Stichting Werken onder Overdruk

SWOD

WORKING CONDITIONS CATALOGUE
Working under Hyperbaric Conditions
Diving Work
SCUBA Other

Document code CAT 001.6 II UK

Stichting Werken onder Overdruk
SWOD

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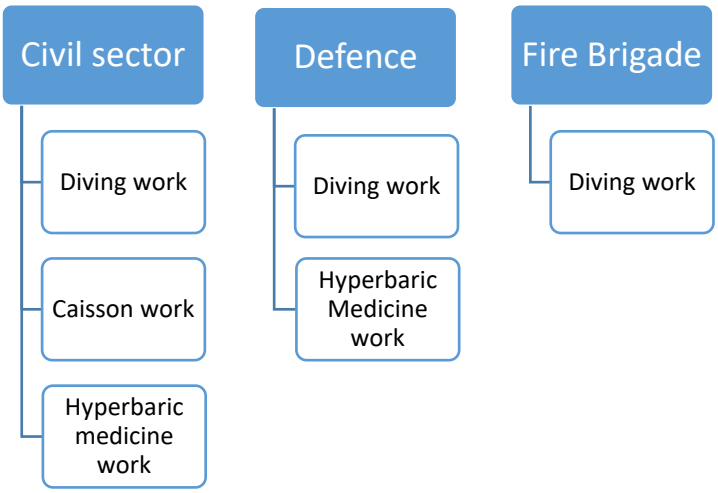
Preface

The Foundation Working under Hyperbaric Conditions (SWOD) represents the three areas of work; diving work, caisson work and hyperbaric medicine work within the three subsectors of Defence, Fire Brigade and Civil sector in the field of Working Conditions.



This version of the Working Conditions Catalogue Working under Hyperbaric Conditions inclusive WOD-SOE and three Information notes diving were approved on 3 December 2024 by the SWOD Central Committee of Experts and are in force from 1 February 2025.

Disclaimer

Although the Working Conditions Catalogue has been made with the greatest possible care, the Foundation Working under Hyperbaric Conditions, nor the website manager, nor the author assume no liability for any incorrect information, the possible causes and the possible consequences thereof.

If any questions arise concerning the accuracy of the requirements in the Working Conditions Catalogue, please refer to the Dutch version of the document, which is the official version.

Project group Working Conditions Catalogue Working under Hyperbaric Conditions

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Document code	Expired version	Current version dated	Status	Approved by CCvD	Approved by Board
CAT 001.6 II UK	CAT 001.5 II UK	3 December 2024	Public	3 December 2024	3 December 2024

Changes 2024 update compared to the 2023 version

Nr	Location of change	Description of change
1.	Page with 2024 changes	New
2.	Index	All topics are now listed including chapter 8 and with hyperlink
3.	Chapter 1 Terms/ abbreviations and description	• Added are Breathing Gas, Breathing Air, Working Conditions Catalogue, Third Parties. • Adjusted are Diving Category A, B and C and Hyperbaric Treatment chamber (1 compartment), SCUBA, SCUBA with a provision of breathing air from the surface (OLV) and SSE
4.	Chapter 2 Introduction	Added Scope SCUBA Other diving and training levels
5.	Chapter 5 Working Conditions Catalogue working under hyperbaric conditions	Added text 2024 update Removed 2023 amendments. Changes 2024 are now in this page
6.	Chapter 6 Documents which form part of the Working Conditions Catalogue	Removed 2023 update. Update 2024 is in the WOD-SOE
7.	Chapter 7 Management System and Diving Project Plan	Added Management System section
8.	Chapter 8 Risks and Minimum control measures SCUBA Other diving	Explanation of use adjusted
		8.1 Duties, responsibilities and requirements
		8.1.1 Clients/ Third parties moved to the beginnng of the Chapter and expanded
		8.1.2 Employer/ diving company • Expanded and includes now all Diving Project Plan documents
		8.1.2.5 Dive depth adjusted in accordance with SWOD Registration scheme Diver
		8.1.6 Work preparator diving work. New
		8.3 Personnel
		8.3.1.5 Diving medical attendant requirements adjusted in accordance with SWOD Registration scheme
		8.3.1.6 Diving physician requirements adjusted conform the Examination guideline Occupational health medical examination Working under Hyperbaric conditions Diving work Document code: CAT 003.1
		8.3.2 Number of personnel/ team size • Categories changed conform SWOD Registratie scheme Diver • Presence diving team members at dive location. New • Filling function diving medical attendant in a team/ dive team. New.
		8.4 Medical
		8.4.1 Medical equipment changed in accordance with SWOD Registration scheme diving medical attendant and diver

		8.5 Workplanning
		8.5.2.20 Work permit. New
		8.5.2.21 Excavation by divers. New
		8.6 Emergency procedures and contingencies
		8.6.1.1 Diving personnel drill emergency situations. New
9.	Chapter 9 References Working Conditions Catalogue Diving work	List of References updated conform to Chapter 8

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1. TERMS / ABBREVIATIONS AND DESCRIPTION

Term / abbreviation	Description
AB	Working Conditions Decree.
AR	Working Conditions Regulations.
ATB	Working Hours Decree.
ATW	Working Hours Act.
AW	Working Conditions Act.
ADC	Association of Diving Contractors.
ADCI	The International Association of Offshore Diving Contractors.
BHV	In-house Emergency Service organization.
Breathing gas	Breathing gas is a collective name for gas mixtures that vary in composition according to the kind of gas, duration and pressure (including breathing air). Breathing gases are suitable for use in breathing apparatus and the composition meets the requirements referred to in NEN-EN-12021.
Breathing air	Compressed air and contains 21% oxygen gas, at least 78% nitrogen gas and a maximum of 1% other gases. Breathing air complies with the requirements referred to in NEN-EN-12021.
Caisson	A structural construction which by means of excavation of the soil at the underside is moved to a deeper level or by means of immersion in open water is placed on the bottom. (Ref. WOD-SOE)
Caisson work	Performing work in a space under a pressure of at least 104 Pa above atmospheric pressure and wholly or partially is surrounded by a liquid including the stay in and the transportation to and from that space. (Ref. AB article 6.13)
CCvD	Central Committee of Experts.
Client	A client is a person who, or a company that, issues an order to a contractor. In the case of diving operations in the context of public order and safety, the client means the owner/manager of the diving site.
DMAC	Diving Medical Advisory Committee.
DP	Dynamic Positioning.
Diving work	Performing work in a liquid or in a dry diving bell including the stay in this liquid or in this dry diving bell, whereby for breathing use is made of a gas under a higher pressure than atmospheric pressure. (Ref. AB article 6.13)
Diving work Category A	The Registration Scheme distinguishes the following scopes: For light work with SCUBA equipment scopes A9, A15, A15OLV and A30.
Diving work Category B	The Registration Scheme distinguishes the following scopes: When performing heavy work with SSE equipment scopes B30, B50R and B50.
Diving work Category C	The Registration Scheme distinguishes the following scopes: When performing heavy work with SSE equipment, including diving from a closed diving bell scope C.
Diving Company	Employer who makes his employees perform diving work.
Diving Project Plan	Consists of documentation and information for the safe and efficient performance of diving operations. Documentation present on the diving project includes: Work instruction, RI&E, Work plan and Project RI&E.
EHBO	First Aid.

Term / abbreviation	Description
Habitat	A mobile work chamber underwater with open access underwater which can only be entered by means of diving. (Ref. WOD-SOE)
HES	Hyperbaric Evacuation System.
Hyperbaric treatment chamber (2 or more compartments)	A permanently installed compression chamber in a hospital or medical institute, intended for treatment of patients under hyperbaric conditions in accordance with a treatment protocol prescribed by a physician. (Ref. WOD-SOE)
Hyperbaric treatment chamber (1 compartment)	A treatment chamber (mono place) which does not comply with the Working Conditions Decree Article 6.18 Compression chamber diving work as there is only one compartment present.
Hyperbaric facility	A building with a hyperbaric treatment chamber, control panel, patients - , personnel - , breathing gas- and emergency facilities.
Hyperbaric medicine	Treatment of patients in a hyperbaric treatment chamber with oxygen under hyperbaric conditions supervised by a qualified physician for treatment indications which have been evidence based substantiated or indications based on research findings in accordance with MEC Guidelines.
IMCA	International Marine Contractors Association
IMO	International Maritime Organization
LMRA	Last Minute Risk Analysis. The LMRA is carried out at the workplace prior to the work being executed to check whether pre-estimated risks and measures correspond to the situation at the workplace and whether they need to be changed. (management of change)
Management of Change (MOC)	This contains the process that must take place to modify an existing approved Dive Project Plan. An MOC procedure is used to ensure that health- and safety- and environmental risks are carefully evaluated and controlled before significant changes are made. MOC can also be during the dive.
Manual	Care system, quality assurance manual.
MEC	Medical Ethical Committee.
MSC	Marine Safety Committee (IMO).
NADO	Netherlands Association of Diving Companies.
NDC	Netherlands Diving Centre (till 2014).
NEN-EN	European standard which is accepted as a Dutch standard.
NIPV	Netherlands Institute for Public Safety.
NLA	Netherlands Labour Authority.
Other work under hyperbaric conditions	Performing of other work than diving or caisson work in a space under a pressure of at least 10^4 Pa above atmospheric pressure, including the stay in that space. (Ref. AB article 6.13)
Project RI&E	An RI&E conducted for a specific project by a diving company, client and relevant expert person(s). Project RI&E is additional to the RI&E.

Term / abbreviation	Description
RI&E	Risk Assessment and Evaluation. Every company with employees must have a health and safety service or health and safety expert identify whether and how the work may be dangerous or unhealthy for employees. This must be recorded in writing. This RI&E must also include a Plan of Action (PVA). This describes the measures an employer will take to address the identified risks.
RIVM	National Institute for Public Health and the Environment.
ROV	Remotely Operated Vehicle.
SCUBA	Self Contained Underwater Breathing Apparatus, being a collective term for diving equipment characterised by breathing gas supply from cylinders carried by the diver.
SCUBA with Surface Air Supply (OLV)	SCUBA, for every deployed diver equipped with a high-pressure air supply from the surface. A compact, self-contained diving equipment suitable for light work in the A category.
SSE	Surface Supplied Equipment, being an collective term for diving systems that have standard breathing gas supply from the surface, with one or more divers connected to a diving panel, and are suitable for performing heavy-duty work in the B category.
SWOD	Foundation Working under Hyperbaric Conditions.
Third parties	Third parties include; the contractor performing the work for the client and supervising the diving company, captain of a vessel, DP operators, crane operators, lock operators, platform managers, consultants working for a client, business experts.
VCA	Safety, Health and Environment Checklist Contractors.
Working Conditions Catalogue	Written agreements between representatives of employers and employees at national level, in a business sector, or in an industry, including the government, in which measures or provisions for the prevention or limitation of occupational risks are laid down concerning the way in which one or more regulations under or pursuant to the Working Conditions Act can be met in a working area .(Ref. Policy rule working conditions catalogues 2019). (See also chapter 4 in this document 'Frequently asked questions and answers')
Work instruction	(Diving) instruction, (diving) regulation, and/or (diving) manual as prescribed in Working Conditions Decree article 6.15 paragraph 1 a.
Work plan	Plan prepared specifically for the diving operations to be performed with specific tasks and risks. Work plan is supplementary to the work instruction.
WOD-SOE	Working under Hyperbaric Conditions System- and Maintenance requirements.

2 INTRODUCTION

This document Diving Work SCUBA Other of the Working Conditions Catalogue Working under Hyperbaric Conditions applies to all employers and employees involved in diving activities carried out with SCUBA Other.

This Working Conditions Catalogue identifies risks which may occur when carrying out work under hyperbaric conditions. For all these risks, it is indicated which minimum control measures an employer and employee shall take to manage these risks.

This document also lists documents that are part of the Working Conditions Catalogue Working under Hyperbaric Conditions namely Working under Hyperbaric Conditions System- and Maintenance requirements (WOD-SOE) and a number of Information notes diving. Moreover in Chapter 7, there is a description about the Diving Project Plan and inventory and evaluation of risks.

The Working Conditions Catalogue Working under Hyperbaric Conditions consists of 4 documents. They are:

- SCUBA scope A 9
- SCUBA Other
- SSE
- Dry diving bell / saturation

2.1 APPLICATION AREA OF THE WORKING CONDITIONS CATALOGUE WORKING UNDER HYPERBARIC CONDITIONS

The Working Conditions Catalogue Working under Hyperbaric Conditions is according to the Working Conditions Act applicable:

1. On Dutch territory.

2. Within the boundary of the exclusive economic zone of the Netherlands. The boundaries coincide with:
   a. the boundary of the territorial sea of the Netherlands, referred to in Article 1, first paragraph, of the Dutch territorial sea boundaries; and
   b. the boundaries of the part of the continental shelf allocated to the Netherlands.

3. On sea going ships registered in the Netherlands.

This also applies to permanently installed platforms and FPSOs operating within the boundaries of the exclusive economic zone of the Netherlands.

2.2 UNSUITABILITY FOR APPLICATION DIVING WORK SCUBA AND SCUBA WITH OLV

SCUBA and SCUBA with OLV are unsuitable for use in activities performed:

- On a construction site and/or a construction as described in Article 1.1 paragraph 2 of the Working Conditions Decree and for application in mining/energy production related work. Excluded are activities carried out within the framework of relief- and rescue activities.
- From a DP ship.

2.3 SCOPE WORKING CONDITIONS CATALOGUE WORKING UNDER PRESSURE DIVING WORK SCUBA OTHER SCOPES AND APPLICATION

This Working Condition Catalogue applies to the following scopes:
- **A15:** carrying out light work, with SCUBA diving equipment, to a depth of 15 metres, within the limits of no-deco diving times;
- **A15OLV:** performing light work, with SCUBA diving equipment and optionally with connection to a high-pressure air supply from the surface, to a depth of 15 metres, within the limits of no-deco dive times;
- **A30:** performing light work, with SCUBA diving equipment up to and including a depth of 30 metres.

3 PARTIES WORKING CONDITIONS CATALOGUE WORKING UNDER HYPERBARIC CONDITIONS

	CNV	CNV Vakmensen
Ministerie van Defensie	Defensie	Ministerie van Defensie
NADO	NADO	Nederlandse Associatie van Duikondernemingen
NAUTILUS INTERNATIONAL	Nautilus /FNV	Nautilus International
ndc nationaal duikcentrum netherlands diving centre	NDC	Voormalig Nationaal Duikcentrum (tot 2014)
CvD CS	CvD CS	College van Deskundigen Civiele Sector (na 2014)
Nederlandse Vereniging Beroepsduikers	NVB	Nederlandse Vereniging van Beroepsduikers
Nederlandse Vereniging van Dierentuinen	NVD	Nederlandse Vereniging van Dierentuinen
POLITIE	Politie	

	Caissonsector	Nederlandse Vereniging Aannemers Funderingswerken
	NVvHG	Nederlandse Vereniging voor Hyperbare Geneeskunde
	NIPV	Nederlands Instituut Publieke Veiligheid
		Brandweer Nederland

4 FREQUENTLY ASKED QUESTIONS AND ANSWERS

4.1 WHO IS THIS WORKING CONDITIONS CATALOGUE FOR?

The Working Conditions Catalogue is specifically intended for employers and employees in the Sector Working under Hyperbaric Conditions, but also for the clients/ third parties mentioned in the risk group**: Duties, responsibilities and requirements.**

Working under Hyperbaric Conditions definitions and applicability:

- **Diving work**: performing work in a liquid or in a dry diving bell including the stay in this liquid or in this dry diving bell, whereby for breathing use is made of a gas under a higher pressure than atmospheric pressure.
- **Caisson work**: performing work in a space under a pressure of at least 10^4 Pa above atmospheric pressure and wholly or partially is surrounded by a liquid including the stay in and the transportation to and from that space.
- **Hyperbaric medicine work**: performing work in a hyperbaric treatment chamber under a pressure of at least 10^4 Pa above atmospheric pressure.
- **Other work under hyperbaric conditions**: performing of other work than diving or caisson work in a space under a pressure of at least 10^4 Pa above atmospheric pressure, including the stay in that space.

4.2 WHAT IS A WORKING CONDITION CATALOGUE?

A Working Condition Catalogue contains agreements regarding controlling of (specific) Health and Safety risks at sector-, branch - or company level. Social partners (employers and employees) agree together which way the requirements in the Working Conditions Act and legislation can be met. They provide practical solutions to meet the target requirements of the government. They choose themselves the form, content and distribution of the catalogue. In that way it is custom-made.
The Working Conditions Catalogue replaces the statutory Working Conditions Policy Rules.

4.3 WHAT IS THE PURPOSE OF THE WORKING CONDITIONS CATALOGUE?

The main purpose of this Working Conditions Catalogue is to provide employers and employees an as practicable as possible tool to improve working conditions at the work location.

4.4 WHAT CHANGES AS A RESULT OF THE WORKING CONDITIONS CATALOGUE FOR WORKING UNDER HYPERBARIC CONDITIONS?

The working conditions policy does not change very much. The employer remains responsible for ensuring good working conditions, which at least meet the requirements of the Working Conditions Act and legislation. The employee is obliged during his activities at the work location, in accordance with his training and instructions given by the employer, to take care, to his best ability, of his own health and safety and that of other persons involved.
This Working Conditions Catalogue contains solutions / measures to reduce risks.

4.5 WHAT CAN AND MUST EMPLOYEES DO WITH THE WORKING CONDITIONS CATALOGUE?

In the Catalogue the protection level for the risks have been defined. Employees can with the help of the Working Conditions Catalogue check themselves if the work location complies. On the other hand employees are also obliged to comply with the requirements in the Working Condition Catalogue. ”I did not know!” no longer applies.

4.6 Is it compulsory to comply with the Working Condition Catalogue?

The Netherlands Labour Authority (NLA) inspects companies for compliance with the law and legislation, taking into account the solutions in the Working Conditions Catalogue. If you deviate from these solutions, you have to reach a level of health and safety which is at least as high as when you would have followed the Working Conditions Catalogue. The NLA will check this.

5 WORKING CONDITIONS CATALOGUE WORKING UNDER HYPERBARIC CONDITIONS

5.1 WORKING CONDITIONS CATALOGUE DOCUMENTS

As of 1 January, 2007, the Working Conditions Legislation has undergone a significant change. The most important change as of 1 January 2007 was a further increase of the responsibility of employers and employees by having the standards drawn up by private parties.
The former National Diving Centre (NDC) has at that time managed the process to develop the Working Conditions Catalogue for the field of activity working under hyperbaric conditions.
In 2010 the Working Condition Catalogue Working under Hyperbaric Conditions part: Diving work and part: Caisson work and other work under hyperbaric conditions was approved by the former Labour Inspectorate (Netherlands Labour Authority) and came into force for the field of activity.
Since that time the Working Conditions Catalogue for working under hyperbaric conditions is available on the website https://www.arbocataloguswoo.nl/en/.

2014 update
Since the Working Conditions Catalogue fits seamlessly into the objectives of the Foundation Working under Hyperbaric Conditions (SWOD) the Working Conditions Catalogue management was transferred to SWOD in 2012.
Mid 2013 a SWOD Project group started with the update of the Working Conditions Catalogue Working under Hyperbaric Conditions and creating the document Working under Hyperbaric Conditions System- and Maintenance requirements (WOD-SOE) which forms part of the Working Conditions Catalogue. In spring 2014 this version of the Working Conditions Catalogue and the WOD-SOE was approved by former Inspection SZW (Netherlands Labour Authority), whereupon this revised version came into force.
The official publication in the Government Gazette took place on 18 August 2014, Government Gazette 23207.

2018 update
End 2015 the SWOD Project group started again with a new update of the Working Conditions Catalogue Working under Hyperbaric condition for diving work and caisson work and also of the document Working under Hyperbaric Conditions System- and Maintenance requirements (WOD-SOE). On 20 March 2018 these versions were approved by the SWOD Central Committee of Experts (CCvD), following which these revised versions are in force from 1st October 2018.

2020 update
In 2018 a start was made with another update of the Working Conditions Catalogue Diving work and WOD-SOE and two new Information notes diving were developed These were approved by the SWOD Central Committee of Experts (CCvD) on 23rd June 2020 and are in force from 1st October 2020.

2023 update
Another update of the Working Conditions Catalogue Diving work and WOD-SOE was started in 2020 and a third Information note diving was also created. These were approved by the SWOD Central Committee of Experts (CCvD) on 30 January 2023.

2024 update
Another update of the Working Conditions Catalogue Diving work and WOD-SOE was started in 2023. These were approved by the SWOD Central Committee of Experts (CCvD) on 3 December 2024.

5.2 BASE MATERIAL

The control measures in the Working Conditions Catalogue are amongst others based on:

- Current Working Conditions Act, Working Conditions Decree, Working Conditions Regulations, the former Working Conditions Policy Rules and the former Assessment Guideline governing the Maintenance of Systems for Diving and Caisson Equipment (BRL D&C);
- IMO regarding vessels with a (DP) Dynamic Positioning System used for diving work;
- IMO regarding provisions for hyperbaric evacuation of saturation divers in case these have to be evacuated from a vessel;
- IMCA D 014 IMCA International Code of Practice for Offshore Diving;
- Industry guidelines regarding diving work such as published by IMCA;
- Medical guidelines regarding diving work published by DMAC;

5.3 VALIDITY WORKING CONDITIONS CATALOGUE

The current Working Conditions Catalogue Working under Hyperbaric Conditions part: Diving work and the part: Caisson work and other work under hyperbaric conditions, WOD-SOE and Information notes diving are in force from 1 February 2025.

The employers and employees have agreed when drawing up the first Working Conditions Catalogue that the Working Conditions Catalogue will be evaluated after periods of 3 years. They can then see whether major changes have occurred regarding the work, or rules or working methods. And that may be a reason to adjust the contents of the Working Conditions Catalogue accordingly.

The employers and employees may jointly also decide that an interim update is necessary, such as on account of investigation results and recommendations after accidents during work under hyperbaric conditions. In addition the knowledge and technique evolve constantly, which also may lead to an update of the Working Conditions Catalogue.

Comments / remarks documents

In case you have points of improvements or recommendations regarding the Working Conditions Catalogue, WOD-SOE and Information notes diving you are requested to inform SWOD. During the next update these points can be discussed and be incorporated.

5.4 THE MANAGEMENT

The Working Conditions Catalogue is managed by SWOD Central Committee of Experts (CCvD). The CCvD consists of representatives of the Fire Brigade, Civil sector and Defence. Jointly they will follow the developments in the field of activity working under hyperbaric conditions and when required update the Working Conditions Catalogue and have it approved by the Netherlands Labour Authority (NLA) when appropriate.

6 DOCUMENTS WHICH FROM PART OF THE WORKING CONDITIONS CATALOGUE

6. 1 WORKING UNDER HYPERBARIC CONDITIONS SYSTEM- AND MAINTENANCE REQUIREMENTS- WOD-SOE

6.1.1 Purpose WOD-SOE

The WOD-SOE is an integral part of the Working Conditions Catalogue Working under Hyperbaric Conditions and consists amongst others of:

- Maintenance system requirement (Chapter 3)
- Minimum system requirements (Chapter 4)
- Detail sheets which include minimum requirements for equipment when new and when in use (Chapter 5)

The System- and Maintenance requirements in the WOD-SOE have been established by the input of a wide group of experts from various sectors of the diving- and caisson industry, hyperbaric medicine, authorities and employers- and employee organisations. The “Assessment Guideline governing the Maintenance of Systems for Diving and Caisson Equipment, version 01 d.d.31 March 2006 (BRL D&C) has served as a basis of the WOD-SOE. Where applicable the requirements have been updated to the current technical and scientific developments.

In the Working Conditions Decree (Article 6.15 paragraph 1 sub b) is defined that when carrying out work under hyperbaric conditions sound equipment which is in a good condition shall be provided to the employees. In order to comply with the above mentioned article the equipment which is used during work under hyperbaric conditions must as a minimum comply with the System- and Maintenance requirements (WOD-SOE).

By complying with the requirements in the WOD-SOE, you as employer have taken measures that the employees are provided with sound material and that this material is in good condition. Working with sound material which is in a good condition together with requirements regarding personnel and risk management constitute the conditions which contribute to the safety of working under hyperbaric conditions.

National labour Authority (NLA) will when carrying out their inspection task also use the WOD-SOE as part of the legislation and regulations applicable for working under hyperbaric conditions and on the basis of these documents inspect and in case it is necessary enforce the law.

The WOD-SOE can be found at https://www.arbocataloguswoo.nl/en/ and can be downloaded as a PDF document.

6.2 INFORMATION NOTES DIVING

6.2.1 Purpose Information notes

The Information notes are an integral part of the Working Conditions Catalogue Working under Hyperbaric Conditions.

The purpose of these Information notes is to create awareness of possible risks present when diving. By highlighting the risks and providing guidance on methods to assess and best manage these risks, the risks can be reduced or even eliminated.

Information notes supplement the "Risks and Minimum Control Measures" listed in the Working Conditions Catalogue.

The Information notes can be found at https://www.arbocataloguswoo.nl/en/ and can be downloaded as a PDF document.

6.2.2 Approved Information notes until 2024

Nr.	Subject	Approved by SWOD CCvD
1	Information note Nr. 1 Risks and Control measures pressure differences (Delta P)	June 2020
2	Information note Nr. 2 Risks and Control measures working with high pressure jetting gun	June 2020
3	Information note Nr. 3 Risks and Control measures working at contaminated locations	July 2022

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7. MANAGEMENT SYSTEM AND DIVING PROJECT PLAN

7.1 MANAGEMENT SYSTEM

Diving companies must have a Management System for amongst others Safety, Health, Quality and Equipment.

7.2 DIVING PROJECT PLAN AND INVENTORY AND EVALUATION OF RISKS

Prior commencement of diving operations a Diving Project Plan must be in place.
The Diving Project Plan must be based on the risk inventory and evaluation for the diving operations to be carried out. In this way this gives implementation to the Working Conditions Act, Working Conditions Policy Article 3 and Inventory and Evaluation of Risks Article 5.

7.2.1 Inventory and evaluation of risks

Section 8 of the Working Conditions Catalogue lists the following topics with risks and minimum control measures to be taken into account as a minimum when identifying and assessing the risks of the work to be carried out:
8.1 Duties, responsibilities and requirements;
8.2 Equipment;
8.3 Personnel;
8.4 Medical;
8.5 Work planning (This is not an exhaustive list of all hazards or all measures needed to control risks. There may also be specific hazards known by the client);
8.6 Emergency procedures and contingencies.

7.2.2 Diving Project Plan

This must at least consist of:
1. Documents that must be present and activities that must take place prior the diving operations commence;
2. Interaction and activities / responsibilities client/ third parties and diving company;
3. Documents and procedures at the start and during diving operations.

The diving supervisor(s) must be familiar with the Diving Project Plan.

7.2.2.1 Documents and activities prior diving operations commence

Diving Project Plan	**Company documentation**	**- Work instruction** **- RI&E**
	Work preparation	**- Work plan** **- Project RI&E**
	Prior commencement and during work operations	**- Last Minute Risk Analysis (LMRA)** **- Management of Change procedure (MOC)**

7.2.2.2 Interaction between client and diving company

Example client and diving company activities and responsibilities

Fase	Client	Section	Diving company	Chapter/ section
1	Suitable diving company for the work to be carried out	8.1.1.2	**Management system** safety, health, quality and equipment	
			Company documentation Work instruction (Diving manual / handbook) + RI&E	 8.1.2.1.1 8.1.2.1.2
2	Information to contractor / diving company Participation in execution of Project RI&E (depending on complexity of work) Agreement with Work plan Health and Safety plan	8.1.1.3 8.1.1.1	**Work preparation** Project RI&E Work plan + Breathing gas stock + Equipment requirements + Personnel requirements + Medical	 8.1.2.1.4 8.1.2.1.3 8.1.3.4 8.2 8.3 8.4
3	Safe situation on the work site and simultaneous	8.1.1.3	**Prior commencement diving** Personnel familiarity with	

	activities		diving system, work plan, operations and precautions Suitability of diving equipment and diver personal equipment LMRA + Management of Change (MOC)	 8.2 8.1.2.1.5 8.1.2.1.6
4	Warning of change situation at work site	8.1.1.3	**Execution diving operations**	8.5

7.2.2.3 Documents and procedures at start and during diving operations

The following is an example and depending on the operations and Project RI&E may need to be adapted / extended.

Example of measures during diving operations:

Step	Actors	Action
1	Diving Company Diving Supervisor Site Supervisor Client	**1A/** Project RI&E and Work plan: ⟹ carry out and agree with all involved parties
		1B/ Management of Change procedure: ⟹ adjust Work plan and carry out Project RI&E
		Work location
2	Diving supervisor	LMRA prior starting the work e.g.: ✓ Weather situation and forecast ✓ Water flow rate ✓ Other activities in the area ✓ Safe work location ✓ Suitable Work Equipment and breathing gas ✓ Personnel certified and experienced ✓ Communication and emergency communication ✓ Emergency facilities to rescue diver ✓ Precautions high pressure jetting gun ✓ Project equipment in accordance Work plan **Results LMRA:**
		V ⟹ Workconditions in accordance with Work plan *continue with step 3*
		✖ ⟹ Workconditions **NOT** in accordance with Work plan *go back to step 1B*
3	Diving supervisor	Discussion Work plan and control measures diving operations with divers and other personnel
4	Diving supervisor Site Supervisor	Work permit (written approval) for diving operations (When applicable)
5	Diving supervisor Site Supervisor	When applicable at Delta P follow Lock out Tag out procedure and control
6	Diving supervisor Site Supervisor	Install safety provisions according to the Work plan

7	Diving supervisor	When applicable isolate diver from Differential Pressure Danger Zone (DPDZ)	
8	Diving supervisor	Discuss dive plan diver with the diving team	
9	Diver	**Execution Work plan:**	
		V	No deviations from Work plan during diving activities ⟹ *continue with step 10*
		✖	Deviations from Work plan during diving activities ⟹ *go back to step 1B*
10	Diving supervisor	Control during operations above- and underwater	
11	Diving supervisor	When request for extra work ⟹ *go back to step 1B*	
12	Diving supervisor	Job completed: Cancel Work permit / written approval for diving activities	
13	Diving supervisor Site Supervisor	Resume diving activities after leaving dive site ***go back to step 2***	

8 RISKS AND MINIMUM CONTROL MEASURES SSE DIVING

EXPLANATION OF USE

Subjects
In each subject there is description of Risks and Minimum control measures. The project group Working Conditions Catalogue Working under hyperbaric conditions has chosen the subdivision used by IMCA in its document IMCA D 014 "International Code of Practice for Offshore Diving".

Risks
The Risks column covers all risks relating to a particular subject. Each risk is presented in as brief a description as possible.

Minimum control measure
The minimum control measures described in the Working Conditions Catalogue are the minimum measures an employer and employee must take to manage the corresponding risk. An employer is always free to take additional (or more far-reaching) measures.

Terms and abbreviations
For explanation of the terms and abbreviations used in this chapter, see Chapter 1 “Terms/ Abbreviations and Description.

8.1 DUTIES, RESPONSIBILITIES AND REQUIREMENTS

Risks	Minimum control measure	Reference
8.1.1 Client/ third parties		
8.1.1.1 Health- and Safety plan		
Absence or incomplete Health- and Safety plan	For high-risk projects, the client prepares a Health and Safety Plan	AB article 2.28 Health- and Safety plan
8.1.1.2 Ensuring obligations for the working conditions are taking into account		
Diving company is not able to carry out the work	Client verifies that the diving company can carry out the work.	AB article 2.26 General health and safety principles in the design of a structure
8.1.1.3 Information to diving company		
Incomplete informing the diving company	Formally define roles, responsibilities and authority for all parties involved.	AW article 19 Multiple employers
	Prior commencement by the diving company of the Project RI&E and Work plan inform the diving company amongst others about: • Contaminated soil and water and the possible hazardous substances and biological agents present and concentration; • Hazards at the work site, both above water and underwater including obstructions and their location; • Possible danger from pressure differences (Delta P) and locations, such as at locks, water inlets and outlets and ship propellers and thrusters; • Other activities that take place on and near the work site that may pose a hazard to diving personnel such as lifting operations, pile driving, seismic surveys; • RI&E carried out by the client; • Clients health and safety plan. Before commencement and during diving operations: • Immediate communication of any changes.	AB article 2.28 Health- and Safety-plan AW article 10. Preventing hazards to third parties Information note Diving No. 1 Risks and control measures pressure differences (Delta P) Information note Diving No. 3 Risks and control measures for work at contaminated locations

Risks	Minimum control measure	Reference
8.1.2 Employer/ diving company		
8.1.2.1 Diving Project Plan A Dive Project Plan must be in place before diving operations commence. (See also Chapter 7)		
8.1.2.1.1 Work instruction		
Work instruction not in line with the law and legislation and industry standard	Version control, list of changes, evaluation and maintenance (custodian / secretary).	
Work instruction incomplete (unsound work instruction)	Minimum contents: • Responsibilities and authorities; • Equipment and maintenance; • Diving procedures, including; emergency procedures (See also: EMERGENCY PROCEDURES AND CONTINGENCIES); • The Standby diver deployment and preparedness / the level the standby diver needs to be dressed; • Facilities and procedures for situations which deviate from commonly occurring work situations; • Guidelines for decompression; • Reporting accidents and medical assistance; • Composition and use of the First Aid equipment; • Team composition (size, qualifications and tasks and authorities); • Cleaning / disinfection procedures.	AB article 6.15 Safety measures, paragraph 1a. sound work instruction International Code of Safety for Diving Operations, 2023 (Resolution MSC.548(107)) RIVM guidelines
8.1.2.1.2 RI&E and work situation		
Insufficient assurance of a safe work situation	Availability of a RI&E and action plan. Adjust RI&E in case of changed working conditions and/or methods. Providing a safe and suitable work location. Recording of tasks and responsibilities of third parties/ supporting personal.	AW article 5 Inventory and evaluation of risks AB Chapter 3 Organisation of workplaces AW Chapter 10 Preventing Hazards to third parties AW article 19 Multiple employers

Risks	Minimum control measure	Reference
		International Code of Safety for Diving Operations, 2023 (Resolution MSC.548(107)
Personnel unable to perform their duties due to being under the influence of drugs, alcohol and/or mind-altering substances.	Instructions / requirements regarding medication, alcohol and mind-altering substance use must be in place.	
Unreported pregnancy to employer.	Include obligation to report pregnancy in work instructions. Educate diving staff on the risk and prohibition of working under hyperbaric condition during pregnancy.	AB Chapter 5 Section 3 Pregnant and breast feeding employees AB 6.29 Work prohibitions for working under excess pressure AB 1.41 Risk assessment and evaluation
8.1.2.1.3 Contents Work plan		
Work plan is incomplete	Minimum contents of Work plan: • Project specific Tasks, Responsibilities and Authorities; • Project RI&E; • Plan how to carry out the work.	AB article 4.50 Work plan
8.1.2.1.4 Project RI&E To carry out a specific project in a safe and healthy manner and under the correct circumstances, the risks must be assessed.		

Risks	Minimum control measure	Reference
Project RI&E incomplete	Content Project RI&E, at least focus on the following topics: • Address and location; • Dive location safely accessible; • Can the diver enter and exit the water safely; • Is there shipping traffic; • Waterway authority informed; • Is communication possible (distance, language, noise, means, etc.); • How is communication arranged between diver and diving supervisor; • Is there a risk of falling or slipping; • Size of dive team; • Diving medical attendant present? Is rescue in case of an emergency possible; • What emergency facilities are necessary, e.g. presence/availability of a compression chamber diving work; • Weather conditions; • Maximum dive depth to be reached and dive depth; • Is there current (including those caused by locks, pumping stations, inlets and outlets of cooling systems, ship propellers and thrusters (Delta P)); • Is there any tidal movement and is it known when the tides changes; • What is the expected underwater visibility; • Are there contaminants and conventional explosives in the water/bottom and, if so, should measures be taken to minimise exposure to them for divers; • Is decontamination of contaminants necessary and what resources are needed for this; • Any underwater obstacles known and the location.	AW article 5 Inventory and evaluation of risks
8.1.2.1.5 LMRA procedure Prior commencement of the diving work a LMRA must be carried out at the diving location		

Risks	Minimum control measure	Reference
LMRA incomplete	Content LMRA, at least the following topics to be adressed: • Safety around the dive site (are there no loose parts, hoses, cables, etc. at the site); • In the event of an emergency can emergency services reach and leave the dive site; • Suitable facilities/resources are available to allow the diver to enter and exit the water safely; • Are hazardous places marked; • Weather conditions and what are the prospects; • Maximum current velocity; • Visibility under water; • Work in the area that may affect diving work; • Are all safety devices in place? Are access and escape route safe; • Are divers/diving crew suitable/deployable for the task to be performed; • Sufficient breathing gas of the correct composition; • Correct diving equipment, and in good condition; • Work equipment suitable and safe for the work to be performed.	AW article 5 Inventory and evaluation of risks
8.1.2.1.6 Management of Change procedure (MOC)		
Undescribed or new risks which are not controlled.	Use Management of Change (MOC) procedure/ instruction. In case of deviations from the work plan: • Stop work; • Adjust work plan; • Conduct project RI&E; • Perform LMRA; • Work meeting with all parties involved and diving personnel before start of diving work.	AW article 5 Inventory and evaluation of risks

Risks	Minimum control measure	Reference
	If additional work is requested: • Adjust work plan; • Carry out project RI&E; • Perform LMRA; • Work discussion adjustments with all parties involved and diving personnel before commencement of diving operations.	AW article 5 Inventory and evaluation of risks
8.1.2.2 Infectious Diseases		
Illness, death, infection other persons.	In accordance with RI&E: • Inform employees regarding the risks of infectious diseases; • Provide information and instructions on what precautions to take; • Provide materials for employees to protect and disinfect themselves; • Establish disinfection protocols for materials, workplaces and living spaces; • Take quarantine measures for sick workers; • Require workers to report if he/she has been in contact with infected persons; • Vaccinate workers before he/she is sent to a site with infectious diseases.	AB Chapter 4 Hazardous substances and biological agents. NIPV Infectious diseases: prevention is better than cure. RIVM guidelines
8.1.2.3 Physical load		
Physical load	Inventory of heavy material, provision of information / advice.	AB Chapter 5, Section 1. Physical load
8.1.2.4 Diving with a breathing gas mixture other than breathing air for example nitrox, heliox or trimix		
The diver has not been (sufficiently) educated / trained to dive with a breathing gas other than breathing air. See the registration scheme's	Following adapting RI&E all personnel involved shall follow education / training for the use of a breathing gas other than breathing air with: • The equipment which is required for this; • The diving tables which will be used; • Emergency procedures.	AW article 8 Information and training

Risks	Minimum control measure	Reference
8.1.2.5 Diving Depth		
The diver has not been (sufficiently) educated/trained to dive to the planned dive depth with the dive method used. See the registration schedules for this	If a registered diver is required to carry out incidental deeper diving than determined for scopes A30, such a dive is possible under the following conditions: • the employer includes the associated risks in the RI&E, as referred to in Article 5 of the Working Conditions Act; • the employer draws up an action plan for these additional risks with regard to equipment, the diving tables to be used and emergency procedures; and • the registered diver receives demonstrable effective education and training appropriate to the type of work.	AW article 8 Information and training SWOD Registration scheme Diver
8.1.2.6 Compression chamber diving work		
Injury	At the place where diving work is performed in water at a depth of more than 15 m or in any other liquid at a pressure higher than $1{,}5.10^5$ Pa above atmospheric pressure, a suitable compression chamber, equipped with a personnel- and medicine lock, must be provided.	AB article 6.18 Compression chamber diving work
	A compression chamber should also be provided if the travel time between the dive site and the nearest treatment facility with compression chamber exceeds 2 hours.	AB article 6.18 Compression chamber diving work
8.1.3 Diving supervisor		
8.1.3.1 Familiarity work instruction and work plan		
Insufficient familiar with the work instruction and the work plan	Diving supervisor shall be given sufficient time to become familiar with the work instruction and work plan.	AW article 8 Information and training AW article 11 General obligations of employees

Risks	Minimum control measure	Reference
8.1.3.2 Familiarity diving system		
Insufficient familiar with the diving system	Diving Supervisor shall be given sufficient time to become familiar with the hyperbaric system / diving system being used.	AW article 8 Information and training AW article 11 General obligations of employees
8.1.3.3 Personnel		
Not suitably trained / examined	The diving supervisor is checking whether the diving team is suitable for the tasks the diving team is planned to execute and or the diving team is in possession of the correct and valid (diving) certificates and a valid medical examination.	AB article 6.14 Suitability AB article 6.16 Diving work
The diver and diving supervisor are not (sufficiently) trained to dive with SCUBA with Surface Air Supply	Training, competence monitoring by employer and notification by employee.	AW article 8 Information and training
8.1.3.4 Breathing gas quantity and composition		
Insufficient quantity of breathing gas during diving	In case of emergency the diver shall be able to make use of such a quantity of reserve breathing gas which will allow him to abort the dive and to complete it in a safe manner. Hereby use can be made of a checklist, check by the diving supervisor, reserve pressure warning system (active or passive depending on the circumstances) and a dive planning / dive worktime calculation.	AB article 6.15 Safety measures paragraph 1b Sound materials WOD-SOE Minimum system requirement
	When using SCUBA with OLV, the content of the SCUBA breathing gas cylinder(s) used is leading in determining the planned maximum dive time.	AB article 6.15 Safety measures paragraph 1b Sound materials WOD-SOE Minimum system requirement
Insufficient breathing gas and/or oxygen to be able to treat a diver with a decompression illness in a compression chamber	Prior to the dive the dive supervisor needs to check that the recommended minimum quantities of breathing gas and oxygen are present for the treatment of a diver with a decompression illness in the compression chamber.	AB article 6.15 Safety measures paragraph 1b Sound materials IMCA D 050

Risks	Minimum control measure	Reference
Incorrect breathing gas	Prior the dive the diving supervisor shall ensure that the correct breathing gas is used (See also DUTIES, RESPONSIBILITIES AND REQUIREMENTS item 8.1.2.4).	AB article 6.15 Safety measures paragraph 1b Sound materials
	In the case of SCUBA diving, when using a breathing gas other than air, the composition of the breathing gas must be conclusively established before the dive commences.	AB article 6.15 Safety measures paragraph 1b Sound materials
8.1.4 Divers		
8.1.4.1 Familiarity work plan		
Insufficient familiar with the work plan	Divers must be sufficiently instructed, proper instruction (for example start work meeting / kick-off) and formal recording of tasks and responsibilities.	AW article 8 Information and training AB article 6.15 Safety measures paragraph 1a Proper written work instructions
8.1.5 Diving assistant (Tender)		
8.1.5.1 Familiarity work activities		
Insufficient familiar with the work activities under hyperbaric conditions and the associated tasks and responsibilities	Proper instruction (for example start work meeting / kick-off) and formal recording of roles and responsibilities.	AW article 8 Information and training AB article 6.15 Safety measures paragraph 1a Proper written work instructions
8.1.6 Work preparator diving work		
8.1.6.1 Unfamiliar with Working Conditions Catalogue WoO, Information notes diving , WOD-SOE and information Client		
Insufficient or unfamiliar with the Risks and Minimum control measures in the Working Conditions	The person preparing procedures and materials for diving work must be familiar with applicable laws and regulations.	AW article 8 Information and training AW article 11 General obligations of

Risks	Minimum control measure	Reference
Catalogue and Information notes and Minimum Requirements in the WOD-SOE. Injury or fatal accident personnel.		employees Working conditions catalogue WoO inclusive Information notes diving and Working under hyperbaric conditions System and Maintenance requirements (WOD-SOE)
Inadequate or unfamiliar with the information from the Client of the Work Site to the Diving Company. Injury or fatal accident personnel.	When drawing up the Work Plan and carrying out the Project RI&E, preparing the Diving Project Plan and the equipment to be used must be familiar with the information given to the Diving Company by the Client.	AW article 8 Information and training AW article 11 General obligations of employees
8.1.7 Other supporting personnel		
8.1.7.1 Familiarity work activities		
Insufficient familiar with the work activities under hyperbaric conditions and the associated tasks and responsibilities	Proper instruction (for example start work meeting / kick-off) and formal recording of roles and responsibilities.	AW article 8 Information and training AB article 6.15 Safety measures paragraph 1a Proper written work instructions

8.2 EQUIPMENT

Risks	Minimum control measure	Reference
8.2.1 Equipment general and Personal Protective Equipment		
Damaged	Equipment management, checking by diver and diving supervisor, working in accordance with WOD-SOE.	AB Chapter 8 Personal protective equipment and health and safety signs AW article 8 Information and training paragraph 3 • WOD-SOE Maintenance system requirements • Detail sheets • Minimum system requirements International Code of Safety for Diving Operations, 2023 (Resolution MSC.548(107)
Not inspected	Checking by or under the responsibility of the diving supervisor, working in accordance with WOD-SOE.	
Unsound	Checking by or under the responsibility of the diving supervisor, working in accordance with WOD-SOE.	
Prepared incorrectly and or not functioning	Checking by or under the responsibility of the diving supervisor, working in accordance with WOD-SOE.	
Non-compliance with the minimum system requirements	Working in accordance with WOD-SOE.	
8.2.2 Breathing gas quality		
Wrong breathing gas quality	Periodic inspecting installation and before use inspection of examination / testing report, working in accordance with WOD-SOE.	WOD-SOE Detail sheets
8.2.3 Transportation of a (wounded) diver to and from the diving work location		
Incurring injury, damage diving equipment or delay	The availability of a suitable means/ device: • allowing the diver to safely enter and exit the liquid in which the diving work is carried out • to bring in case of an emergency a wounded or unconscious diver on deck and/or ashore. Working in accordance WOD-SOE.	AB article 4.7 Measures for unintended events WOD-SOE Minimum system requirements

Risks	Minimum control measure	Reference
8.2.4 Thread connection of valves on diving cylinders		
Incurring damage and injury of personnel, possibly with fatalities, as a result of use of different types of thread on the cylinder and the valve, as a result of which the valve by the pressure in the cylinder may eject with great force out of the cylinder. This can take place during maintenance and inspection of diving cylinders	Check that the thread of the cylinder is exactly the same type as the thread of the valve.	AB article 7.3. Suitability of work equipment AB article 7.4. Soundness of work equipment and unintended events NEN-EN 144-1 IMCA D 064

8.3 PERSONNEL

Risks	Minimum control measure	Reference
8.3.1 Qualification and competence		
8.3.1.1 Diver		
Not qualified and/or incompetent diving personnel	Training, practice, competence verification and checking of certificates. The diver must indicate that he is trained and competent for the work to be carried out.	AW article 11 General obligations of employees AW article 8 Information and training, AB: article 6.14 Suitability AB 6.16 Diving work SWOD Registration scheme Diver
Lack of practical experience or specific practical experience	The number of divers used with no or restricted practical experience shall be considered during the work preparation phase.	
8.3.1.2 Standby diver		
Too late ready to assist a diver in distress	1. A standby diver must be present at the diving location. 2. The standby diver must be immediately ready and completely dressed, except for his mask or diving helmet, if diving work is carried out under the following conditions: • With current / tidal conditions above 0,5 meter per second; • When diving is carried out under hazardous conditions; • In case of high probability the diver will get stuck to something; • In any other situation when the diving supervisor is of the opinion there is a need that a diver requires immediate assistance. 3. In all other situations the standby diver must be immediately available, the diving equipment be ready, tested and ready for immediate use.	AB: article 6.16 Diving work SWOD Registration scheme Diver

Risks	Minimum control measure	Reference
8.3.1.3 Deckcrew/ Riggers		
Incompetent personnel	Training, practice, competence verification in accordance IMCA or equivalent by employer and notification by the employee.	AW article 11 General obligations of employees AW article 8 Information and training IMCA C003
8.3.1.4 Diving Supervisor		
Not qualified and/or incompetent diving personnel	Training, practice, competence monitoring and verification of certificates by employer and notification by the employee.	AW article 11 General obligations of employees AW article 8 Information and training AB article 6.14 Suitability AB article 6.16 Diving work SWOD Registration scheme Diving Supervisor, Diving medical attendant

Risks	Minimum control measure	Reference
8.3.1.5 Diving medical attendant		
Not qualified and/or incompetent diving medical attendant	1. Training, practice, competence verification and checking of certificates and notification by the employee. 2. For diving work in: Scope A0, A15 and A 15OLV within the limits of no-deco dives the diving medical attendant must as a minimum be in possession of a Diving Medical Attendant scope B1 certificate. Scope A30 and the categories B and C the diving medical attendant must as a minimum be in possession of a Diving Medical Attendant scope B2 certificate. To decide if the available medical care is adequate or available quickly enough shall be established by means of a Project RI&E.	AW article 11 General obligations of employees AB article 6.15 Safety measures paragraph 1c SWOD registration scheme Diving medical attendant AW article 8 Information and training
Not available for attending hyperbaric treatment in the compression chamber	Any dives made by the diving medical attendant must not impair his availability as diving medical attendant.	AB article 6.16 Diving work paragraph 4

Risks	Minimum control measure	Reference
8.3.1.6 Diving physician		
Not qualified and/or incompetent diving physician	A category diving physician B or a category diving physician A shall be in possession of a valid certificate which is applicable for the work he is going to perform, taking in consideration: A diving physician A is only allowed to carry out periodical (renewal) examination of professional divers. A diving physician B is allowed to: • Perform the initial occupational health medical examination of persons required to carry out diving work; • Perform periodical (renewal) examination of professional divers; • Perform the occupational health medical examination of persons required to carry out diving work after the detection of a diver illness, such as decompression sickness or air embolism or after a diving-related accident; • To act as a diving medical attendant; • To act as diving medical advisor.	AB: article 6.14 a Occupational health medical examination paragraph 1 and paragraph 2 AB: article 6.14b Diving physician AB: article 6.15 Safety measures paragraph 2 SWOD registration scheme Diving physician Examination guideline Occupational health examination Working under Hyperbaric conditions Diving work Document code: CAT 003.1
8.3.2 Number of personnel / team size		
8.3.2.1 Too small team		
Too small team to get a diver in distress out of a liquid and/or to mobilise in an adequate manner external assistance	Minimum team size during diving is at all times in accordance with AB article 6.16 paragraph 1 (at least one diver, one standby diver and one diving supervisor). In case diving is carried out in the diving work category scope A15, A15OLV, A30, B30, B50R, B50 and C no use may be made of the deviation which is defined in AB article 6.16 paragraph 4.	AB article 6.16 Diving work paragraph 4 SWOD registration scheme Diver

Risks	Minimum control measure	Reference
8.3.2.2 Team size determination		
Too small team to be able to execute the work in a safe manner	Team size is determined by the nature of the work, diving method and handling of potential emergency situations. Under the circumstances mentioned below there is a potential risk that the divers will get into difficulties, such as meant in AB article 6.16 paragraph 4: • Standby diver cannot put on diving equipment by himself; • Poor visibility, namely: at less than 1 meter persons or objects are not clearly visible; • Impossibility to free ascend; • Presence of obstructions; • Entering hollow spaces; • Educating and training of divers with exception of the situation whereby at least two certified divers with diving equipment are in the water.	AB article 6.16 Diving work paragraph 4
8.3.2.3 Presence diving team members at diving location		
Absence of dive team members at the dive site resulting in too small a team presence or incorrect composition	All dive team members required during dive operations must be present at the dive site and immediately ready to safely perform the dive operations.	AB article 6.15 Safety measures AB article 6.16 Diving work
8.3.2.4 Filling the position of dive medical attendant in a team/dive team		
No diving medical attendant available	In case of a diving team consisting of 3 persons, the diving supervisor or the standby diver (if there are no limitations due to any dives made by the standby diver) may also act as the diving medical attendant.	
8.3.3 Working periods / times		
Exhaustion and loss of concentration	Working in accordance with the ATW.	ATW
8.3.4 Safety Training		
Insufficient knowledge and experience with regard to safe working	Sufficiently participating in safety trainings and practicing emergency procedures (See also: EMERGENCY PROCEDURES AND CONTINGENCIES) associated with the work.	AW article 8 Information and training AB article 4.7 Measures for

Risks	Minimum control measure	Reference
		unintended events VCA BHV EHBO, etc..

8.4 MEDICAL

Risks	Minimum control measure	Reference
8.4.1 Medical equipment		

Incorrect composition of medical equipment	Oxygen kit is a necessary element of the first aid equipment. The quantity of available oxygen must be sufficient for the travel time to the nearest recompression facility (See EMERGENCY PROCEDURES AND CONTINGENCIES point 8.6.3.1) or the time it takes till arrival of professional medical assistance.
	
	Diving medical attendant Scope B1 (scopes A9, A15, A15OLV
	minimum medical equipment
	• Oxygen kit;
	• First aid kit as defined by the company medical department or complies with the "Orange Cross" guidelines for companies;
	
	Diving medical attendant B2 (Scopes A 30 en categories B and C)
	minimum medical equipment:
	
	At the diving location without compression chamber:
	• Oxygen kit;
	• First aid kit as defined by the company medical department or complies with the "Orange Cross" guidelines for companies;
	• Means to be able to make the diagnoses, such as:
	  ○ stethoscope
	  ○ reflex hammer
	  ○ blood pressure measuring device
	  ○ otoscope (battery operated)
	  ○ refillable pencil torch
	  ○ thermometer (electronic) (Suitable for hypothermia and fever)
	  ○ tong depressors wood
	  ○ tuning fork 512 Hz
	  ○ emergency blanket
	
	During diving work where adequate medical care cannot be available quickly enough, as a minimum the following extra means need to be present at the diving location:
	• Stretcher;
	• AED.
		AB article 6.15 Safety measures paragraph 1d adequate First aid equipment
		
		AB article 4.7. Measures for unintended events
		
		DMAC 15
		
		SWOD Registration scheme Diving medical attendant and Diver

Risks	Minimum control measure	Reference
	At the diving location with compression chamber: The minimum medical equipment without compression chamber, complemented with in the compression chamber the following means: • mouth wedge (for acute oxygen poisoning); • a pressure resistant flashlight; • writing material (pressure resistant).	
8.4.2 Medical examination/ checks		
Use of medication, alcohol use and use of hallucinogenic drugs	1. Employers' regulations / requirements regarding medicine, alcohol and mind-altering substance use (see also section 8.1.2.1.2). 2. The diver must declare when he uses these substances.	AW article 11 General obligations of employees AB article 9.5 Obligations of self employed persons and assisting employers IMCA D 061
Physical condition	Notification by the diver.	AW article 11 General obligations of employees AB article 9.5 Obligations of self employed persons and assisting employers
Mental condition	Notification by the diver.	AW article 11 General obligations of employees AB article 9.5 Obligations of self employed persons and assisting employers
No diver medival	1. Check diver logbook + notification by the diver. 2. The examination prior commencement working under hyperbaric conditions shall be carried out by a Diving Physician B in a sufficiently equipped centre to carry all aspects of the examination. Periodical renewal examinations, every twelve months, may also be carried out by a Diving Physician A.	AW article 11 General obligations of employees AB article 6.14 Suitability SWOD registration scheme

Risks	Minimum control measure	Reference
	Following a diver illness such as decompression sickness, air embolism or a disorder mentioned as absolute contra-indication the medical examination shall take place by a physician with a certificate Diving Physician B. Regarding to the medical examination for persons carrying out diving work, caisson work and other work under hyperbaric conditions the following applies: A person who is required to carry out diving work, caisson work and other work under hyperbaric conditions: • Shall without restrictions be able to carry out his work under hyperbaric conditions, under physical heavy circumstances be able to swim / walk, communicate and be able to cope with the responsibility psychologically; • May not endanger himself or another member of the team by a medical disorder during working under hyperbaric conditions such as loss of consciousness, loss of orientation or panic attack; • May not have a disorder which as a result of working under hyperbaric conditions may worsen; • May not have a disorder which may cause the development of a diver illness such as decompression illness or barotrauma. 3. Examination in accordance with: Examination guideline Occupational health examination Working under Hyperbaric Conditions Diving work Document code: CAT 003.1	Updated advice on 'Diving medical fitness divers COVID 19' Ref SWOD 2022/833/ PGDZ. Examination guideline Occupational health examination Working under Hyperbaric Conditions Diving work Document code: CAT 003.1
8.4.3 Liaison with a suitable diving physician		
No diving physician available	Agreement / contract with diving physician in which availability of the diving physician is recorded.	AB article 6.15 Safety measures paragraph 2
Non-functioning means of communication	Appropriate means of communication in relation to the work location (inclusive back-up).	

Risks	Minimum control measure	Reference
8.4.4 Medical and Physiological considerations		
8.4.4.1 Diver monitoring		
Failure to observe changes in the health status of the diver	Monitoring the health status of the diver. Possible ways are: video (ROV), voice communication and line signals. The Project RI&E will indicate which method(s) must be used.	
8.4.4.2 Flying after diving		
Contract a decompression sickness during flying after diving	Planning air travel in accordance with the requirements in the decompression tables being used.	
8.4.4.3 Diving medical risks		
Primary diver sickness, secondary diver sickness, other disorders and decompression sickness	Diving medical aspects of diving as described in the textbook diving medical attendance for the relevant category of diving work, briefing, presence of a diving medial attendant and medical evacuation plan, contact means and options with diving physician, presence of a First Aid kit.	SWOD registration scheme Diver, Diving physician, Diving medical attendant
Decompression sickness	Checking diver logbook + notification by diver (possibly recreational diving and diving at third parties) and use of decompression tables, presence of a compression chamber diving work in accordance with AB: article 6.18. Compression chamber diving work	AW article 11 General obligations of employees

8.5 WORKPLANNING

Risks	Minimum control measure	Reference
8.5.1 Risico Management Process		
Not described or new risks which are not managed	Diving Project Plan present prior execution of the work (See also DUTIES, RESPONSIBILITIES and REQUIREMENTS 8.1.2.1)	AW article. 5 Risk assessment and evaluation
8.5.2 Operational and Safety Aspects		
8.5.2.1 Falling in the water and drowning risk		
Drowing risk	Depending on the situation use of: • Life jacket; • guardrails/railings; • secure with a line/fall protection; • rescue equipment; • other suitable means.	Article 3.16. Preventing danger of falling
8.5.2.2 SCUBA		
Limited breathing gas quantity	Unsuitable for application at mining / energy production related work under hyperbaric conditions.	
	SCUBA and SCUBA with OLV are unsuitable for use in activities performed on a construction site and/or a construction as described in Article 1.1 paragraph 2 of the Working Conditions Decree and for application in mining/energy production related work. Excluded are activities carried out within the framework of relief- and rescue activities.	
8.5.2.3 Diving depth		
Not capable to remain at the desired water depth	A provision to allow the diver to remain at the desired water depth.	
Diving method / category / equipment unsuitable for the diving depth and or diving work	Comply with the limits in the SWOD registration scheme Diver. Working in accordance the WOD-SOE (See also DUTIES, RESONSIBILITES AND REQUIREMENTS 8.1.2.4 and 8.1.2.5)	SWOD registration scheme Diver WOD-SOE minimum system requirements
Use of incorrect decompression table	Establish the diving depth. Facilities in accordance with the WOD-SOE.	WOD-SOE minimum system requirements
Diving deeper than 30 metres	Adapting RI&E with explicit attention for: quantity available breathing gas in case of a failure of the primary breathing gas supply, the type of breathing gas used, decompression	WOD-SOE minimum system requirements

Risks	Minimum control measure	Reference
	tables used in case of emergency. (See also DUTIES, RESPONSIBILITIES AND REQUIREMENTS point 8.1.2.5).	
8.5.2.4 Discharges		
Contaminated water (thermal and/or chemical), uncontrolled "blowing away" of the diver	Closing of discharge or keep a safe distance, in case of pollution and dangers of pressure differences (DELTA P). (See WORK PLANNING item 8.5.3.2.	Information note Nr. 1 Risks and Control measures pressure differences (Delta P) Information note Nr. 3 Risks and Control measures working at contaminated locations
8.5.2.5 Dangers of differential pressure (Delta P). Amongst others, but not limited to: Dams, Dikes, Locks, Weirs / Barriers, Water reservoirs, Swimming pools and Drains. Ships, pipelines and other hollow constructions. Hydroelectric power stations, Desalination plants and intakes of other plants		
Divers, diving supervisors and other personnel involved are not able to recognize and/or are unaware of the presence of the hazards	Remove any pressure difference or ensure that it cannot occur. Performing and recording of a Project RI&E with a project manager and client familiar with the relevant location and drawing up a work plan. (See also WORK PLANNING 8.5.1 Risk Management Process) Before commencing the work: Check with the project manager and the client, familiar with the location concerned, whether all safety measures laid down in the work plan have been taken and record this. In case of changes of the work plan or work situation: Carry out again the Project RI&E with the project manager and the client and record this in an amended work plan. (Management of change). Avoid the risk. Do not allow a diver to approach from the upstream side with a visible or invisible flow due to pressure difference. Only approach from the downstream side if possible. Discuss with the diving team and other personnel involved the risk for any potential hazard at the site.	AW: article. 5 Risk assessment and evaluation AW article 8 Information and training Information note Nr. 1 Risks and Control measures pressure differences (Delta P) UK Health &Safety Executive (UKHSE) Diving Information Sheet No. 13 Differential pressure hazards in diving UKHSE research report: RR761 - Differential pressure hazards in diving

Risks	Minimum control measure	Reference
	Performing a Last Minute Risk Analysis (LMRA). Discuss the emergency scenarios and the actions to be taken should unexpected events occur. Provide all personnel involved with the necessary information to ensure the work is carried out safely. If the failure of a (temporary) construction is part of the risk, the integrity of the (temporary) construction must be part of the Project RI&E. Use the reference table "annex F" in the HSE document RR 761 to see if foreseeable circumstances may take place whereby the extent of a pressure difference danger zone may increase or the estimated forces may exceed the accepted values. Use the guidelines in the Information note diving No 1 Risks and control measures of Pressure Differentials (Delta P).	https://www.adc-int.org/files/Delta-P%20Diving%20Checklist_01_28_22_FINAL.pdf What is Delta P https://www.youtube.com/watch?v=AEtbFm_CjE0 Video produced by the Ontario Ministry of Labour, this video talks about the hazards of Delta P around dams (Courtesy Ontario Ministry of Labour. 2011) https://www.youtube.com/watch?v=7yEmC-z-dRU . IMCA Information note 975 Diving From, On or in Close Proximity to Merchant Vessels – Protocol for Isolating Machinery Systems: New Industry Guidance Published IMCA D 076 ADC-GP-02 Identification, Assessment and control of differential pressure hazards.
Entrapment of the diver and/or standby diver and possible injury or death	Ask yourself if diving needs to take place or that there are alternatives. Check whether control measures are effective before the diver enters the water. Use SSE to perform this work or other diving method after making a detailed RI&E. Use pre-installed means to prevent suction due to pressure differences. Prevent a diver from coming in the danger zone by using a cage and/or limiting the diving umbilical or signal line length. Use where possible extra or double fitted gates or valves. Do not allow the diver to work on a seal which must prevent an outflow at that moment. Take control measures when pipes with pressure differences are made open.	

Risks	Minimum control measure	Reference
8.5.2.6 Diving near ROV operations		
Accidental contact with the ROV	Direct contact between diving supervisor and ROV supervisor. ROV video picture available to the diving supervisor. Thruster guards fitted to ROV thrusters.	IMCA D 054 IMCA R 045 IMCA R 004
8.5.2.7 Safe use of electricity		
Incur electrical shock	Consult a specialist for minimum control measure.	IMCA D 045 IMCA R 004
8.5.2.8 Liftbag		
Uncontrolled ascent of the "load" whereby the diver is dragged along with it	Measures to prevent uncontrolled ascent, for example by anchoring the load, an automatic dump. **(Only in applicable in case of scope A 30)**	IMCA D 016 WOD-SOE Detail sheets
Following ascent again uncontrolled descent of the load	Preferably use a closed lifting bag. **(Only in applicable in case of scope A 30)**	IMCA D 016
8.5.2.9 Diving from and/or on DP vessels or floating structures		
Unplanned loss of position resulting in an uncontrolled movement (horizontal or vertical) of the diver	In case of DP vessels at least an IMO equipment class 2, and working in accordance with IMCA D 010. **(DP is not applicable when using SCUBA)** In case of mechanical anchoring (spud poles, anchors and/or ropes) an anchoring system such that the vessel remains stationary.	IMCA D 010 IMCA D 078 IMO DP Guidelines MCS.1/ Circ.1580
Undesired contact between diver and propulsion units (such as: propellers, rudders, thrusters, jets)	Switching off and securing of propulsion units.	Information note Nr. 1 Risks and Control measures pressure differences (Delta P)
8.5.2.10 Working with Oxygen enriched mixtures and Oxygen in compression chambers and other enclosed spaces		
Self-ignition / explosion hazard and fire acceleration in a	The percentage of oxygen in a compression chamber and other enclosed (control rooms, accommodation-, living- or work-) spaces shall not come above 23%.	WOD-SOE Minimum system requirements

Risks	Minimum control measure	Reference
compression chamber and other enclosed spaces by high oxygen percentage		
Fire in the compression chamber due to incorrect / dirty greasy clothing and footwear	Fire can be caused by static electricity and dirty greasy clothing and footwear and can easily ignite especially under hyperbaric conditions and with an increased oxygen percentage. Use clean grease-free clothing.	HSE UK A guide to the Work in Compressed Air Regulations 1996
Fire in the compression chamber due to the use of prohibited substances and equipment	1. Draw up a list which substances and equipment are prohibited in the compression chamber and inform people about this. Prohibited substances and equipment are materials that can cause fire or an explosion under hyperbaric conditions, which get damaged under hyperbaric conditions and cleaning agents and paint that are a health hazard under hyperbaric conditions. 2. Check that no prohibited materials are taken into the compression chamber.	A European Code of Good Practice for Hyperbaric Oxygen Therapy Annex 4.
8.5.2.11 Working with oxygen enriched breathing gasses		
In systems which are used with breathing gases containing an oxygen percentage between 25% and 40% explosion and fire hazard due to presence of grease and oils	1. Applied materials and equipment for the use of oxygen with a percentage between 25 - 40% must be cleaned of visible dirt, grease and oils. 2. Use of oxygen compatible lubricants. 3. Taking into account manufacturer's guidelines.	
In systems which are used with breathing gases containing an oxygen percentage of 40% and higher explosion and fire hazard due to use of unsuitable materials and due to presence grease and oils	The materials and equipment used: • must be suitable for use of oxygen percentage of 40% and higher in accordance with requirements in the WOD-SOE; • are oxygen cleaned and remain oxygen clean. For oxygen clean, the smallest traces of hydrocarbons and contaminants must be removed and this must be confirmed by an inspection by a competent person.	WOD-SOE Minimum system requirements IMCA D 031

Risks	Minimum control measure	Reference
8.5.2.12 Underwater obstructions		
Getting entangled	If possible and necessary removal, exploratory dive. Include in the Work plan. Consult available data regarding the diving location.	
Damage to diving equipment	If possible and necessary removal, exploratory dive. Include in the Work plan. Consult available data regarding the diving location.	
8.5.2.13 Lifting and scaffolding		
Diver / diving equipment is struck by falling / moving objects and/or become trapped	Scaffolding and lifting on platforms and work locations near diving work not simultaneously to take place. Physical separation of scaffolding, lifting- and diving work such that falling / moving objects under no circumstances can hit / trap a diver / diving equipment.	
8.5.2.14 Diving in the vicinity of pipelines		
Injury as a result of overpressure reactions (for example during testing or damage)	During testing divers have to be away from of the pipeline. When working on damaged pipelines, pressure reduction.	Information note Nr. 1 Risks and Control measures pressure differences (Delta P)
Injuries caused by heat	Voldoende afstand houden.	
Diving in contaminated water (leakage of the contents)	See WORK PLANNING 8.5.3.2.	Information note Nr. 3 Risks and Control measures working at contaminated locations
8.5.2.15 Diving on depressurised or empty pipelines, hoses and subsea constructions		
Getting trapped by negative pressure	If possible use a diffuser. Availability of pressure equalising measures (for example an emergency valve to quickly remove the negative pressure).	
8.5.2.16 Diving on underwater installations		
Injury resulting from overpressure reactions	Putting in place safety barriers.	
Diving in contaminated water (leakage of the contents)	See WORK PLANNING 8.5.3.2.	Information note Nr. 3 Risks and Control measures working at

Risks	Minimum control measure	Reference
		contaminated locations
8.5.2.17 Cathodic protection		
Incurring electrical shock	Switching off system, subject to voltage and distance to the diver.	IMCA D 045
8.5.2.18 Diving near flare		
Injury as a result of heat and fallout	In advance define the risk area and stay outside of it.	
8.5.2.19 Seismic operations, sonar transmissions and piling		
Injury	Seismic operations, sonar transmissions and piling operations not to be carried out simultaneously with diving work or maintain minimum distances based on the (transmission) power being used.	DMAC 06 DMAC 12
8.5.2.20 Work permit		
Injury by Delta P, falling objects, ship movements and construction activities	A written permit when work needs to be carried out on platforms, pipelines, subsea constructions, locks, construction sites and with varies parties	AB article 1.1 Definitions general paragraph 2 AB article 2.42a Workpermit
When diving from ships/ floating objects by Delta P or divingplatform which is not stationary	When diving from a ship or floating object make use of a permit to dive system	

Risks	Minimum control measure	Reference
8.5.2.21 Excavation by divers		
Collapse hazard, injury or death from being buried and or trapped.	Determine soil type and condition; Inspect the working environment such as lumps hanging from walls, holes in the soil and for accumulations of soil material that may cause a soil shift during excavation due to loss of stability; Generally maintain an embankment slope of 1:3 unless a different slope has been identified in the RI&E; Check the embankment slope regularly; Avoid creating a tunnel or hole when using a high-pressure jetting gun or airlift. Reduced visibility during excavation makes this a major risk; Attach an airlift to an anchor point to prevent the airlift from rising to the surface and falling back down, possibly dragging the diver, if it becomes blocked; Good communication between diver and diving supervisor to be able to immediately stop the airlift or high pressure jetting gun supply in case of emergency; Prevent the umbilical from being buried by the removed soil or sucked into the airlift.	AW artocle 3 Occupational Health and Safety policy IMCA D 074 ADCI International Consensus Standards for Commercial Diving and Underwater Operations 5.34 Underwater Excavation Operations Guidelines
8.5.3 Considerations air-, weather- and sea conditions		
8.5.3.1 Underwater visibilty		
Poor visibility, insufficient overview of the work location	Conform Work instruction	
8.5.3.2 Air- water- and soil pollution		
Adverse health effects	Inspection in advance, work plan, Project RI&E and clothing precautions, hereby attention for biological agents, hazardous substances and chemicals, not only for the diver but also for the other team members (think hereby for example about the diving bell, (possibly equip with gas detection equipment), personnel on deck and ashore).	AB Chapter 4 section 9 Bioligical agents IMCA D 021 Information note Nr. 3 Risks and Control measures working at

Risks	Minimum control measure	Reference
	Making use of the guidelines in Information note Diving Nr. 3 Risks and Control measures working at contaminated locations.	contaminated locations
8.5.3.3 Current/ tides		
Adverse impact on reaching and staying at the work location	Conform Work instruction. Include as a specific point of attention in the Project RI&E.	IMCA D067
8.5.3.4 Wave height		
Influencing in water decompression	Working in accordance with the limits set out in the diving tables.	AB Chapter 6 Physical factors, outdoor climate and weather circumstances
Injury and or damage when getting in and out of the water by the diver	Description of the limit which is based on the equipment being used and the location where the diving takes place.	AB Chapter 6 Physical factors, outdoor climate and weather circumstances
Equipment moving on deck	Description of the limit which is based on the equipment being used and the location where the diving takes place.	AB Chapter 6 Physical factors, outdoor climate and weather circumstances
Influencing lifting work	Description of the limit which is based on the equipment being used and the diving location where work takes place.	AB Chapter 6 Physical factors, outdoor climate and weather circumstances
8.5.3.5 Weather conditions		
Precipitation Cold, humidity, slippery	Protective clothing.	AB Chapter 6 Physical factors, outdoor climate and weather circumstances
Wind Wind chill, reduced stability of people and objects	Generic description of the limit which is based on the equipment being used and the location where the diving takes place.	AB Chapter 6 Physical factors, outdoor climate and weather circumstances
Thunderstorm, Lightning strike	Set situation-dependent limit regarding minimum distance from thunderstorm.	AB Chapter 6 Physical factors, outdoor climate and weather circumstances
Darkness Insufficient overview of the work location	Lightning.	AB Chapter 6 Physical factors, outdoor climate and weather circumstances
Reduced visibility (above water) Insufficient overview	Setting of a limit, the work area of the diver must always be visible and in case of shipping set a situation dependant limit.	AB Chapter 6 Physical factors, outdoor climate and weather

Risks	Minimum control measure	Reference
of the work location		circumstances
Temperature Hypothermia and overheating / heat stroke	1. Conform work instruction regarding the work duration, clothing, shelter, conditioned work environment, diver and also other personnel. 2. Ways to maintain the body temperature of the diver in thermal balance.	AB Chapter 6 Physical factors, outdoor climate and weather circumstances
8.5.3.6 Ice		
Dysfunction of diving equipment as a result of freezing	In case of freezing discontinue diving operation, establish a specific work plan.	AB Chapter 6 Physical factors, outdoor climate and weather circumstances
Ice formation resulting in increase of weight	(Support) equipment must be designed for ice formation.	AB Chapter 6 Physical factors, outdoor climate and weather circumstances
8.5.3.7 Hazardous marine life		
Personal injury	Protective clothing conform Work instruction.	
8.5.4 Communications		
8.5.4.1 Communication with third parties / bystanders, such as shipping, deck personnel, operators, crane drivers		
Occurrence of dangerous situations such as: collision, being run down, falling loads, getting trapped, sucked in or getting stuck, etc.	Agree communication and remain in contact with third parties / bystanders, marking of the dive location and show the required signals.	
8.5.4.2 Miscommunicatie		
Uncertainty about instructions diving supervisor versus diver	In advance agree language to be used. Recording of communication procedure in the work instruction.	AB Artikel 1.5ha Language requirements regulated professions
8.5.5 Diving from vessels, fixed platforms or floating installations		
Not being optimally equipped of ad-hoc used vessels, fixed platforms and	Performing of a Project RI&E when diving from non-purpose built diving vessels, fixed platforms or floating structures. This is specifically to establish the limitations regarding execution of diving operations	IMCA D 014, Section 7.6

Risks	Minimum control measure	Reference
floating structures for the safe execution of diving work	from the above mentioned work locations.	
8.5.6 Diving from a vessel under power and making way		
Suffer injury, as a result of rotating / moving parts of the vessel	Diving from vessels making way shall be avoided. (See also WORK PLANNING 8.5.2.9)	

8.6 EMERGENCY PROCEDURES AND CONTINGENCIES

Risks	Minimum control measure	Reference
8.6.1 Diving emergencies		
8.6.1.1 Diving personel practising emergency situations		
Not practised in emergency situations/ emergency procedures	Practice emergencies: • Equipment not functioning properly; • Rescue diver by standby diver; • Practice on dive simulator.	AW article 8 Information and training
8.6.1.2 Loss of communication		
Increased risk of accidents	1. Abort the dive. 2. Working conform WOD-SOE.	WOD-SOE Minimum system requirements
8.6.1.3 Diver in distress		
Increased risk of personal injury	Abort the dive, provide assistance including deployment of the standby diver and implementation of the agreed emergency procedure.	AB article 4.7 Measures for unintended events AW article 15 Expert company emergency response assistance AB article 6.15 Safety measures paragraph 1 d Adequate first aid equipment
8.6.1.4 Dealing with an injured or unconscious diver		
Risk of (additional) injury, drowning	Inclusion of this emergency procedure in the work instruction.	AB article 4.7 Measures for unintended events AW article 15 Expert company emergency response assistance AB article 6.15 Safety measures paragraph 1 d Adequate first aid equipment
8.6.1.5 Non-functioning or defective equipment		
Increased risk of	Abort the dive and implement agreed emergency	AB article 4.7

Risks	Minimum control measure	Reference
accidents and personal injury	procedure.	Measures for unintended events AW article 15 Expert company emergency response assistance AB article 6.15 Safety measures paragraph 1 d Adequate first aid equipment WOD-SOE Minimum system requirements
8.6.1.6 Fire in and/or around the compression chamber or the compression facility		
Injury, decompression sickness	Compression chamber in accordance with the requirements in the WOD-SOE, firefighting procedures and procedures in which explicit focus on dealing with forced decompression because of an evacuation.	AB article 4.7 Measures for unintended events AW article 15 Expert company emergency response assistance AB article 6.15 Safety measures paragraph 1 d Adequate first aid equipment WOD-SOE Minimum system requirements
8.6.2 Habitat / underwater dry working space		
Death of divers	Procedures and provisions for survival in the habitat of trapped divers for at least 48 hours. Procedures to rescue divers out of the habitat within 48 hours.	AB article 4.7 Measures for unintended events AW article 15 Expert company emergency response assistance AB article 6.15 Safety measures paragraph 1 d Adequate first aid equipment

Risks	Minimum control measure	Reference
		WOD-SOE Minimum system requirements IMCA D 014 Chapter 9
8.6.3 Evacuation of divers from the diving location because of an emergency situation such as fire or sinking ship / platform		
8.6.3.1 SCUBA, no or interrupted decompression following dive due to evacuation		
Incuring decompression sickness	Procedure and resources (amongst others sufficient oxygen and medical supplies during transport) to transfer diver to the nearest recompression facility.	AB article 4.7 Measures for unintended events AW article 15 Expert company emergency response assistance AB article 6.15 Safety measures paragraph 1 d Adequate first aid equipment
8.6.4 Diving contractor contingency centre		
Inability to deal adequately with emergencies which may occur	The availability of a room equipped with sufficient communication facilities, relevant documentation and other necessary facilities for the supporting / coordinating team that is deployed in case of an emergency.	AB article 4.7 Measures for unintended events AW article 15 Expert company emergency response assistance AB article 6.15 Safety measures paragraph 1 d Adequate first aid equipment

9 REFERENCES WORKING CONDITIONS CATALOGUE DIVING WORK

9.1 LAW

9.1.1 Working Condition Legislation / Working Conditions Act (AW)

The Working Conditions Act itself contains no articles that specifically deal with working under hyperbaric conditions or diving work. However the Act does contain general articles which focus on safety, health and welfare.
Important articles in the context of diving work are amongst others:

- Occupational Health and Safety policy: article 3
- Inventory and evaluation of risks: article 5
- Information and training: article 8
- Reporting accidents and occupational diseases: article 9
- Preventing hazards to third parties: article 10
- General obligations of the employees: article 11
- Expert company emergency response assistance: article 15
- Multiple employers: article 19

See www.wetten.overheid.nl/BWBR0010346
(An English Translation of the Working Conditions Act can be found on the OSHA European website **http://osha.europa.eu/fop/netherlands/en/legislation/index_html**)

9.1.2 Working Conditions Decree (AB)

The Working Conditions Decree does contain specific requirements in relation to working under hyperbaric conditions and diving work. In Chapter 6 (physical factors), section 5 (working under hyperbaric conditions) those requirements can be found. Important requirements in relation to diving work are:

- Organisation of workplaces: Chapter 3
- Dangerous substances and biological agents: Chapter 4
- Special provisions concerning information and instructions: Chapter 4 section 9
- Physical load: Chapter 5 Section 1
- Pregnant and breast-feeding employees: Chapter 5 section 3
- Physical factors, outdoor climate and weather conditions Chapter 6
- Personal protective equipment and health and safety signs: Chapter 8
- General definitions, item 2 construction site / structure: article 1.1
- Risk assessment and evaluation: article 1.41
- Language requirement for regulated professions: article 1.5ha
- General health and safety principles in the design of a structure: article 2.26
- Health and safety plan: article 2.28
- Working permit: article 2.42a
- Preventing danger of falling: article 3.16
- Measures for unintended events: article 4.7
- Workplan: article 4.50
- Suitability: article 6.14
- Occupational Health medical examination: article 6.14a paragraph 1 and paragraph 2
- Diving physician: article 6.14b
- Safety Measures: article 6.15 1a proper written work instruction

- Safety measures: article 6.15 paragraph 1 b sound materials
- Safety measures: article 6.15 paragraph 1 c
- Safety measures: article 6.15 paragraph 1 d adequate first-aid equipment
- Safety measures: article 6.15 paragraph 2
- Diving work: article 6.16
- Diving work; article 6.16 paragraph 4
- Compression chamber diving work: article 6.18
- Work prohibitions for working under hyperbaric conditions: article 6.29
- Suitability of work equipment: article 7.3
- Soundness of work equipment and unintendent events: article7.4
- Obligations of self-employed persons and co-operating employers: article 9.5

See www.wetten.overheid.nl/BWBR0008498
(An English Translation of the Working Conditions Decree can be found on the OSHA European website **http://osha.europa.eu/fop/netherlands/en/legislation/index_html**)

9.1.3 Working Conditions Decree and Self-employed persons (ZZP-ers)

Article 9.5 of the Working Conditions Decree describes the obligations of self- employed persons and co-operating employers. In this Article 9.5 is indicated that nearly all requirements of the Working Conditions Decree in relation to diving work are applicable. The relevant articles are: 6.14a, 6.15a, 6.16, 6.17 and 6.18.
See also
https://www.nlarbeidsinspectie.nl/onderwerpen/arboregels-voor-zelfstandigen
https://www.arboportaal.nl/onderwerpen/zelfstandige-ondernemers-zonder-personeel-zzp

9.1.4 Working Conditions Regulations (AR)

Also in the Working Conditions Regulations articles can be found which relate to diving work. The regulations provide further details regarding the articles in the Working Conditions Decree.

9.1.5 Working times legislation

The Working Times Act provides rules regarding maximum working hours and minimum rest periods. The Working Times Act does however make exceptions for Defence, Fire Brigade, Supervisory and (special) Investigative services. For divers working in the mining industry in addition to the normal rules of the Working Times Act and – Decree further rules are applicable.
See publication of the Ministry of SZW regarding Working Hours Act in Dutch
See pubication of the Ministry of SZW regarding Working Hours Act in English

See also the information of our government on the website of the National Labour Authority
https://www.nlarbeidsinspectie/onderwerpen/arbeidstijdenwet

9.1.6 Working times in the mining sector

The Working times Act (hereafter called ATW) is the basic legislation for working hours. Working hours and rest periods, as laid down in the ATW, do not always allow sufficient scope for all sectors to conduct their business effectively. Mining is one of those sectors for which additional and different regulations are required. Therefore the Working Times Decree (hereafter called ATB) contains

additional and different rules for employees who perform work on or from a mining installation (an at sea or surface water located drilling or production platform) or an onshore mining location.
Also for divers who carry out work for the mining sector additional and different rules are contained in the ATB.
When applying the rules of the ATB, it must be remembered that the regulations of the ATW which are not explicitly deviated from in the ATB remain applicable. Furthermore, for some work a choice may be made between the working times scheme of the ATW and that of the ATB.

Collective scheme NADO, NVB, CNV and FNV Bondgenoten
Since April 2007 the ATW legislation has been changed on a number of points in order to respond to the wish to create more flexibility. The ATW no longer has a standard and consultation scheme. There is now a (principal) norm which may be deviated from in a collective scheme. At companies where nothing has been agreed the principal norm will apply. It is only possible to deviate from the principal norm by means of collective agreements between the employer and employees. In that case, the more flexible norm of the collective scheme will apply.
In April 2008 the branch organisation NADO (Netherlands Association of Diving Companies), the NVB (Netherlands Association of Professional divers), CNV and FNV signed a collective agreement so the more flexible norm of the collective scheme is applicable to them.

Download the publication of Staatstoezicht op de Mijnen

9.1.7 Decree medical devices

http://wetten.overheid.nl/BWBR0007307

9.1.8 In-house Emergency Service organisation (BHV)

https://www.arboportaal.nl/onderwerpen/bedrijfshulpverlening

9.1.9 Building together safely and healthy. The building process in the Working Conditions Decree

https://www.nlarbeidsinspectie.nl/publicaties/brochures/2017/05/17/samen-veilig-en-gezond-bouwen

9.2 Document Working under Hyperbaric Condition System- and Maintenance Requirements (WOD-SOE)

See our website for downloading the PDF Document https://www.arbocataloguswoo.nl/en/.
Also available in English.

9.3 Information notes

- Information note Diving No. 1 Risks and control measures of differential pressure (Delta P) https://www.arbocataloguswoo.nl/nl/drukverschillen-delta-p
- Information note Diving No.2 Risks and control measures of High pressure jetting gun operations https://www.arbocataloguswoo.nl/nl/werkzaamheden-met-hogedrukspuit
- Information note Diving No.3 Risks and control measures of working at contaminated locations https://www.arbocataloguswoo.nl/nl/werkzaamheden-op-verontreinigde-locaties

9.4 SWOD Examination guideline

Examination guideline Occupational health examination Working under Hyperbaric Conditions Diving Work. Document code: CAT 003.1 https://www.arbocataloguswoo.nl/nl/keuringsrichtlijn-werken-onder-overdruk-duikarbeid

9.5 Infectious diseases

- NIPV Infectious diseases: prevention is better than curing. 20171009-IFV-KP-Infectieziekten.pdf
- RIVM guidelines www.rivm.nl

9.6 A European Code of Good Practice for Hyperbaric Oxygen Therapy Annex 4

https://www.dhmjournal.com/images/53/DHM%2053%204_Suppl.pdf

9.7 Diving work guidelines/ norms

9.7.1 DMAC Diving Medical Advisory Committee

http://www.dmac-diving.org/
DMAC 06 The effects of sonar transmission on commercial diving activities
DMAC 12 Safe diving distance from seismic surveying operations
DMAC 15 Medical equipment to be held at the site of an offshore diving operation

9.7.2 HSE The Health and Safety Executive

http://www.hse.gov.uk

9.7.3 IMCA – IMCA Marine Contractors Association

http://www.imca-int.com/
IMCA Diving
IMCA D 010 Diving operations from vessels operating in dynamically positioned mode
IMCA D 014 IMCA International Code of Practice for Offshore Diving
IMCA D 016 Underwater air lift bags
IMCA D 021 Diving in contaminated waters
IMCA D 031 Cleaning for oxygen service: Setting up facilities and procedures
IMCA D 045 Code of practice for the safe use of electricity underwater
IMCA D 050 Minimum quantities of gas required offshore
MCA D 054 Remotely operated vehicle intervention during diving operations
IMCA D 061 Guidance on health, fitness and medical issues in diving operations
IMCA D 064 Guidance on Diving Cylinder and Valve Compatibility
IMCA D 067 The Effects of Underwater Currents on Divers' Performance and Safety
IMCA D 076 Protection of water intake points for diver safety
IMCA Remote Systems and ROV
IMCA R 004 Code of Practice for the Safe & Efficient Operation of Remotely Operated Vehicles
IMCA R 045 Code of practice for the safe use of electricity under water

9.7.4 IMO International Maritime Organization

www.imo.org
IMO RESOLUTIONS
http://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Pages/Default.aspx

IMO DP Guidelines MCS.1/Circ.1580
International Code of Safety for Diving Operations, 2023 (Resolution MSC.548(107)

9.7.5 NEN Normen

NEN Normen are available from the Nederlands Normalisatie-instituut (NNI).
For more information www.nen.nl
NEN-EN 12021 en "Ademhalingsbeschermingsmiddelen - Ademgas voor ademhalingstoestellen"
NEN-EN 144-1 Ademhalingsbeschermingsmiddelen - Afsluiters voor gasflessen - Deel 1: Verbindingen voor inlaataansluitingen

9.7.6 VCA - Veiligheid, Gezondheid en Milieu Checklist Aannemers

http://www.vca.nl/

9.8 DELTA P

ADCI
https://www.adc-int.org/files/Delta-P%20Diving%20Checklist_01_28_22_FINAL.pdf

What is Delta P
https://www.youtube.com/watch?v=AEtbFm_CjE0

UK Health &Safety Executive (UK HSE)
http://www.hse.gov.uk/pubns/diveindx.htm
Diving Information Sheet No. 13:
Differential pressure hazards in diving

UK HSE research report:
RR761 - Differential pressure hazards in diving
http://www.hse.gov.uk/research/rrhtm/rr761.htm

Ontario Ministry of Labour
Video produced by the Ontario Ministry of Labour, this video talks about the hazards of Delta P around dams (Courtesy Ontario Ministry of Labour. 2011
https://www.youtube.com/watch?v=7yEmC-z-dRU

IMCA Information note ID: 975
Diving From, On or in Close Proximity to Merchant Vessels – Protocol for Isolating Machinery Systems: New Industry Guidance Published

ADC GP-02 Identification, Assessment and control of differential pressure hazards