



Australian Government

**DEFDV001B Dive using self-contained
underwater breathing apparatus in open
water to 30 metres**

Release 2

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Modification History

Release	TP Version	Comments
2	DEF12 V2	Layout adjusted. No changes to content.
1	DEF12 V1	Primary release.

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

As agreed in the creation of this Training Package, applications for units transferred from the PUA00 Public Safety Training Package will be developed as part of continuous improvement plans, and taking into account the change in Unit of Competency format as detailed in templates for Streamlined Training Packages.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

HLTFA311A Apply first aid.

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. Plan a decompression dive	<p>1.1 Dive plan is constructed using <i>decompression tables</i>.</p> <p>1.2 Dive plan is discussed and cleared, as necessary, by the supervisor.</p>
2. Select, inspect and fit equipment	<p>2.1 <i>Equipment</i> is selected, inspected for serviceability, fitted and tested if required.</p> <p>2.2 Any unserviceable equipment is quarantined and defects are reported according to organisational procedures.</p> <p>2.3 Independent check of fit and function of equipment by a diver's attendant or dive supervisor is ensured.</p>
3. Enter and exit the water	<p>3.1 Markers are positioned in the water to identify the presence of divers.</p> <p>3.2 <i>Water is entered</i> from sea-borne and land-borne <i>platforms</i>.</p> <p>3.3 An in-water leak test is conducted at the surface to ensure the integrity and functionality of the equipment.</p> <p>3.4 In-water checks are conducted.</p> <p>3.5 <i>Buoyancy</i> is adjusted to commence the dive and as required throughout the dive.</p>

ELEMENT	PERFORMANCE CRITERIA
<p>4. Descend to, and ascend from, a 30 m bottom</p>	<p>4.1 Measured and controlled breathing is maintained throughout the dive operation.</p> <p>4.2 Measured and controlled finning is maintained throughout the dive operation.</p> <p>4.3 Discomfort is prevented and safety is ensured by descending and ascending at an appropriate rate in accordance with dive plan, using appropriate <i>decompression techniques</i>.</p> <p>4.4 <i>Diving descent and ascent techniques</i> are implemented.</p> <p>4.5 <i>Relevant factors</i> are monitored throughout the dive.</p> <p>4.6 <i>Threats</i> posed are avoided or managed to ensure personal safety.</p> <p>4.7 <i>Effects of open water environment</i> are considered and managed during the dive to prevent impact against rocks, hulls or interference with other divers.</p> <p>4.8 Spatial awareness is recovered when balance is lost under conditions of zero visibility.</p> <p>4.9 When lost and/or separated, <i>recovery is ensured</i>.</p> <p>4.10 Adequate awareness of, and distance from, <i>surface and sub-surface hazards</i> is maintained.</p> <p>4.11 Minimal disturbance to bottom is ensured to enable maximum visibility and a safe work environment.</p> <p>4.12 <i>Safe surfacing is ensured</i>.</p>
<p>5. Identify and manage dive-specific medical problems</p>	<p>5.1 Signs and symptoms of compression related problems are recognised (in self and others) and immediate corrective procedures are taken.</p> <p>5.2 Signs and symptoms of decompression related problems are recognised (in self and others) and immediate corrective procedures are taken.</p> <p>5.3 Heat and cold related problems are recognised (in self and others) and immediate corrective procedures are taken.</p>
<p>6. Communicate through underwater radio devices</p>	<p>6.1 <i>Electronic communications device</i> and <i>accessories</i> are inspected for serviceability and fitted.</p> <p>6.2 Messages are transmitted and received in accordance with <i>radio telephone procedures</i> (RTP).</p> <p>6.3 Electronic communications device transmission safety requirements are adhered to when working around <i>dangerous items</i>.</p> <p>6.4 Electronic communications device and accessories</p>

ELEMENT	PERFORMANCE CRITERIA
	are de serviced and stowed.
<p>7. Communicate non-verbally with other divers</p>	<p>7.1 Diver-to-diver hand signals are used appropriately throughout the dive operation.</p> <p>7.2 Written and diagrammatic communications on underwater writing boards are used appropriately throughout the dive operation.</p> <p>7.3 Standard single line signals are used appropriately throughout the dive operation.</p>
<p>8. Perform a simple navigation leg underwater</p>	<p>8.1 Compass bearing is maintained underwater using a compass.</p> <p>8.2 Distance for a constant swim rate underwater is estimated and maintained.</p> <p>8.3 Distance travelled is estimated using a watch.</p>
<p>9. React to individual and group contingencies/emergencies</p>	<p>9.1 Flooded face mask is resolved by clearing and refitting.</p> <p>9.2 Blocked mouthpiece is resolved by clearing and refitting.</p> <p>9.3 Failed primary breathing system is resolved through switching to the alternate sources.</p> <p>9.4 Irrecoverable malfunctions are managed through buddy breathing and/or emergency surfacing.</p> <p>9.5 Lost/severed safety line/s are managed through surfacing.</p> <p>9.6 Significant systemic failures are managed through the ditching drill and emergency surfacing drill.</p> <p>9.7 Surfacing is accomplished with the optimum safe speed on hearing the emergency recall signal.</p> <p>9.8 Other divers are <i>assisted</i>.</p>
<p>10. Maintain equipment</p>	<p>10.1 Equipment is maintained during the dive.</p> <p>10.2 Post-dive, equipment is de-serviced, and tested (if required) and stowed.</p> <p>10.3 Unserviceable equipment is quarantined and defects are reported in accordance with organisational procedures.</p>

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
- 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)	1	20	Depth: 2-9 m

mins sunset/ sunrise)			
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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.

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.

<i>Decompression tables</i> may include:	<ul style="list-style-type: none"> • Defence Civil Institute of Environmental Medicine
<i>Equipment</i> may include:	<ul style="list-style-type: none"> • breathing system and devices: <ul style="list-style-type: none"> • cylinder • configuration • demand • independent primary • pressure • positive • single • supply • buoyancy devices: <ul style="list-style-type: none"> • buoyancy compensator • weight belt • dive clothing: <ul style="list-style-type: none"> • fins • gloves • wet-suit (includes booties and hood) • diving accessory equipment: <ul style="list-style-type: none"> • communications slate • compass • face mask/mouthpiece ensemble • knife • watch • safety equipment: <ul style="list-style-type: none"> • diver's safety lines
<i>Entry to the water</i> may include:	<ul style="list-style-type: none"> • dive • forward/backward jump • roll-back • walk-in (backwards)
<i>Platforms</i> may include:	<ul style="list-style-type: none"> • boats • semi-permanent platforms • ships
<i>Buoyancy</i> includes:	<ul style="list-style-type: none"> • positive • negative

	<ul style="list-style-type: none"> • neutral
<i>Decompression techniques</i> may include:	<ul style="list-style-type: none"> • lazy-shot and drifting stops • lazy-shot and fixed shot rope • lazy-shot and float line • lazy shot and life line • surface
<i>Diving descent and ascent techniques</i> may include:	<ul style="list-style-type: none"> • breathing • buoyancy maintenance • equalisation • maintaining situational and positional awareness throughout the dive • monitoring equipment and gauges • propulsion • surfacing
<i>Relevant factors</i> may include:	<ul style="list-style-type: none"> • air • depth • equipment • location • other divers • time
<i>Threats</i> may include:	<ul style="list-style-type: none"> • pollution • weed • other debris
<i>Effects of open water environment</i> may include:	<ul style="list-style-type: none"> • currents • swells • wave action
<i>Ensuring recovery</i> may include:	<ul style="list-style-type: none"> • employing rendezvous procedures • surfacing
<i>Surface and sub-surface hazards</i> may include:	<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • beams • culverts • gates

	<ul style="list-style-type: none"> • 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
<i>Ensuring safe surfacing</i> must include:	<ul style="list-style-type: none"> • checking for the sounds of propellers before committing to breaching the surface • advancing the arm above the head for protection and signalling, and once surfaced, gaining 360 degree awareness
<i>Electronic communications device</i> may include:	<ul style="list-style-type: none"> • topside/surface • sub-surface divers systems: <ul style="list-style-type: none"> • hard wire • through water voice
<i>Accessories</i> may include:	<ul style="list-style-type: none"> • antenna • ear set • microphone
<i>Radio telephone procedures</i> may include:	<ul style="list-style-type: none"> • call-signs • phonetic alphabet • pro-words • relaying messages • words twice procedures
<i>Dangerous items</i> may include:	<ul style="list-style-type: none"> • explosives
<i>Assisting other divers</i> may include:	<ul style="list-style-type: none"> • 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.