Office of Industrial Relations
Workplace Health and Safety Queensland

Occupational diving work

Code of Practice 2005

Queensland Government

This Queensland code of practice was preserved as a code of practice under section 284 of the *Work Health and Safety Act 2011*.

This code was varied by the Minister for Education and Industrial Relations on 27 November 2011 and published in the Queensland Government Gazette on 2 December 2011.

This preserved code commencesd on 1 January 2012.

This code was varied by the Minister for Education and Industrial Relations on 1 July 2018.

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Introduction

The *Occupational diving work Code of Practice* is an approved code of practice under section 274 of the *Work Health and Safety Act 2011* (the WHS Act).

An approved code of practice is a practical guide to achieving the standards of health, safety and welfare required under the WHS Act and the *Work Health and Safety Regulation 20*11 (the WHS Regulation).

From 1 July 2018 duty holders are required to comply either with an approved code of practice under the WHS Act or follow another method, such as a technical or an industry standard, if it provides an equivalent or higher standard of work health and safety to the standard required in the code.

A code of practice applies to anyone who has a duty of care in the circumstances described in the code. In most cases, following an approved code of practice would achieve compliance with the health and safety duties in the WHS Act, in relation to the subject matter of the code. Like regulations, codes of practice deal with particular issues and do not cover all hazards or risks which may arise. The health and safety duties require duty holders to consider all risks associated with work, not only those for which regulations and codes of practice exist.

Codes of practice are admissible in court proceedings under the WHS Act and WHS Regulation. Courts may regard a code of practice as evidence of what is known about a hazard, risk or control and may rely on the code in determining what is reasonably practicable in the circumstances to which the code relates.

An inspector may refer to an approved code of practice when issuing an improvement or prohibition notice. This may include issuing an improvement notice for failure to comply with a code of practice where equivalent or higher standards of work health and safety have not been demonstrated.

How is the code organised

In providing guidance, the word ‘should’ is used in this code to indicate a recommended course of action, while ‘may’ is used to indicate an optional course of action.

This code also includes various references to provisions of the WHS Act and WHS Regulation which set out the legal requirements. These references are not exhaustive. The words ‘must’, ‘requires’ or ‘mandatory’ indicate that a legal requirement exists and must be complied with.

Who has duties?

A **person conducting a business or undertaking** has the primary duty under the WHS Act to ensure, as far as reasonably practicable, that workers and other persons are not exposed to health and safety risks arising from the business or undertaking.

Officers, such as company directors, have a duty to exercise due diligence to ensure that the business or undertaking complies with the WHS Act and WHS Regulation. This includes taking reasonable steps to ensure that the business or undertaking has and uses appropriate resources and processes to provide and maintain a safe work environment.

Workers have a duty to take reasonable care for their own health and safety and that they do not adversely affect the health and safety of other persons. Workers must comply with any reasonable instruction and cooperate with any reasonable policy or procedure relating to health and safety at the workplace.

Consulting workers
Consultation involves sharing of information, giving workers a reasonable opportunity to express views and taking those views into account before making decisions on health and safety matters.

The Act requires that you consult, so far as is reasonably practicable, with workers who carry out work for you who are (or are likely to be) directly affected by a work health and safety matter.

If the workers are represented by a health and safety representative, the consultation must involve that representative.

You must consult your workers when proposing any changes to the work that may affect their health and safety.

Consulting, cooperating and coordinating activities with other duty holders
The Act requires that you consult, cooperate and coordinate activities with all other persons who have a work health or safety duty in relation to the same matter, so far as is reasonably practicable.

Sometimes you may share responsibility for a health and safety matter with other business operators who are involved in the same activities or who share the same workplace. In these situations, you should exchange information to find out who is doing what and work together in a cooperative and coordinated way so that all risks are eliminated or minimised as far as reasonably practicable.

Further guidance on consultation is in the *Work health and safety consultation, co-ordination and co-operation Code of Practice*.

1. Risk from certain medical conditions

The *Work Health and Safety Regulation 2011* (WHS Regulation) requires a person conducting a business or undertaking (PCBU), or someone on their behalf, to ensure a worker has a current certificate of medical fitness to dive before carrying out general diving work. The PCBU must ensure any work carried out by the worker is within any limits stated in the certificate. A PCBU doing underwater diving work must have a current certificate of medical fitness to dive and any work carried out by the person must be within any limits stated in the certificate.

PCBUs who perform higher risk diving profiles should ensure that the diving medical practitioner is aware of these profiles. The dive medical practitioner may recommend higher levels of screening in these cases.

Examples of higher risk diving profiles include profiles that routinely involve:
- decompression stop diving
- multiple ascents
- dives below 30m
- decompression using gases other than air.

PCBUs should request that workers advise them of any conditions which are contraindications to diving.PCBUs and workers with these conditions should not dive. Examples of contraindicated conditions are colds, hay fever, ear infections and hangovers.

2. Competence to perform occupational diving work and undertake the risk assessment process

The WHS Regulation defines different ways in which competence must be demonstrated for a diver to undertake occupational diving work and to undertake the risk assessment process.

In determining the most appropriate competency option, the PCBU should review the occupational diving work and ensure that the competency option selected is relevant to the work. Issues to consider should include:

- the diving environment
- the diving equipment and breathing gas to be used
- the decompression schedule to be used
- the tasks to be undertaken
- any tools to be used
- any other hazards associated with the task.

3. Proof of competency for underwater diving work

The WHS Regulation requires proof of competency for all occupational diving work.

4. Risk assessment process to be carried out for all occupational diving

The WHS Regulation requires that a risk assessment process be undertaken by a competent person prior to undertaking occupational diving work.

The factors mentioned in AS/NZS 2299, part 1, appendix D 3.4 form a list of hazards that may or may not be present. Each factor should be considered, and an assessment made of the risk. The list is not exclusive and all other hazards not otherwise identified should be considered in the risk assessment.

The process of risk assessment is described in more detail in the *How to manage work health and safety Risks Code of Practice*.

The factors mentioned in AS/NZS 2299, part 1, Appendix D paragraph 3.4 are:

- **Environmental conditions:** certain parameters should be examined for their effects on the dive from the perspective of operations both on the surface and below, including, but not limited to:
  - strength and direction of wind and the degree of influence that it may have on the diving operation and emergency response capability
  - current and tide
  - visibility
  - entrapment hazards
  - depth at worksite
  - water temperature
  - time of day
  - underwater terrain
  - atmospheric temperature and humidity

  - contaminants
  - isolation of the dive site.
- **Task related factors:** the complexity of the diving task or the presence of a component which is non-routine in nature may increase the level of risk associated with a diving operation.
- **Hyperbaric/physiological factors:** hyperbaric and physiological factors include:
  - frequency of diving, including repetitive diving, multi-day diving
  - depth of dive
  - duration of dive
  - breathing gas
  - exertion required to reach dive site or conduct task
  - excessive noise
  - immediate pre-dive fitness (prior dives, prior physical exertion, fatigue, recent illness)
  - altitude exposure.
- **Associated activity factors:** the effects of associated activity factors should be assessed. These associated activities include:
  - manual handling
  - boat handling
  - dive platforms
  - crane operation
  - rigging.
- **Other hazards:** presence of other hazards such as the following should be taken into account:
  - dangerous marine animals
  - shipping movements
  - water inlets
  - hazards peculiar to the dive locations
  - use or presence of hazardous chemicals, biological pollutants or explosives.
- **Emergency response factors:** there should be an assessment of what would be required in case of an emergency. The assessment should include consideration of:
  - the location and availability of appropriate emergency systems
  - emergency response procedures.

Once the risks have been assessed, the competent person should decide on and implement control measures to prevent or minimise the level of exposure to the risks. In deciding on the control measures, the hierarchy of control measures mentioned in AS/NZS 2299, part 1, Appendix D paragraph 4.2 should be taken into account.

This Appendix states:
Appropriate control measures should be applied to risks, using the hierarchy of controls in the following order:

- **Elimination:** where the level of risk cannot be controlled to an acceptable level, no diving should take place.
- **Substitution**: where the risk can be controlled by performing the task using alternative methods of diving, consideration should be given to using these alternative methods.
- **Design**: plant and procedures should be designed to minimize risk.
- **Isolation:** persons should be isolated from the identified hazards.
- **Administrative:** every dive plan should seek to minimize the degree and duration of the diver's exposure to risk.

Note: Almost every aspect of dive planning falls into this administrative category.

Administrative controls include:

  - training, supervision, experience and selection of employees, including staffing levels

  - provision of an appropriate diving operations manual
  - organisation and planning before, during and after the dive
  - selection of appropriate plant
  - selection of the appropriate form and level of communication.
- **Personal protective equipment:** appropriately designed and sized personal protective equipment should be provided, used and maintained. The limitations of all equipment used should be identified as part of the risk assessment process. Information from manufacturers and from records of prior experience should be used to identify limitations.

Examples of appropriate standards that describe control measures in detail include:
- AS/NZS 2299.1 Occupational diving operations - Standard operational practice
- AS/NZS 2299.2 Occupational diving operations - Scientific diving
- AS 3848.2 Filling of portable gas cylinders - Filling of portable cylinders for self-contained underwater breathing apparatus (SCUBA) and non-underwater self-contained breathing apparatus (SCBA) - Safe procedures .

The following are specific controls measures for certain risk areas associated with occupational diving, which should be adopted and followed by PCBUs engaged in occupational diving work.

4.1 Risk to divers from vessels that are underway

Divers associated with vessels that are underway are at risk, both of injury and damaging their equipment. This risk is highest for divers using surface supply breathing apparatus. A PCBU should prevent or minimise this risk by adopting appropriate control measures.

Examples of control measures are:
- propeller guards for relevant vessels
- ensuring the master and relevant crew of any vessel are appropriately qualified and experienced
- ensuring divers are equipped with appropriate emergency breathing supplies and knives
- using buoys or markers to separate diving activity from vessel activity
- using appropriately sized and displayed flags to indicate diving activity and appropriate lights at night (Note: this control measure is only effective where the flag or lights are displayed where diving is taking place, not just in the vicinity)
- ensuring relevant surface workers maintain a watch for approaching vessels and are part of a communications system to allow contact to be made with the approaching vessel in a timely manner

- adopting systems of work to minimise or eliminate the chances of these injuries occurring.

4.2 Equipment required for occupational diving

PCBUs for occupational diving work should use appropriate standards in the selection and use of equipment for occupational diving.

An appropriate standard for equipment for occupational diving work should be selected and used. Appropriate standards for other occupational diving work are:

- AS/NZS 2299.1 Occupational diving operations - Standard operational practice
- AS/NZS 2299.2 Occupational diving operations - Scientific diving
- *Pearl Diving Industry Code of Practice* - Pearl Producers Association of WA.

4.3 Breathing gas quality

PCBUs for occupational diving work should use appropriate standards to ensure breathing gas quality for occupational diving.

The appropriate standard for breathing gas quality for occupational diving work is AS/NZS 2299 Occupational Diving Operations - Part 1 Standard Operational Practice.

4.4 Decompression management

PCBUs for occupational diving work should use appropriate standards to manage the risk of decompression illness for occupational diving.
An appropriate standard to manage the risk of decompression illness for occupational diving work should be selected and used consistently and conservatively. Appropriate standards for other occupational diving work are:

- AS/NZS 2299.1 Occupational diving operations - Standard operational practice
- AS/NZS 2299.2 Occupational diving operations - Scientific diving
- where the level of risk is similar to that of recreational diving or recreational technical diving, then any dive tables approved by a scuba training organisation
- any dive computer used in accordance with the manufacturers instructions.

PCBUs for occupational diving work should ensure that factors that may predispose a diver to developing decompression illness are minimised. The factors are:

- severe exercise during or after decompression
- poor physical fitness and obesity
- water temperature, for example cold water and hot showers
- dehydration
- increased carbon dioxide pressures
- alcohol intake
- physical injury
- dive profiles
- rapid and multiple ascents
- repetitive and multi day diving
- altitude exposure.

4.5 Emergency plans

PCBUs should ensure dive sites have a written emergency plan to deal with emergency situations. These emergency plans should be made readily available to all relevant workers who should be familiar with these plans. Situations covered by written emergency plans should include:

- first aid
- rescue
- evacuation, including evacuation to the nearest recompression facility
- missing persons.

4.6 Rescue of a diver

PCBUs 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:

- Size, type and location of the dive site.
- Appropriateness of rescue procedures to the dive site.
- Adequacy of the communication system so that clear messages and information can be relayed to the appropriate personnel, with the minimum of delay.
- Location of 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.
- 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.

4.7 First aid and oxygen provision

Persons conducting a business or undertaking should ensure:

- A first aid kit is 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, distance from emergency services and the nature and type of underwater diving which is being undertaken.
- A person on the surface at the dive site should hold current training in diving first aid.
- An oxygen system capable of providing a spontaneously breathing person with an inspired oxygen concentration of as near as possible to 100% is available at the dive site. The equipment should also facilitate oxygen enriched artificial ventilation of a non-breathing person. The person/s administering the oxygen should have received training in the correct use of the system.
- 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.
- Sufficient oxygen is available to supply the injured person, taking into account the location of the dive site and access to medical facilities.

5. Administration of the risk assessment process

The WHS Regulation requires certain administration of the risk assessment process (the process). The process must be carried out each time that there is a significant change to the occupational diving work, certain records are to be kept, some training is to be undertaken and the process is to be monitored and reviewed.

The PCBU should ensure that there is adequate supervision to ensure control measures are implemented and kept in place.

6. Training of workers about the risk assessment process

All relevant workers, including non-divers associated with the occupational diving such as vessel masters, should understand the control measures decided upon before diving commences.

Developing documented work procedures that incorporate the control measures will assist in this process. This should take the form of an appropriate operations manual. However separate work procedures may be needed for specific tasks, equipment or conditions.

AS/NZS 2299.1 Appendix E provides advice on the structure of a diving operations manual.

To assist the understanding of workers, a system of training should be developed.
For occupational diving, a training program should include:

- induction training for new workers
- site and/or task specific training (a dive site brief to reinforce key risks and control measures)
- ongoing review and training (to assess and maintain worker's understanding).

The nature of occupational diving work lends itself to practical as well as theoretical training, for example rescue drills.

Appropriate records should be made of training that includes the date, the training undertaken, the trainer and trainee's names.

7. Dive safety logs

The WHS Regulation requires that certain records be kept of the diving undertaken. These records assist in decompression management and provide a tool to monitor and review the occupational diving work.

8. Diver's log

Occupational divers should complete a divers log for their own records. The divers log should include:

- date of dive
- operation number of the dive, that is sequential numbering of each of the dives for any one day
- location and nature of dive site, for example boat or shore diving
- environmental conditions at the dive site
- time in
- time out
- maximum depth of the dive
- bottom time
- the decompression tables followed by the diver
- any emergency or incident of special note which occurred during the dive, for example failure of diving equipment or emergency decompression
- any discomfort or injury suffered by the diver
- depth and duration of safety stop.

9. High risk diving work

A PCBU at a workplace where high risk diving work is carried out must ensure that the following are in accordance with AS/NZS 2299.1 (Occupational diving operations—Standard operational practice)—
(a) the fitness of persons carrying out the work
(b) the competence of persons carrying out the work
(c) the carrying out of the work.

A person must not carry out high risk diving work unless the person has the qualifications, knowledge, skills and experience required by AS/NZS 2299.1 (Occupational diving operations—Standard operational practice) for work of the kind to be carried out by the person.
high risk diving work means work—
(a) carried out in or under water or any other liquid while breathing compressed gas; and
(b) involving one or more of the following—
    (i) construction work
    (ii) testing, maintenance or repair work of a minor nature carried out in connection with a structure
    (iii) inspection work carried out in order to determine whether or not work described in subparagraph (i) or (ii) is necessary
    (iv) the recovery or salvage of a large structure or large item of plant for commercial purposes

    but does not include minor work carried out in the sea or the waters of a bay or inlet or a marina that involves cleaning, inspecting, maintaining or searching for a vessel or mooring.

Appendix 1: Dictionary

Bottom time: The time between a diver leaving the surface at the start of a dive and starting the final ascent.

Dive time: The time between a diver leaving the surface at the start of a dive and surfacing at the end of the dive.

Diving first aid: A current qualification received for training in:

- first aid and emergency oxygen administration to injured divers
- training in diving accident management
- field clinical assessment.

Repetitive dive group/pressure group means a letter of the alphabet, given by dive tables, that represents an estimate of the amount of residual nitrogen in a diver's tissues immediately on surfacing at the end of a dive.

Repetitive factor/pressure group at end of surface interval: A letter of the alphabet, given by dive tables, that represents an estimate of the amount of residual nitrogen in a diver's tissues as determined by the repetitive dive group and the surface interval.

Residual nitrogen: Nitrogen in excess of the amount normally present in a person's tissues that is dissolved in the person's tissues.

Surface interval: The time a diver spends at the surface between dives.

Time in: The time a diver leaves the surface at the start of a dive.

Time out: The time a diver surfaces at the end of a dive.