



# BP Guide

## Diving Activity Guidance

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## Foreword

This is the first issue of D-G 3.2-0002.



## Introduction

All Downstream diving operations involve a unique combination of occupational health and safety issues performed in an unforgiving environment where errors can have serious consequences.

This BP Downstream Diving activity guidance document outlines BP's recommended practice for diving operations at all BP Downstream's managed and operated worksites.

This BP guidance identifies industries best practices for evaluation and suitability of a contracted diving support service including the provision of personnel, equipment and support vessels for acceptability against the requirements of the BP Operating Management System within Downstream.



## 1 Scope and exclusions

The purpose of this guidance is to provide industry best practice to support the entity to ensure the safe execution of diving operations at BP Downstream owned/operated facilities. A diving operation is defined as being any operation that includes, or has the potential to include diving as a part of the work-scope.

The Downstream diving activities are managed in accordance with the following:

- Industry best practice recommendations (as outlined and referenced in this document) with regard to the diving activities; and
- BP's Control of Work requirements.

The contents of this guidance document and the OMS documents that it supports align with the sections of the Upstream Diving Practice [GOO-UZ-PRA-00001](#) that are appropriate to the Downstream diving activities conducted in inshore waters.

Downstream diving activities can include (but not be limited to) the following:

- Underwater inspection and survey of ship/shore interface structures and underwater pipelines.
- Repairs of ship/shore interface structures including fendering and underwater pipelines.
- Construction/modification of ship/shore interface structures, fendering, underwater pipelines and dolphins.
- Removing fouling from facility water inlets/outlets and fire pump systems.
- Visual inspection of: the ship/shore interface structure, underwater pipelines and equipment (e.g. jetty structures, fendering, fire and cooling water in/outlets) when possibility of damage is suspected.

This guidance document also describes recommended practice guidance for the roles and responsibilities placed upon the diving contractor and BP personnel for diving operations carried out directly for BP.

This guidance is relevant and applicable to the following methods and locations of diving operations:

- Inland/Inshore diving operations.
- Mobile/portable (including Rigid Inflatable Boats) surface supplied diving systems using compressed air as the breathing medium.

## 2 Terms and definitions

For the purpose of this BP Guide, the following terms and definitions apply:

### **BP Managed and Operated Worksite**

Identifies any worksite where BP as operator manages the overall operation, recognising that diving operations are typically conducted by specialist contractors.



## Diving

When a person enters the water or another liquid to perform work and who will rely upon and breathe compressed air or another life sustaining gas mixture greater than 1.0 Atmosphere / Bar of pressure. A person can also be considered to be diving if they are contained within a chamber or pressure vessel and exposed to a pressure greater than 100 millibars above 1.0 Atmosphere / Bar of pressure.

## Diving Operation

Any operation that includes, or has the potential to include diving as a part of the work scope.

## Inshore/Inland Waters

Inside territorial waters (normally within 12 miles or 19.25 kilometres from shore), including docks, harbours, canals, culverts, rivers, estuaries, lakes, reservoirs, dams, flooded tunnels and tanks.

## 3 Symbols and abbreviations

For the purpose of this BP Guide, the following symbols and abbreviations apply:

CSR        Client Site Representative

EPRD      Entity Person Responsible for Diving activity

## 4 Roles and responsibilities

### 4.1 Entity person responsible for diving activity (EPRD)

The Entity Person Responsible for Diving activity is a BP Entity person appointed with overseeing the diving activity:

- a. Accountable for providing a safe dive site for the dive contractor to perform the agreed scope of work.
- b. Ensures a close working link with the Approved Diving Activity Contractor supervisor to review the dive-plan, the risk assessments and complete the checklists in a formal setting prior to starting the diving activity.
- c. Approves the dive plan documents and ensures the entity complies with all BP and regulatory requirements for diving operations.
- d. Where the diving activity is part of a larger project ensure regular communication take place with the Project manager to update on potential changes that could impact the dive activity.

### 4.2 Client site representative (CSR)

- a. Ensures the diving contractor delivers the approved diving plan including; completion of checklists, risk assessments and planning documents which are pertinent to the diving activities.
- b. Is present during all diving operations.
- c. Provides advice and support to the EPRD of the Downstream facility in the event that Diving Activities are required at locations where the services of a Downstream-approved Diving Activity Contractor would not be available.



- d. Under such circumstances a BP-Approved Diving Contractor is to be contacted as soon as possible to fulfil the role of Client Site Representative. The primary objective of the CSR is to provide the EPRD with expert advice to ensure that such diving activities are performed safely including such circumstances where the dive contractor would be unable to comply with the BP Downstream Diving Baseline Criteria.
- e. The CSR role meets the competencies as outlined in section 5.1.4 of the Upstream Diving Practice [GOO-UZ-PRA-00001](#)
- f. The scope of the CSR's role includes all or some of the following:
  - 1. Assisting the Downstream Entity with selecting the most appropriate (basis HSSE remit) Dive Contractor at a specified location.
  - 2. Liaising with the Dive Contractor to identify and agree upon an appropriate and achievable Diving Standard for the pending Diving Activities.
  - 3. Providing support and assistance to the EPRD to risk assess and prepare a dive Plan for the pending Diving Activities.
  - 4. Providing support to the EPRD to manage the Diving Activities when they are taking place.
- g. In the event that the CSR has any health, safety, environmental or security concerns which could affect the scheduled diving activities, then he or she is to suspend commencement of the diving activities immediately and inform the EPRD/Entity Operations Manager.
- h. In the event that the CSR has provided support by his/her attendance on site; on completion of the diving activities the CSR will send a full report to Downstream Segment Marine Authority
- i. As a minimum, the report includes the following details:
  - 1. Executive Summary.
  - 2. Details regarding current dive qualifications of all dive team members.
  - 3. Details regarding diving equipment support craft utilised in support of the diving activities.
  - 4. Record of events.
  - 5. Copies of all checklists, risk assessments and planning documents pertinent to the diving activities.
  - 6. A gap analysis between the diving standards utilised on site and the BP Diving Activity Baseline Criteria.

#### **4.3 BP approved diving activity contractor**

- a. Ensures diving operations provided to the entity are safe, reliable and conform to BP requirements and comply with Local and/or National regulations.
- b. The approved Diving activities contractors' responsibilities include, but are not limited to:
  - 1. Providing resources to execute the Diving activity.
  - 2. Writing and performing the execution work procedures.





3. Issuing the Emergency Response Document(s).
4. Holding recognised risk assessments for the work being executed.
- c. BP approved diving activity contractors will have agreed to and signed '[Downstream Diving Activity Bridging Documents](#)' and comply and adhere to the entities Control of work/Permit to work documentation.
- d. A list of approved diving activity contractors is available through the Global Diving team and can be requested through the Segment Marine Authority.
- e. The entity ensures that the diving activities conducted are performed or supervised by the dive contractor in accordance with the following:
  1. Industry best practice recommendations (as outlined and referenced in Table B.1 with regard to the diving activities).
  2. BP's Control of Work requirements.
- f. Prior to any diving activity the entities liaises with the Downstream Segment Marine Authority to ensure the selection of approved diving contractors, CSR and the safe execution of diving operations at BP Downstream owned/operated facilities.

## 5 Interface between the Downstream Entity LOMS and the dive contractor's SMS.

This interface is provided through the '[Downstream Diving Activity Bridging Document](#)' which clarifies the following Control of Work obligations:

- a. The Entity Person Responsible for Diving Activity (EPRD) and team are accountable for providing a safe dive site for the dive contractor to perform the agreed scope of work.
- b. The dive contractor is accountable for ensuring that the agreed scope and procedures have been written and work is performed in compliance with the contractors and legislative expectations, policies and practices, and incorporate industry best practice with regard to the following elements:
  1. Training and certification of the divers.
  2. Type of equipment used for performing the diving activity.
  3. The dive team size and the assigned roles within the team (see baseline criteria).
  4. Preparation of a site specific dive plan including an operation specific emergency response procedure.
  5. Compliance with local permit requirements and regulations.
  6. Compliance with the customer's Control of Work requirements.
- c. The Downstream Entity is accountable for providing a safe dive site, whereas the CSR is accountability lies with the provision of the exact requirements to ensure the dive site is safe.

The Downstream Entity is not expected to be subject matter experts with all the risks associated with the planned diving activity. For this reason it is crucial that the Downstream Entity and dive supervisor work together to review the dive-plan, review their risk assessments and complete the checklists in a formal



setting prior to starting the diving activity. The formal setting is described as the “Pre-Dive Risk Assessment and Dive-Plan Conference”

The primary objective of this conference is to ensure the Downstream Entity is able to provide the dive contractor with a safe dive site. It also allows the dive contractor to verify that appropriate diving activity criteria and limits have been defined and agreed; resources and emergency contingencies are available to complete the planned diving activity safely.

## 6 Downstream diving activity criteria for the dive contractor

In the case of BP approved Diving Activity contractors these recommendations are included in the dive contractor’s individual copy of the bridging document, Pre-Dive Risk Assessment and discussed during the Dive-Plan Conference.

- a. They have been included in this guidance document to assist the Entity to monitor the diving activities more effectively and to accurately record the events in the Post-Diving Activity Report which is to be completed following completion of all diving activities.
- b. The EPRD ensures the dive contractors are familiar with and follow the guidance provided in Table B.1

### 6.1 Diving activity pre-diving plan and questionnaire

- a. Prior to arrival at the dive location, the Diving Activities Contractor completes the following:
  1. A diving plan which includes an operation-specific emergency response procedure
  2. [The Diving Activity Pre-Diving Questionnaire](#)
- b. Thorough completion of the Diving Activity Pre-Diving Plan by the dive contractor will provide invaluable input into the Pre-Dive Risk Assessment and Dive Plan Conference.
- c. During the conference:
  1. The contents of the diving contractor’s own risk assessment documents are being reviewed alongside the entities own risk assessment for the diving activity.
  2. The divers are familiar with completing their own documentation so their content can be reviewed as thoroughly as the entities own risk assessment and the dive supervisor be asked to explain its contents.
- d. When completed, a copy of the dive plan and Diving Activity Questionnaire is to be sent to the Downstream Segment Marine Authority.

Sending the dive plan and Diving Activity Questionnaire to the Downstream Segment Marine Authority (SMA) serves as a notification that the diving activity is scheduled and will enable the SMA and the Diving TA to review its content and provide any guidance and support in the event that they identify any potential HSSE or CoW integrity gaps.

Early Pre-planning is essential to ensure any diving operation is performed safely and efficiently. This enables all accountable parties to:

- Obtain Subject Matter expertise from the Upstream Diving Authorities



- Determine and agree upon the safest location to conduct the dive having considered the prevailing and forecast weather conditions, water depths, drafts, tidal streams and currents
- Verify and satisfy local permitting requirements
- Verify proximity of and travelling time to nearest diver de-compression chamber to dive site

## 6.2 Diving contractor emergency procedures

- a. The contractor adheres to their own standards except where a combination of their own supplemented by BP's set a higher standard.
- b. The EPRD supported by the CSR is responsible for ensuring that the dive contractor has robust diving emergency procedures in place before commencing any diving activity at the diving worksite.

## 6.3 Downstream diving activity baseline criteria

The dive contractor complies with the following recommendations for any Diving Activity arranged by/contracted to a BP facility:

- a. All members of the diving contractor's team are fully qualified and in possession of current and valid certification to perform their assigned role in compliance with applicable national legislation.
- b. A diving plan is prepared by the nominated dive contractor and provided to the Entity Operations Manager, EPRD and Marine Advisor (if the diving activity affects the ship/shore interface) for review.
- c. The diving plan includes an operation-specific emergency response procedure.
- d. The emergency response procedure contains all relevant emergency procedures and contact details appropriate for the specific operation and location.
- e. A Risk Assessment is to be conducted by the Dive Contractor to identify hazards relating to the planned diving activities which is specific to the conditions affecting the location at the time it is planned to commence such activities.
- f. Prior to commencement of Diving Activities, the Dive Supervisor attends a Pre-Dive Risk Assessment and Dive Plan Conference chaired by the Entity Operations Manager, EPRD or his/her delegate.

During this meeting, the following objectives are to be completed:

1. Review of the Dive Contractor's Dive Plan inclusive of the operation-specific emergency response procedure.
  2. Verification that the control and mitigation measures, which were identified by the Dive Contractor's Risk Assessment; will be implemented and consideration of any further hazards appropriate to the prevailing circumstances and conditions at the dive location.
  3. Completion of all [Pre-Diving Activity Checklists](#).
- g. Surface-supplied diving from either static locations or mobile/portable systems are not being used.



- h. The working diver wears a rigid type helmet.
- i. The standby diver either wears a band-mask or a rigid type helmet but has to be in immediate readiness to enter the water and render assistance.
- j. Voice communications between divers and the surface is to be provided.
- k. The minimum team size is five and comprises of the following:
  - 1. Supervisor
  - 2. 1 Working Diver
  - 3. 1 Standby Diver
  - 4. 1 Working Diver Tender
  - 5. 1 Standby Diver Tender
- l. The Diving Supervisor is not permitted to dive.
- m. The Standby Diver cannot have any residual decompression penalty from previous dives.
- n. Where diving operations require more working divers, the team structure is increased in accordance with the following:
  - 1. During surface-supplied diving, there is a nominated standby diver at immediate readiness to assist the working divers.
  - 2. There is at least one standby diver for every two divers in the water.
  - 3. The standby diver has a dedicated tender.

***The standby diver or his tender are not permitted to undertake any additional duties.***

- o. As a minimum, the dive team:
  - 1. Includes one diver medic, who is not permitted to dive.
  - 2. All divers are trained in first aid, CPR and oxygen administration.
  - 3. Ideally, the dive team includes two diver medic technicians, one of which is the Diving Supervisor.
- p. Regardless of whether there are one or two working divers, the panel air supplies will be arranged to allow independent supplies to the working and standby divers.
- q. Dive support craft are fitted with a jet drive system or their propellers are guarded.
- r. All power and air services for divers and sub-sea equipment is provided by the contractor and not by the Entity.
- s. The diving contractor has responsibility to ensure the provision of facilities so that a diver can be recompressed in an emergency. Downstream recommends a Diver De-compression Chamber to be available at the dive location. However if this can't be achieved, the Diver De-compression
- t. Chamber is located as near as practicable to the diving site in compliance with the minimum requirements shown in Table 1.



Table 1 – Decompression chamber requirements

Decompression Penalties	Maximum Diving Activity Depth		Diver Decompression Chamber (DDC) Requirement
	Feet	Metres	
No planned in-water decompression	0-33	0-10	Diving contractor should identify the nearest suitable operational two-person, two-compartment chamber. Under no circumstances, should this be more than two hours' travelling distance from the dive site.
All diving activities	33-165	10-50	A suitable, operational, two-person, two compartment chamber should be provided for immediate use at the site of the diving project.
For diving activities at any depth where: 1) The depth of the seabed at the dive site is 100 fsw /30 msw or more; or 2) surface sea &/or swell conditions are such that it may adversely affect a diver maintaining a constant working depth at the dive site.			Additional DDCs may be required where treating a decompression injury (dci) incident would stop diving operations if only one DDC is available.

- u. It is recognised that on occasions, some of the requirements included in the Diving Activities Baseline Criteria requires modification to address identified risks associated with the specific Diving Activity work-scope. In such circumstances such modifications are supported as an outcome of a documented Risk Assessment and/or appropriate equipment certification.
- v. At locations where more rigorous requirements than those referred to above are applicable to comply with legislative requirements or to satisfy Diving Contractor's own requirements the more rigorous requirements are to be implemented and followed.

**The use of SCUBA equipment for diving activity is not permitted at any Downstream facility** – exceptions apply under special circumstances only (6.4).

**6.4 Minimum criteria for diving activities performed under exceptional circumstances**

Under exceptional circumstances; diving activities can be urgently required at very short notice or are arranged and authorised by parties external to BP.

Such diving activities referred to above are not be defined as Downstream diving activities for the purpose of this guidance document.

These activities include the following:

- a. Underwater inspections conducted by divers arranged and authorised by local authorities to perform inspection of marine vessels, moored up at BP facilities of the vessel's underwater hull for the purpose of performing anti-smuggling or security searches\*.
- b. Emergency removal of fouling from intakes, cleaning/polishing propeller or repairs to marine vessels moored at BP facilities.

*\*Such searches and or emergency activities are on a regular basis conducted without prior warning from local Authorities and/or ship owners and it is not unusual for divers to be in the water conducting their search without the facility being made aware that the activity is taking place. In many cases, the jetty supervisor/operations manager would not be able to prevent such dive operations*



*taking place as the vessel is under the jurisdiction of the governing authorities whilst operating within territorial waters.*



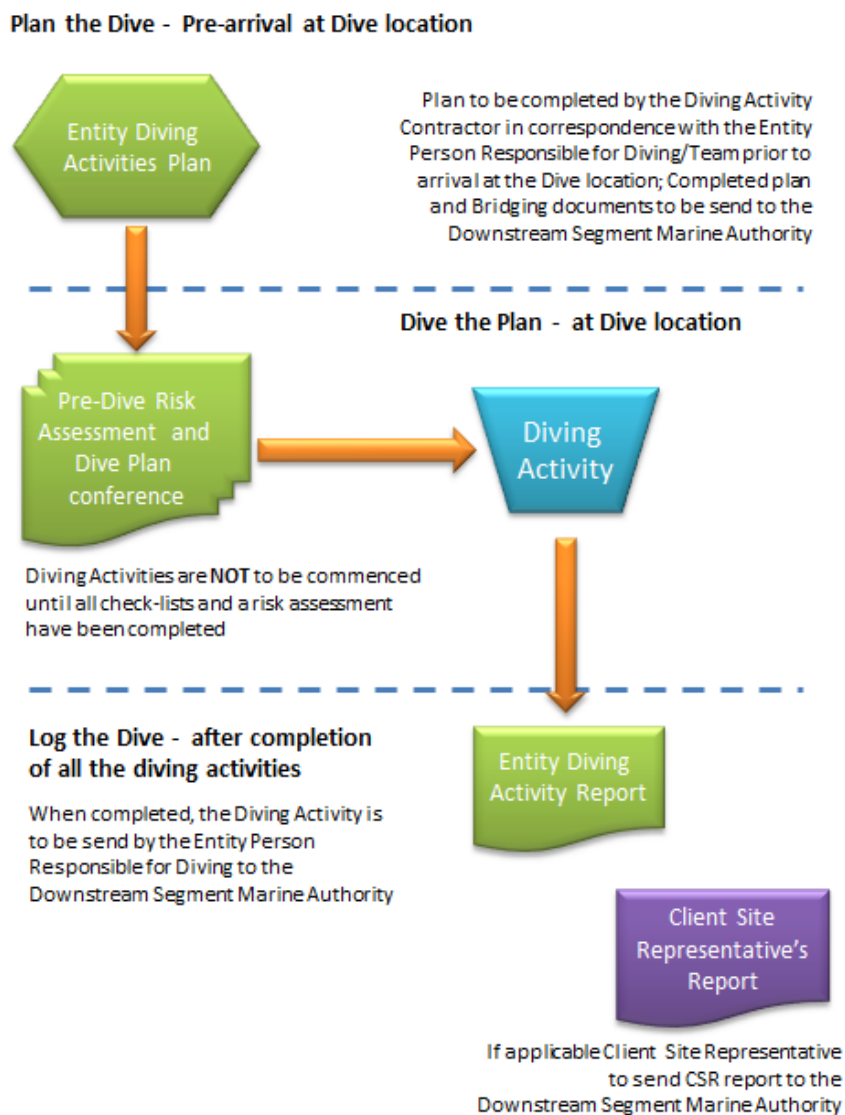
## Annex A Distinct phases of a Downstream diving activity

The three distinct phases to any diving activity are:

- Planning the Dive
- Diving the Plan
- Logging the Dive

Figure A.1 shows how and when each phase of a diving activity is managed.

Figure A.1 - Three distinct phases of a Downstream diving activity





## Annex B Diving Industry Best Practices

Currently there is no standard for diving activities which is applicable at a global level. The mandated and recommended standards for such activities vary considerably from one location to the next. For this reason this guidance and the documents listed below have been modelled to align with the Upstream Diving Practice and the Industry best practices set out in the Table B.1.

- BP Downstream Diving Activity Pre-Diving Plan and Questionnaire
- Downstream Diving Activity Bridging Document'
- Pre-Diving Activity Checklists

**Table B.1 – Industry best practices references**

Number	Reference Title	Issuing Organisation
ACOP L104	Diving at Work Regulations 1997 Approved Code of Practice (ACOP) L104. HSE Commercial Diving Projects Inland/Inshore	HSE
OGP DRP 411	OGP Diving Recommended Practice Report 411 (June 2008)	Oil and Gas Producers
OGP 431	Diving Worksite Representative Roles, Responsibilities and Training (November 2009)	Oil and Gas Producers
IMCA D 018	Code of practice on the initial and periodic examination, testing and certification of diving plant and equipment	IMCA
IMCA D 023	Design for Surface Orientated (Air) Diving Systems	IMCA
IMCA D 040	Design for mobile/portable surface supplied systems (Diving Equipment Systems Inspection Guidance Notes)	IMCA
6 <sup>th</sup> Edition 2010	ADCI Consensus Standards for Commercial Diving and Underwater Operations	ADCI
ADC-GP-001 (Aug09)	Diving From, On or In Close Proximity to Merchant Vessels. Protocol for Isolating Machinery Systems.	ADC-UK



## Annex C

### Diving activity equipment

The following equipment details have been included to provide information to those that are not be familiar with the equipment used in support of diving operations. Figure C.1 shows a diving helmet.

Figure C.1 - Diving helmets (hats)

Kirby Morgan Superlight



This diving helmet is very common in the commercial diving industry. It provides integral communications and breathing gas supply via an umbilical deployed from the dive support craft.

Figure C.2 shows another Kirby Morgan product used commonly in the commercial diving industry.

It provides integral communications and breathing gas supply via an umbilical deployed from the dive support craft but does NOT provide head protection.

Figure C.2 - Band masks

**KMB BANDMASK® 28**



Figure C.3 shows a CRFB.S0007 DDC manufactured by Submarine Manufacturing and Products Ltd. It weighs approximately 3 ¼ tonnes with a Length of 4 metres and breadth of 1.8 metres

Figure C.3 - Diver decompression chamber (DDC)

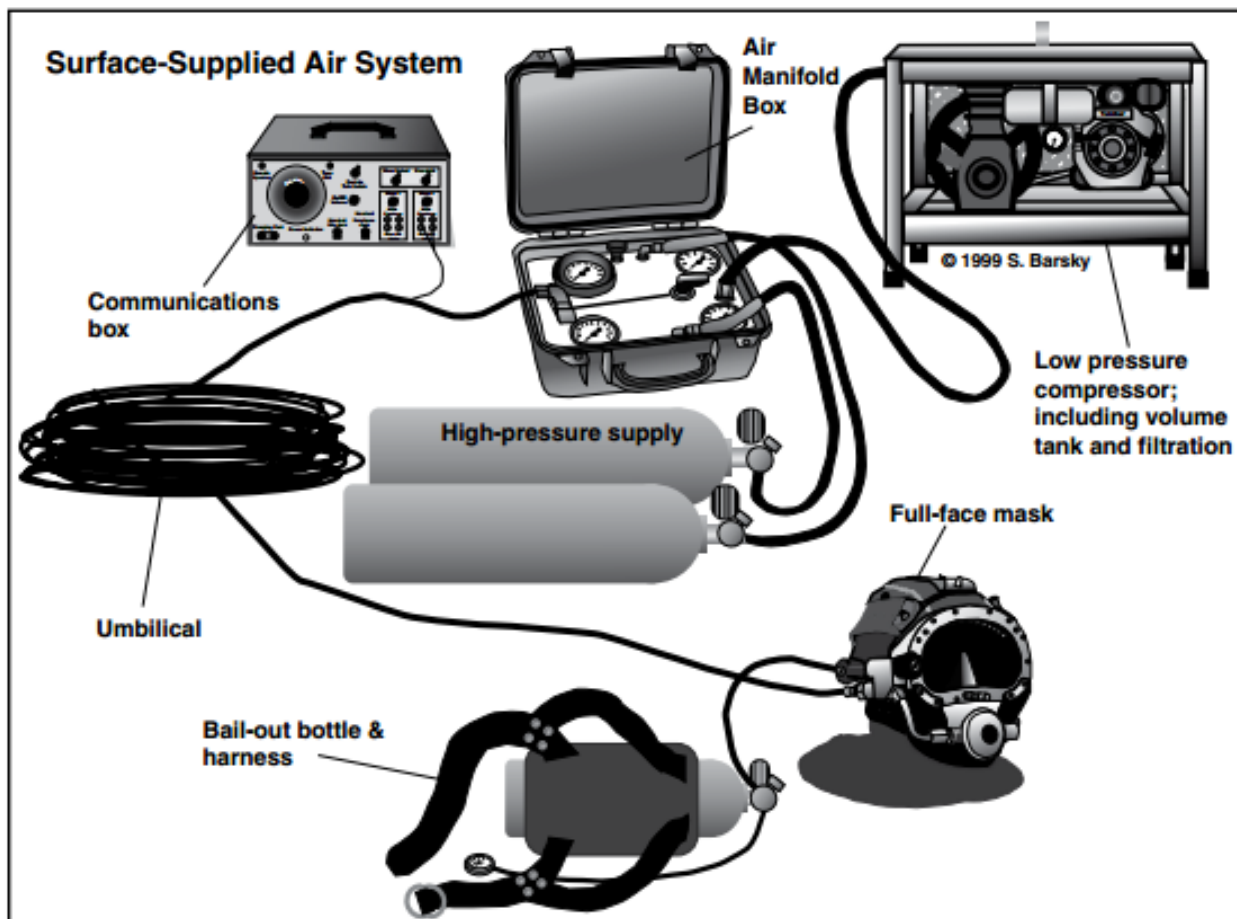


The reason why a DDC is required is to recompress divers that show manifestations of decompression illness symptoms following their ascent. Despite the relative shallow depths that divers work at when performing Diving Activities they are still exposed to the risk of an Arterial Gas Embolism due to rapid ascent.

Surface air supply is shown in Figures C.4 through C.7.

Figure C.4 - Typical surface-supplied system

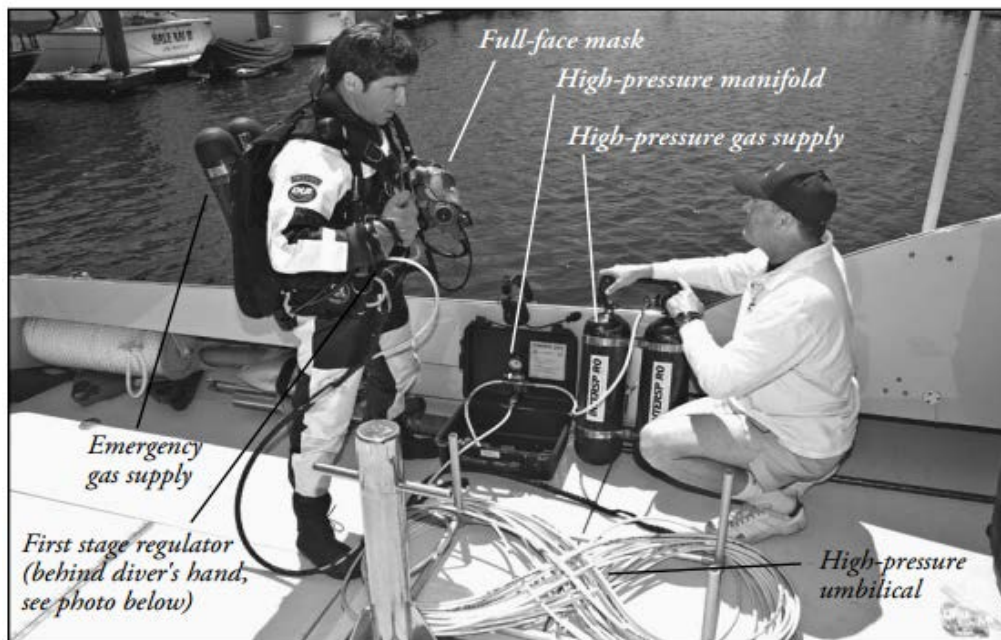
*Pictures taken from 'Diving In High Risk Environments' by Steve Barsky*



*Diagram of a typical surface-supplied system. Note that this system can use either low-pressure or high-pressure air, but the air pressure sent to the diver is always low-pressure.*

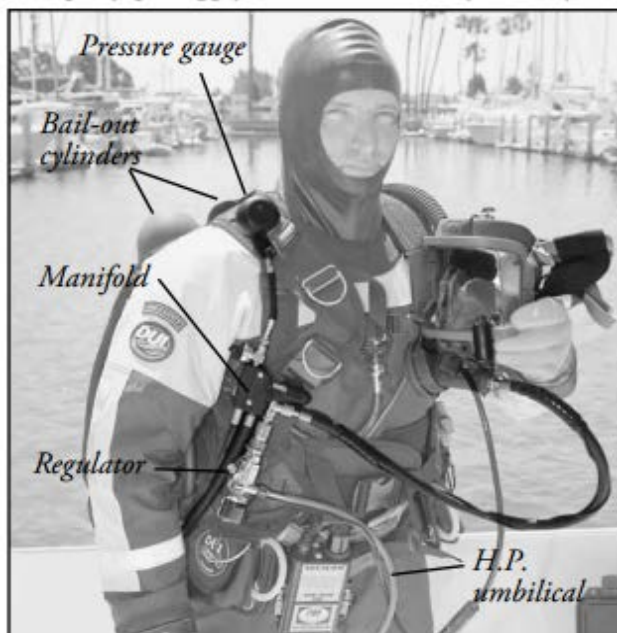
Figure C.5 - High pressure surface air supply

Pictures taken from 'Diving In High Risk Environments' by Steve Barsky



*This diver is using a high-pressure surface-supplied diving system. The main gas supply is from the two high-pressure cylinders resting on the deck. The gas then feeds to the high-pressure manifold and from there to the umbilical. The diver wears a small manifold block on his buoyancy compensator. This block is where the first stage regulator reduces the pressure from the topside supply, and also allows the diver to select his bail-out cylinders (4500 p.s.i.) as the emergency gas supply. Communications for this system are wireless rather than hard wired.*

Figure C.6 - High pressure surface air supply 2



*With a high-pressure surface-supplied diving umbilical, the pressure from the surface must be reduced at the regulator on the manifold worn by the diver. Note the hose connected from the surface at the diver's right, which connects to the manifold, tying together the bail-out cylinder and the full-face mask. The diver can turn on the reserve cylinders at the manifold block.*

Figure C.7 - Low pressure surface air supply



*Layout of a typical diver's air manifold box. This system will accept both high-pressure and low-pressure air supplies, but only supplies low-pressure air to the diver.*



## Revision Log

Date	Owner	Approver	Description
20-Dec-2016	Elias Storm	Mitch Beekman	Initial issue