive and as required throughout the dive
4. Descend to, and ascend from, a 30 m bottom	4.1 Measured and controlled breathing is maintained throughout the dive operation 4.2 Measured and controlled finning is maintained throughout the dive operation 4.3 Discomfort is prevented and safety is ensured by descending and ascending at an appropriate rate in accordance with dive plan, using appropriate decompression techniques 4.4 Diving descent and ascent techniques are implemented 4.5 Relevant factors are monitored throughout the dive 4.6 Threats posed are avoided or managed to ensure personal safety 4.7 Effects of open water environment are considered and managed during the dive to prevent impact against rocks, hulls or interference with other divers 4.8 Spatial awareness is recovered when balance is lost under conditions of zero visibility 4.9 When lost and/or separated, recovery is ensured

ELEMENT

PERFORMANCE CRITERIA

1. Plan a decompression dive

- 1.1 Dive plan is constructed using decompression tables
- 1.2 Dive plan is discussed and cleared, as necessary, by the supervisor
- 4.10 Adequate awareness of, and distance from, surface and sub-surface hazards is maintained
- 4.11 Minimal disturbance to bottom is ensured to enable maximum visibility and a safe work environment
- 4.12 ***Safesurfacingisensured***

ELEMENT	PERFORMANCE CRITERIA
1. Plan a decompression dive	1.1 Dive plan is constructed using decompression tables 1.2 Dive plan is discussed and cleared, as necessary, by the supervisor
5. Identify and manage dive-specific medical problems	5.1 Signs and symptoms of compression related problems are recognised (in self and others) and immediate corrective procedures are taken 5.2 Signs and symptoms of decompression related problems are recognised (in self and others) and immediate corrective procedures are taken 5.3 Heat and cold related problems are recognised (in self and others) and immediate corrective procedures are taken
6. Communicate through underwater radio devices	6.1 Electronic communications device and accessories are inspected for serviceability and fitted 6.2 Messages are transmitted and received in accordance with radio telephone procedures (RTP) 6.3 Electronic communications device transmission safety requirements are adhered to when working around dangerous items 6.4 Electronic communications device and accessories are de serviced and stowed
7. Communicate non-verbally with other divers	7.1 Diver-to-diver hand signals are used appropriately throughout the dive operation 7.2 Written and diagrammatic communications on underwater writing boards are used appropriately throughout the dive operation 7.3 Standard single line signals are used appropriately throughout the dive operation
8. Perform a simple navigation leg underwater	8.1 Compass bearing is maintained underwater using a compass 8.2 Distance for a constant swim rate underwater is estimated and maintained 8.3 Distance travelled is estimated using a watch
9. React to individual and group contingencies/emergencies	9.1 Flooded face mask is resolved by clearing and refitting 9.2 Blocked mouthpiece is resolved by clearing and refitting 9.3 Failed primary breathing system is resolved through switching to the alternate sources 9.4 Irrecoverable malfunctions are managed through buddy breathing and/or emergency surfacing

ELEMENT

PERFORMANCE CRITERIA

1. Plan a decompression dive

- 1.1 Dive plan is constructed using decompression tables
- 1.2 Dive plan is discussed and cleared, as necessary, by the supervisor
- 9.5 Lost/severed safety line/s are managed through surfacing
- 9.6 Significant systemic failures are managed through the ditching drill and emergency surfacing drill
- 9.7 Surfacing is accomplished with the optimum safe speed on hearing the emergency recall signal
- 9.8 Other divers are ***assisted***

10. Maintain equipment

- 10.1 Equipment is maintained during the dive
- 10.2 Post-dive, equipment is de-serviced, and tested (if required) and stowed
- 10.3 Unserviceable equipment is quarantined and defects are reported in accordance with organisational procedures

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required Skills

- compile briefs and clear messages
- conduct decompression stops
- conduct predetermined decompression requirements
- conduct unplanned decompression procedures arising from the onset of (simulated) compression related problems
- navigate
- signalling:
 - hand signalling
 - line signalling
 - written signalling
- switch from primary to the reserve air system
- use the phonetic alphabet
- use words twice procedures

Required Knowledge

- decompression calculations
- dive equipment
- dive physics
- dive physiology and medicine:
 - heat and cold illnesses
 - compression illnesses
 - decompression illnesses
- general occupational/diving safety awareness:
 - diving in harbours
 - diving in tidal waters, currents and tides
 - diving on/near a ship's bottom (e.g. boats, propellers, etc.)
- lost/separated
- entrapment/foul lines
- marine animal threats
- pollution/weed
- working in confined spaces
- general precautions to be taken against the range of hazards
- hand signals
- handling procedures for non-functional items
- line signals
- literacy

REQUIRED SKILLS AND KNOWLEDGE

- marine animal threats
- marine hazards
- navigation theory
- oceanography
- radio frequency hazards
- radio telephone procedures (RTP)
- relevant references and Australian Standards
- phonetic alphabet
- principles of underwater communication systems and diver intercom systems and their limitations
- safe operating ranges for air-supplies
- surfacing procedures
- use of (air) decompression tables to determine decompression time/s and depth/s for a range of dive profiles

Evidence Guide

Critical aspects for assessment and evidence required to demonstrate competency in this unit

Assessment must confirm the ability to:

- safely enter and exit the water appropriate to the launch platform, equipment and conditions
- avoid and manage medical complications during dives
- avoid and manage hazards during dives
- comply with assigned call-signs
- act as a relay between two call-signs
- receive a number of hand signal messages, demanding acknowledgement, interpretation and appropriate responses from the diver
- relay hand signal message to other divers
- receive a number of written messages including diagrams, demanding acknowledgement, interpretation and appropriate responses from the diver
- draft a number of written messages including diagrams
- receive a number single line signal messages, demanding acknowledgement, interpretation and appropriate responses from the diver
- navigate underwater, using a compass only, a complete triangle, of side length not less than 30 m (way-points only to be distinguishable within 8 m).

Consistency in performance

Competency will be demonstrated over a minimum of 12 (ADAS Pt 1 Restricted) dives with the diver diving to 30 m using SCUBA (air) in open water that includes the following requirements:

- day and night
- sub-surface conditions:
- current (0–2 knots)
- visibility (0 metre +)
- temperature (0 degrees +)
- range of surface and sub-surface hazards.

Table 1 (below) outlines the minimum dives required by this Unit of Competency. At the time of printing, this contributed to the achievement of an ADAS Pt 1 (restricted) license, however divers seeking ADAS licensing need to confirm details with ADAS.

Table 1

Condition	No of Dives	Bottom time (mins)	Remarks
Between 0-30 m	12	325	Represents total accrued – refer ADAS Pt 1 Restricted (Science Diver)
Special Qualifiers			
25-30 m dive	1	15	
Zero visibility	1	20	Depth: 2-9 m
Night (+30 mins sunset/sunrise)	1	20	Depth: 10 m

Table 2 (below) outlines the minimum dives required for an ‘unrestricted’ ADAS Pt 1 license, however divers seeking ADAS licensing need to confirm details with ADAS.

Table 2

Condition	No of Dives	Bottom time (mins)	Remarks
Between 0-30 m	21	660	Represents total accrued – refer ADAS Pt 1 Diver
Special Qualifiers			
28-30 m dive	1	15	
Zero visibility	2	20 (per dive)	Depth: 2-9 m
Night (+30 mins sunset/sunrise)	1	20	Depth: 2-9 m

Context of and specific
resources for assessment

Context of assessment

Competency will be assessed in the ocean over a range of oceanic, diurnal and nocturnal environments, supported by questioning on shore or aboard vessels. When practicable, assessment should relate to the diver's vocational focus.

Specific resources for assessment

Access to a complete range of diving, safety and accessory equipment; open water dive site; and dive platform.

Guidance information for
assessment

Information that will assist or guide assessment will be written during Phase II of the Review of the PUA00 Public Safety Training Package.

Range Statement

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.

Decompression tables may include

Defence Civil Institute of Environmental Medicine

Equipment may include

Breathing system and devices:

- cylinder
- configuration
- demand
- independent primary
- pressure
- positive
- single
- supply

Buoyancy devices:

- buoyancy compensator
- weight belt

Dive clothing:

- fins
- gloves
- wet-suit (includes booties and hood)

Diving accessory equipment:

- communications slate
- compass
- face mask/mouthpiece ensemble
- knife
- watch

Safety equipment:

- diver's safety lines

Entry to the water may include

Dive
Forward/backward jump
Roll-back
Walk-in (backwards)

Platforms may include

Boats
Semi-permanent platforms

RANGE STATEMENT

| Ships

RANGE STATEMENT

Decompression techniques may include

Lazy-shot and drifting stops
Lazy-shot and fixed shot rope
Lazy-shot and float line
Lazy shot and life line
Surface

Surface and sub-surface hazards may include

Anchor drop zones
Cathodic protection devices
Electrical cabling
Inlets and sonar/radio frequency hazards
Marine animals
Piers and jetties
Pipelines
Pollutants
Propellers/thrusters
Trapping hazards:

- beams
- culverts
- gates
- grottoes and caves
- intakes and out-falls
- nets
- safety, anchor and communications lines
- sluices
- sewers
- submerged ships, vehicles and structures

Vessel rocking and associated movement

Signs and symptoms of diving induced medical problems may include

Disablement through pain
Incoherence
Loss of task focus
Reduction in breathing/bubbles
Unconsciousness
Vomiting

Medical problems may include

Compression related problems including:

- barotrauma (such as equalisation problems with aural/sinus canals)
- narcosis
- oxygen toxicity

Decompression related problems including:

- anoxia and hypoxia

RANGE STATEMENT

- barotraumas such as:
- squeeze (face, body, and lung)
- dental
- aural
- sinuses
- gastro-intestinal
- pulmonary (interstitial emphysema, pneumothorax, tension pneumothorax, mediastinal emphysema, subcutaneous emphysema, and arterial gas embolism)
- carbon dioxide retention
- carbon dioxide and carbon monoxide poisoning
- decompression illness
- primary and secondary drowning

Heat and cold related problems including:

- heatstroke
- hypothermia

RANGE STATEMENT

Individual contingencies/emergencies may include	Blockage to mouthpieces Buoyancy device malfunction Communication device malfunction Complete breathing system malfunction Entrapment Flooding of mask Loss of spatial awareness Partial breathing system malfunction Severed safety lines
Group contingencies/emergencies may include	Injured buddy Lost buddy Unconscious buddy
Buoyancy includes	Positive Negative Neutral
Diving descent and ascent techniques include	Breathing Buoyancy maintenance Equalisation Maintaining situational and positional awareness throughout the dive Monitoring equipment and gauges Propulsion Surfacing
Relevant factors may include	Air Depth Equipment Location Other divers Time
Threats may be posed by	Pollution Weed Other debris
Effects of open water environment includes	Currents Swells Wave action
Ensuring recovery may include	Employing rendezvous procedures Surfacing
Ensuring safe surfacing	Checking for the sounds of propellers before committing to breaching the surface

RANGE STATEMENT

must include	Advancing the arm above the head for protection and signalling, and once surfaced, gaining 360 degree awareness
Electronic communications device may include	Topside/surface Sub-surface divers systems: • hard wire • through water voice
Accessories may include	Antenna Ear set Microphone
Radio telephone procedures may include	Call-signs Phonetic alphabet Pro-words Relaying messages Words twice procedures
Dangerous items may include	Explosives
Assisting other divers includes	Physically recovering a diver to the surface using the 'companion diver' drill (including unconscious companion) Searching for a lost buddy Sharing air supply through buddy breathing

Unit Sector(s)

Not applicable.

Corequisite Unit/s

Co-requisite Unit/s	Nil
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