INTERNATIONAL STANDARD

ISO 21417

First edition
2019-08

Recreational diving services — Requirements for training on environmental awareness for recreational divers

Services relatifs à la plongée de loisirs — Exigences de formation pour la sensibilisation à l'environnement des plongeurs de loisirs

Reference number
ISO 21417:2019(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Competencies **1**
5 General **1**
6 Theoretical knowledge **2**
6.1 Climate change 2
6.2 Local threats 2
6.3 Best environmental practices 3
6.3.1 Impact of diving activities 3
6.3.2 Interacting responsibly 3
6.3.3 Positive actions to conserve the aquatic world 4
6.4 Types of aquatic environment 4
6.5 Environmental issues — Tropical waters 4
6.6 Environmental issues — Temperate waters 4
6.7 Environmental issues — Polar waters 5
6.8 Environmental issues — Freshwater 5
7 Practical training **5**
7.1 General 5
7.2 Surface activities not involving diving 5
7.3 In-water activities — Dive 5
8 Instructors **6**
Bibliography **7**

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 228, *Tourism and related services.*

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The diving community has a unique capability and therefore responsibility in observing and reporting on the condition of the aquatic environment. It is therefore important to have a standard on responsible environmental practices in recreational diver training.

In diver training and diving activities, divers should have an awareness of their environmental impact. This should include actively minimizing any negative aspects, both potential and actual. Such training should encourage awareness of environmentally positive actions.

This document outlines how the recreational diving community can make use of this capability while ensuring that full consideration is given towards divers' interaction with the aquatic environment.

Recreational diving services — Requirements for training on environmental awareness for recreational divers

1 Scope

This document specifies requirements for training programmes designed to educate participants in environmental awareness and sustainable environmental practices in recreational diving activities.

The training programmes consist of theory and an optional practical training segment/water session.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 13970, *Recreational diving services — Requirements for the training of recreational snorkelling guides*

ISO 24801-3, *Recreational diving services — Requirements for the training of recreational scuba divers — Part 3: Level 3 — Dive leader*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
diving activities
activities including scuba diving, snorkelling, free diving (breath hold diving) and diving support services

4 Competencies

The training programme shall ensure that, by the end of the course, successful participants will

— be able to apply best practices with regard to their own activities;

— be able to identify best practices with regard to services provided to the participant (e.g. by boat operators, dive centres);

— understand how to interact with the aquatic environment in a way that minimizes negative impact;

— understand how individuals involved in aquatic activities can act to benefit the aquatic world by taking part in activities such as clearing aquatic debris, surveying, reporting or observing aquatic life.

5 General

Elements of the training programme in accordance with Clause 6 may be open to divers and non-divers.

For any programme parts involving diving or snorkelling activities, the applicable ISO standards for recreational diving and snorkelling shall apply.

6 Theoretical knowledge

6.1 Climate change

Climate change caused by greenhouse gas emissions (e.g. CO_2) is a major threat to the global aquatic environment. Divers can help to monitor some of the effects of this.

The training programme shall ensure that participants are aware of the following factors concerning climate change which may affect diving and diving tourism:

— global warming;

— rising sea levels;

— mass coral bleaching;

— ocean acidification reducing coral's ability to secrete its limestone skeleton;

— changes in patterns of ocean currents and weather.

6.2 Local threats

The training programme shall ensure that participants are aware of the following factors concerning local threats which may affect diving and diving tourism:

— overfishing, which disrupts the ecological balance by eliminating apex predators and herbivorous fish;

— destructive fishing methods such as irresponsible spear fishing, the use of drift nets, bottom trawling and dredging, as well as the use of dynamite and cyanide;

— the removal of fish, invertebrates and other organisms and materials for the aquarium trade, souvenir industry or jewellery, for example;

— the purchase of souvenirs originating from the aquatic environment;

— land-based sources of pollution, such as excess sedimentation from inland erosion, especially in areas near large rivers and estuaries. Other land-based pollutants include fertilizers, pesticides, chemicals and sewage, which may result in eutrophication (excess nutrient input);

— overdevelopment of coastal areas leading to increased sedimentation and habitat degradation;

— anchor and collision damage by vessels;

— other potential negative impact resulting from general tourism and non-diving water sports;

— the use of cosmetics and sun screen products that are considered to be harmful to aquatic life should be avoided as far as possible.

6.3 Best environmental practices

6.3.1 Impact of diving activities

The training programme shall ensure that participants are knowledgeable of the following issues with regard to potential negative impact of recreational diving activities:

— transfer of organisms from one body of water to another, for example via dive gear (unwanted introduction of alien species);

— irresponsible spear fishing and harvesting of aquatic life;

— feeding of fish;

— anchoring;

— contact with organisms (e.g. coral reefs, sponges, fish, turtles);

— respect for cultural resources and underwater heritage sites;

— consideration of a site's overuse or "carrying capacity" (i.e. how many divers can an area support – over time and space – without causing degradation of the resources or site);

— physical damage from diver or boat contact;

— behaviourial changes of aquatic life due to the presence of divers and boats;

— silt displaced by finning, leading to increased sedimentation on flora and fauna;

— bubbles in overhead environments damaging delicate organisms.

6.3.2 Interacting responsibly

The training programme shall ensure that participants are knowledgeable on the following issues with regards to responsible interactions with the environment in order to avoid or minimize negative impact:

a) choosing entry and exit points;

b) avoiding touching, interfering with or removing aquatic life and/or artefacts from the environment;

c) the importance of properly secured equipment in order to avoid unintentional contact with the aquatic environment (e.g. by trailing hoses);

d) special concerns for underwater photographers:

   — not interfering with aquatic life for the purpose of composing a picture;

   — taking special care with macrophotography;

   — minimizing the use of flash or lights.

e) wrecks:

   — removal of artefacts;

   — respecting memorial sites (e.g. war graves);

   — minimizing impact;

   — the impact of exhaled breathing gas on metal structures;

   — anchoring/mooring without damaging wrecks.

6.3.3 Positive actions to conserve the aquatic world

The training programme shall ensure that participants are aware of the importance of taking positive actions to conserve the aquatic world such as:

— marine debris collection;

NOTE If an object has become an integral part of the aquatic environment (e.g. as a habitat) it might be better to leave it in place.

— surveying the aquatic world;

— control of invasive species;

— creation of artificial reefs (following a proper environmental impact assessment);

— supporting sustainable fisheries;

— participation in scientific projects (including citizen science projects);

— reducing carbon footprint.

6.4 Types of aquatic environment

The training programme shall ensure that participants are aware of major types of aquatic environments, such as:

— oceans (tropical waters, temperate waters, polar waters);

— freshwater (lakes, quarries, water reservoirs, rivers and canals).

The following subclauses provide details of the special considerations for specific types of environments. The training programme may cover all of these segments or may focus on a specific environment and only cover that particular environment in detail. As a minimum, however, participants shall be made aware of the need for additional knowledge and skills when diving in unfamiliar environments.

6.5 Environmental issues — Tropical waters

The training programme shall ensure that participants are knowledgeable of the following factors concerning the aquatic world in tropical waters:

a) general information on reefs and corals (e.g. how reefs grow, how reefs form, reef structures, reef top, drop off);

b) symbiosis in the ecosystem of the reef;

c) threats to coral reefs, such as

   — temperatures/coral bleaching;

   — silt on the reef;

   — impact damage.

6.6 Environmental issues — Temperate waters

The training programme shall ensure that participants are knowledgeable of the following factors concerning the aquatic world in temperate waters:

— various bottom compositions (e.g. kelp, algae, sea grass);

— tides and water movement.

6.7 Environmental issues — Polar waters

The training programme shall ensure that participants are knowledgeable of the following factors concerning the aquatic world in polar waters:

— decline of polar habitats;

— delicate ecosystem;

— slow metabolism.

6.8 Environmental issues — Freshwater

The training programme shall ensure that participants are knowledgeable of the following factors concerning the freshwater aquatic environment:

— cross-contamination between different bodies of water;

— mixing of thermal layers caused by divers' bubbles;

— damage to sensitive shorelines caused by divers entering and exiting the water or boat launching;

— adverse effects of diving activities might be more concentrated in smaller bodies of water.

7 Practical training

7.1 General

The training programme may provide one or more of the following practical lessons or activities. If a practical training is included, the following requirements shall apply.

7.2 Surface activities not involving diving

The training programme may provide non-diving surface activities from boats or on shore in locations such as intertidal zones, rock pools and fresh water bodies, which may include:

— identifying and observing aquatic life;

— looking for signs of pollution or debris;

— collecting waste and carrying out beach clean-ups;

— documenting and reporting what has been observed.

7.3 In-water activities — Dive

The training programme may include one or more dives.

The purpose of such dives could be:

— noting any damage caused by human activity;

— surveying and identifying aquatic life;

— removing waste and sources of pollution;

— capturing images of designated aquatic life.

If a dive is included in the training programme, it shall include the following:

— briefing (specifying objectives of the dive, including environmental and safety aspects);