



# **ZERO FATALITY STANDARD – ZFS No.11 UNDERWATER WORK**

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3<sup>rd</sup> Version - December 2023

## PURPOSE OF THE STANDARD

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This standard establishes the requirements for conducting underwater work and outline the minimum content to be included in the procedures of Colbun and Collaborating Companies.

These requirements complement the current Diving Regulations for Professional Divers issued by the Chilean Navy.

It applies to all operations requiring a worker to submerge in marine, river, lake waters, or tanks.

## GUIDELINES

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### 1. PERSONNEL REQUIREMENTS

#### 1.1. TEAM REQUIREMENTS

A minimum team must include a diving supervisor responsible for the activity, two or more divers for the tasks, and one assistant.

#### 1.2. HEALTH REQUIREMENTS

Personnel performing underwater work must have a valid pre-employment or occupational medical examination certifying their physical, psychological, and health fitness to perform underwater tasks.

#### 1.3. COMPETENCY REQUIREMENTS

All team members (except the assistant) performing underwater activities must hold the following certifications:

- a. A valid Professional Commercial or Specialist Diver's License.
- b. The Diving Supervisor must hold a valid Professional Supervisor Diver's License.
- c. For decompression maneuvers, diving personnel must have at least five years of verifiable experience.

#### 1.4. SUPERVISOR RESPONSIBILITIES

- a. Plan the dive, verify the work area conditions, identify task risks, and prepare a contingency plan for emergencies during the dive.
- b. Check environmental conditions (e.g., water state, weather, currents, temperature) that may affect dive planning.
- c. Assess the divers' physical condition before and after each dive.
- d. Provide pre-dive instructions and review the dive plan with the team.
- e. Suspend or postpone operations if weather or safety conditions pose a risk to the dive team.

- f. Ensure divers maintain updated diving logs and complete them post-dive.
- g. Inspect the equipment and tools prior to each dive to ensure proper function and configuration.

## **2. EQUIPMENT AND WORKING TOOLS REQUIREMENTS**

### **2.1. WORK AREA REQUIREMENTS**

The underwater work area must meet the following criteria:

- a. Clearly mark and signal the dive area.
- b. Apply the [ZFS No 1 Energy Isolation and Lockout/Tagout \(LOCO\)](#) when there is a risk of water flow, systems, or equipment entrapping or injuring the diver.
- c. Provide communication systems between the dive site and the surface.
- d. For dives at altitudes exceeding 100 meters above sea level (e.g., lakes), ensure the dive plan accounts for altitude diving conditions.

### **2.2. EQUIPMENT AND TOOL REQUIREMENTS**

All equipment and tools used for underwater work must be inspected for function and condition, meeting the following requirements:

- a. Diving equipment must comply with:
  - i. Current certification as per the Chilean Navy’s Diving Regulations for Professional Divers.
  - ii. Inspection records for each piece of equipment before each dive, verifying operability.
- b. Emergency response equipment must be in optimal condition and certified when applicable.
- c. Each diver must be equipped with a safety mini cylinder as a backup breathing system.
- d. It is recommended that each diver use a dive computer for continuous monitoring during dives.

## **3. REQUIREMENTS ASSOCIATED WITH ACTIVITY DEVELOPMENT**

### **3.1. WORK PLANNING REQUIREMENTS**

For activity development, the following planning and control measures must be observed:

- a. A dive plan must be established with the corresponding notification to the maritime authority.
- b. Obtain a valid permit for the activity, authorized only for the specified work and conditions, including local maritime authority approval.
- c. Before each dive, the dive supervisor must conduct a physical assessment of the divers to ensure no condition or injury poses a risk under hyperbaric conditions.

- d. In the event of a diving-related incident, the diver must undergo a medical examination to confirm their fitness to return to diving activities.
- e. Record all diving operations and results in the compressor history file.
- f. Maintain a personal log for each diver, detailing their experience, hyperbaric exposure, breathing medium used, etc. This log must include a photograph, identification data, national ID number, and signature.
- g. Electrical tools or equipment used underwater must only be energized once the diver is underwater and prepared to commence work.
- h. This translation incorporates technical language from standards such as ISO, OSHA, and ANSI, ensuring clarity, precision, and alignment with international best practices for safety in underwater work environments.

#### **4. RECORDS**

[Use Checklist No. 11 to verify compliance Zero Fatalities Standards-Colbun S.A.](#)

### **EXCEPTIONS**

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Previous to the start of work, Colbun's Facility Manager (Project, Power Plant) may authorize exceptions to this Standard in writing. Should there be a discrepancy where there is more than one Facility Manager, it must be escalated to a higher hierarchical level for definition.