



Environment and Labour
OCCUPATIONAL HEALTH AND SAFETY DIVISION

A GUIDE TO THE

**OCCUPATIONAL DIVING
REGULATIONS**

FOR THE

SEAFOOD HARVESTING INDUSTRY

A GUIDE TO THE OCCUPATIONAL DIVING REGULATIONS

The information contained in this guide provides readers with the basic requirements of the Nova Scotia *Occupational Diving Regulations* as they relate to the seafood harvesting industry. The seafood harvesting industry includes sea urchin harvesting and aquaculture operations.

For specific or detailed requirements, the reader should review the *Occupational Diving Regulations*. The Regulations are available at www.gov.ns.ca/enla/ohs/publicat.htm or copies may be requested by calling the Information Specialist at 902-424-5400 or toll free 1-800-952-2687 (1-800-9LABOUR). Copies of standards referenced in the regulations can be found at your regional public library or can be viewed at the Nova Scotia Department of Environment and Labour library. For your reference and convenience, this guide notes the section of the regulations where one can find the various requirements.

INTRODUCTION AND APPLICATION

Why do we need Occupational Diving Regulations?

Diving can be a dangerous job if the proper safety precautions aren't taken. Divers are exposed not only to the possibility of drowning, but also to several other risks such as respiratory and circulatory risks, hypothermia, low visibility, and physical injury from the operation of various types of equipment. The regulations set minimum standards for safe diving and establish an even playing field for all of the diving industry.

Who do the regulations apply to? (Section 3)

The regulations apply to all occupational diving. This includes:

- seafood harvesting diving (sea urchin and aquaculture operations)
- commercial and industrial diving
- scientific diving
- diving instructors.

This guide highlights the basic requirements of the regulations that apply to diving using SCUBA equipment in the seafood harvesting industry. If you use other types of diving equipment (ie. surface supplied) or are in another industry, there may be additional requirements and you should refer to the *Occupational Diving Regulations* directly.

RESPONSIBILITIES & CREW SIZE

Who must make sure the regulations are followed? (Section 6)

All persons involved with a dive have a responsibility to ensure the regulations are followed. This includes:

- the diver
- the license holder
- the diving supervisor
- other dive team members
- boat captains
- deck hands.

In some instances the regulations say who is responsible for making sure the regulations are followed. In many instances this is the diving supervisor. At other times, responsibility is placed on the employer (the person who hired any or all of the dive team members) or the diver. However, even if responsibility is not specifically placed on you, you may still have to make sure the regulation's requirement is carried out if you are the person who has the most control over the situation. For instance, if the boat captain has control over placing the necessary buoys, then section 29(2) requires the boat captain to do so.

What is the role of the Diving Supervisor? (Sections 7 & 8)

The diving supervisor has responsibility for the overall supervision of all dives conducted at a dive site and is designated in writing by the employer. A diving supervisor must be present at the dive site while dives are being carried out and ensure the regulations are followed and any plans or procedures are followed. A diving supervisor is not allowed to dive except when:

- there is an emergency
- the diving supervisor has delegated the duties of supervisor to another person who is competent to supervise the dive.

For example, in the sea urchin industry, a diving supervisor may delegate his duties as supervisor to another diver who has surfaced. Then, the supervisor can dive.

Who is on the dive team? (Section 2)

The dive team is made up of the diving supervisor, all the divers, standby or buddy divers, and diver's tenders participating in a dive.

What is the smallest crew size for seafood harvesting dives? (Section 9)

The smallest crew size using SCUBA equipment in the seafood harvesting industry is three:

- one supervisor who also acts as a diver's tender
- two divers in the water.

KNOWLEDGE, TRAINING & EXPERIENCE

What type of training and experience do divers need? (Section 16)

Each member of the dive crew must have the proper knowledge, training, and experience to carry out the work they are assigned to do. The regulations require that the diving supervisor, diver and diver's tender meet the competency requirements set out in CSA Standard Z275.4-02, "Competency Standard for Diving Operations". That is, they must have knowledge of the topics listed in the standard for their position. As an example, Appendix A lists the competence requirements for a restricted SCUBA diver (the most common classification in seafood harvesting).

Dive team and crew members must also be trained in any work procedures and must know how to operate any equipment they are required to use.

In addition, all members of a dive team must have a valid standard first aid certificate before a dive can be started.

LIFELINES & COMMUNICATION

Do divers need a lifeline? (Section 49)

Divers using SCUBA equipment do not need to be tethered to the surface by a lifeline if:

- divers use the buddy system (2 divers remain in close contact and both divers surface if they lose contact)

OR

- divers are in constant voice communication with the surface.

If a lifeline is used, it must be monitored at all times by a diver's tender. If diving is taking place in open water and no lifeline is being used, divers must carry an audio or visual locating device (ie. a whistle or a flashlight).

Do divers need voice communications with the surface? (Section 32)

No. The regulations allow the use of pre-arranged signals on a lifeline or float. However, voice communications is required when average currents during a dive are more than 2 km per hour or diving near intakes.

MEDICAL CERTIFICATES

What type of medical certificate is required to dive? (Sections 14 & 15)

All divers must be certified as medically fit to dive by a physician at least every two years. Physicians must consider the factors listed in CSA standard Z275.2-04 "*Occupational Safety Code for Diving Operations*" when carrying out the medical exam (these factors are available from the Occupational Health and Safety Division at the address at the end of this booklet). Divers may go to their family physician for a medical exam.

Regardless of any medical certificate a diver may have, they must not dive if they are ill, fatigued, impaired, injured or in anyway unfit to dive.

DIVE SITE & DIVE BASE

What makes up the dive site? (Section 29)

A dive site is the area where a dive is conducted, and includes the surface dive base, the underwater work site and any area in between. Buoys, lights, flags, lamps, barriers or placards must be placed and displayed to define the boundaries of a dive site and a notice must be posted on each vessel setting out the boundaries of the dive site. Only equipment that is going to be used in connection with a dive can be brought within the boundaries of a dive site.

What can be used as a dive base? (Section 30)

A dive base is the surface location from which diving is done. This may be the shore or a boat, scow, float, raft, or platform. The dive base must be stable and large enough to fit all persons and equipment that are going to be present at any one time. It must also be

equipped with a way to help divers to get in and out of the water (ie. a ladder) and immediately bring an unconscious diver out of the water. Off-shore dive bases must:

- have 2 ways to evacuate people in an emergency (ie. the boat that is the dive base, and a life boat would equal 2 ways to evacuate)
- if it is a boat, be able to stay stationary, and be able to move without being a hazard to the divers.

DIVE PLANS & DIVE TEAM BRIEFING

What has to be included in the dive plan? (Section 20)

Before any diving can take place, a written dive plan that is specific to the dive site must be developed in consultation with the dive team. The dive plan must include:

- a description how the work will be carried out and the diving equipment to be used
- times to be spent at each depth
- the decompression tables and procedures to be used
- how hazards will be identified
- a list of industrial plants and water control facilities near the dive site
- instructions for getting medical assistance in an emergency
- emergency procedures for:
 - ▶ evacuating an ill or injured diver
 - ▶ responding to a loss communication
 - ▶ responding to a diving equipment malfunction
 - ▶ responding to hazardous weather or water conditions;
 - ▶ responding to any difficulties in keeping the dive base stationary;
 - ▶ aborting a dive.

What needs to be included in the dive team briefing? (Section 21)

Before any diving is carried out, the diving supervisor must brief the dive team on the :

- dive plan
- planned location of all divers
- communication signals to be used

What emergency contact information is needed? (Section 23)

Each dive site must have an up-to-date list of the locations and telephone numbers of the hyperbaric chambers and hospitals nearest to the dive site.

DECOMPRESSION TABLES & AIR SUPPLIES

What decompression tables and procedures can be used? (Section 25)

The regulations do not list specific procedures or dive tables. But, any decompression tables or procedures that are used must be sufficient to protect the divers health and safety. The tables and procedures must be kept at the dive site.

Diving computers or similar devices can be used as well as paper dive tables.

What is the standard for breathing mixtures? (Section 35)

Any breathing mixture used for a dive must be appropriate for the depth and type of diving and meet the purity requirements listed in Appendix B. The dive shop where you buy the air should make sure the air meets these standards.

What about back-up air supplies? (Section 36)

There must be at least one fully charged cylinder and a regulator available for emergency use at the dive site.

EQUIPMENT REQUIREMENTS

What are the requirements for tests, examinations, maintenance, and repair of equipment? (Sections 41, 42, 43, 46, & 59)

Generally, diving equipment must be examined by a competent person each day it is used and it must be tested, repaired and maintained in accordance with the manufacturers' specifications for the equipment. Gauges or meters have to be tested at least once per year. Generally, records of tests and repairs must be kept for 2 years. Maintenance and operating manuals for diving equipment must be at the dive site. If any diving equipment breaks down, the supervisor must be told immediately and the equipment not used until it is repaired. If the diving equipment breaks down during a dive, the dive must be aborted.

There are specific requirements for SCUBA cylinders. Cylinders must be:

- examined according to the manufacturer's specifications and found to be in good working condition no more than 24 hours before they are used
- visually inspected, both internally and externally at least once per year.

Owners of SCUBA cylinders must keep a written record of the tests and inspections for at least one year.

What equipment does a diver need to carry? (Section 44)

Each diver must have a knife, weights, a diving suit or protective clothing, and a harness. A diver who may be exposed to falling objects must wear head protection. Divers must make sure all their equipment is working properly before they dive.

SPECIFIC HAZARDS

What are the requirements for specific hazards? (Sections 70 - 74)

The following actions must be taken in order to protect the divers:

Hazard	Action
Water flow	The flow must stopped and locked-out or controlled
Hazardous mechanisms	The diver must be told about them, and they must be locked out or controlled
Low visibility	During periods of darkness or low visibility, divers must be provided with a lamp or similar device.
Weather	Diving must be suspended if weather or water conditions are or may become hazardous.

SCUBA RESTRICTIONS

What restrictions are placed on the use of SCUBA? (Section 86, 87&101)

Where they are necessary to the normal operations of the business, seafood harvesting operations can use SCUBA for:

- high pressure jetting
- hoisting
- using power tools of any size
- diving near underwater intakes more than 10 cm (4 inches) in diameter.

Examples of activities that would be considered integral to normal operations are cleaning aquaculture nets and removing dead fish from the pens. Activities like constructing new pens are not seen as necessary to operations and fall under different rules. In these cases, you should review the regulations.

In these cases, an approved code of practice must first be obtained from the Nova Scotia Department of Environment and Labour. Our Info-Sheet on Diving Codes of Practice describes what a code of practice is and how to apply for one.

SCUBA cannot be used for dives to a depth of more than 40m(130 feet).

DIVER'S LOG BOOK & SUPERVISOR'S RECORD

Do divers need to keep any records? (Section 83 & 84)

Yes. All divers must keep a logbook containing the information related to the dives they have carried out. The logbook must:

- have the name of the diver written on it
- be permanently bound (like a book)
- have pages that are numbered in order
- be kept at the dive site while the diver is diving
- be kept by the diver for two years after the last entry.

Divers must make their own entries into their logbook and sign them before they leave the dive site. The diving supervisor must countersign any entry.

For each dive a diver carries out, the following information must be entered into the logbook by the diver:

- the date and location of the dive
- the names of the diver's employer and diving supervisor
- if applicable, the name, call number or other identification marking of any vessel or installation from which the dive was conducted
- the fact that SCUBA equipment using air was used
- the time the dive began, the bottom time of the dive and the duration of the dive
- the work performed during the dive
- the maximum depth of the dive
- any decompression table and procedure followed
- any accident, near miss or unusual incident
- any discomfort, illness or injury experienced by the diver
- any other factor that the diver considers relevant to their health or safety.

The Occupational Health and Safety Division has produced diver logbooks that meet the requirements of the Regulations for those SCUBA diving using regular air with no decompression. Contact the Division for a free logbook (see Available Information and Contacts at the end of this booklet).

What type of record does the diving supervisor keep? (Section 85)

The diving supervisor must keep a "diving supervisor's record". The diving supervisor's record is different from the diver's logbook in that it contains information about all of the dives carried out by all divers at the dive site. The diving supervisor's record must include:

- the name of the diving supervisor
- the names of all employers (divers working at the same dive site may actually have different employers)
- records of all equipment examinations required by the regulations
- an entry for each planned dive or dives conducted by a all divers at the dive site. So, if there are two divers diving at the site, the supervisor must make two separate entries into the record.

The diving supervisor must make and sign an entry as soon as possible after each dive and file a signed copy of the record with all employers within 7 days of a dive. Once the employer receives the record, they must keep it for at least two years from the date of the last entry made by the supervisor.

The entry a supervisor makes in the diving supervisor's record for each dive includes the information in the diver's logbooks plus:

- the names of each standby diver and diver's tender
- the weather and water conditions
- all underwater work site hazards
- a note indicating whether a dive was conducted in a contaminated environment
- the time each diver left the surface, arrived at the bottom, left the bottom and re-emerged at the surface
- any other factor relevant to the health or safety of the divers.

If divers are performing "bounce diving" (repeatedly submerging and returning to the surface without leaving the water) an entry in the supervisor's record must include each of the following for each time the diver leaves the surface:

- the time each diver left the surface
- the time each diver arrived at the bottom of the dive
- the time each diver left the bottom of the dive
- the time each diver re-emerged at the surface

WHEN WILL THE REGULATIONS BECOME LAW?

The *Occupational Diving Regulations* will become law on May 1, 2006.

AVAILABLE INFORMATION AND CONTACTS

There are several free items available to help divers comply with these regulations. These include:

- the *Occupational Diving Regulations* themselves
- extra copies of this guide
- a reference guide of the regulations
- divers' log books
- supervisor records
- medical examination forms
- a guide to Diving Codes of Practice.

All of these materials can be obtained by contacting our Information Specialist.

As well, our Information Specialist can help answer any question you may have on any aspect of the *Occupational Diving Regulations*.

The Information Specialist can be contacted at:

Occupational Health and Safety Division
NS Department of Environment and Labour
PO Box 697
Halifax, NS B3J 2T8
1-902-424-5400 1-800-952-2687 (1-800-9LABOUR)
<http://www.gov.ns.ca/enla/ohs/contact.asp>

APPENDIX A

Competence standard for a Restricted SCUBA Diver as outlined in CAN/CSA-Z275.4-02 Competency Standard for Diving Operations

A restricted SCUBA diver must

1. understand the physical laws affecting the diver and the underwater operation;
2. be able to perform calculations involving the properties of gases and liquids, using various units of measurement, to determine volume and pressure requirements, compressor outputs, and buoyancy functions;
3. understand
 - a. the relevant anatomy and physiology of the human body, in particular the respiratory, circulatory, and central nervous systems;
 - b. the effects on the diver of breathing various gases at elevated pressures;
 - c. the principles governing compression and decompression and the uptake, distribution, and elimination of gases, and be able to use the appropriate decompression tables;
 - d. the causes, manifestations, and treatment of pressure-related diseases (pulmonary barotrauma, gas embolism) and the effects of pressure on body cavities;
 - e. the causes, manifestations, and treatment of decompression sickness;
 - f. the physiology of thermal balance for the diver;
 - g. how to care for and manage a diving emergency in the field;
 - h. the importance of proper evacuation procedures and of selecting the proper destination for an evacuated diving casualty;
 - i. the operational diving techniques used in the field and the duties of the dive site personnel employed on a SCUBA diving operation;
 - j. the maintenance and use of the common types of SCUBA diving equipment;
 - k. the procedures involved in preparing operational and contingency plans;
 - l. the use of SCUBA equipment in the tethered mode, secured to a float on the surface;
 - m. the principles of use of underwater wireless communication systems, diver line signals, and diver hand signals;
 - n. the principles of use of high-pressure compressor systems;
 - o. hazards related to changing weather conditions;
 - p. the hazards involved in diving from vessels;
 - q. the hazards found in ocean diving, including tidal currents, underwater entrapment, and hazardous sea life;
 - r. the hazards involved in hazardous water flows, differential pressures, and underwater mechanisms;
 - s. the limitations and operational restrictions of the use of SCUBA; and
 - t. relevant diving regulations and CSA standards.
4. have logged 25 open-water dives with at least 900 minutes of in-water time.

APPENDIX B

Purity Requirements for Normal SCUBA Tank Air

Oxygen	20–22%
Nitrogen and rare gases	78–80%
Carbon monoxide	Less than 5 mL/m ³ (ppm)
Carbon dioxide	Less than 500 mL/m ³ (ppm)
Methane	Less than 10 mL/m ³ (ppm)
Volatile non-methane hydrocarbons	Less than 5 mL/m ³ (ppm) as methane equivalents
Volatile halogenated hydrocarbons	Less than 5 mL/m ³ (ppm)
Nitrogen dioxide	Less than 0.3 mL/m ³ (ppm)
Nitrous oxide	Less than 2.5 mL/m ³ (ppm)
Oil, particulates, and condensates	Less than 1 mg/m ³
Odours	None allowed