
Part 31 Diving Operations

Highlights

- Rather than specify detailed procedural requirements in this Part, section 424 requires employers to meet the requirements of CSA Standard Z275.2-04, *Occupational Safety Code for Diving Operations*, to ensure that diving operations are performed safely.
- Section 424 requires that divers meet the minimum requirements of CSA Standard Z275.4.02, *Competency for Diving Operations*.
- Section 437 amends CSA Standard Z275.2-04 to provide divers with an added level of safety by requiring that the intake mechanism of a pipe, tunnel or duct be locked out. Stopping the flow associated with the intake is by itself insufficient.

Requirements

Section 423 Application

This Part applies to commercial diving performed by workers who are diving at a work site. It does not apply to sport or recreational diving or to a person instructing others in sport or recreational diving.

Commercial diving involves a wide range of activities. Divers are exposed not only to the possibility of drowning, but also to a variety of occupational health and safety hazards such as respiratory and circulatory risks, hypothermia, low visibility and physical injury from the operation of heavy equipment under water.

The type of dive, its duration, the frequency of diving and the type of work being performed increase the already high risk of this strenuous work. Additional hazards are also associated with the actual work of underwater cutting and welding, materials handling, hull scrubbing and other types of work involving the use of hand and power tools.

Section 424 Employer responsibilities

To ensure that commercial diving operations are run safely, employers must meet the requirements of the listed CSA standards. In combination, these three standards establish the requirements for hyperbaric facilities required in the event that a diver requires decompression, safe work practices to be used during operations, and diver competency requirements.

Hyperbaric facilities

CSA Standard CAN/CSA Z275.1-93 (R2004), *Hyperbaric Facilities*, sets requirements for the design, construction, maintenance and testing of hyperbaric chambers. The primary function of these chambers is to be able to subject humans to pressure environments exceeding 1 atmosphere absolute, such as those required in diving operations, work under compressed-air conditions, medical treatment, training and research. The types of chambers included in the Standard are the transportable, evacuation, monoplace and submersible chambers.

A submersible compression chamber is a chamber that is intended to be submerged and is designed to transport a person at atmospheric pressure, or divers at pressures greater than atmospheric pressure, from the surface to an underwater work site and back. This type of chamber includes the compression chamber of a diving submersible.

A lock-out submersible is a self-propelled submersible fitted with a submersible compression chamber from which a diving operation can be carried out and that has a separate 1 atmosphere chamber from which the submersible is operated.

Safety code for diving operations

Commercial diving operations must meet the requirements of CSA Standard Z275.2-04, *Occupational Safety Code for Diving Operations*. This standard applies to occupational diving operations conducted in connection with all types of work and employment, and describes the requirements for occupational safety. The standard addresses equipment requirements for

- (a) SCUBA diving systems,
- (b) surface-supply diving systems,
- (c) deep-diving systems, and
- (d) diving in contaminated environments.

The standard specifies requirements for

- (a) medical certificates and medical examinations,
- (b) diver logbooks,
- (c) dive procedures,
- (d) emergency services and contingency planning,
- (e) breathing mixtures and their purity,
- (f) decompression procedures and tables,
- (g) diving equipment,
- (h) crew sizes, and
- (i) diving in contaminated environments.

Diver competency

Each occupational diver must meet the requirements of CSA Standard Z275.4-02, *Competency Standard for Diving Operations*. Competency documents must be available at the dive site for inspection by an officer. Sport diving competency documents alone are not acceptable for commercial diving purposes. In the case of “restricted scuba diving”, a sport diving certificate is a prerequisite, supplemented with significant theoretical and practical training.

The CSA Standard applies to occupational diving operations conducted in connection with all types of work and employment, and describes the requirements for minimal competency levels for all personnel directly associated with the techniques of diving identified in the Standard.

The *OHS Code* requires all workers to be competent to perform the work assigned to them. Divers must be competent in both the theory and use of the type of diving equipment they use. The Standard provides diver training facilities and the diving industry with a uniform minimum level of training course content necessary for the various levels of diver techniques.

The Standard addresses competency requirements for the following:

- (a) occupational (open-circuit) SCUBA diving;
- (b) surface-supplied diving
 - (i) air — both restricted and unrestricted surface-supplied; and
 - (ii) mixed gas;
- (c) deep diving
 - (i) bell techniques (bell),
 - (ii) saturation techniques (SAT), and
 - (iii) atmospheric diving system techniques (ADS); and
- (d) diving and hyperbaric physicians.

The Standard addresses competency requirements for the following personnel associated with the diving techniques listed above:

- (a) divers/pilots;
- (b) tenders;
- (c) diving supervisors;
- (d) hyperbaric chamber operators;
- (e) hyperbaric life-support technicians (LST) and certified hyperbaric technicians (CHT); and
- (f) medical physicians.

The employer is responsible for ensuring that divers meet the requirements of the Standard. To do this, an occupational diver must be assessed by the employer as meeting the minimum requirements of CSA Standard Z275.4-02 and is therefore competent to dive at a work site.

In cases where the employer is unable to make the assessment of worker competency, a diver would be considered to meet the requirements if the diver were to

- (a) possesses a valid certificate issued by the Diver Certification Board of Canada (DCBC) (an example of the certificate appears on the DCBC Web site). DCBC is a federally incorporated not-for-profit body that was set up to certify commercial divers and dive supervisors. Divers and supervisors must demonstrate that they have sufficient training and experience to enable them to meet the competency requirements of the appropriate clauses of the CSA Standard;
- (b) possesses a valid graduation diploma or certificate from one of the commercial diver training schools accredited by DCBC. A list of accredited training schools, and other information related to diver certification can be found at the DCBC Web site at: www.divercertification.com. If the diver cannot demonstrate proof of successfully completing an accredited diver training course, but has many years of diving experience and personal log books with records of commercial dives that are stamped and signed by the dive supervisors, the diver can attend an assessment course at one of the diver training schools accredited by DCBC. The assessment allows the diver to demonstrate his or her competency at the level described in CSA Standard Z275.4-02, *Competency Standard for Diving Operations*. If the diver can demonstrate the required competency, the assessment organization may recommend to DCBC that a diver certification certificate be issued to the diver. If the diver lacks competency in any area, the diver may be trained in those competencies;

- (c) possess a valid diving certificate issued by the National Energy Board (NEB) – see www.neb-one.gc.ca/safety/index_e.htm#DivingCertification;
- (d) possess a valid diving certificate issued by the Association of Diving Contractors International – see www.adc-int.org/; or
- (e) possess a valid diving certificate issued by the International Marine Contractors Association – see www.imca-int.com/core/imca.

Commentary regarding “restricted scuba diving” activities

“Restricted scuba diving” refers to diving activities involving the use of scuba gear to a maximum depth of 20 metres. Workplace Health and Safety regularly receives inquiries about the qualifications a scuba diver must possess in order to perform activities such as:

- (a) minor routine cleaning and maintenance using hand tools (and a limited range of power tools) in pools of water to a maximum depth of 20 metres;
- (b) entering large volume water holding tanks to display animals held in those tanks or to clean out waste materials produced by those animals; and
- (c) entering bodies of water on golf courses or similar facilities to retrieve golf balls or other items.

Section 424 of the OHS Code references CSA Standard Z275.2-04, *Occupational Safety Code for Diving Operations* and CSA Standard Z275.4-02, *Competency Standard for Diving Operations*. The requirements of these diving standards must be met unless the employer is granted a written “acceptance” from Workplace Health and Safety to deviate from the stated requirements. When applying CSA Standard Z275.2-04 to the work activities described above, the following requirements within the standard apply:

- (a) divers must meet the requirements for regular medical examinations by a qualified hyperbaric physician as described in Clause 3.2.1 Medical qualification; and
- (b) divers must have the skills training required by Clause 3.2.2 Training qualifications. This means compliance with the appropriate portions of CSA Standard Z275.4-02, *Competency Standard for Diving Operations*. CSA Standard Z275.4-02 also includes competency requirements for those workers functioning as scuba tender and scuba supervisor.

Based on the work activities described above, divers doing this work are classified as “restricted scuba divers”. According to Clause 4.1.2 of CSA Standard Z275.4-02, a restricted scuba diver must have the following prerequisites:

- (a) a recreational scuba diving certification or equivalent — a certificate issued by NAUI, PADI or similar organization is sufficient;
- (b) commercial diving medical certificate; and
- (c) a minimum of 10 hours bottom time with a minimum of 20 logged dives.

Having met these prerequisites, candidates can then undertake to meet the additional restricted scuba diver requirements of Clause 4.4 of the Standard, Competency Elements for Restricted SCUBA Divers. This training can be done by an external agency or by someone within the employer’s organization who has the skills necessary to competently teach the divers and evaluate their performance. To assist persons delivering this material, CSA has issued a companion standard that describes the teaching objectives and course curricula in greater detail. This information can be found in CSA Standard Z275.5-05, *Occupational diver training*.

In reviewing CSA Standard Z275.2-04, *Occupational Safety Code for Diving Operations*, additional requirements apply. The following clauses within the standard must be met:

- (a) 3.3 Diving records;
- (b) 3.4 General dive procedures i.e. dive plan, presence of dive supervisor and standby diver, etc.;
- (c) 3.5 Diving hazards i.e. includes approaches to intakes and exhausts;
- (d) 3.6 Emergency services and contingency planning;
- (e) 3.7 Breathing mixtures;
- (f) 3.8 Purity of breathing mixtures;
- (g) 5 General equipment requirements; and
- (h) 6 SCUBA diving.

In essence, employers can take divers with recreational diving certificates and train them up to the level expected of an occupational diver performing restricted scuba diving activities.

Physician qualifications

Commercial divers need to anticipate the progression of natural diseases, detect any long-term consequences of diving and ensure that they are capable of safely performing their work. A physician, knowledgeable and competent in dive medicine, must regularly assess a diver as fit for work.

CSA Standard Z275.4-02, *Competency Standard for Diving Operations*, specifies the minimum competency requirement for physicians offering services related to diving i.e. hyperbaric medicine. A general practitioner or specialist is not qualified to issue a diver's medical certificate unless the physician has received additional training in hyperbaric medicine as described below.

The CSA Standard divides competency in hyperbaric medicine into three broad categories as follows:

Level 1 — a physician with basic training in diving medicine who is capable of screening workers for exposure to pressure and advising on the management of pressure-related accidents. To be certified at this level, physicians must be able to demonstrate that they

- (a) are in possession of a license to practice in Alberta,
- (b) have completed a basic training course in diving medicine,
- (c) have an effective working knowledge of the physical laws affecting the diver and the underwater operation,
- (d) have an understanding of the interaction that occurs between these physical laws and the diver's physiology and on the implications of this interaction for the diver,
- (e) have a sufficient awareness of the pathological conditions that can arise as a consequence of exposure to pressure,
- (f) have the ability to perform a competent physical evaluation of diving candidates, divers, and caisson workers,
- (g) are familiar with the management steps to be followed in the event of an accident or other adverse condition arising as a consequence of diving operations, and
- (h) are knowledgeable with respect to the appropriate steps to be taken in the initial investigation of any diving incidents, accidents, or fatalities, including but not limited to the appropriate autopsy protocol to be followed in the event of death.

Level 2 — a physician with advanced training in diving medicine who is capable of all the activities of a Level 1 physician and additionally is able to manage all aspects of pressure-related accidents, including entering the chamber to attend the injured worker.

Level 2 physicians must

- (a) meet all requirements for Level 1 physicians,
- (b) be familiar with the general principles of management for all forms of decompression illness, including the various tables and the appropriate application,

- (c) be sufficiently physically fit to participate in chamber diving operations. (They are not required to meet the physical fitness standard where they are able to delegate to other qualified personnel all medical acts that would require exposure to elevated pressure),
- (d) have completed training with regard to the safe operation of hyperbaric facilities, and be familiar with CSA Standard Z275.1-93 (R2004), *Hyperbaric Facilities*, and
- (e) have sufficient practical experience with any chamber systems in use to ensure appropriate application of CSA Standard Z275.1.

Level 3 — a physician who has advanced training in diving medicine and has practical experience with management of diving-related illness and injury such that he or she is thoroughly familiar with all aspects and hazards of pressure and underwater exposures and can manage any pressure-related accident, including saturation and long-term management.

Level 3 physicians must

- (a) meet all requirements for Level 1 and Level 2 physicians,
- (b) have additional training and/or experience in the management of pressure-related accidents, including the use of saturation methods and long-term follow-up,
- (c) be thoroughly familiar with all aspects and hazards of pressure and underwater environments, and
- (d) have an understanding of the various standards applicable to the safe conduct of the diving operations underway and of their application.

Section 437 Intakes, pipes and tunnels

This section amends the referenced CSA standard, providing the diver with an added level of safety by requiring that the intake mechanism of a pipe, tunnel, duct or similar mechanism be locked out. Stopping the flow associated with the intake is by itself insufficient – someone could inadvertently turn on a pump or motor and re-establish the flow, exposing a diver to a preventable life-threatening hazard. The amendment prohibits work to proceed unless the flow is stopped.