

We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

5,300

Open access books available

130,000

International authors and editors

155M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.

For more information visit www.intechopen.com



Introductory Chapter: Underwater Ordeals

Sérgio Lousada and Rafael Camacho

1. Underwater works

Underwater work is work done underwater, generally by divers during diving operations, but includes work done underwater by remotely operated vehicles and manned submersibles.

The versatility and multifarious skills of underwater works means that it is possible to operate over a wide range of activities, working in hyperbaric conditions or in confined spaces. The divers' experience in the field and their detailed knowledge of diving procedures enables them to operate in highly specific segments [1]:

- inspection of civil-engineering structures;
- undersea foundations and welds;
- ship hull inspections and raising of wrecks;
- work in hostile and nuclear environments;
- dam inspections using an ROV (Remotely Operated Vehicle);
- installing or commissioning outfalls, undersea conduits, and cables.

2. Trades and crafts

Virtually, all the civil-engineering trades and crafts can be transposed to underwater work, as in the case of high-pressure cleaning, cementing, welding, cutting, among others [1]. Therefore, all professional diving occupations have a few skills commonly used:

- underwater navigation;
- underwater searches;
- rigging and lifting;
- inspection, measuring, and recording;
- and the use of basic hand tools.

Some skills are specific to specialist occupations such as: erecting formwork and shuttering (civils), oxy-arc cutting (salvage, ships husbandry, offshore), hydraulic bolt-tensioning (offshore oil and gas), bomb disposal (military, public safety), search and rescue (public safety, police), and site surveys and mapping (scientific, archeology).

3. Ordeals

Most construction projects involving professional divers are engineered by road, canal, and port engineers, but only a few know in depth the risks inherent in the underwater work performed by professional divers [2].

As in any profession, engineers need a permanent updating in their area of expertise through continuous training [2].

One of these subareas is underwater engineering. However, for several years, engineering projects have suffered from a lack of rigor in their approach to underwater work, both at budget level, constructive procedures and in terms of safety and health [2].

It is believed that this is so, mainly due to the ignorance of the exceptional conditions that the hyperbaric environment imposes throughout the activity and the legal framework that regulates it. This means that the tasks are tendered with significant shortcomings that hinder their subsequent execution in adequate conditions of safety and economic viability [2].

The main objective of this book is precisely conveying the on-going constructive procedures, methods and methodologies, the equipment, the limitations, and the specificities that the hyperbaric environment has, where the diver develops his work, that so much condition an underwater work.

IntechOpen

Author details

Sérgio Lousada^{1,2,3,4*} and Rafael Camacho^{1,5}

1 Faculty of Exact Sciences and Engineering (FCEE), Department of Civil Engineering and Geology (DECG), University of Madeira (UMa), Funchal, Portugal

2 VALORIZA - Research Centre for Endogenous Resource Valorization, Portalegre, Portugal


3 Institute of Research on Territorial Governance and Inter-Organizational Cooperation, Dąbrowa Górnicza, Poland

4 CITUR - Madeira - Centre for Tourism Research, Development and Innovation, Madeira, Portugal

5 IHM - Investimentos Habitacionais da Madeira, EPERAM, Portugal

*Address all correspondence to: slousada@staff.uma.pt

IntechOpen

© 2020 The Author(s). Licensee IntechOpen. This chapter is distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/3.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. 

References

[1] VINCI Construction. Expertises, Know-How, Underwater Works [Internet]. 2019. Available from: <https://www.vinci-construction-maritime-fluvial.fr/en/categorie/65/10/know-how/underwater-works.html> [Accessed: 20 July 2019]

[2] Colegio de Ingenieros de Caminos, Canales y Puertos. Jornada Técnica Sobre Buceo Profesional en la Ingeniería [Internet]. 2019. Available from: http://www3.ciccp.es/wp-content/uploads/2017/06/JORNADA_BUCEO_INGENIERIA.pdf [Accessed: 20 July 2019]

IntechOpen