

## **Workplace Health and Safety Regulation 2008**

On 1 September 2008, the *Workplace Health and Safety Regulation 1997* was repealed and replaced by the *Workplace Health and Safety Regulation 2008*. The new Regulation:

- remakes provisions of the old Regulation
- removes the [rural industry exemption](#) from existing regulatory requirements (except in relation to operator licensing for earthmoving equipment and particular cranes) over the next two years
- changes the numbering.

Workplace Health and Safety Queensland will be undertaking a process to review and update all forms and documents on the departmental website to ensure consistency with the new regulation. Until this process is complete, all forms and documents must be read in conjunction with the information provided in the [comparison table](#) (PDF, 255 KB). The comparison table has been provided to assist with the practical application of the *Workplace Health and Safety Regulation 2008*. It is not intended to provide a determination or comment on compliance or to provide legal interpretation. It is intended as a guide only and is provided as an information source only.

## **Workplace Health and Safety Amendment of Codes of Practice Amendment Notice (No. 1) 2008**

A number of workplace health and safety codes of practice have been amended to bring them into line with the *Workplace Health and Safety Regulation 2008*. Current codes of practice need to be read in conjunction with the information provided in the [Workplace Health and Safety Amendment of Codes of Practice Amendment Notice \(No. 1\) 2008](#) (PDF, 322 KB). However, this document does not include amendments to the following codes of practice:

- Compressed Air Recreational Diving and Snorkelling
- Recreational Technical Diving
- Scaffolding
- Safe Design and Operation of Tractors

# Code of Practice for Recreational Technical Diving

incorporating – EANx diving Mixed gas diving Rebreather diving Decompression diving (using air or other gases)

## Important information about the Code

1. The code was made on 24 September 2001
2. The code first commenced 1 February 2002
3. The code was amended on 28 April 2006
4. The code expires 10 years after it commenced

## What is this Code of Practice about?

The purpose of the *Recreational Technical Diving Code of Practice* is to give practical advice about ways to manage exposure to risks identified as typical when conducting recreational technical diving.

## This code is divided into seven parts.

- (a) **Part 1** of the code outlines control measures which can be used to manage risks common to EANx diving, mixed gas diving and decompression diving.
- (b) **Part 2** of the code outlines control measures which can be used to manage specific risks for EANx diving.
- (c) **Part 3** of the code outlines control measures which can be used to manage specific risks for mixed gas diving.
- (d) **Part 4** of the code outlines control measures which can be used to manage specific risks for decompression diving.
- (e) **Part 5** of the code provides some guidance notes on certain important health and safety issues relating to diving.
- (f) **Part 6** of the code provides some information about general hazards.
- (g) **Part 7** of the code provides some information on the risk management process.

## Workplace health and safety obligations and the *Workplace Health and Safety Act 1995*

The *Workplace Health and Safety Act 1995* places obligations on certain persons to ensure workplace health and safety. Workplace health and safety is ensured when persons are free from death, injury or illness (and the risk of death, injury or illness) caused by workplaces, relevant workplace areas, work activities or plant or substances for use at a workplace. Ensuring workplace health and safety involves identifying and managing exposure to the risks at your workplace.

## How can you meet your obligations?

Under the Act, there are three types of instruments to help you meet workplace health and safety obligations – regulations, ministerial notices and codes of practice.

If there is a regulation or ministerial notice about a risk, you **MUST** do what the Regulation or notice says.

If there is a code of practice about a risk, you **MUST** either –

- (a) do what the code says; or
- (b) do all of the following –
  - adopt and follow another way that gives the same level of protection against the risk;
  - take reasonable precautions and
  - exercise proper diligence.

If there is no regulation, ministerial notice or code of practice about a risk, you must choose an appropriate way to manage exposure to the risk and take reasonable precautions and exercise proper diligence to ensure that your obligations are met.

### **Note:**

There may be additional risks at your workplace which have not been specifically addressed in this Code of Practice. You are required under the Act to identify and assess these risks and ensure that control measures are implemented and reviewed to prevent or minimise exposure to these risks.

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## Part 1 Recreational technical diving

### 1.1 What is this part about?

This part of the code offers advice to employers and self-employed persons and workers in the recreational technical diving industry on how they can make recreational technical diving a healthier and safer activity.

It covers the management of risks common to all aspects of recreational technical diving. Recreational technical diving means underwater diving for recreation, other than in a swimming pool –

- (a) using EANx or mixed gas; or
- (b) that is decompression diving using compressed air or other gases.

This part also includes provisions from the *Workplace Health and Safety Regulation 1997* that apply to all aspects of recreational technical diving.

### 1.2 Meaning of some terms used in this code of practice

**Alternative ascent system** A buoyancy device capable of supporting the weight of a submerged diver and an ascent line that the diver may follow to the surface and use to complete any decompression requirements. The device should be coloured so it can be clearly seen from searching boats.

**AS** Australian Standard.

**Ascent path** Any continuous navigational aid indicating the direction to the ascent line and eventually the surface.

**Certificated scuba diver** A person who holds a certificate in recreational diving issued by a recreational scuba training organisation.

**Certificated decompression diver** A person who holds a certificate in decompression diving issued by a recreational technical diving training organisation.

**Certified assistant** A person who holds a current qualification from a recreational scuba training organization, designed to qualify the person to assist a dive instructor.

**Competent person** A person who has acquired, through training, qualifications, experience or a combination of these, the knowledge and skill enabling the person to competently carry out the activities for which the competent person is responsible.

**Confined water** Water which offers pool-like conditions, good visibility, and water which is shallow enough so that all divers can stand up with their heads well clear of the water.

**Decompression diving** Diving that requires a diver to take a planned stop during the final ascent to decompress.

**Dive instructor** A person who holds a current qualification from a recreational scuba training organisation, designed to qualify the person as a recreational scuba instructor.

**Dive supervisor** The person appointed to supervise the diving area whenever divers are in the water and who holds a current qualification in diving operations leadership from a recreational scuba training organisation.

**Dive team** The maximum number of divers in the water with the same dive plan.

**Diving first aid** Current training in first aid and emergency oxygen administration to injured scuba divers obtained from a person or organisation authorised by the *Ambulance Act 1991*, and training in scuba accident management and field clinical assessment. Further information on authorised persons or organisations can be obtained from the Department of Emergency Services.

**Diving operations** Any activity in which there is a person using underwater diving equipment and breathing compressed air or other gas, and who is subject to pressure greater than 1 atmosphere absolute.

**Diving medical practitioner** A medical practitioner who has satisfactorily completed a course in diving medicine approved by the Board of Censors of the South Pacific Underwater Medicine Society.

**EANx** A mixture of oxygen and nitrogen in which the volume of oxygen in the mixture is at least 22%.

**Gas breathing system** A cylinder and regulator combination.

**Mixed gas** An underwater breathing mixture other than compressed air or EANx.

**Non-English speaking diver** A diver who cannot understand and speak any English, or whose grasp of the English language is such that he or she is not able to readily understand or question any instruction and advice given in English.

**Open water** Any body of water which is subject to wind, swell, current and waves and which can be used for diving.

**PPO<sub>2</sub>** Partial pressure of oxygen.

**Rebreather** A semi-closed or closed circuit self-contained underwater breathing apparatus.

**Recreational diving** Any of the following underwater diving for recreation using compressed air, other than diving in a swimming pool or decompression diving –

- (a) resort diving
- (b) diving by a person undertaking training in diving for recreation, whether or not the person is being photographed, filmed or videoed while diving
- (c) diving for recreation by a person with a qualification in underwater diving, whether or not the person is being photographed, filmed or videoed while diving.

**Recreational technical diving** Underwater diving for recreation, other than in a swimming pool –

- (a) using EANx or mixed gas; or
- (b) that is decompression diving using compressed air or other gases.

**Recreational scuba training organisation** An organisation engaged in the certification of recreational divers through documented training procedures which, in principle, comply with sections 2 and 3 of *Australian Standard 4005.1(1992) – Training and certification of recreational divers Part 1: Minimum entry-level SCUBA diving*

**Recreational technical scuba training organisation** An organisation engaged in the certification of recreational technical divers through documented training procedures.

**Redundant gas system** An additional gas storage and delivery system that contains sufficient gas to allow the diver to return from the furthest point of the dive achievable on the current gas and ascend to a point where another gas supply is available. This should take into consideration the possibility of ascent line loss.

**Resort Diving** An introductory scuba experience, or introductory educational diving program, conducted according to a recreational scuba training organisation's program or a recreational technical scuba training organisation's program, whether or not the person is being photographed filmed or videoed while diving

**Scuba** An open circuit self-contained underwater breathing apparatus.

### 1.3 Health and safety control measures related to all aspects of recreational technical diving

This section outlines some control measures which can be used to manage risks related to all aspects of recreational technical diving. Part 7 of this code gives further information on the risk management process.

#### **When conducting recreational technical diving the employer/self-employed person should –**

- (a) undertake risk management at their own workplace to ensure the control measures he or she chooses are suitable for the workplace and the tasks and activities being undertaken; and
- (b) ensure all diving is subject to co-ordination by a dive supervisor or other person or persons who have been appointed by the employer/self-employed person for that purpose. Diving procedures should be documented along with the responsibilities of lookouts, dive supervisors, dive instructors and other workers with respect to health and safety. It is important that responsibilities are clearly allocated and the diving procedures to be followed are known to all parties.

### 1.3.1 Ensuring no persons are left behind

Section 86B of the Regulation **'Count of all persons on board to be made and recorded'** requires that –

A count of all persons on board must be made and recorded when an employer or self-employed person uses a boat to transport persons to, or to the vicinity of, a recreational technical diving site.

Before the boat departs for the site, the employer or self-employed person must ensure a crew member –

- (a) counts all persons on board; and
- (b) makes a written record of the count; and
- (c) verifies the count by signing the written record or if the record is made electronically – by entering in the record the name of, and a unique identifier for, the crew member.

If anyone leaves the boat permanently for alternative transport to shore or another vessel, or if an additional person permanently joins the boat, the employer or self-employed person must ensure a crew member -

- (a) counts the persons leaving the boat as they leave it; and
- (b) counts the persons boarding the boat as they board it; and
- (c) makes a written record of each of the counts; and
- (d) makes a written record of the number of persons currently on board; and
- (e) verifies the information recorded under paragraphs (c) and (d) by signing the written record or if the record is made electronically – by entering in the record the name of, and a unique identifier for, the crew member.

Before the boat departs from the site or its vicinity, the employer or self-employed person must ensure a crew member –

- (a) counts the persons on board; and
- (b) makes a written record of the count; and
- (c) compares the count with the last count recorded under this section to ensure the counts agree; and
- (d) verifies the information recorded under paragraph (b), and the comparison done under paragraph (c), by making a record of the comparison and signing it or if the record is made electronically – by entering in the record the name of, and a unique identifier for, the crew member.

The employer or self-employed person must keep each record made under this section for at least 1 year.

Two types of systems may be used to carry out the count -

#### Passive count systems, for example, a head count

These systems require little participation by the people being counted. They tend to be quicker and less obtrusive but are also more susceptible to error. If passive systems are used, the count should be done twice, and independently, by different crew members.

#### Active count systems, for example, roll calls, tagging or signing systems

Active count systems require the people being counted to actively participate in the counting process. These systems tend to be slower than passive systems but are less prone to error.

The use of an active system is preferred, but for vessels carrying over 50 people, passive systems may be more appropriate.

As with any other system it is important the adopted process is clearly known to all workers and the responsibility for completing the count is clearly allocated to a person or persons on each day. The employer/self-employed person should ensure all other people on board the vessel are clearly informed of the counting process to be followed.

### 1.3.2 Medical fitness to dive

#### 1.3.2A Medical fitness of diving workers

Sections 78 and 79 of the Regulation apply to all underwater diving work, including recreational technical diving work. These sections of the Regulation require an employer or someone on his or her behalf to view the worker's current certificate of medical fitness to dive. The employer must ensure any work carried out by the worker is within any limits stated in the certificate. An employer/self-employed person doing underwater diving work must have a current certificate of medical fitness to dive and any work carried out by the employer/self-employed person must be within any limits stated in the certificate.

A 'certificate of medical fitness to dive' is a certificate that -

- (a) has been issued by a diving medical practitioner
- (b) shows its date of issue
- (c) shows the certificate holder's name
- (d) shows the holder is medically fit to dive in accordance with the fitness criteria specified in *Australian/New Zealand Standard 2299.1 - 1999 Occupational diving operations*, appendix K, paragraph K4
- (e) may show any limits on diving imposed on medical grounds.

The certificate is current if it –

- (a) has not been superseded or revoked
- (b) has not expired
- (c) is not more than 1 year old.

The employer/self-employed person should request that workers advise the employer/self-employed person of any conditions in themselves which are contraindications to diving. Employers/self-employed persons and workers with these conditions should not dive. Examples of contraindicated conditions are colds, hay fever, ear infections and hangovers.

### 1.3.2B Medical fitness of resort divers

Section 86C of the Regulation '**Medical conditions of resort divers**' requires that –

An employer or self-employed person who intends to conduct resort diving for a person may allow the person to do resort diving only if –

- (a) the person first gives the employer or self-employed person a medical declaration in the approved form about his or her medical fitness to dive; and
- (b) the employer or self-employed person, or someone on his or her behalf –
  - i. has read the declaration; and
  - ii. does not know or suspect that the declaration is false or misleading; and
  - iii. has assessed the person's fitness to dive, having regard to the declaration; and
  - iv. decides it is reasonable to allow the person to dive.

Example of the process of assessment –

A declaration discloses a medical condition. The employer then seeks medical advice. In accordance with the medical advice, the employer decides that it is reasonable to allow the person to dive.

Any medical advice received in relation to resort divers should be recorded. If the information on the approved form indicates the prospective diver has consumed alcohol within 8 hours prior to the diving, he or she should not dive.

A copy of the approved form can be found on the next page.



## Medical declaration for resort diving

**TO BE COMPLETED AND SIGNED BY RESORT DIVER****Personal Details**

Surname	Given Names
Address	
Phone	
Date of birth / /	Sex: _Male _Female

**Have you ever suffered, or do you now suffer from, any of the following -**

	YES	NO
Asthma or wheezing		
Brain, spinal cord or nervous disorder		
Chest surgery		
Chronic bronchitis or persistent chest complaint		
Chronic sinus conditions		
Collapsed lung (pneumothorax)		
Diabetes mellitus (sugar diabetes)		
Ear surgery		
Epilepsy		
Fainting, seizures or blackouts		
Heart disease of any kind		
Recurrent ear problems when flying		
Tuberculosis or other long-term lung disease		

**Are you currently suffering from -**

	YES	NO
Breathlessness		
Chronic ear discharge or infection		
High blood pressure		
Other illness or operation within the last month		
Perforated eardrum		

	YES	NO
Are you currently taking any medicine or drug (excluding oral contraceptives)?		
Have you ingested any alcohol within the 8 hours prior to diving?		
Are you pregnant?		
Do you understand that concealment of any condition incompatible with safe diving might put your life or health at risk?		

Signature	Date / /
Witness	Date / /

### 1.3.2C Medical fitness of certificated divers

If the employer/self-employed person has concerns regarding the medical fitness of a potential diver, the employer/self-employed person should:

- (a) advise the diver to seek medical advice; or
- (b) advise the diver not to dive; or
- (c) ensure a dive supervisor or dive instructor accompanies the diver on a dive.

### 1.3.3 Supervision of divers in open water

#### 1.3.3A All divers - dive site supervision

Section 86D of the Regulation '**Lookout and rescuer**' requires that –

The employer or self-employed person may allow a person to do recreational technical diving only if there is at least 1 person acting as lookout for the diving.

The lookout must –

- (a) be positioned out of the water where the lookout can see the whole area where the diving is taking place; and
- (b) be solely engaged in being the lookout; and
- (c) be able to recognize relevant hazards and divers in difficulty; and
- (d) be able to either –
  - i. rescue a diver; or
  - ii. direct a person who is immediately available and capable of rescuing a diver to rescue a diver; and
- (e) be able to either –
  - i. provide first aid including expired air resuscitation, oxygen resuscitation and external cardiac compression; or
  - ii. direct a person who is immediately available and capable of providing the first aid to provide the first aid.

A lookout is taken to be acting as a lookout while occupied under (d) or (e) of this section 86D if –

- (a) the employer or self-employed person, or someone on his or her behalf, has conducted a proper assessment of the risks involved in not having another person available to act as a lookout while the lookout is occupied under (d) or (e) of this section; and
- (b) it is reasonable having regard to those risks not to have another person available to act as lookout.

A dive supervisor should manage the dive operation and remain at the surface of the dive site while diving is taking place.

The employer or self-employed person should ensure the lookout -

- (a) scans the area under his or her supervision in an effective and efficient manner
- (b) if required, rescues a diver or directs a person who is immediately available and capable of rescuing a diver to rescue a diver
- (c) has a level of fitness so his or her own health and safety are not compromised if required to carry out or assist in a rescue

- (d) if required, provides first aid including expired air resuscitation, oxygen resuscitation and external cardiac compression or directs a person who is immediately available and capable of providing the first aid to provide the first aid
- (e) observes divers when they are entering and exiting the water or are on the surface
- (f) has access to binoculars and polarised sunglasses so that visibility across and into the water can be improved
- (g) continually monitors the positions of the divers, looks for hazards or changes which may lead to problems, and identifies problems so that dive operations can be adjusted as required
- (h) wears a brightly coloured shirt, wet suit or other identifying clothing or equipment so the lookout can be recognised easily by divers
- (i) be part of a communication system which is relevant to the dive site and which allows for necessary communication with divers and any other appropriate personnel so that effective and efficient transfer of information can occur. A communication system may include, for example, ordinary voice communication, a loud hailer, 2-way radios, whistles or signalling.

### 1.3.3B Resort divers - *inwater supervision*

Section 86E of the Regulation '**Supervision of resort divers**' requires that –

The employer or self-employed person ensures that each person doing resort diving is supervised in the water by a dive instructor, or a dive instructor assisted by a certified assistant.

A dive instructor must not supervise more than 4 resort divers at a time.

A dive instructor assisted by a certified assistant must not supervise more than 6 resort divers at a time.

In relation to the ratios of diving workers to resort divers, the regulation gives the maximum number of resort divers who can be supervised by a dive instructor or a dive instructor and certified assistant. In some instances, the number of resort divers being supervised may need to be lowered. For instance, if a risk assessment shows that the abilities, fitness and confidence levels of divers, and the environmental conditions at the dive site put the health and safety of workers or resort divers at an unacceptable risk, then the ratios should be reviewed.

When divers are being supervised by a dive instructor only, then the divers should –

- (a) swim closely on each side of the instructor; OR
- (b) swim closely abreast with the instructor close in front of the students, facing them and swimming backwards.

When divers are being supervised by a dive instructor and certified assistant, the divers should swim in single file or abreast, with an instructor or certified assistant at the front and rear of the divers.

While in the water, the dive instructor and certified assistant should always be positioned so they can make immediate physical contact with, and render assistance to, any resort diver. No course should be conducted with 1 instructor only which allows the students to swim in single file behind or in front of the instructor. Indian file swimming with only 1 instructor at the beginning or end of the students has been the cause of divers being lost.

### 1.3.3C Certificated divers - *inwater supervision*

The employer/self-employed person should ensure conditions at the chosen dive site are

suited to the qualifications and skills of the divers. If an assessment reveals the dive site conditions are outside the qualifications and skills of the divers, then inwater supervision should be provided.

### 1.3.4 Appropriate skills and knowledge of divers

#### 1.3.4A Skills and knowledge of resort divers

The employer/self-employed person should ensure the dive instructor assesses the knowledge, skills and abilities of potential divers and provides the necessary information and instruction to minimise the risks to the person's health and safety. Skills taught **underwater** should include -

- (a) mask clearing
- (b) removing and replacing the regulator.

These skills should be taught in situations where resort divers can easily keep their heads clear of the water. Such situations would include shallow water, or where there is some form of support such as a bar hanging from the side of the boat for the divers to hold onto, or a platform on which the divers can stand.

Divers should also be instructed and/or informed about -

- (a) equalising the pressure in their ears
- (b) using appropriate hand signals
- (c) using an emergency ascent procedure which includes exhaling on ascent, and achieving and maintaining positive buoyancy on the surface.

Consideration should also be given to the following issues during information and instruction sessions -

- (a) environmental conditions and marine life at the dive site, for example, depth, currents, visibility and behaviour of marine animals likely to be encountered
- (b) health and safety issues relating to the vessel, for example, entry and exit points
- (c) health and safety issues relating to dive site entry such as a beach, jetty, pontoon, river bank
- (d) location and roles of supervisory staff, for example, dive instructors, dive supervisors and lookouts
- (e) any other information required because the assessment shows the prospective diver needs such information to dive safely.

#### 1.3.4B Skills and knowledge of certificated divers

The employer/self-employed person should ensure the dive supervisor assesses the competence of each diver prior to diving. Factors taken into account should include -

- (a) the recency of the diver's recreational technical certificate and of the last dive
- (b) the diving experience of the diver since the certificate was gained, for example, as contained in log books
- (c) the diver's current fitness to dive.

If there are doubts as to the competence of the diver to complete a particular dive, the dive supervisor or dive instructor should accompany the diver on that dive or assess the diver during an assessment dive.

Certificated divers should be advised of the following -

- (a) boundaries of the dive site
- (b) environmental conditions and marine life at the dive site, for example, depth, terrain, currents, visibility and behaviour of marine animals likely to be encountered
- (c) health and safety issues relating to the vessel, for example, entry and exit points
- (d) health and safety issues relating to dive site entry such as a beach, jetty, pontoon, river bank
- (e) location and roles of supervisory staff, for example, dive instructors, dive supervisors and lookouts
- (f) to regularly monitor air levels in air cylinders and the minimum air content required for safe return to the surface. This advice would need to take into account the depth of the dive and exertion levels, for example, when diving against a current
- (g) to dive in dive buddy teams
- (h) not to dive to depths greater than that to which they have been trained or have experience. (As recreational technical diving workers should not be required to dive beyond 40 metres, certificated divers should be advised that if they get into difficulty beyond this depth, their rescue may put a recreational technical diving worker at unacceptable risk)
- (i) their responsibilities as divers to dive safely and comply with the instructions of the employer/self-employed person or persons acting on their behalf
- (j) emergency procedures such as recall, distress and rescue procedures, and use of signalling devices.

Depending on certain factors such as the competency of the divers, environmental conditions and the nature of diving being undertaken, consideration should be given to offering other advice such as –

- (a) the risks to health and safety from a build-up and release of nitrogen in the blood and bodily tissues because of multiple ascents or multiple dives in any 24 hour period, or because of a series of dives over a number of days with inadequate surface intervals to allow the nitrogen to off-gas
- (b) the risk to health and safety from nitrogen narcosis at depth and the need to move to shallower water if this occurs
- (c) the danger of maximum bottom time non-decompression diving
- (d) the risks of decompression diving
- (e) the need for safety stops
- (f) the risks associated with flying or altitude exposure after diving
- (g) the effects of dehydration after diving
- (h) the risks associated with exertion after diving
- (i) the risks associated with diving while ill.

### 1.3.5 Instruction and advice to a non-English speaking diver

#### 1.3.5A Resort divers

Information and advice should be given to a non-English speaking diver in a manner that enhances understanding by the diver. This should occur through -

- (a) the information being explained to the diver by an instructor who speaks the same language as the diver; OR
- (b) the use of an interpreter with a sound knowledge of diving and diving terminology to relay the instructor's instructions to the diver and feedback the responses to the instructor. The interpreter should be able to speak fluently to the instructor and the diver in languages they can readily understand; OR
- (c) the use of instruction sheets written in a language the diver can read and

understand, and testing of the diver by having him or her demonstrate the required knowledge and skills to the instructor.

Diving should not proceed unless the instructor is satisfied the person can dive safely.

### 1.3.5B Certificated divers

Information and advice should be given to a non-English speaking diver in a manner that enhances understanding by the diver. This should occur through the provision of the necessary information and advice in a language easily understood by the diver. This information and advice can be in verbal or written form.

### 1.3.6 Equipment for diving

The employer/self-employed person should ensure diving equipment supplied to divers is –

- (a) suitable for the type of diving being undertaken and of sufficient quality to ensure it performs effectively for the wearer
- (b) checked before diving starts to ensure it is in safe working condition
- (c) cleaned and kept in good repair
- (d) maintained in accordance with manufacturers' specifications.

Oral/nasal equipment should be disinfected prior to use by another person, that is, it does not need disinfecting if the same person is using the equipment over a period of time.

### 1.3.7 Gas quality in gas cylinders

The employer/self-employed person should ensure that -

- (a) compressed gas cylinders are filled, tested, operated and maintained according to manufacturers' instructions and the ***Australian Standard 3848.2 - 1999 Filling of portable gas cylinders – Part 2 Filling of portable cylinders for self-contained underwater breathing apparatus (SCUBA) and non-underwater self-contained breathing apparatus (SCBA) – Safe procedures***
- (b) water content in the cylinders is monitored and the cylinders are checked and cleaned at regular intervals to prevent or minimise corrosion of the inner surface and to clean out any residues of corrosion
- (c) on any day that compressed air cylinders are being used, samples of the air in the cylinders are "sniff" tested to ensure the air has no objectionable or nauseous odour
- (d) cylinders contain –
  - not more than 5 ppm pf carbon monoxide
  - not more than 480 ppm of carbon dioxide or 900 mg/m<sup>3</sup>
  - not more than 0.3 mg/m<sup>3</sup> of oil
- (e) cylinders are not filled to a pressure that exceeds the lesser of the working pressure ratings of either the valve, yoke or cylinder.

Compressors used to fill compressed gas cylinders should -

- (a) be designed specifically for the purpose of filling compressed gas cylinders used by underwater divers
- (b) be tested for gas quality, and operated and maintained according to manufacturers' instructions
- (c) be positioned so only clean, uncontaminated gas is taken into the compressor
- (d) have filters which are in sound working order so they effectively remove contaminants so these cannot enter the cylinders. (Water content of the gas reduces the effectiveness and life of the filters).

### 1.3.8 Emergency plans

The employer/self-employed person should ensure dive vessels have a written emergency plan to deal with emergency situations. These emergency plans should be made readily available to workers who should be familiar with these plans. Situations covered by written emergency plans should include –

- (a) first aid
- (b) rescue
- (c) evacuation
- (d) missing persons.

### 1.3.9 Rescue of a diver

The employer/self-employed person should ensure effective and efficient rescue and resuscitation procedures have been developed. In the development of these procedures, consideration should be given to the following factors -

- (a) size, type and location of the dive site
- (b) appropriateness of rescue procedures to the dive site
- (c) adequacy of the communication system so that clear messages and information can be relayed to the appropriate personnel, including emergency services personnel, with the minimum of delay
- (d) location of lookouts/rescuers and their skills and fitness levels. Rescuers should have knowledge and skills in diving and in the management of diving related incidents, injuries and illness. They should also have a level of fitness so their own health and safety are not compromised, and be dressed and equipped so they are ready to enter the water quickly
- (e) availability, locality and appropriateness of any rescue equipment such as rescue boards, tenders, flotation devices and ropes. Any rescue vessels or equipment should be maintained in a ready condition and positioned so they can be used to reach a diver in distress with the minimum of delay. An appropriate powered tender vessel should be maintained in a ready condition in the water for the purpose of rescue during diving operations.

### 1.3.10 First aid and oxygen

An employer/self-employed person should ensure -

- (a) a first aid kit is readily available at the dive site. The contents of this kit should be sufficient to cater for the injuries that may occur. Consideration also should be given to the number of divers and the nature and type of underwater diving being undertaken.
- (b) a person on the surface at the dive site should hold current training in diving first aid, including emergency oxygen administration
- (c) an oxygen system capable of delivering as near as possible to 100% oxygen is immediately available so it can be administered with the minimum of delay. The person/s administering the oxygen should have received training in the correct use of the system.
- (d) oxygen equipment and oxygen levels are checked daily by a person who has received training to carry out the checks correctly. Any other maintenance of the oxygen system should be carried out by an authorised service agent.
- (e) sufficient oxygen is available to supply the injured person, taking into account the location of the dive site and access to medical facilities

### 1.3.11 Flying after diving

The longer the period between diving and subsequent flying, the less likely it is that

decompression illness will occur.

All divers should be advised, therefore, that after diving, they should wait a minimum of 12 hours before flying in a pressurised aircraft. Where divers have had daily multiple dives for several consecutive days or have made dives that require decompression stops, the minimum time before flying after diving should be extended to 24 hours.

## Part 2 Recreational technical diving using EANx

This part of the code offers advice to employers, self-employed persons and workers in the recreational technical diving industry on how they can make recreational technical diving using EANx a healthier and safer activity.

This part outlines some control measures which can be used to manage specific risks related to recreational technical diving using EANx.

### 2.1 Diving using EANx with SCUBA

#### 2.1.1 General

An employer/self employed person should ensure –

- (a) EANx diving does not take place unless an EANx dive supervisor is present at the dive site
- (b) only a certificated EANx scuba diver undertakes recreational scuba diving using EANx unless the diver is undertaking -
  - i. training for the purpose of certification as an EANx scuba diver in accordance with this code; or
  - ii. an introductory dive experience and the diver is accompanied by an EANx dive instructor
- (c) PPO<sub>2</sub> exposure times are not exceeded
- (d) maximum depth of a dive is based on the PPO<sub>2</sub> for the specific EANx breathing mixture used and does not exceed 1.6 bar PPO<sub>2</sub>
- (e) before a breathing mixture is used, the diver conducts a gas analysis to verify the O<sub>2</sub> content. The results should be recorded in the EANx dive safety log and on the cylinder.

#### 2.1.2 Qualifications and experience of an EANx dive instructor

The employer/self-employed person of an EANx dive instructor should ensure the EANx dive instructor –

- (a) is trained and certificated by a recreational technical diving training organisation to instruct in EANx diving
- (b) is a certificated recreational scuba diving instructor
- (c) has instructed and certificated at least 25 entry-level or higher level divers
- (d) is qualified as an EANx diver
- (e) has completed 20 EANx dives.

#### 2.1.3 Qualifications and experience of an EANx dive supervisor

The employer/self-employed person of an EANx dive supervisor should ensure the EANx dive supervisor –

- (a) is trained and certificated by a recreational scuba training organisation to supervise diving
- (b) is qualified as an EANx diver.

#### 2.1.4 Prerequisites for EANx divers in training

The employer/self-employed person should ensure that before a trainee undertakes a course in recreational scuba diving using EANx, that the trainee -

- (a) is a certificated recreational scuba diver

- (b) has a minimum of 20 logged scuba dives.

Prior to issuing a certificate in EANx diving, the employer/self-employed person should ensure the trainee has completed a course in EANx and has done 2 open-water dives using EANx.

### 2.1.5 Equipment

The employer/self-employed person should ensure that each diver is equipped with-

- (a) fins
- (b) mask
- (c) snorkel (attachable or attached to mask)
- (d) compressed gas cylinder and valve designed specifically for SCUBA
- (e) buoyancy control device fitted with a power inflator device
- (f) regulator fitted with an alternate gas source or a redundant breathing system
- (g) submersible depth and timing device, or a dive computer
- (h) cylinder pressure gauges
- (i) quick-release weight system
- (j) exposure protection, as appropriate to conditions
- (k) a knife or line cutter if there is a risk of entanglement
- (l) emergency signalling equipment including –
  - i. a high visibility signalling device, for example, a safety sausage
  - ii. an audible signalling device, for example, a whistle
  - iii. a lighted signalling device, for example, a glow stick, if diving is to take place close to dusk or after dark
- (m) a torch, if night diving is being undertaken.

### 2.1.6 Pre-dive checks and emergency procedures

The employer/self-employed person should ensure the divers are advised about -

- (a) the dive plan
- (b) maximum depth for the breathing gas
- (c) loss of breathing gas procedures
- (d) buddy separation procedures
- (e) emergency procedures, including the location of and contact procedures for the nearest recompression facilities
- (f) checking the position and correct operation of their own equipment and that of their buddy's.

### 2.1.7 EANx dive safety log

Section 86 F of the Regulation “**Dive safety log**” requires that –

If the employer or self-employed person intends to conduct recreational technical diving, a dive safety log must be kept.

The dive safety log must contain the required information about –

- (a) each dive conducted by the employer or self-employed person; and
- (b) each dive done by the employer, self-employed person or the employer’s workers in conducting the dive.

The following is the required information for diving using EANx with scuba–

- (a) the diver’s name
- (b) the name of any buddy with whom the dive is conducted
- (c) the dive supervisor’s name
- (d) the date and location of the dive
- (e) time in
- (f) time out
- (g) maximum depth of the dive
- (h) any incident, problem, discomfort or injury experienced or suffered by the diver
- (i) if the dive was done using a dive computer – the dive time
- (j) if the dive was done using dive tables – the repetitive dive group and either bottom time or dive time
- (k) if the repetitive dive group and surface interval result in a repetitive factor – the surface interval and the repetitive factor
- (l) oxygen content of the EANx
- (m) maximum operating depth for the gases being used.

On completion of a dive, a diver must verify his or her return from the dive by signing the dive safety log entry for the diver or if the log is kept electronically – by entering in the log entry the name of, and a unique identifier for, the diver.

The dive supervisor or someone else authorised by the employer or self-employed person must sign the dive safety log to verify that the log entry for each diver is complete and has been signed by the diver or if the log is kept electronically – by entering in the log entry the name of, and a unique identifier for, the diver.

The master of any boat used in connection with the diving, or someone authorised by the employer or self-employed person, must sign the dive safety log to verify that the log entry for each diver has been completed and signed as required by this section or if the log is kept electronically – by entering in the log entry the name of, and a unique identifier for, the diver.

Each entry and signature in the dive safety log must be made as soon as possible. For example, the signature of the diver in the dive safety log is an important check on whether a diver has returned to the boat. Accordingly, the signature needs to be made as soon as the diver has removed necessary gear and dried the diver’s hands.

The employer or self-employed person must keep the dive safety log for at least 1 year.

The dive safety log should also contain the information on the environmental conditions at the dive site, for example, surface conditions, currents, visibility and maximum depth.

During a dive, the log should be monitored so that missing diver situations are quickly identified. For example, if a 40 minute bottom time dive is planned and an accurate “time in” is recorded, then a dive supervisor should be organising a response to a missing diver

situation if the diver is absent for more than the bottom time, ascent time and stop time, that is 45 minutes.

## 2.2 Diving using EANx rebreathers

### 2.2.1 General

An employer/self-employed person should ensure –

- (a) EANx rebreather diving does not take place unless an EANx rebreather dive supervisor is present at the dive site
- (b) only a certificated EANx rebreather diver undertakes recreational diving using EANx rebreathers unless the diver is undertaking training for the purpose of certification as an EANx rebreather diver in accordance with this code
- (c) oxygen partial pressure exposure times are not exceeded
- (d) maximum depth of a dive is based on the PPO<sub>2</sub> for the specific EANx breathing mixture used and does not exceed 1.6 bar PPO<sub>2</sub>
- (e) before a breathing mixture is used, the diver conducts a gas analysis to verify the O<sub>2</sub> content. The results should be recorded in the EANx rebreather dive safety log and on the cylinder.

**Rebreathers should not be used for introductory experiences or resort dives in open water for non-certificated diving.**

### 2.2.2 Qualifications and experience of a rebreather dive instructor - EANx

The qualifications of a diver and dive instructor are model specific to the type of rebreather being used. The advice listed below should be followed in addition to the manufacturers' recommendations.

An employer/self-employed person of an EANx rebreather dive instructor should ensure the EANx rebreather dive instructor –

- (a) is trained and certificated by a recreational technical diving training organisation to instruct in EANx rebreather diving
- (b) is a certificated recreational scuba dive instructor
- (c) has instructed and certificated at least 25 entry-level or higher level divers
- (d) is qualified as a EANx rebreather diver
- (e) has completed 20 dives using a rebreather
- (f) has successfully completed a rebreather instructor's course on the model being used.

### 2.2.3 Qualifications and experience of an EANx rebreather dive supervisor

The employer/self-employed person of a EANx rebreather dive supervisor should ensure the EANx rebreather dive supervisor –

- (a) is trained and certificated by a recreational scuba training organisation to supervise diving
- (b) is qualified as an EANx rebreather diver.

### 2.2.4 Prerequisites for rebreather divers in training using EANx

The employer/self-employed person should ensure that before a trainee undertakes a course in recreational diving using a rebreather and EANx, that the trainee -

- (a) is certificated as an EANx diver
- (b) has a minimum of 5 logged EANx dives.

Before being granted certification, the trainee should complete at least 1 confined water session and 4 open water dives using the rebreather during training.

### 2.2.5 Equipment

The employer/self-employed person should ensure each diver is equipped with –

- (a) fins
- (b) mask
- (c) EANx rebreather unit
- (d) buoyancy control device fitted with a power inflator device
- (e) 1 submersible depth gauge and 1 submersible timing device, or 1 dive computer
- (f) submersible cylinder pressure gauges for each cylinder used
- (g) a redundant breathing system
- (h) quick-release weight system
- (i) exposure protection, as appropriate to conditions
- (j) a knife or line cutter if there is risk of entanglement
- (k) emergency signalling equipment, including –
  - i. a high visibility signalling device, for example, a safety sausage
  - ii. an audible signalling device, for example, a whistle
  - iii. a lighted signalling device, for example, a glow stick, if diving is to take place close to dusk or after dark
- (l) a torch, if night diving is being undertaken
- (m) for divers undergoing training, including in semi-closed circuit rebreathers, a PPO<sub>2</sub> monitor of the inspired gas which can be read by the diver.

### 2.2.6 Pre-dive checks and emergency procedures

The employer/self-employed person should ensure the divers are advised about -

- (a) the dive plan
- (b) dive objectives
- (c) maximum depth for the breathing gas
- (d) loss of breathing gas procedures
- (e) buddy separation procedures
- (f) safety requirements
- (g) emergency procedures, including the location of and contact procedures for the nearest recompression facilities
- (h) checking the position and correct operation of their own equipment and that of their buddy's.

The employer/self-employed person should ensure manufacturers' recommendations and/or specifications are followed in respect of –

- (a) pre-dive checks and emergency procedures
- (b) carbon dioxide scrubbers.

## 2.2.7 EANx rebreather dive safety log

Section 86 F of the Regulation “**Dive safety log**” requires that –

If the employer or self-employed person intends to conduct recreational technical diving, a dive safety log must be kept.

The dive safety log must contain the required information about –

- (a) each dive conducted by the employer or self-employed person; and
- (b) each dive done by the employer, self-employed person or the employer’s workers in conducting the dive.

The following is the required information for diving using an EANx rebreather –

- (a) the diver’s name
- (b) the name of any buddy with whom the dive is conducted
- (c) the dive supervisor’s name
- (d) the date and location of the dive
- (e) time in
- (f) time out
- (g) maximum depth of the dive
- (h) any incident, problem, discomfort or injury experienced or suffered by the diver
- (i) if the dive was done using a dive computer – the dive time
- (j) if the dive was done using dive tables – the repetitive dive group and either bottom time or dive time
- (k) if the repetitive dive group and surface interval result in a repetitive factor – the surface interval and the repetitive factor
- (l) oxygen content of the EANx
- (m) maximum operating depth for the gases being used.

On completion of a dive, a diver must verify his or her return from the dive by signing the dive safety log entry for the diver or if the log is kept electronically – by entering in the log entry the name of, and a unique identifier for, the diver.

The dive supervisor or someone else authorised by the employer or self-employed person must sign the dive safety log to verify that the log entry for each diver is complete and has been signed by the diver or if the log is kept electronically – by entering in the log entry the name of, and a unique identifier for, the diver.

The master of any boat used in connection with the diving, or someone authorised by the employer or self-employed person, must sign the dive safety log to verify that the log entry for each diver has been completed and signed as required by this section or if the log is kept electronically – by entering in the log entry the name of, and a unique identifier for, the diver.

Each entry and signature in the dive safety log must be made as soon as possible. For example, the signature of the diver in the dive safety log is an important check on whether a diver has returned to the boat. Accordingly, the signature needs to be made as soon as the diver has removed necessary gear and dried the diver’s hands.

The employer or self-employed person must keep the dive safety log for at least 1 year.

The dive safety log should also contain the information on the environmental conditions at the dive site, for example, surface conditions, currents, visibility and maximum depth.

During a dive, the log should be monitored so that missing diver situations are quickly identified. For example, if a 40 minute bottom time dive is planned and an accurate “time in” is recorded, then a dive supervisor should be organising a response to a missing diver

situation if the diver is absent for more than the bottom time, ascent time and stop time, that is 45 minutes.

## 2.3 Blending, testing, storage and use of EANx

If EANx is blended, tested, stored or used at the workplace, the employer/self-employed person should ensure -

- (a) EANx gas mixing and EANx cylinder filling are carried out by a competent person
- (b) all equipment associated with the filling or use of EANx is used in accordance with manufacturers' recommendations
- (c) all scuba cylinders to be used for the storage of EANx are clearly marked "NITROX"
- (d) prior to using an EANx cylinder, the O<sub>2</sub> content in the cylinder is tested by the diver
- (e) after testing, a tag/decal is completed by the diver and is attached to the cylinder showing -
  - i. oxygen percentage
  - ii. maximum operating depth of the gas mixture
  - iii. cylinder serial number, in case the tag is separated from the cylinder.

## Part 3 Recreational technical diving using mixed gas

This part of the code offers advice to employers, self-employed persons and workers in the recreational technical diving industry on how they can make recreational technical diving using mixed gas a healthier and safer activity.

This part outlines some control measures which can be used to manage specific risks related to recreational technical diving using mixed gas.

### 3.1 Diving using mixed gas with SCUBA

#### 3.1.1 General

The employer/self-employed person should ensure -

- (a) mixed gas diving does not take place unless a dive supervisor is present at the dive site
- (b) only a certificated mixed gas scuba diver undertakes recreational scuba diving using mixed gases unless the diver is undertaking training for the purpose of certification as a mixed gas scuba diver in accordance with this code
- (c) oxygen partial pressure exposure times are not exceeded
- (d) maximum depth of a dive does not exceed the depth where -
  - i. oxygen in the mixture being breathed at any time exceeds a partial pressure of 1.4 bar while diving and 1.6 bar during decompression
  - ii. nitrogen in the mixture being breathed at any time exceeds a partial pressure of 4.0 bar while diving
- (e) minimum depth does not exceed the depth where oxygen in the mixture currently being breathed is less than a partial pressure of 0.16 bar
- (f) before a breathing mixture is used, the diver conducts a gas analysis to verify the O<sub>2</sub> content. The results should be recorded in the mixed gas dive safety log and on the cylinder.

#### 3.1.2 Qualifications and experience of a mixed gas dive instructor

The employer/self-employed person of a mixed gas dive instructor should ensure the mixed gas dive instructor –

- (a) is trained and certificated by a recreational technical diving training organisation to instruct in mixed gas diving
- (b) is trained and certificated by a recreational technical diving training organisation to instruct in decompression diving
- (c) is a certificated EANx instructor
- (d) has instructed and certificated at least 25 EANx divers
- (e) is qualified as a mixed gas diver
- (f) has completed 15 mixed gas dives.

#### 3.1.3 Prerequisites for mixed gas divers in training

The employer/self-employed person should ensure that before a trainee undertakes a course in recreational scuba diving using mixed gas, the trainee -

- (a) is a certificated EANx scuba diver
- (b) is a certificated decompression diver
- (c) has a minimum of 150 logged dives, of which 50 have been at a depth greater than 30 metres
- (d) has completed a minimum of 30 logged dives within the last 12 months
- (e) has completed a minimum of 30 dives using EANx.

### 3.1.4 Equipment

The employer/self-employed person should ensure each diver is equipped with -

- (a) fins
- (b) mask
- (c) compressed gas cylinders and valves designed specifically for SCUBA
- (d) buoyancy control device
- (e) regulators on all cylinders. At least 1 second stage attached to the bottom mix should have a low pressure line a minimum of 1.5 metres in length
- (f) 2 submersible depth gauges and 2 submersible timing devices, or 2 dive computers
- (g) cylinder pressure gauge connected to each cylinder used
- (h) quick-release weight system where required
- (i) exposure protection, as appropriate to conditions
- (j) a knife or line cutter
- (k) emergency signalling equipment including –
  - i. a high visibility signalling device, for example, a safety sausage
  - ii. an audible signalling device, for example, a whistle
  - iii. a lighted signalling device, for example, a glow stick, if diving is to take place close to dusk or after dark
- (l) a torch
- (m) a redundant gas breathing system
- (n) 2 copies of the dive team's dive plan
- (o) whenever cylinders are manifolded, an isolation valve should be fitted to the manifold
- (p) alternative ascent system
- (q) a reel where direct ascent to the surface is not possible.

### 3.1.5 Pre-dive checks and emergency procedures

The employer/self-employed person should ensure the divers are advised about -

- (a) the dive plan
- (b) gas change over depths
- (c) the sequence and role of each diver
- (d) gas turn around pressures
- (e) maximum and minimum depths for each breathing gas
- (f) run times
- (g) omitted decompression procedures
- (h) emergency procedures including –
  - i. loss of breathing gas procedures
  - ii. buddy separation procedures
  - iii. loss of ascent path procedures
  - iv. the location of and contact procedures for the nearest recompression facilities
- (i) checking the position and correct operation of their own equipment and that of their buddy's
- (j) analysing their gas mixtures
- (k) performing for themselves and their buddy an in-water check (leak test) and an in-water regulator location and correct operation check.

### 3.1.6 Mixed gas dive safety log

Section 86 F of the Regulation “**Dive safety log**” requires that –

If the employer or self-employed person intends to conduct recreational technical diving, a dive safety log must be kept.

The dive safety log must contain the required information about –

- (a) each dive conducted by the employer or self-employed person; and
- (b) each dive done by the employer, self-employed person or the employer’s workers in conducting the dive.

The following is the required information for diving using mixed gas with scuba –

- (a) the diver’s name
- (b) the name of any buddy with whom the dive is conducted
- (c) the dive supervisor’s name
- (d) the date and location of the dive
- (e) time in
- (f) time out
- (g) maximum depth of the dive
- (h) any incident, problem, discomfort or injury experienced or suffered by the diver
- (i) if the dive was done using a dive computer – the dive time
- (j) if the dive was done using dive tables – the repetitive dive group and either bottom time or dive time
- (k) if the repetitive dive group and surface interval result in a repetitive factor – the surface interval and the repetitive factor
- (l) oxygen and nitrogen content (if any) of the mixed gas
- (m) maximum operating depth for the mixed gas
- (n) minimum operating depth of the bottom mix.

On completion of a dive, a diver must verify his or her return from the dive by signing the dive safety log entry for the diver or if the log is kept electronically – by entering in the log entry the name of, and a unique identifier for, the diver.

The dive supervisor or someone else authorised by the employer or self-employed person must sign the dive safety log to verify that the log entry for each diver is complete and has been signed by the diver or if the log is kept electronically – by entering in the log entry the name of, and a unique identifier for, the diver.

The master of any boat used in connection with the diving, or someone authorised by the employer or self-employed person, must sign the dive safety log to verify that the log entry for each diver has been completed and signed as required by this section or if the log is kept electronically – by entering in the log entry the name of, and a unique identifier for, the diver.

Each entry and signature in the dive safety log must be made as soon as possible. For example, the signature of the diver in the dive safety log is an important check on whether a diver has returned to the boat. Accordingly, the signature needs to be made as soon as the diver has removed necessary gear and dried the diver’s hands.

The employer or self-employed person must keep the dive safety log for at least 1 year.

The dive safety log should also contain the information on the environmental conditions at the dive site, for example, surface conditions, currents, visibility and maximum depth.

During a dive, the log should be monitored so that missing diver situations are quickly identified. For example, if a 40 minute bottom time dive is planned and an accurate “time in”

is recorded, then a dive supervisor should be organising a response to a missing diver situation if the diver is absent for more than the bottom time, ascent time and stop time, that is 45 minutes.

## 3.2 Diving using mixed gas rebreathers

### 3.2.1 General

The employer/self-employed person should ensure that –

- (a) mixed gas rebreather diving does not take place unless a dive supervisor is present at the site
- (b) only a certificated mixed gas rebreather diver undertakes recreational diving using a mixed gas rebreather unless the diver is undertaking training for the purpose of certification as a mixed gas rebreather diver in accordance with this code
- (c) maximum dive depth does not exceed the depth where -
  - i. oxygen in the mixture being breathed at any time exceeds a partial pressure of 1.4 bar while diving and 1.6 bar whilst on a mandatory decompression stop
  - ii. nitrogen in the mixture being breathed at any time exceeds a partial pressure of 4.0 bar while diving
- (d) oxygen partial pressure exposure times are not exceeded
- (e) before a breathing mixture is used, the diver conducts a gas analysis to verify the O<sub>2</sub> content. The results should be recorded in the mixed gas rebreather dive safety log and on the cylinder.

**Mixed gas rebreathers should not be used for introductory experiences or resort dives in open water. Mixed gas rebreathers should be used only for divers in open water undergoing training for certification in mixed gas rebreather diving, or for divers who are already certificated to use a mixed gas rebreather.**

### 3.2.2 Qualifications and experience of a rebreather dive instructor - mixed gases

The qualifications of a diver and dive instructor are model specific to the type of rebreather being used. The advice listed below should be followed in addition to the manufacturers' recommendations.

An employer/self-employed person of a mixed gas rebreather dive instructor should ensure the mixed gas rebreather dive instructor –

- (a) is trained and certificated by a recreational technical diving training organisation to instruct in mixed gas rebreather diving
- (b) is a certificated EANx instructor
- (c) is qualified as a mixed gas rebreather diver for the model being used
- (d) has completed 50 dives using a mixed gas rebreather and 20 dives with the rebreather model being used for instruction
- (e) has successfully completed a rebreather instructor's course on the model being used.

### 3.2.3 Prerequisites for rebreather divers in training using mixed gas

The employer/self-employed person should ensure that before a trainee undertakes a course in recreational diving using a rebreather and mixed gas, that the trainee -

- (a) is certificated as an EANx scuba diver
- (b) has a minimum of 100 logged dives, 20 of which must be with EANx.

Before being granted certification, the trainee should complete at least 1 confined water session and 8 open water dives using the rebreather during training.

### 3.2.4 Equipment

The employer/self-employed person should ensure each diver is equipped with -

- (a) fins
- (b) mask
- (c) mixed gas rebreather unit
- (d) buoyancy control device
- (e) 2 submersible depth gauges and 2 submersible timing devices or 2 dive computers
- (f) cylinder pressure gauges connected to each cylinder used
- (g) a redundant gas breathing system
- (h) quick-release weight system, if appropriate
- (i) exposure protection, as appropriate to conditions
- (j) a knife or line cutter where there is a risk of entanglement
- (k) emergency signalling equipment, including –
  - i. a high visibility signalling device, for example, a safety sausage
  - ii. an audible signalling device, for example, a whistle
  - iii. a lighted signalling device, for example, a glow stick, if diving is to take place close to dusk or after dark
- (l) a torch, if applicable
- (m) a reel where direct ascent to the surface is not possible.

### 3.2.5 Pre-dive checks and emergency procedures

The employer/self-employed person should ensure the divers are advised about -

- (a) the dive plan
- (b) omitted decompression procedures
- (c) emergency procedures including -
  - i. loss of breathing gas procedures
  - ii. buddy separation procedures
  - iii. the location of and contact procedures for the nearest recompression facilities
- (d) checking the position and correct operation of their own equipment and that of their buddy's.

The employer/self-employed person should ensure manufacturers' recommendations and/or specifications are followed in respect of –

- (a) pre-dive checks and emergency procedures
- (b) carbon dioxide scrubbers.

### 3.2.6 Mixed gas rebreather dive safety log

Section 86 F of the Regulation “**Dive safety log**” requires that –

If the employer or self-employed person intends to conduct recreational technical diving, a dive safety log must be kept.

The dive safety log must contain the required information about –

- (a) each dive conducted by the employer or self-employed person; and
- (b) each dive done by the employer, self-employed person or the employer’s workers in conducting the dive.

The following is the required information for diving using a mixed gas rebreather –

- (a) the diver’s name
- (b) the name of any buddy with whom the dive is conducted
- (c) the dive supervisor’s name
- (d) the date and location of the dive
- (e) time in
- (f) time out
- (g) maximum depth of the dive
- (h) any incident, problem, discomfort or injury experienced or suffered by the diver
- (i) if the dive was done using a dive computer – the dive time
- (j) if the dive was done using dive tables – the repetitive dive group and either bottom time or dive time
- (k) if the repetitive dive group and surface interval result in a repetitive factor – the surface interval and the repetitive factor
- (l) oxygen and nitrogen content (if any) of the mixed gas
- (m) maximum operating depth for the mixed gas
- (n) minimum operating depth of the bottom mix.

On completion of a dive, a diver must verify his or her return from the dive by signing the dive safety log entry for the diver or if the log is kept electronically – by entering in the log entry the name of, and a unique identifier for, the diver.

The dive supervisor or someone else authorised by the employer or self-employed person must sign the dive safety log to verify that the log entry for each diver is complete and has been signed by the diver or if the log is kept electronically – by entering in the log entry the name of, and a unique identifier for, the diver.

The master of any boat used in connection with the diving, or someone authorised by the employer or self-employed person, must sign the dive safety log to verify that the log entry for each diver has been completed and signed as required by this section or if the log is kept electronically – by entering in the log entry the name of, and a unique identifier for, the diver.

Each entry and signature in the dive safety log must be made as soon as possible. For example, the signature of the diver in the dive safety log is an important check on whether a diver has returned to the boat. Accordingly, the signature needs to be made as soon as the diver has removed necessary gear and dried the diver’s hands.

The employer or self-employed person must keep the dive safety log for at least 1 year.

The dive safety log should also contain the information on the environmental conditions at the dive site, for example, surface conditions, currents, visibility and maximum depth.

During a dive, the log should be monitored so that missing diver situations are quickly

identified. For example, if a 40 minute bottom time dive is planned and an accurate “time in” is recorded, then a dive supervisor should be organising a response to a missing diver situation if the diver is absent for more than the bottom time, ascent time and stop time, that is 45 minutes.

### 3.3 Blending, testing, storage and use of mixed gases

The employer/self-employed person should ensure -

- (a) all gas blending is undertaken by a competent person in the blending of gases to produce underwater breathing mixtures
- (b) all equipment associated with the filling or use of mixed gases is to be used in accordance with manufacturers' recommendations
- (c) all cylinders to be used for the storage of mixed gas are clearly marked as to their contents
- (d) prior to using a mixed gas cylinder, the O<sub>2</sub> content in the cylinder is tested by the diver
- (e) after testing, a tag/decal is attached to the cylinder showing -
  - i. oxygen percentage
  - ii. calculated nitrogen percentage
  - iii. calculated helium or other gas percentage
  - iv. minimum operating depth of the gas mixture
  - v. maximum operating depth of the gas mixture
  - vi. cylinder serial number, in case the tag/decal is separated from the cylinder.

## Part 4 Decompression diving (using air or other gases)

This part of the code offers advice to employers, self-employed persons and workers in the recreational technical diving industry on how they can make decompression diving a healthier and safer activity.

This part outlines some control measures which can be used to manage specific risks related to decompression diving.

### 4.1 Diver surface support station when doing decompression diving

Where decompression diving is taking place the employer/self-employed person should ensure there is a diver surface support station and that the following equipment is available from this station –

- (a) emergency breathing gas positioned for use during decompression
- (b) a device for the purpose of controlling position and maintaining ascent rate during decompression, for example, an ascent line
- (c) a copy of each dive team's dive plan
- (d) copy of each diver's calculated gas consumption requirements for the dive, showing adequate gas supplies to safely complete the required dive profile without the use of the diver's redundant gas system.

The employer/self-employed person should ensure that at all times divers are in the water that there is on the surface –

- (a) a person trained and competent in the operation of all emergency equipment on the diver surface support station
- (b) a person who is fully aware of the dive plan for each dive team
- (c) if the station is a boat, a person capable of controlling the vessel.

The number of support personnel required should be determined during the dive plan risk assessment. Consideration should be given to all factors which influence the degree of risk, including the maximum number of divers in the water at any time, the prevailing conditions, the location and nature of the dive site and the level of experience of divers.

The employer/self-employed person should ensure that all divers undertaking decompression diving are equipped with an alternate ascent system and a redundant gas system.

### 4.2 Maximum exposures to decompression diving

The employer/self-employed person should ensure dives are planned so that divers are not exposed to –

- (a) oxygen in the mixture being breathed at any time in excess of a partial pressure of 1.6 bar
- (b) nitrogen in the mixture being breathed at any time in excess of a partial pressure of 5.0 bar while diving.

### 4.3 Prerequisites for divers doing decompression diving to depths of 40 metres or less on air

The employer/self-employed person should ensure that any diver undertaking decompression diving on air to depths of 40 metres or less has –

- (a) successfully completed a course in decompression diving; or
- (b) has 10 logged decompression dives.

If a diver cannot meet either of these requirements and still intends to do decompression diving, the diver should be accompanied on any decompression dive by a dive supervisor or dive instructor competent in decompression diving on air.

### 4.4 Prerequisites for divers doing decompression diving to depths over 40 metres on air

The employer/self-employed person should ensure that any diver undertaking decompression diving on air to depths over 40 metres has successfully completed a course in decompression diving.

## Part 5 Guidance notes – diving

These guidance notes offer information on certain important health and safety issues relating to diving. They should be read along with the information in this industry code of practice, and used in the development of risk management procedures at a workplace.

The issues covered in these guidance notes are –

- decompression illness
- nitrogen narcosis
- barotrauma
- panic.

### 5.1 Decompression illness

As a diver descends below the surface of the water, the increased pressure means nitrogen from the gas supply will be absorbed into body tissues. When a diver ascends, the surrounding pressure decreases, and the nitrogen previously absorbed begins to leave the body as the diver breathes out. As long as the nitrogen taken into the body is kept within reasonable limits, the diver should not be at risk of decompression illness. Decompression illness can result, however, when the nitrogen in the body is excessive to a diver's individual limits, and nitrogen which is not expelled from the body begins to form bubbles in the blood vessels and tissues when the diver ascends. These bubbles can cause tissue damage and block blood vessels, obstructing blood flow to vital organs.

Once these bubbles form, a decrease in pressure such as ascent in the water or travel over mountains or in aircraft will expand the bubbles.

Symptoms of decompression illness in divers include –

- (a) mental dullness
- (b) fatigue
- (c) pins and needles (prickling and itching)
- (d) pain in the joints and muscles
- (e) numbness
- (f) headache
- (g) weakness
- (h) dizziness and nausea.

Medical advice should always be sought if symptoms are displayed.

Decompression illness can arise after any diving even when diving has been carried out within the limits of standard decompression tables. Susceptibility to decompression illness varies among individuals, however, some factors which can contribute to the development of decompression illness include –

- (a) poor physical condition/fatigue
- (b) chronic injuries or recent bruises or strains
- (c) obesity – overweight people are at higher risk
- (d) age – older people are at higher risk
- (e) cold – diving in cold conditions make decompression illness more likely
- (f) dehydration
- (g) heavy physical exertion before, during or soon after a dive
- (h) drinking alcohol or taking certain drugs before or after a dive
- (i) prolonged hot showers after a dive

- (j) previous incidences of decompression illnesses
- (k) depth – generally the deeper the dive the greater the risk, although decompression illness has occurred in divers diving to depths of less than 10 metres
- (l) decompression diving
- (m) carrying out free or buoyant ascent training
- (n) multiple ascent diving
- (o) multiple dives over multiple days
- (p) prolonged dive times
- (q) carbon dioxide excess
- (r) increase in altitudes shortly after diving, for example, flying or travelling over mountains.

## 5.2 Nitrogen narcosis

Nitrogen narcosis can result from breathing nitrogen under pressure. It acts like a drug and affects individuals differently. Nitrogen narcosis affects reasoning, judgement, memory, perception, concentration and co-ordination. It may lead to over confidence, anxiety or panic. Survival instincts and responses may be suppressed. If the dive is uneventful, the narcotic effects of nitrogen narcosis may not be evident. A diver failing to follow instructions or the dive plan, or being inattentive to buoyancy, air supply or buddy signals may be suffering from nitrogen narcosis.

Diving on air at or beyond 30 metres significantly increases the risk of nitrogen narcosis. Nitrogen narcosis can develop when diving in shallower depths, but is less likely to be evident, that is, a diver may not be aware that he or she is affected by nitrogen narcosis and/or it may not be evident to an observer. Safe diving beyond 30 metres requires an awareness of the increasing risk of this condition and its symptoms, and the practices required to reduce the symptoms and the associated likelihood of an accident. Nitrogen narcosis is directly related to diving at depths and diminishes as a diver ascends to shallower water. If a diver begins to be affected by nitrogen narcosis, then immediate ascent to shallower depths, taking into account decompression requirements, is required.

Factors known to increase the effects of nitrogen narcosis include –

- (a) fatigue or heavy work
- (b) anxiety, inexperience or apprehension
- (c) the diver feeling cold
- (d) poor visibility
- (e) carbon dioxide excess
- (f) recent alcohol intake or use of sedative drugs including sea sickness medications or marijuana.

## 5.3 Barotrauma

Barotrauma is injury brought about because of pressure differences between air-containing cavities of the body and the environment. Examples of air-containing cavities at risk of barotrauma include the ears, sinuses, lungs and the face-mask cavity.

During descent in underwater diving the external pressure is greater than the pressure within air-containing cavities. For example, if a diver cannot or does not equalise the ears during descent, then a perforated eardrum can result.

When a diver ascends, the external pressure is less than the pressure within an air-containing cavity, for example, the lungs. If the diver does not exhale on ascent and/or makes a rapid ascent, the lungs will expand as the volume of gas increases. It can result in lung tissue being so overstretched that it tears at its weakest point with gas escaping

through this tear and entering surrounding tissues or the bloodstream. If the gas enters the bloodstream, it may lead to arterial gas embolism which can result in, for example, a stroke or other neurological condition.

As the greatest pressure changes occur near the surface, the diver is most at risk of barotrauma within the first 10 metres.

## 5.4 Panic

Studies have implicated panic as a contributor to many recreational diving deaths. As panic develops, anxiety increases and a diver reduces his or her capacity to think rationally and may focus on only one act or goal while forgetting about other important requirements. For instance, a panicky diver might focus on reaching the surface but forget to exhale during ascent.

Factors which can play a role in the development of panic include –

- (a) equipment problems such as low air and ill-fitting equipment
- (b) environmental hazards such as cold water, deep diving, marine animals and poor visibility
- (c) personal factors such as fatigue, medical or physical unfitness, seasickness, alcohol intake, inexperience, excessive general anxiety, phobias, diving accidents, dizziness or disorientation
- (d) inadequate instruction and training of divers.

Effective explanation and training in relation to all relevant aspects of diving can help minimise the likelihood of panic. Additionally, it is important for a diver to know his or her limitations and to stay within these. While the person displaying anxiety and lack of confidence may be readily noticed and can be more thoroughly trained, more carefully monitored, given more assistance or advised not to dive, also at risk is the overconfident diver who is out of touch with, or concealing his or her real capabilities and concerns.

## Part 6 General hazard areas – diving operations

There are some hazards which are, to greater or lesser degrees, present at all workplaces. This section covers 6 of these general hazards.

In the following general hazard areas of plant, noise, hazardous substances, manual tasks, confined spaces and workplace environment, examples only of control measures are given.

**The employer/self-employed person should carry out a risk assessment of his or her own workplace and workplace activities to ensure that the control measures he or she chooses are suitable for his or her workplace and the tasks being undertaken.**

### 6.1 Plant

Injuries which can result from the use of or exposure to plant include lacerations, amputations, fractures, crush injuries and bruising.

In the recreational technical diving industry, plant includes compressors, scuba tanks, regulators, hoses, buoyancy control devices, life jackets, masks, snorkels, fins, wet suits, tenders, motors, rubbish bins as well as any machinery and equipment on board vessels, such as cranes, inflatable dinghies, outboard motors, kitchen equipment and appliances.

### 6.1.1 Some control measures to prevent or minimise the risk of injury from plant

The employer/self-employed person should ensure –

- (a) plant is suitable for the work or activity being done, for example, life jackets are available in a range of sizes which ensure comfort for the wearer and in a colour that can be easily seen in the marine environment
- (b) plant is being used properly and safely
- (c) plant that has been modified has not created risks to people's health and safety
- (d) plant is serviced, maintained and tested according to manufacturers' instructions and appropriate records are kept of this servicing, maintenance and testing
- (e) operators are trained, and where required, hold current relevant certificates
- (f) workers and at risk visitors wear appropriate protective equipment if no other protection is available
- (g) adequate and appropriate guarding is installed to prevent people coming into contact with moving parts, for example, prop guards are attached to the motors of tenders and rescue vessels
- (h) health and safety information on plant from manufacturers, importers and suppliers is obtained when the plant is purchased, and is available at or near where the plant is used.

## 6.2 Noise

Excessive noise can result in hearing loss. It can also create other problems such as stress leading to tiredness, irritability and headache. It can cause dizziness, raise blood pressure and increase heart rate. Noise increases the risk of accidents by disguising sounds of approaching danger or warnings, and affects balance, concentration and communication among people.

Excessive noise is defined in 2 parts as noise in excess of the exposure standard, namely:

- (a) an 8 hour exposure of 85 dB(A) which refers to an average of the total sound energy of 85 decibels received over 8 hours; and
- (b) a peak value of 140 dB(lin) which represents the upper limit of 140 decibels to which a person may be exposed at any time. This level of noise can cause immediate hearing damage.

Generally speaking, if it is necessary to raise your voice to be heard by others who are less than a metre away, noise will most likely be a problem at your workplace. On a vessel, however, the wind factor, may also make voices hard to hear.

### 6.2.1 Some control measures to prevent or minimise the risk of exposure to noise

The employer/self-employed person should ensure –

- (a) noise emission data are obtained from suppliers and that suitable plant with the lowest noise level is selected
- (b) devices which will reduce noise, such as mufflers or specially designed mats under motors, are used where appropriate
- (c) noisy equipment is separated from people by enclosing it, for instance, in a sound-proofed area
- (d) regular maintenance on plant is carried out
- (e) work practices are arranged so people spend a limited time in a noisy environment
- (f) personal hearing protectors are provided. These should be supplied to people in the

area where noise is excessive and when other measures to reduce the risk of hearing loss are not suitable. The employer/self-employed person should provide training in the use of these protectors. When selecting hearing protectors, the employer/self-employed person should ensure they are appropriate to the wearers, the work environment and to the noise problem in the workplace.

- (g) areas where noise is excessive are signposted. These are areas that have noise levels above 85 dB(A) over an 8 hour period. These areas should be signposted as 'hearing protection areas' and the boundaries clearly defined. No person should enter a "hearing protection area" during normal operation, even for brief periods, unless appropriate personal hearing protectors are worn.

### 6.3 Hazardous substances

Exposure to hazardous substances can cause a variety of health problems ranging from skin irritation and chemical burns to serious poisoning.

Hazardous substances are used widely in industry and employers and self-employed persons need to be very sure before deciding their workplace does not have any.

Hazardous substances in the diving industry include:

- (a) acidic or caustic cleaning agents
- (b) chlorine
- (c) anhydrous ammonia (a refrigerant)
- (d) flammable substances such as fuels, oils, gases and lubricants.

#### 6.3.1 Some control measures to prevent or minimise the risk of exposure to hazardous substances

If hazardous substances are used at the workplace, the employer/self-employed person **must** –

- (a) keep a register which contains a list of all hazardous substances used at the workplace and the current Material Safety Data Sheet (MSDS) for each hazardous substance used. MSDSs can be obtained from chemical suppliers. Manufacturers, importers or suppliers of substances must show that the health and safety effects of the substance have been established and they must make this information available.
- (b) undertake a risk assessment as soon as possible after the substance is first used
- (c) ensure all hazardous substance containers are labelled so the contents can be readily identified and used correctly
- (d) make relevant information available to all persons who could be exposed to a hazardous substance. A copy of the MSDS must be kept close to where any hazardous substance is being used so a worker who may be exposed can easily refer to the MSDS.
- (e) train all workers who may be exposed to a hazardous substance in the safe use of that substance. The employer/self-employed person must keep records of this training.

The employer/self-employed person should also –

- (a) review the use of the substance and cease to use it if not essential, or replace it with a substance which is less hazardous
- (b) keep the work area well ventilated by opening doors and windows and/or using extraction ventilation systems so airborne contaminants are kept to a minimum
- (c) provide proper storage facilities for hazardous substances
- (d) have emergency planning arrangements in case an emergency involving a hazardous substance occurs

- (e) apply the precautions for use, and safe handling information from the relevant MSDS.

## 6.4 Manual tasks

Manual tasks can lead to strains, sprains and serious long-term injury and disability to various parts of the body including backs, shoulders, arms and hands.

Manual tasks are those activities requiring the use of force by a person to grasp, manipulate, strike, throw, carry, move (lift, lower, push, pull), hold or restrain an object, load or body part. This includes activities where people are handling loads, using handtools or working in the same position for long periods of time.

Manual tasks with potential risks in the diving industry include:

- (a) handling people by assisting divers out of the water
- (b) handling people by rescuing divers in difficulty
- (c) kitchen work/catering using handtools and handling heavy food stores
- (d) moving equipment such as oxygen cylinders and scuba tanks
- (e) working in awkward positions, particularly in small spaces such as engine rooms
- (f) manual handling carried out on unstable, moving surfaces or in adverse environmental conditions, for example, on a small inflatable.

### 6.4.1 Some control measures to prevent or minimise the risk of injury from high risk manual tasks

The employer/self-employed person should ensure –

- (a) mechanical handling equipment is used where possible, for example, tank trolleys, mobile gear crates, mobile belt loaders onto floating vessels, cranes on vessels for duck/dinghy and equipment transfers
- (b) tasks are varied or, where repetitive tasks are carried out for long periods, rest periods or tasks rotation are used to break-up any length of time spent on the repetitive activity, for example, split the filling of tanks with other tasks
- (c) items which are used frequently, are stored or shelved between knee and shoulder height, for example, stacking tanks on a boat in storage racking
- (d) the majority of tasks carried out by standing workers are at waist height and within easy reach
- (e) workplace layout is designed so twisting movements are kept to a minimum
- (f) adequate training in the preferred methods of manual handling are provided and supervision is available to workers
- (g) where mechanical aids and assistive devices cannot be used, team lifting can be used where workers are suitably selected and trained in the handling methods, for example team handling of inflatable duck/vessel at the waterline onshore.

## 6.5 Confined spaces

Confined spaces present a risk to health and safety whenever a person has to enter them. A person whose upper body or head is within a confined space is considered to have entered the confined space. Confined spaces potentially contain many hazards, which are often invisible and cannot be detected without special equipment. These hazards include:

- lack of oxygen
- toxic gases, vapours and fumes
- flammable or explosive gases, vapours and fumes
- mechanical equipment.

### 6.5.1 Some control measures to prevent or minimise the risk of injury from confined spaces

An employer/self-employed person **must** ensure all persons required to carry out work within or on a confined space are provided with training in -

- (a) the hazards associated with the confined space
- (b) risk assessment procedures
- (c) risk control measures
- (d) first aid and emergency and rescue procedures
- (e) selection, use, fit and maintenance of personal protective equipment.

Before a person enters the confined space to carry out work, the employer/self-employed person **must** –

- (a) ensure a competent person undertakes a risk assessment
- (b) issue an entry permit
- (c) isolate the confined space
- (d) ensure the confined space is tested and monitored for –
  - safe oxygen level
  - toxic gases, vapours and fumes
  - flammable or explosive gases, vapours and fumes
- (e) ensure that before a person enters a confined space, the space has a safe level of oxygen, atmospheric contaminants are reduced to a level below the relevant exposure standards, the space is free from extremes of temperature and the concentration of flammable contaminants is at a safe level
- (f) ensure persons entering the confined space wear suitable personal protective equipment, including supplied air respiratory equipment, where it is not possible to provide a safe oxygen level or reduce atmospheric contaminants to a safe level
- (g) ensure that where the risk assessment indicates a risk to health and safety, no-one enters the confined space unless a stand-by person is present outside the space
- (h) ensure that appropriate signs and protective barriers are erected to prevent entry of persons not involved in confined space work.

Once work in the confined space has been completed, the employer/self-employed person **must** ensure all persons have left the confined space before authorising the confined space to be returned to service.

## 6.6 Workplace environment

Workplace environment is a broad term and includes –

- (a) floor surfaces, building, fixtures, lighting and electrical fittings in your workplace, air quality and temperature, water temperature and surface conditions, and marine animals
- (b) general housekeeping at the workplace, for example, making sure that aisles and exits are not obstructed
- (c) an emergency plan so that people can respond quickly and effectively to any incident that happens in the workplace
- (d) other work environment issues such as sun and wind exposure, working at heights or in confined or diminished workspaces.

Given the range of risks which can be associated with the work environment, injuries or diseases can differ markedly. For instance, slips, trips and falls can result in sprains or fracture, while extremes of temperature can result in heat stress or hypothermia.

Environmental factors can also increase the risk of injury related to manual tasks in the diving industry. These factors include:

- (a) cold water temperature
- (b) wet surfaces while handling equipment
- (c) moving and unstable surfaces, for example, vessels
- (d) poorly lit engine rooms, pontoons.

**Risks can be controlled by using the hierarchy of controls on Step 3 Risk control measures in Part 7.**

**6.6.1** Some control measures to prevent or minimise the risk of injury from the workplace environment

- (a) elimination/substitution of the hazard, for example, replacing slippery flooring with non-slip flooring
- (b) engineering controls, for example, keeping the hazard and people apart by putting a locked door on a confined space
- (c) administrative controls such as adjusting the time and conditions of a person's exposure to the risk. For example, rotating tasks so people do not spend too long in hot or cold conditions
- (d) providing personal protective equipment when other ways of controlling risks cannot be used, for example, providing appropriate thermal protection for cold water dives.

## Part 7 Risk Management

Risk management plays an important role in the management of workplace health and safety. It is a logical and systematic approach which can result in a reduction in the incidence of injury and disease. The 5 steps to risk management are –

- Step 1                **Identify** hazards
- Step 2                **Assess** the risks
- Step 3                **Decide** on control measures to prevent or minimise the level of the risks
- Step 4                **Implement** control measures
- Step 5                **Monitor and review** the effectiveness of the control measures

A **hazard** is something with the potential to cause harm. A **risk** is the likelihood that death, injury or illness might result because of the hazard. For example, electricity is a hazard but the risk of electrocution may be small unless, for instance, installation and maintenance are not carried out properly, or electrical equipment has not been used properly.

### Step 1

#### Identify hazards

Methods to identify hazards include:

- (a) consultation with workers
- (b) observations and inspections of the work site using, for example, a hazard checklist
- (c) incident, accident and injury data
- (d) identifying the work processes
- (e) material safety data sheets and product labels
- (f) consultation with specialist practitioners, industry associations, unions and government bodies.

### Step 2

#### Assess the risks

Risk assessment is something we do all the time, not just at work. For example, crossing a street has an element of risk. When crossing a street that has little traffic, a person looks both ways, listens for traffic then crosses. If however, the street is very busy, a person might use a pedestrian crossing (a control measure).

On assessing the risks, the employer/self-employed person should consider the following –

- (a) the nature of the hazard, and associated risks
- (b) the hazard severity and health effects
- (c) duration and frequency of exposure to the hazard
- (d) the probability that an event will occur.

#### Risk can be thought of in everyday terms

1. There are risks to health and safety that are minor, and unlikely to occur. No further action is required other than maintaining the risks at that level.
2. There are risks that are minor but may occur frequently. The outcome may not be

serious but someone may be injured. Appropriate corrective action should be taken.

3. There are risks so great that alterations to working arrangements must occur as a matter of priority.

## Step 3

### Decide on control measures

Risk control measures (in order of preference) include

**Elimination/Substitution** which is a permanent solution and should be attempted in the first instance. The hazard is either eliminated altogether or substituted by one that presents a lower risk. This could involve the elimination of a hazardous substance or the substitution of a toxic substance with a less toxic substance.

**Engineering controls** which involve some change to the work environment or work process which places a barrier, or interrupts the transmission path, between the person and the hazard. Examples of engineering controls are prop guards over propellers or a locked door on an engine room.

**Administrative controls** reduce or eliminate exposure to a hazard by adherence to procedures or instructions. Such controls may include reducing the exposure to a hazard by job rotation, advice and instruction to divers and a person count.

**Personal protective equipment** is worn by people as a barrier between themselves and the hazard. The success of the control is dependent on the protective equipment actually being worn or worn correctly, as well as being chosen correctly. Masks and snorkels are examples of personal protective equipment.

Attempts should be made to select control measures from the top of the hierarchy, for example, if possible, choose 1 before 2 or 2 before 3. In some instances, it may be necessary to use a combination of control measures to achieve the desired level of risk control. The environment in which diving takes place means, however, a heavy reliance on personal protective equipment.

The control measures selected should:

- adequately control exposure to the risk;
- not create another hazard; and
- allow the person to do the work without undue discomfort or distress.

## Step 4

### Implement control measures

This step involves putting selected control measures in place. This could involve:

- (a) developing work procedures to ensure the new control measures are effective, for example, defining responsibilities of management, supervisors and workers
- (b) clearly communicating information about the new control measures and the reasons for the changes to workers and other persons at the workplace
- (c) providing training and instruction for workers, supervisors and other persons in relation to the new control measures
- (d) providing adequate supervision to verify that the new control measures are being used correctly

- (e) including provision in work procedures about the maintenance of the control measures to ensure the ongoing effectiveness of the new control measures.

## Step 5

### Monitor and review

The final step in the risk management process is to monitor and review the effectiveness of the control measures. In doing so, the employer/self-employed person should determine whether—

- (a) the chosen control measures have been implemented as planned
- (b) the chosen control measures are working
- (c) the new control measures have created new problems or worsened existing problems.

The employer/self-employed person should also set a date to review the entire risk management process.