

# SAFETY AND HYGIENE REGULATIONS



UNIVERSITAT POLITÈCNICA DE CATALUNYA  
BARCELONATECH  
Servei de Prevenció de Riscos Laborals

## UNDERWATER ACTIVITIES MAIN RISKS AND PREVENTIVE MEASURES

CODE **SHR 902** Date: **May 2021** Version: **01** Page: **1 of 4**

### RISKS OF DIVING AND BASIC RECOMMENDATIONS

The environment determines the risks to which you may be exposed during underwater activities. To avoid them, you must respect certain rules and protocols, which in some cases are determined by the specific regulations governing the activity. You must dive in company, never alone, and be in perfect health. The main risks are the following:

#### Barotrauma

This is the variation in the volume of air that the body contains because of the pressure difference, which can mainly cause damage to the ear, paranasal sinuses and lungs. The symptoms vary according to the injured area, including earache, noise, dizziness, decreased hearing and nausea.

Preventive measures to adopt:

- Avoid fast ascents and descents.
- During the descent, perform the compensation manoeuvre if your ears are affected.
- Be familiar with all the parts of your equipment and keep it properly maintained.

#### Hearing loss

Divers may suffer hearing loss caused by the time of exposure to pressure and the depth of the dives. It is caused by exposure of the ear to high pressure.

Preventive measures to adopt:

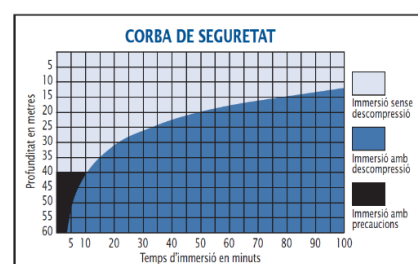
- Organise the dive: set the maximum number and duration of dives and limit the number of successive dives.

#### Decompression sickness

This is caused by the formation of nitrogen gas bubbles inside the tissues and blood during the ascent, as a result of the pressure. The symptoms vary according to the severity of the sickness and include spots on the skin, pain in the bones, joints and muscles, headaches, seizures, gastrointestinal symptoms, difficulty breathing and oedema.

Preventive measures to adopt:

- Limit the number and depth of the dives.
- Do not ascend at a speed of more than nine metres per minute.
- Respect the decompression tables. Organise the dive previously.



Corba de seguretat per a temps d'immersió i diferents profunditats.

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### Hyperoxia

Intoxication caused by an increase in the partial pressure of oxygen with depth, usually because the mixture is too rich in oxygen. The symptoms of hyperoxia are tachycardia, tremors, dizziness and nausea.

Preventive measures to adopt:

- Respect the maximum depth limits.

### Exposure to low temperature

Contact with cold water can cause hypothermia. The usual symptoms are chills, slow breathing, weak pulse and decreased consciousness.

Preventive measures to adopt:

- Wear suitable isothermal clothing, complemented with boots and gloves when appropriate.

### Presence of living beings

Divers can be injured by contact with toxic or poisonous substances generated by living beings in the water, or by fish bites.

Preventive measures to adopt:

- Familiarise yourself with and learn to identify the fauna in the environment.
- Use diving equipment that protects the skin and mucous membranes.
- If a diver is stung or bitten by living beings, transfer them to the nearest health centre.

### Limits to underwater work

**Pregnant and breastfeeding workers are prohibited from working at hyperbaric pressures.**

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### OTHER RISKS RELATED TO UNDERWATER ACTIVITIES

#### **Presence of objects, work equipment, cables and ropes in circulation areas, both on the dock and on board the boat**

These objects may cause falls on the same level during the preparation of the dive.

Preventive measures to adopt:

- Keep the tools, materials and objects used in the work areas tidy when you are preparing the materials both on the dock and on board the boat.
- Wear non-slip footwear for moving on the dock and on the boat deck.

#### **Access to the boat at the dock**

People can fall at different levels when accessing the boat at the dock.

Preventive measures to adopt:

- As a general rule, boats must have a boarding ladder, a walkway or another similar device that provides safe access to the boat.
- Do not board or leave the boat until the skipper has secured it properly and given permission.

#### **At the beginning and end of the dive**

During the duration of the dive, the skipper of the boat must take the necessary measures to avoid collisions with the boat or accidental contact with the boat's propeller.

Preventive measures to adopt:

- When divers are under water and on the surface, the boat's engine must remain disengaged from the propeller or switched off according to the circumstances that the skipper considers appropriate for safety.

### OTHER REQUIREMENTS FOR UNDERWATER WORK

- The presence of a **health and safety resource**, which is required for underwater work.
- A medical examination.
- Liability and personal injury insurance for underwater activities.
- Appropriate qualifications and professional identity cards.
- Administrative authorisations.
- An underwater work control sheet. A professional diving diary.
- Previous planning of the dive.
- Support boats for the diving operations.
- A hyperbaric chamber less than two hours away. For diving at depths greater than 50 metres, it is recommended to have the chamber in the diving area.
- An alpha flag on the support boat or on a buoy to indicate the presence of divers.

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### DOCUMENTATION NECESSARY TO CARRY OUT SCIENTIFIC DIVING ACTIVITIES

To carry out scientific diving activities, you must **apply for authorisation** to the Catalan Ministry of Climate Action, Food and Rural Agenda, using the form “*Application for authorisation of underwater activities*”.

This application specifies the details of the applicant, the representative, the diving staff, the activities to be carried out and the depth, duration and location of the activity. The attached documents must include the following:

- Proof of current accident and civil liability insurance according to the activity to be carried out.
- A copy of the recreational dive log.
- A copy of the diver’s **certification card\***.
- A descriptive report of the scientific diving activity.
- Proof of having a support boat.

\* You must apply for the certification card to the Catalan Ministry of Climate Action, Food and Rural Agenda using the form “*Application for a recreational underwater certification card (FECDAS, PADI, ACUC, SSI, NAUI, IDEA, SDI, PDA, ESA, ANDI, PSI and PROTEC)*”.

The documents attached to this application must include the following:

- An underwater activities log issued by an official body with the medical examination section completed by a doctor who has a degree, speciality, diploma or certificate related to underwater activities issued by an official body.
- An official medical certificate of fitness for diving with the same requirements as the previous section. If you present a diving certificate issued by an official body that is less than two years old, this certificate will not be required.
- A copy of the membership card of FECDAS, PADI, ACUC, SSI, NAUI, IDEA, SDI, PDA, ESA, ANDI, PSI or PROTEC.

**Further information is available at:**

<http://agricultura.gencat.cat/ca/ambits/nautica-busseig/busseig-professional/>

#### References:

- *Treballs subaquàtics – Quaderns de prevenció*  
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- *Treballs subaquàtics – Full monogràfic 12*  
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