Diving Equipment Systems Inspection Guidance Note

DESIGN for Surface Orientated (Air) Diving Systems

International Marine Contractors Association

www.imca-int.com

IMCA D 023 Rev. 1
January 2014

The International Marine Contractors Association (IMCA) is the international trade association representing offshore, marine and underwater engineering companies.

IMCA promotes improvements in quality, health, safety, environmental and technical standards through the publication of information notes, codes of practice and by other appropriate means.

Members are self-regulating through the adoption of IMCA guidelines as appropriate. They commit to act as responsible members by following relevant guidelines and being willing to be audited against compliance with them by their clients.

There are two core activities that relate to all members:

- Competence & Training
- Safety, Environment & Legislation

The Association is organised through four distinct divisions, each covering a specific area of members' interests: Diving, Marine, Offshore Survey, Remote Systems & ROV.

There are also five regional sections which facilitate work on issues affecting members in their local geographic area – Asia-Pacific, Central & North America, Europe & Africa, Middle East & India and South America.

IMCA D 023 Rev. 1

IMCA D 023 has been revised and updated to incorporate equipment improvements and changed operating practices since its first publication in 2001. The format has also been changed slightly to improve ease of use and provide better referencing.

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DESIGN for Surface Orientated (Air) Diving Systems

IMCA D 023 Rev. 1 – January 2014

Part 1: Guidance

Part 2: Detail Sheets

1 Introduction

1.1 Background

In the early 1980s, in order to give some guidance to the offshore industry, IMCA's predecessor the Association of Offshore Diving Contractors (AODC) started to produce a number of reference documents, standards and guidance notes. This process continued through the 1980s. It was clear, however, that there was still considerable confusion with some diving systems being "audited" several times a year by different clients, each of whose representatives had slightly different interpretations as to what was required.

AODC published document reference AODC 052 – *Diving Equipment Systems Inspection Guidance Note (DESIGN)* – in February 1989 that sought to clarify any interpretations necessary and to identify a common standard that could be applied by all parties during an inspection. It was intended for use offshore in the UK sector of the North Sea but in the absence of other guidance it became a standard reference in many parts of the world, particularly where there were no specific national regulations.

Subsequently AODC expanded and revised the document which was re-issued as Rev. 1 in February 1995. This more comprehensive document covered both air and saturation diving systems. It was still based on the requirements of the UK sector of the North Sea but was adopted by many clients and diving contractors world-wide. Some users, however, found it to be complex and difficult to use.

With the increasingly international nature of the offshore diving industry, IMCA revised AODC 052 Rev. 1 in order to simplify it, clarify any anomalies which had shown up and adapt it for international use, rather than restrict it to North Sea use. It was also decided to split it into separate documents, one for surface diving (IMCA D 023 published 2000) and the other for saturation diving (IMCA D 024 published 2001). Subsequently documents were issued in 2006 for surface supplied mixed gas diving (IMCA D 037) and mobile/portable surface supplied diving (IMCA D 040).

IMCA D 024 for saturation/bell diving systems was updated and issued as Rev. 1 in 2013. A further update is due early in 2014.

1.2 Current Version of IMCA D 023

IMCA D 023 for surface orientated (air) diving systems has now been revised and updated to incorporate equipment improvements and changed operating practices since its first publication in 2000. The format has also been changed slightly to improve ease of use and provide better referencing.

It is intended that this document should be used in conjunction with IMCA D 018 – *Code of practice on the initial and periodic examination, testing and certification of diving plant and equipment.* Cross-references to this Code are provided where appropriate.

1.3 Status of the Document

This document offers examples of good practice. It gives advice on aspects of a diving system that should be configured in certain ways in order to provide a safer system of working. It also identifies how inspection and testing can be carried out safely and efficiently.

The document has no direct legal status but many courts, in the absence of specific local regulations, would accept that a company carrying out diving operations in line with the recommendations of this document was using safe and accepted practices.

Any company which wishes to do so is free to carry out its operations in ways which do not comply with the recommendations in this document but in the event of an accident or incident it may be asked to demonstrate that the methods or practices that it used were at least as safe as if it had followed the advice of this document.

It is also recognised that other Codes or standards exist. In the absence of specific local regulations, companies carrying out diving operations are free to use this IMCA document or any other suitable standard as the basis for their activities.

1.4 Work Covered by the Document

This document addresses various aspects of a surface orientated (air) diving system as utilised within the offshore diving industry.

The aim of the document is to provide a comprehensive reference source addressing the philosophy of what equipment and layout is required for a safe diving operation plus the examination, test and certification requirements necessary to meet agreed industry practice. This will apply anywhere in the world being:

- outside the territorial waters of most countries (normally 12 miles or 19.25 kilometres from shore);

OR

- inside territorial waters where offshore diving, normally in support of the oil & gas or renewable/alternative energy industries, is being carried out. Specifically excluded are diving operations being conducted in support of civil, inland, inshore or harbour works or in any case where operations are not conducted from an offshore structure, vessel or floating structure normally associated with offshore oil & gas or renewable/alternative energy industry activities.

This document is intended to assist the following, among others:

- manufacturers and suppliers of diving plant and equipment;
- diving contractors commissioning new build diving systems;
- personnel involved in diving operations;
- vessel owners and marine crews involved with diving operations;
- staff involved in the maintenance, repair, test or certification of plant and equipment;
- client and contractor representatives;
- diving system auditors;
- all personnel involved in quality assurance (QA) and safety;
- concession holders or operators who have a duty of care.

IMCA has included recommendations in areas where there is a difficult balance between commercial considerations and safety implications. It is recognised however that safety must never be compromised for any reason.

1.5 National and Other Regulations, Standards and Codes

A number of countries in the world have national regulations that apply to offshore diving operations taking place within waters controlled by that country. In such cases national regulations must take precedence over this document and the contents of this document should be used only where they do not conflict with the relevant national regulations.

Any person carrying out offshore diving operations should establish whether there are any national regulations applying in the area where diving will take place, remembering that a number of countries have regulations which apply anywhere in the world to diving taking place from vessels registered in that country (the flag state).

There may also be international regulations, codes or standards (such as International Maritime Organization (IMO) documents) that diving contractors either have to comply with or take serious note of.

1.6 Layout of Document

The information is presented in the form of detail sheets, each of which specifies the requirements for a generic item of plant or equipment, or a group of items, which are covered by the same criteria.

The testing requirements identified will normally correspond with the certification that the diving contractor maintains in a plant and equipment register, or records in the planned maintenance system.

Only generic items of diving plant and equipment are addressed and the detail sheets do not include information on constituent parts of ancillary equipment.

1.7 Implementation

Very little contained in this document is new, rather it is revised to recognise changes in good practice which have evolved over the years and thus it should be possible to implement the requirements of this document soon after publication.

1.8 Updating Arrangements

This document is a dynamic document and the advice given in the published version will be reviewed periodically by IMCA and any necessary improvements incorporated, in the light of further experience gained. Any person with suggested improvements is invited to forward these, in writing, to IMCA (imca@imca-int.com).

1.9 Classification Societies

A number of classification societies publish rules for diving equipment. These normally require similar standards to this document; however it needs to be understood that the requirements of a particular classification society may not be the same as the requirements of this document. Compliance with one does not mean automatic compliance with the other.

1.10 Use of the Completed Document

A completed and up to date version of this document should be available for a surface orientated (air) diving system prior to diving operations commencing.

The relevant item line in the document then needs to be updated each time a test becomes due or when a replacement certificate is issued.

It is intended that the overall document for a particular surface orientated (air) diving system will be re-completed no more frequently than annually (unless the system is moved from one vessel to another, for example) and that at other times, such as a change of client or jurisdictional location, all that is normally required is a check on the completed document, possibly supported by a small number of spot checks of equipment or certificates.

1.11 Annual Auditing of Diving Systems

IMCA guidance document IMCA D 011 – *Annual auditing of diving systems* – explains how IMCA's DESIGN audit documents can be used as the basis for an annual audit.

2 List of Acronyms

AODC	Association of Offshore Diving Contractors
ASME	American Society of Mechanical Engineers
BA	Breathing apparatus
BIBS	Built-in breathing system
CCTV	Closed circuit television
DESIGN	Diving Equipment Systems Inspection Guidance Note
DMAC	Diving Medical Advisory Committee
DP	Dynamic positioning
ECU	Environmental control unit
FMEA	Failure modes and effects analysis
fsw	Feet of seawater
HAZOP	Hazard and operability study
HP	High pressure
IMCA	International Marine Contractors Association
IMO	International Maritime Organization
LP	Low pressure
msw	Metres of seawater
NDE	Non-destructive examination
PDF	Portable document format
PMS	Planned maintenance system
PPE	Personal protective equipment
PRV	Pressure relief valve
psi	pounds per square inch
PVHO	Pressure vessels for human occupancy
QA	Quality assurance
RA	Risk assessment
ROV	Remotely operated vehicle
SWL	Safe working load
UPS	Uninterruptible power supply

3 The Competent Person

3.1 General

From the inception of occupational health and safety law, there has existed the problem of how to apply constraints that are sufficient to protect persons at work but that are not so restrictive as to render them impracticable. For any given activity the level of risk can vary widely according to individual circumstances and, in many situations, it would be unnecessarily burdensome to apply the same limitations to operations at the lower end of the risk scale as for those at the higher end. This is very much the case in the field of diving equipment, plant and components.

Over the years legislators have evolved the concept of "The Competent Person" to allow a flexible response according to the prevailing circumstances. There are many examples of its use in health and safety legislation.

Legally, the term "competent person" can refer to an individual, partnership, company or other form of organisation.

3.2 Application of the Philosophy of "The Competent Person"

In the field of plant and equipment examination, test and certification, the alternative to using the concept of the competent person would be to specify precisely the qualifications, training and experience of persons undertaking any of these tasks, as well as exactly what has to be done on each occasion.

The difficulty of drawing up such detailed requirements would lead to a grave mismatch between the written requirements and what is required to secure adequate health and safety. In addition the end result would lack the flexibility to allow work to continue broadly in the form in which it is known today. The concept of the competent person avoids this problem.

The normally accepted definition of a competent person, with regard to plant and equipment examination and test (rather than someone involved with maintenance), is:

"Someone who by virtue of their training or experience, or a combination of both, has such practical and theoretical knowledge and actual experience of the plant which has to be examined or tested as will enable him to detect defects or weaknesses which it is the purpose of the examination or test to discover and to assess their importance in relation to the safety of the plant."

The competent person should have the maturity to seek such specialist advice and assistance as may be required to enable him to make necessary judgements and must be a sound judge of the extent to which he can accept the supporting opinions of other specialists.

3.3 Types of Competent Person

In some cases this document requires the competent person to satisfy themselves that the design or construction of diving plant and equipment makes it suitable for use. That requires a high level of diving expertise which will involve persons with a detailed knowledge of diving techniques and practices and the environment in which the plant will be used.

Other parts of the Code require a competent person to issue a certificate lasting for a period stating that the plant or equipment has been examined and tested and may be safely used. The competent person for these purposes should specialise in relevant aspects of the work and may be an employee of an independent company or an employee of the owner of the equipment, unless a specific legal requirement says this can not be the case. If employed by the owner of the equipment, however, his duties should include this type of work on a regular basis, and his responsibilities enable him to act independently and in a professional manner.

The competent person should also be active in his trade or profession and be capable of making an independent judgement on the safety of what is being tested or examined or the activity that is being supervised.

For the more straightforward tests or examinations, this level of competence would normally be met by a technician specialising in this type of work (IMCA D 018 category 2) and in some cases may be met by the diving supervisor or the life support supervisor (IMCA D 018 category 1). For more complex tests and examinations the competent person may require to possess specific academic or trade qualifications or to have access to specialised equipment (IMCA D 018 categories 3 and 4).

There are some circumstances, however, where diving plant and equipment is owned by the owner of an offshore installation or diving support vessel and national regulations may require that examination and testing of specific items such as pressure vessels, lifting appliances and other parts of the diving equipment is to be carried out by a competent person who is neither the owner of the installation nor his employee.

3.4 Categories of Competent Person

IMCA D 018 identifies in detail the various categories of competent person who are able to issue certificates confirming that plant and equipment has been examined and tested in line with the recommendations contained therein.

IMCA issues guidance on the assessment of competence, particularly for Category 1 and 2 personnel (IMCA C 003 – *Guidance document and competence tables: Diving Division*).

3.5 Appointment of a Competent Person

No official body appoints competent persons for the purpose of examining and testing diving plant and equipment. This is entirely a matter to be decided by the person or organisation that wishes to obtain the certification. The competence of any particular individual or organisation may, however, be challenged by any relevant national authority in its enforcement role.

3.6 Completing this Document

The completion of this document may be carried out by more than one person. In that case each person should be knowledgeable and experienced in the areas which they are completing.

The document may be completed entirely by employees of the owner of the diving plant or equipment or may be completed entirely by a specialist working for a client or third party. It may also be a combination of these. If the person completing the document is an employee of the diving contractor then they would normally have no involvement in the day to day operation of that particular diving system.

In all cases the person(s) completing the document should have the necessary competence to form sensible judgements on the matters contained within it.

4 Responsibilities

4.1 The Diving Contractor

The diving contractor is required to ensure that all plant and equipment necessary for the safe conduct of a diving operation is available for immediate use. This also applies to all facilities provided on a standby or reserve basis which should also be available for immediate use.

In both cases this means that the items need to be examined, tested and certified as suitable for use as necessary.

It is normally the responsibility of the diving contractor to ensure that a complete copy of this document is prepared for any individual diving system and is updated at regular intervals (normally as each certificate is renewed).

4.2 The Person Completing this Document

The person completing this document has two main areas of responsibility:

Firstly he must satisfy himself that he has the necessary knowledge and experience and is indeed competent to carry out the checks, examinations and tasks that he is being asked to do.

Secondly he must carry out his duties diligently and thoroughly. His decisions can have serious safety implications for those who subsequently use the equipment or plant as they are heavily reliant on the person identifying any faults, omissions or problems.

More detailed guidance on the system of auditing, types of auditors, etc. is contained in IMCA D 011.

5 Planned Maintenance Systems (PMS)

5.1 General

It is a basic requirement that plant and equipment used in diving operations must be properly maintained in order to ensure that it is safe while being used. Whilst this document does not specify what sort of planned maintenance programme should be employed to ensure conformance, experience has shown that such a system is the best way to achieve systematic and effective maintenance.

It needs to be understood that PMS refers to the regular and planned maintenance of items of equipment and not just to their inspection, testing and certification – although this may also be required as part of the PMS.

5.2 Planned Maintenance Programmes

These may be prepared in different formats such as:

- a series of notebooks or files etc., one being provided for each major item of equipment or for assemblies of equipment;
- a computer program, backed up by a hard or non-corruptible copy. The intent of this is to ensure that it is impossible to erase all of the records inadvertently;
- a card index system.

Whichever system is used provision must be made for the following:

- inclusion of manufacturers' recommendations and manuals, where appropriate;
- compliance with the requirements of this document where some types of certification are achieved by means of the PMS;
- a record of planned work to be kept showing each item of maintenance and the interval at which it should be maintained, i.e. daily, weekly, monthly, yearly, etc.;
- a record of unplanned work, including repairs;
- traceability to the person who carried out the work as recorded on an item of equipment whether manual or computer systems are employed;
- records to be kept logically. There should be no doubt on which day maintenance has been carried out and by whom;
- ensuring that maintenance which has been delayed on a particular piece of equipment for any reason, is carried out at the first available opportunity to avoid a hazardous situation arising;
- availability of adequate spares to permit routine and non-routine replacement as necessary.

5.3 Relevance of PMS

While this document is not directly concerned with the planned maintenance system, it is unlikely that a diving system would be able to meet the requirements of the periodic examination, testing and certification advice contained in IMCA D 018 unless an adequate PMS existed. In this respect the PMS would normally be one of the matters considered by the person completing this document when deciding on the level of test and examination required by IMCA D 018 in relation to any specific piece of plant and equipment.

A PMS normally includes the daily/weekly/monthly examinations, tests, maintenance, etc. required for the safe and efficient on-going operation of the equipment. This will typically be based on manufacturers' recommendations and the requirements of the diving contractor's own procedures.

6 Key Features of this Document

6.1 General

Since this document is produced to give guidance and to minimise confusion, it is necessary to elaborate on a number of terms used in the document and also to explain the way in which it is intended that the document will be used.

6.2 Meaning of Terms Used

Within IMCA D 018 various terms are used extensively such as "examination", "visual examination", "function test" and "test". Detailed explanations of what these terms mean are included within the preamble to IMCA D 018 and should be referred to by the person completing this document in order to understand what any particular certificate actually shows.

6.3 Extension of Validity Periods

This document gives maximum validity periods for each certificate. However, it is obvious that an item with a validity on the certificate of 12 months does not become unsafe at 12 months and 1 day if it was safe at 11 months and 29 days.

This document recognises that diving plant and equipment often operates in remote locations where it is difficult to carry out the required testing. This may also be the case because of operational reasons where the equipment is in constant use.

Diving contractors are encouraged to plan ahead in order that certificates can be renewed in time. If, however, due to operational circumstances, a certificate cannot be renewed within the prescribed period, then an extension of up to a maximum of 30 days can be issued if the diving or life support supervisor operating the equipment confirms, in writing, that it is operating satisfactorily and appears in good condition. Where there is one or more qualified equipment technicians, whose duties include maintaining this equipment, then they should also confirm the equipment is satisfactory before such an extension is issued.

The issue of any such extension will need to follow the diving contractor's management of change (MoC) procedure.

The person completing this document should not themselves make the decision to extend validity periods but should, if relevant, establish if a written agreement exists as described above.

It must be clearly understood that the extension period referred to here is only in respect of compliance with this document. It does not provide extension where a government regulation may prescribe validity periods nor does it vary any requirements of a classification society. Similarly an agreement by a classification society or government body to extend a validity period of their certification does not alter the requirements of this document.

Any piece of plant or equipment whose certification validity has expired (subject to the possible 30 day extension above) should not be used again until it has undergone the necessary examination and testing by a competent person as laid out in this document.

6.4 Modifications

It is clear that modifications made to items of plant and equipment during the period of validity of a certificate can have an effect on the validity of the certificate.

Since there can be many different types of modification it is not possible to give specific guidance on what will and what will not affect the certification.

Replacement of the termination on a wire rope used for man carrying will certainly require a retest and recertification whereas replacing a small fitting on an LP air line with an identical fitting would be regarded as maintenance and would not normally affect the validity of the certification.

As a guide, however, replacement of one item with an identical or near identical item would not normally require full re-certification although simple tests such as a function test would typically be required – but even this will depend on the circumstances.

As a matter of good operating practice, any modifications made to, work carried out on or replacement parts fitted to diving plant and equipment should be recorded in a formal manner (such as using a management of change procedure) and details passed to the owner's/diving contractor's onshore offices unless this is part of the routine maintenance required under the PMS when then the actions will only require to be recorded within the PMS records.

It must be left up to the competence and judgement of the person carrying out the modifications and of the supervisor using the plant or equipment after modification as to whether full or partial re-certification is considered necessary.

6.5 Layout of Detail Sheets

6.5.1 Item Column

This column gives each piece of equipment, test or item a unique number for ease of identification. These numbers have no technical significance.

6.5.2 Description Column

This gives a short description of the item for ease of identification. Where testing is required, a reference is given to the relevant section in IMCA D 018 – *Code of practice on the initial and periodic examination, testing and certification of diving plant and equipment.*

6.5.3 Requirement Column

This describes exactly what the person completing this document needs to check for each item.

6.5.4 Need Column

This identifies the importance given to each requirement.

A. This signifies that the requirement is necessary and must be met. Only in the most unusual circumstances would a diving system be considered safe to use if a requirement with an A need had not been met.

B. This also signifies a requirement which is considered as necessary but there may be other ways of meeting the requirement than the method identified in the 'Requirement' column. It is left up to the discretion of the person completing this document as to whether the requirement is being suitably met.

C. This refers to a requirement which is optional and the absence of which would still allow the diving equipment to be used safely.

6.5.5 Response Column

This is where the person completing this document will write their comments and observations. It will be used to answer any questions asked in the 'Requirement' column (see 7.4 for details).

6.5.6 Certificate Issue Date Column

Where a certificate is required, the date of its issue should be entered here. The relevant part of the column is shaded if no certificate is required.

7 Completing the Document

7.1 Electronic/Paper

The document is available in two formats, hard (paper) copy and electronically. The paper version is perfectly acceptable and may often be used during inspections and checks (see section 7.3, however, regarding detail sheet section 11).

It is anticipated, however, that most users will prepare and maintain the document electronically as it is intended that it will be a dynamic document that is regularly updated as tests and, examinations are carried out and certificates re-issued.

7.2 Format

The document is available using Microsoft® Word, making extensive use of tables and Microsoft® Excel. These optimised versions are made available for electronic completion and delivery of the document by users.

A protected PDF version of this document as-published is also available.

7.3 Variations

The document has deliberately been made as flexible as possible, particularly when used electronically. If more space is needed in the 'Response' column then it can easily be created.

If there is more than one of the same item on a particular dive system then the section or part of a section should be duplicated and repeated. This means, for example, that if there are two surface compression chambers then that section would be completed twice, once for each chamber. Similarly if there were, for example, six diving helmets, then the part on diving helmets would be completed six times within the overall section.

Detail sheet section 11 is different to the others in that it is intended that the two columns on the right side ('Response' and 'Certificate Issue Date') should be repeated for each compressor, pump, ECU etc. This will mean extending section 11 to the right by several more columns, depending on the number of compressors, pumps etc. involved. It is therefore likely that detail sheet section 11 will need to be prepared and maintained in an electronic format.

It is recommended that items not required for a particular system are not deleted but rather are marked as "not applicable". This will ensure that the tables in the various sections look similar to a master copy of the blank document, which may make it easier for a subsequent person to check.

7.4 Phraseology

It is obviously a matter for the person(s) completing the document as to exactly what they wish to say in the 'Response' column but some form of explanation should be written down.

Single words or short phrases such as "acceptable", "suitable", "adequate", "yes", "meets the requirement" or similar should not be used as these provide no useful information to anyone reading the completed document. As a minimum, enough information should be given to allow a person reading the document to understand why the person completing it considers the 'Requirement' for a particular item to have been met.

Equally, where items of plant or equipment have unique serial numbers then these should be inserted in the 'Response' column.

In recent years some persons completing this document have used a number of photographs embedded electronically in the document as well as an explanation to demonstrate compliance and assist in a subsequent review of the document by others. It is certainly not a requirement that photographs are used but it may assist in cutting down long explanations or clearly illustrating a variation, deviation, non-compliance or non-conformance.

7.5 Variations/Deviations from Requirements

The person completing this document should prepare a list identifying any items which do not fully meet the requirements of this document. This will assist in making sure these items are dealt with speedily.

If the item in question has a C in the 'Need' column then variation/deviation does not signify a non-conformance. However if the item is present but is not correct then it should be placed on the variation/deviation list.

7.6 Close Out

To assist in subsequent checking of this document a list should be available detailing how and when any variations, deviations or non-conformances have been closed out and completed. This list should form part of the document available to any client or other interested party for checking.

8 References

The following documents are referred to in this document. Further details on all IMCA/AODC/DMAC publications and their latest revisions are available from the IMCA website (www.imca-int.com). They are available as free downloads.

Association of Offshore Diving Contractors (AODC)

AODC 059	*Pressure gauges and other forms of pressure monitoring equipment used in conjunction with diving operations*

Diving Medical Advisory Committee (DMAC)

DMAC 15	*Medical equipment to be held at the site of an offshore diving operation*

IMCA

IMCA D 009	*Protective guarding of gas cylinder transport containers (quads)*
IMCA D 011	*Annual auditing of diving systems*
IMCA D 018	*Code of practice on the initial and periodic examination, testing and certification of diving plant and equipment*
IMCA D 024	*DESIGN for saturation (bell) diving systems*
IMCA D 039	*FMEA guide for diving systems*
IMCA D 040	*DESIGN for mobile/portable surface supplied diving systems*
IMCA D 043	*Marking and colour coding of gas cylinders, quads and banks for diving applications*
IMCA D 045	*Code of practice for the safe use of electricity under water*
IMCA D 047	*Acrylic plastic viewports*
IMCA D 050	*Minimum quantities of gas required offshore*
IMCA C 003	*Guidance document and competence tables: Diving Division*
IMCA SEL 022/M 194	*Guidance on wire rope integrity management for vessels in the offshore industry*

Diving Equipment Systems Inspection Guidance Note

DESIGN for Surface Orientated (Air) Diving Systems

Detail Sheets

International Marine Contractors Association

www.imca-int.com

IMCA D 023 Rev. 1 – Part 2

Record of Inspections

Name of Vessel/Installation: .....

Brief description of diving system: .....

.....

.....

.....

Last Audit/Inspection

Carried out by: .....

Date: .....

Location: .....

	Non Conformances/Points Noted	**Date Resolved**
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....

Index to Detail Sheets

General Safety

Item	Description	Requirement	Need	Response	Certificate Issue Date
1	**Classification**				
1.1	General	The dive system may or may not be classified by a recognised classification society. Note: The next two points will only apply if the system is classified			
1.2	Conditions	If there are any conditions attached to the classification these should be clearly identified to those operating the system	A		
1.3	Close-out	Any conditions attached to classification should be closed out or have an agreed close-out period with the classification society	A		
2	**System Assessment**				
2.1	General	A systematic assessment of the diving system and its sub-systems should be available confirming that the equipment provided for the diving operation is both adequate and fit for its intended use. This assessment may take the form of a HAZOP, FMEA or detailed Project Risk Assessment. Note: The auditor is not being asked to confirm the adequacy of this assessment, only that it has been carried out	A		
3	**Procedures**				
3.1	General	Dive System operating and emergency procedures should be available at the work site. These would typically comprise generic diving procedures supplemented by project specific addendums. Note: The auditor is not being asked to confirm the adequacy of these procedures, merely that they are present	A		
4	**General System Safety**				
4.1	General Access	There must be a level of access available around the diving system, and any other working areas, sufficient to allow operational personnel to safely and efficiently carry out their duties	A		
4.2	Stretcher Access	There must be clear access to allow a casualty on a stretcher to be moved from the launch and recovery position to the surface compression chamber and from the surface compression chamber to any onboard medical facility (such as a sick bay, hospital, etc.)	A		
4.3	Safety of Access	Consideration shall be given to the safety of personnel operating around the dive system in terms of such things as slip and trip hazards, access steps, hand rails, etc.	B		
4.4	Signs	Safety warning signage (such as electrical hazard, use of PPE, etc.) must be clearly displayed at all relevant locations; the signage shall comply with international/national safety signs requirements	A		
4.5	Sea Fastening (Design)	All items of diving plant on board the vessel should be appropriately sea fastened and there should be supporting documentation available from a competent person attesting that the necessary calculations and checks have been completed. Note: This requirement may be different for a fixed installation. Note: The auditor is not being asked to confirm the adequacy of these calculations and checks, only that they have been carried out	B		

Item	Description	Requirement	Need	Response	Certificate Issue Date
4.6	Sea Fastening (Installation)	If the sea fastening required any welded fixtures then there should be NDE reports available confirming these welds were satisfactorily tested by a competent person	A		
5	**Lighting**				
5.1	General	There must be a level of lighting available at all times around the diving system and any other working areas sufficient to allow personnel to safely and efficiently carry out their duties	A		
5.2	Emergency Lighting	Automatic emergency lighting should be available in all critical areas to allow personnel to move around safely	B		
6	**Diver Access**				
6.1	Safety	Divers (including the surface standby diver) must be able to enter and leave the water safely and in a controlled manner. This should be possible in all normal circumstances	A		
6.2	Standby Diver Location	The surface standby diver must be protected from weather and other elements (including dropped objects) which may affect his concentration. This also means he must be kept suitably warm (or cool)	A		
6.3	DP Vessels	When diving from a vessel on DP, the device used to deploy the diver(s) in to the water must be in an area that is a suitable distance away from any thruster or other object likely to cause problems	A		
6.4	DP Thruster Diagram	A diagram of all thrusters and other hazards must be available. There must also be a diagram available of the maximum permitted lengths of divers' umbilical for each depth for the specific dive location(s)	A		
6.5	Umbilical Length Restriction	The prime requirement while diving from a vessel on DP is that the diver, his umbilical and his equipment are physically restrained from coming in to contact with any thruster or other hazard. This normally means restricting umbilical lengths. A record should be made of any such restrictions	A		
6.6	Diving Ladder	If a ladder is to be used as a means of access to/from the water then it should be securely mounted, extend at least 2 metres (6½ feet) below the water and have sufficient hand holds above water to allow the diver to step easily on to the deck	A		
6.7	Deck Height	A ladder should not be the primary means of exit from the water if the deck on to which the diver has to climb is more than 2 metres (6½ feet) above the water surface	A		
6.8	Emergency Recovery	Arrangements must be in place to recover an injured or unconscious diver from the water to the deck	A		
6.9	Surface Decompression	If using surface decompression techniques, there must be unobstructed access to the recompression chamber from the point where the diver surfaces. This must allow the diver to be inside the chamber and under pressure within the maximum time allowed by the tables in use	A		
7	**Electrical Power**				
7.1	Schematic	Diving system electrical schematics should be available at the work site	A		
7.2	Power Requirements	An assessment is required to identify the electrical power required by all electrically powered equipment forming part of the diving system in normal operational mode. This may include diver launch and recovery system, compressors and diver hot water systems	A		
7.3	Diving	An assessment is required to identify the electrical power for the diving equipment needed for the safe recovery of the divers to the deck if the primary power fails	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
7.4	Life Support	An assessment is required to identify the electrical power for the diving equipment needed to provide life support for any divers in the chamber(s) if the primary power fails	A		
7.5	Emergency Power Requirements	Any equipment identified as necessary to satisfy either of the above conditions must be able to continue operating in the event of loss of primary power. This may be by the use of batteries, stored energy (hydraulic or air power), connection to an emergency generator etc. If a UPS is used as emergency support for low powered electrical apparatus (such as computers and monitoring equipment), an assessment should be available detailing its duration under load against the time necessary to provide emergency power	A		
7.6	Testing *D 018, Sheet 34*	A test should have been carried out within the last 6 months to demonstrate the functioning and adequacy of emergency electrical power supplies. The testing should include checks that power continues to be supplied in normal circumstances even if a UPS fails and that the visual indication of such failure works correctly	A		
8	**Pressure Relief Valves**				
8.1	Identification	It must be possible to identify all PRVs for the unit serial number, unit location, set pressure, reset pressure; the date last tested/due test date	A		
9	**Medical Equipment**				
9.1	Provision	There should be a list in place detailing where and what type of medical equipment is available. As a minimum this should meet the requirements of DMAC 15 (or as agreed with company medical adviser) unless local regulations prohibit any of the contents	B		
9.2	Container	The equipment should be in a suitable protective container clearly marked with a white cross on a green background	B		
9.3	Validity	The equipment must have been checked for integrity within the last 6 months with the date the next check is due clearly marked on it	A		
9.4	First Aid	There should be facilities available for the provision of treatment of minor injuries. This may be by means of a local first aid kit, the presence of a sick bay, platform/ships medic or similar	B		
10	**Maintenance**				
10.1	Requirement	A system should be in place whereby all items of plant and equipment are subject to regular maintenance	A		
10.2	Schedule	A schedule should exist indicating the frequency and content of each task. This should take into account the manufacturer's instructions and it should also meet the requirement of the relevant D 018 detail sheet	A		
10.3	Records	Records (written or electronic) should be available demonstrating that the plant and equipment has been subject to regular planned maintenance	A		

Dive Control

Item	Description	Requirement	Need	Response	Certificate Issue Date
1	**General**				
1.1	Location	The diving supervisor must be protected from weather and other elements (including dropped objects) which may affect his concentration. This also means he must be kept suitably warm (or cool)	A		
1.2	Access	The diving supervisor needs good access to all relevant areas of control and must be able to read all gauges and displays without difficulty	A		
1.3	Lighting	Dive Control and its controls must be adequately illuminated	A		
1.4	Emergency Lighting	There must be sufficient self-contained emergency lighting units in the dive control area to allow the supervisor and any other personnel to operate safely in an emergency	A		
1.5	Operating Procedures	Copies of the diving contractor's manuals and diving rules must be available in dive control. Note: The auditor is not being asked to confirm the adequacy of these manuals and rules, merely that they are present	A		
1.6	Emergency Procedures	Emergency procedures must be readily available. These would typically comprise generic emergency procedures supplemented by project specific addendums. Note: The auditor is not being asked to confirm the adequacy of these procedures, merely that they are present	A		
1.7	Recording Documents	Diving logs or pre-printed sheets and other relevant documentation must be available. These may be hard copy or electronic	A		
1.8	Dynamic Positioning	If the vessel operates on DP then a diagram of all thrusters and other obstructions must be displayed in dive control. There must also be available a diagram of the maximum permitted lengths of divers' umbilical for each depth for the specific dive location(s). This should include the umbilical lengths for the emergency surface standby diver	A		
2	**Communications**				
2.1	Bridge	If diving is taking place from a vessel then there should be both primary and secondary means of communication between dive control and the bridge. The primary link must be hard wire, immediately available and unable to be interrupted. One of these links must be able to operate without the need for external power supply	A		
2.2	Control Room	If diving is taking place from a platform or other production installation then there should be both primary and secondary means of communication between dive control and the control room. One of these links must be able to operate without the need for external power supply. The primary link should be immediately available and unable to be interrupted	A		
2.3	Divers	Two way voice communications with each diver and the standby diver must be provided	A		
2.4	Back-Up	These facilities should be fitted with a back-up power source, such as batteries	B		
2.5	Recording	A recording system must be fitted to record all communications between divers and supervisor. There should be a means of playing back the recording after the dive in order to check satisfactory quality	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
2.6	Back-Up	This recording system should be fed from the UPS or other system to ensure continued operation for at least 30 minutes in the event of loss of main power	A		
2.7	Retention	Provision must be made for retention of recordings for 24 hours after the dive is over	A		
2.8	Chamber	If the chamber is remote from dive control (and is to be used while diving is taking place) then there should be communications between the two areas	A		
2.9	Launch and Recovery Point	The diving supervisor must have verbal communications with the winch operator. This should be dedicated and hard wired if he is remote	A		
2.10	Other Areas	The diving supervisor must have voice communication with other areas, as relevant. This may include machinery operators, deck crew, etc.	A		
2.11	Cranes	If a crane is in use in conjunction with diving operations then there must be a dedicated communications link between the diving supervisor and the crane operator. Where possible this should be hard-wire	A		
2.12	ROV	If an ROV is in use in conjunction with diving operations then there must be a dedicated hard wire communications link between the diving supervisor and the ROV operator	A		
2.13	Comms Testing *D 018, Sheet 6*	All communications links must have been examined and function tested in the last 6 months, in addition to any standard pre-dive checks	A		
3	**Surveillance**				
3.1	Working Areas	The diving supervisor should be able to see (directly or by video link) the launch/recovery area, the chamber and any working areas which are appropriate	A		
3.2	ROV	If an ROV is in use in conjunction with diving operations, the diving supervisor must have a monitor in dive control showing him the same picture as the ROV operator	A		
4	**Alarms**				
4.1	DP	If diving is being carried out from a vessel operating on DP then an audio/visual alarm activated by the DP operator must be fitted in dive control to inform the supervisor of the DP status. It must be tested before each dive when operating on DP	A		
4.2	General Alarm	The vessel or installation general alarm must be linked in to dive control (or sited close by) so that the supervisor is aware of it	A		
4.3	Muting	Any audio (bell, klaxon, etc.) must be capable of being muted or cancelled if it is so noisy or obtrusive that it does not allow the supervisor to hear his other communications	A		
5	**Air Supplies** – *Note: Nitrox may be used in place of air in certain circumstances. If this is being used, then substitute 'nitrox' for the word 'air' in the following sections*				
5.1	Sources	Sufficient sources of air, of breathing quality, must be available and suitably arranged so that if the on line source to the diver fails, an alternative source can be immediately switched on	A		
5.2	Adequacy	Each of the sources should be able to provide adequate pressure and flow rates to all divers that they may be required to supply at the maximum depth of the intended diving operation	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
5.3	Working Diver(s) Surface Sources	There should be a primary air source for each working diver plus a secondary source. Note: The diver's bail-out is not the secondary source	A		
5.4	Wet Bell Supplies	In the event that a wet bell is being used it is acceptable that the secondary source is provided from the on-board cylinders. If this is the method of supply then it should be able to provide adequate pressure and flow rates to all divers that it may be required to supply at the maximum depth of the intended diving operation. The supply should also be sufficient to allow for all required in water decompression	A		
5.5	One Working Diver	For one diver working in the water this requires two sources, one connected as a primary source for the diver and the other as an independent and separate secondary source	A		
5.6	Two Working Divers	For two divers working in the water at the same time this requires three sources, connected either as a separate primary source for each diver with a common secondary or else a common primary source feeding both divers but with independent and separate secondary sources to each diver	A		
5.7	To the Diver	The air supply to each diver must be arranged such that if one line fails then this does not interfere with the supply to another diver	A		
5.8	Surface Standby Diver Main Source	There must be a primary air source to the standby sufficient to allow him to rescue an injured diver and arranged to be separate from the main and secondary sources to the working diver(s)	A		
5.9	Surface Standby Diver Secondary Source	There must be a secondary source for the standby diver but this may be common with the working diver(s) secondary source, provided it is protected from any malfunctions	A		
6	**Monitoring**				
6.1	Monitoring	There must be an oxygen analyser with an audio/visual hi/lo alarm fitted in line on the downstream gas supply to each working and standby diver(s)	A		
6.2	Control Area Ambient Atmosphere	If using nitrox with an oxygen content above 25% then an oxygen analyser with audio/visual alarm must be sited in dive control to warn the occupants of any rise of oxygen levels outside pre-set parameters due to gas leakage in to the area	A		
6.3	Analyser Testing *D 018, Sheet 2*	Analysers should be examined, function tested and calibrated in situ within the last 6 months	A		
7	**Gauges**				
7.1	General	The diving supervisor must have available to him enough suitable gauges so that he is aware of the depth of each diver and of the supply pressures of each main and secondary breathing supply	A		
7.2	Gauge Protection	A pressure limiting device may be fitted to avoid gauges being over pressurised	C		
7.3	Cross-over Valves	Great care must be taken if cross-over valves are fitted with the result that any gauge can possibly read more than one thing. Cross-over valves should either be fixed in one position (the handles may be removed to avoid accidental changes) or should indicate very clearly which source they are connected to. In any event any gauge fitted with a cross-over valve must indicate very clearly at all times exactly what it is reading. This is particularly important if one gauge can show the depth of more than one diver	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
7.4	Depth	These are gauges used to provide information for operational and decompression control. The scale must be appropriate to the duty, i.e. large enough to be read easily and accurately. They should normally operate in the range 25 to 75% of full scale deflection although they will need to operate in the 0 to 25% range if used for decompression. If used for the final stages of decompression they must have scale divisions of no more than 0.5msw/2 fsw	A		
7.5	Unit Marking	All depth gauges should be marked in the same unit system (imperial or metric). Dual scale marking is acceptable	A		
7.6	Contractor's Tables	The unit marking system of the gauges (imperial or metric) should correspond to the units used in the contractor's diving tables	A		
7.7	Digital Gauges	If the gauge is digital then the display must be large and clear enough to be read in all conditions. It must be clearly marked on the unit whether it reads in feet or metres and it should display the reading to one decimal point. (If further information is required, refer to AODC 059)	A		
7.8	Air Source/Supply	These are gauges that indicate pressure. They may be used for life support purposes or may only be indicating gauges. They must be positioned to show the line pressure of sources coming in to the panel and also of any supplies leaving the panel. A system must be in place to ensure that incorrect readings cannot happen in certain valve positions	A		
7.9	Scale Divisions	They must meet the requirements for depth gauges above except that they may be much smaller and with larger scale divisions. They are not calibrated as depth gauges	A		
7.10	Unit Marking	All gas source/supply gauges should be marked in the same unit system (imperial or metric). Dual scale marking is acceptable	A		
7.11	Supply Gauge Isolation	It is normal practice to have an indicating gauge showing the supply pressure to the diver as the supply leaves the panel. This is a single point of failure if the gauge is dislodged or damaged. It is acceptable to fit an isolation valve to the gauge providing that: ♦ Closing the valve does not interfere with the diver's supply ♦ The handle on the valve clearly indicates whether it is open or closed ♦ The handle is secured in the open position using light wire, tape or similar such that it cannot be inadvertently closed Alternatively a flow restrictor can be fitted to limit air losses in the event of gauge failure, instead of an isolation valve. If a flow restrictor is fitted then it should be clearly marked on the panel/schematic	B		
7.12	Gauge Calibration *D 018, Sheet 18, 19 & 20*	All gauges must have been visually examined, function tested in situ, calibrated and/or tested (as relevant) to the required accuracy in the last 6 months	A		
8	**Pipework and Valves**				
8.1	General	All valves must be free of corrosion and should operate easily	A		
8.2	Oxygen Service	All valves and pipework must be cleaned for oxygen service when used for gas mixes containing more than 25% oxygen. This may be demonstrated by means of a suitable procedure to ensure cleanliness which is applied when any components are new or after there has been any significant alteration	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
8.3	Marking	The function of all valves must be clearly marked	A		
8.4	Quarter Turn Valves	Valves carrying oxygen (or mixes containing more than 25% oxygen) at a pressure higher than 15 bar must not be quarter turn	A		
8.5	Quarter Turn Valves and Nitrox	Normal practice is that quarter turn valves should not be used if gas containing more than 25% oxygen is at a pressure higher than 15 bar. There are safety benefits in having quarter turn valves on the diver's gas control panel as this allows the diving supervisor to easily identify if a particular valve is open or closed and also to isolate a leak quickly. When diving using nitrox the gas supply to the diver(s) may require to be up to 20 bar in order to provide sufficient pressure to the helmet at deeper depths. If quarter turn valves are to be used on the control panel then a risk assessment should have been carried out to consider the desirability of having them set against the small increase in risk of fire and explosion at this pressure	A		
8.6	Exhausts	Exhaust pipework must not vent into an enclosed space. Note: Panel PRVs, medical lock vents and sampling for analysis do not constitute exhaust pipework	A		
8.7	Accessibility	Gas pipework, particularly in panels and at connection points, must be easily accessible for maintenance and repair	B		
8.8	Pipework Testing *D 018, Sheet 24.1 & 24.2*	Internal pressure test of all valves, pipework, fittings, etc. to 1.5 times maximum working pressure when new	A		
8.9		Valves and pipework need to have been visually examined in last 6 months	A		
8.10		Valves and pipework need to have had a gas leak test to maximum working pressure in last 2 years	A		
8.11	Relief Valves	Pressure relief valves may or may not be fitted within the control area. If they are fitted then they should comply with the testing requirements detailed below			
8.12	Relief Valve Testing *D 018, Sheet 24.3*	Visual examination in last 6 months	A		
8.13		Function test at required relief setting followed by gas leak test at maximum working pressure in last 2½ years	A		
9	**Electrics**				
9.1	General	All electrical equipment must be securely installed with all power leads and wiring secured in such a way that it is protected from accidental damage	A		
9.2	Hazard Signs	Electrical hazard warning signs should be displayed on all relevant panels and equipment	B		
9.3	Testing *D 018, Sheet 11*	All electrical equipment should have been visually examined and function tested in the last 6 months. Cables should have continuity and resistance tests	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
10	**Firefighting**				
10.1	Availability	Suitable firefighting arrangements must be made for dive control. This may be by means of permanent ship or platform provided equipment or by means of portable extinguishers etc. It should be capable of dealing with any type or size of foreseeable fire hazard	A		
10.2	Firefighting Testing *D 018, Sheet 15 & 16*	Whether fixed or portable it should be in accordance with manufacturer's specification and fit for the purpose it will be used for	A		
10.3		If it is a portable system then it must have had an external visual examination and check that any indicating device reads within the acceptable range within the last 6 months	A		
10.4		If this is a fixed system then the nozzles, valves, pipework, etc. must have been visually examined in the last 6 months	A		
10.5		If this is a fixed system it must be function tested to demonstrate operation of the system OR had a simulated test using air or gas as the test medium in the last 12 months	A		
10.6		If an automatic detection/activation system is fitted then a function test to demonstrate correct operation must have been carried out in the last 12 months	A		
11	**Hot Water Temperature** – *Note: This section is only applicable if hot water units are being used*				
11.1	Display	A display must be visible to the supervisor in dive control showing the temperature of the hot water being supplied to the diver(s)	A		
11.2	Alarm	There must be an audio/visual alarm which indicates if the water temperature moves outside the pre-set limits	A		
12	**Breathing Apparatus**				
12.1	Provision	Emergency breathing apparatus fitted with communications must be available for the supervisor (and winch operator if relevant) so that he may perform his duties in a smoky or polluted atmosphere	A		
12.2	Umbilical Supply	If umbilical supplied from a compressor then the air intake for the compressor must be situated in a pollution free zone. A BA set should also be available in case of umbilical supply failure or to allow escape	A		
12.3	BA Testing *D 018, Sheet 5.1 & 9.1*	Visual examination and function test (including communications) in last 6 months. Check made at same time that cylinder is fully charged	A		
12.4		External visual examination of cylinder plus gas leak test to maximum working pressure in last 2½ years	A		
12.5		Internal and external visual examination of cylinder plus gas leak test to maximum working pressure in last 5 years (possible overpressure test)	A		

Twinlock Air Chamber

A pressure test procedure should be available showing the pressure boundary test sequence.

Where there is more than one chamber, a table should be completed for each one.

Item	Description	Requirement	Need	Response	Certificate Issue Date
1	**General**				
1.1	Location	The chamber must be easily accessible from the diving site. Trip hazards should be removed where possible or highlighted	A		
1.2	Protection	Provision must be made to combat extremes in temperature for the chamber, its occupants and the operator. Chamber and operator must also be protected from any other elements (including dropped objects) which may affect operations	B		
1.3	Access	The supervisor/chamber operator needs good access to all relevant areas of the chamber	A		
1.4	Lighting	There must be a level of lighting available at all times around the chamber, its general area and controls sufficient to allow personnel to safely and efficiently carry out their duties	B		
1.5	Communications	If the chamber is remote from dive control (and is to be used while diving is taking place) then there should be communications between the two areas	A		
1.6	Comms Testing *D 018, Sheet 6*	Communications (if fitted) must be examined and function tested in last 6 months	A		
2	**Pressure Vessel**				
2.1	Design	The pressure vessel forming the chamber must have been designed and built to a recognised international standard and be fit for the purpose of human occupancy Note: Any unit manufactured after 1 July 2014 must also be certified to the recognised international standard Note: The design standard, serial number, date of manufacture, etc. can often be found hard stamped on a suitable part of the unit	A		
2.2	Minimum Diameter	Any chamber manufactured after 1 January 2015 should have a minimum internal diameter of 60 inches if using imperial measurements or 1500 mm if using metric measurements. Chambers manufactured before that date do not need to meet this size requirement	A		
2.3	Occupancy	The chamber must have a specified maximum number of occupants. This capacity will be used to establish the number of BIBS etc. which are required	A	Number of occupants:	
2.4	Volume	It is important that the volume of each lock of the chamber is accurately known to allow gas calculations to be carried out	A	Volume of chamber:	
2.5	Equalisation	There should be a means fitted to allow pressure equalisation of the two compartments	B		
2.6	Chamber Testing *D 018, Sheet 25.1*	Visual examination within last 6 months	A		
2.7		Thorough internal and external visual inspection plus a gas leak test at full working pressure in last 2½ years	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
2.8		Internal overpressure test within the last 5 years (or other testing as agreed by an international classification society) plus a gas leak test at full working pressure	A		
3	**Viewports**				
3.1	Condition	Viewports must be free of cracks or scratches that could affect pressure integrity	A		
3.2	Protection	Where there is a risk of damage to a viewport from dropped objects or other physical impact, then suitable protection must be provided. This may be accomplished by the installation of plastic covers (or similar) over the viewports	A		
3.3	Identification	If the serial number or other identifying mark for each viewport is not visible when fitted in situ then it should be prominently marked on the outside of the chamber adjacent to each viewport	B		
3.4	Viewport Testing *D 018, Sheet 25.2*	Manufactured in accordance with recognised standard and fit for purpose. Further information in IMCA D 047	A		
3.5		Overpressure tested to 1.25 times maximum rated working pressure when new or other testing to establish structural integrity as required by the ASME PVHO standard	A		
3.6		Visual examination in situ in last 6 months	A		
3.7		Gas leak test as an integral part of the chamber they are fitted to in the last 2½ years	A		
3.8		Internal overpressure test as an integral part of the chamber they are fitted to in the last 5 years (or other testing to establish structural integrity as required by the competent person)	A		
3.9		Complete renewal within last 10 years. That is from the date of fabrication	A		
4	**Firefighting** – *Note: This section refers to firefighting facilities external to the chamber. Separate arrangements need to be made for inside the chamber (see 6.27 below)*				
4.1	Availability	Suitable firefighting arrangements must be made for the chamber. This may be by means of permanent ship or platform provided equipment or by means of portable extinguishers etc. It should be capable of dealing with any type or size of foreseeable fire hazard	A		
4.2	Firefighting Testing *D 018, Sheet 15 & 16*	Whether fixed or portable it should be in accordance with manufacturer's specification and fit for the purpose it will be used for	A		
4.3		If it is a portable system then it must have had an external visual examination and check that any indicating device reads within the acceptable range within last 6 months	A		
4.4		If this is a fixed system then the nozzles, valves, pipework, etc. must have been visually examined in the last 6 months	A		
4.5		If this is a fixed system it must be function tested to demonstrate operation of the system OR had a simulated test using air or gas as the test medium in the last 12 months	A		
4.6		If an automatic detection/activation system is fitted then a function test to demonstrate correct operation must have been carried out in the last 12 months	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
5	**Chamber External**				
5.1	Paintwork	Paintwork must be in good condition and the chamber free from serious corrosion	A		
5.2	Insulation	Insulation (if fitted) should be clean and in good condition	B		
5.3	Seals	Seals on mating faces must be clean, undamaged and covered lightly in silicone grease. If the sealing area is painted then this must be in good condition	A		
5.4	External Lights	Any external light assemblies must be designed and mounted in such a way that they will not damage viewports as a result of prolonged heat. They should be in good condition	A		
5.5	Hollow Penetrators	All hollow penetrators must be fitted with protection valves or other devices to stop catastrophic pressure loss	A		
5.6	Electrical Penetrators	All electric penetrators must be certified by a competent person (IMCA D 018 category 3 or 4) as fit for purpose	A		
5.7	Marking	All penetrators must be clearly marked to show their function	A		
5.8	Valves	Valves must be free of corrosion and should move freely through their full range of operation	A		
5.9	Marking	All valves must be clearly marked with their function	A		
5.10	Quarter Turn Valves	Valves carrying oxygen (or mixes containing more than 25% oxygen) at a pressure higher than 15 bar must not be quarter turn	A		
5.11	Oxygen Service	All valves and pipework must be cleaned for oxygen service when used for gas mixes containing more than 25% oxygen. This may be demonstrated by means of a suitable procedure to ensure cleanliness which is applied when any components are new or after there has been any significant alteration	A		
5.12	Exhaust Venting	Exhaust pipework (particularly overboard dumps) should vent into a well ventilated area and not into an enclosed space	A		
5.13	Medical Lock	A medical lock should be fitted to the main lock of the chamber	A		
5.14	Medical Lock Safety Interlock	A safety interlock system must be fitted to the mechanism securing the lock outer door. This interlock must make it impossible to open the mechanism/door if there is still pressure inside the lock and impossible to obtain a gas tight seal on the lock if the door/mechanism is not properly closed	A		
5.15	Medical Lock Pipework Testing *D 018, Sheet 24.1, 34*	Internal pressure test of all valves, pipework, fittings etc. to 1.5 times maximum working pressure when new	A		
5.16		Examination and function test in last 6 months	A		
5.17		Gas leak test at maximum working pressure of the system in last 2 years	A	.	
5.18	Relief Valve	A relief valve of a suitable size should be fitted to protect the chamber and allow for venting in the event of over pressurisation	B		
5.19	Relief Valve Testing	Visual examination within last 6 months	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
5.20	*D 018, Sheet 24.3*	Function test at required relief setting. Refit to chamber and gas leak test to chamber maximum working pressure in last 2½ years	A		
5.21	Electrical Testing *D 018, Sheet 11*	Visual examination, function test plus continuity and resistance tests of all cables and electrical equipment within last 6 months	A		
5.22	Pipework Testing *D 018, Sheets 24.1 & 24.2*	Internal pressure test of all valves, pipework, fittings, etc. to 1.5 times maximum working pressure when new	A		
5.23		Visual examination within the last 6 months	A		
5.24		Gas leak test at maximum working pressure in the last 2 years	A		
6	**Chamber Internal**				
6.1	Paint Work	Paintwork must be in good condition and the chamber free from serious corrosion	A		
6.2	Seals	Seals on mating faces must be clean, undamaged and covered lightly in silicone grease. If the sealing area is painted then this must be in good condition	A		
6.3	Penetrations	All hollow penetrators (other than the medical lock) must be fitted with protection valves or other devices to stop catastrophic pressure loss (see also 5.5 above)	A		
6.4	Marking	All penetrators must be clearly marked to show their function	A		
6.5	Valves	Valves must be free of corrosion and should move freely through their full range of operation	A		
6.6	Marking	All valves must be clearly marked with their function	A		
6.7	Quarter Turn Valves	Valves carrying oxygen (or mixes containing more than 25% oxygen) at a pressure higher than 15 bar must not be quarter turn	A		
6.8	Exhausts	Any open ended exhaust orifice (including medical lock) must be fitted with guards to prevent suction hazard	A		
6.9	Inlets	Any gas inlet pipework should be fitted with some form of diffuser	B		
6.10	Separation	The gas inlet and the exhaust positions should be sufficiently separated that efficient flushing of the chamber atmosphere is possible	A		
6.11	Communication	There must be two way voice communications between each compartment of the chamber and the external control point	A		
6.12	Secondary Communications	A secondary (back up) communication system (such as a sound powered phone) should exist between inside each compartment of the chamber and the control point	B		
6.13	Comms Testing *D 018, Sheet 6*	Examination and function test in last 6 months	A		
6.14	BIBS	In each compartment of the chamber there must be one BIBS connection and mask for each intended occupant plus one spare	A		
6.15	Type	In the main compartment the BIBS should be overboard dump type with exhausts piped outside the chamber and also outside the container/compartment if mounted in a container/compartment	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
6.16	BIBS Testing *D 018, Sheet 5.2*	Visual examination and function test in last 6 months	A		
6.17	Comfort	There should be facilities in the main lock for two divers to lie down comfortably	A		
6.18	Bunks	Any bunks fitted should be securely mounted	A		
6.19	Mattress	Any mattress should be fire retardant	A		
6.20	Sanitary Facilities	Suitable toilet facilities should be available consistent with the length of time the occupants are expected to be in the chamber	B		
6.21	Toilet	If a flush type toilet is fitted then it must have sufficient interlocks to stop it being flushed while occupied	A		
6.22	Toilet Testing *D 018, Sheet 27*	If a flush type sanitary system is fitted, it should have been examined and function tested in the last 6 months	A		
6.23	Illumination	There must be sufficient internal illumination to allow valves and controls to be operated safely. It must also be sufficient to allow surveillance from outside	A		
6.24	Doors	All manway doors must be capable of being opened from either side. They should move freely and open sufficiently to allow stretcher access	A		
6.25	Securing	All doors should be able to be secured in the open position	A		
6.26	Pressure Equalisation	If a dogging system is fitted to the door between the locks then a means should exist to ensure that the entry lock cannot be pressurised above the pressure in the main lock. This may be procedural or by hardware	B		
6.27	Firefighting	A means of firefighting must be available inside the main compartment. Note: Standard fire extinguishers are not normally suitable for hyperbaric use	A		
6.28	Firefighting Testing *D 018, Sheet 16*	External examination of portable firefighting systems plus check that any indicating device is reading within the acceptable range in last 6 months	A		
6.29	Gauge	A gauge or other means of indicating internal depth of the main compartment to the occupants should be available	B		
6.30	Gauge Calibration *D 018, Sheet 19*	All gauges must have been visually examined and checked against a certified test instrument to the required accuracy in the last 6 months	A		
6.31	Atmosphere Control	A scrubber may be fitted to remove CO_2 from the atmosphere	C		
6.32	Scrubber Testing *D 018, Sheet 34*	Any scrubber should be visually examined and function tested in the last 6 months	A		
6.33	Oxygen Service	All valves and pipework must be cleaned for oxygen service when used for gas mixes containing more than 25% oxygen. This may be demonstrated by means of a suitable procedure to ensure cleanliness which is applied when any components are new or after there has been any significant alteration	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
6.34	Pipework Testing *D 018, Sheets 24.1 & 24.2*	Internal pressure test of all valves, pipework, fittings, etc. to 1.5 times maximum working pressure when new	A		
6.35		Visual examination within the last 6 months	A		
6.36		Gas leak test at maximum working pressure in last 2 years	A		
6.37	Electrical Testing *D 018, Sheet 11*	Visual examination, function test plus continuity and resistance tests of all cables and electrical equipment within last 6 months	A		
7	**Control Panel**				
7.1	General	The main controls for the chamber should be grouped together, located at a convenient place	B		
7.2	Control Panel Ambient Atmosphere	If the control panel is in an enclosed area then an oxygen analyser with audio/visual alarm must be sited in the area to warn the operator(s) of any rise of oxygen levels outside pre-set parameters due to gas leakage in to the area	A		
7.3	Surveillance	The personnel in control of the chamber must be able to have sight of the divers inside each compartment. If this is not possible through easily accessible viewports then a CCTV system must be provided	B		
7.4	Sources to the Panel	Two independent sources of air, of breathing quality, must be available and suitably arranged so that if the primary source to the panel fails, a secondary source can be immediately turned on at the panel. The sources must be arranged such that if one line fails then this does not interfere with the other source. Ref. IMCA D 050 Section 2.1 (ii)	A		
7.5	Adequacy	Each of the sources to the panel should be able to provide adequate pressure and flow rates to supply the chamber at the maximum depth of any potential recompression treatment (normally 50 msw)	A		
7.6	Separation	Both primary and secondary air sources to the panel must be separate from the source to the diver(s) in the water	A		
7.7	Pressurisation	There should be a facility to carry out pressurisation of each compartment at the panel	A		
7.8	Valves and Regulators	Valves and regulators to be free of corrosion and operate easily	A		
7.9	Function Marking	The function of all controls (valves, regulators etc.) should be clearly marked	A		
7.10	Quarter Turn Valves	Valves carrying oxygen at a pressure higher than 15 bar should not be quarter turn	A		
7.11	Pipework Testing *D 018, Sheet 24.1 & 24.2*	Internal pressure test of all valves, pipework, fittings, etc. to 1.5 times maximum working pressure when new	A		
7.12		Valves and pipework need visually examined in last 6 months	A		
7.13		Valves and pipework need a gas leak test to maximum working pressure in last 2 years	A		
7.14	Gauges	Suitable gauges should be provided to show the depth inside each compartment. Gauges should also indicate incoming gas pressures	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
7.15	Gauge Calibration *D 018, Sheet 18 & 19*	All gauges must have been visually examined, function tested in situ, calibrated and/or tested (as relevant) to the required accuracy in the last 6 months	A		
7.16	Analysis	A means should be available of analysing the oxygen and carbon dioxide content of the ambient atmosphere in each compartment. This may be chemical tubes for the CO_2 analysis	A		
7.17	Analyser Testing *D 018, Sheet 1 & 2*	Suitable analysers should have been calibrated in situ in the last 6 months. The pump for disposable tube types should be tested in the last 6 months	A		
7.18	Relief Valves	Pressure relief valves may or may not be fitted within the control panel. If they are fitted then they should comply with the testing requirements detailed below			
7.19	Relief Valve Testing *D 018, Sheet 24.3*	Visual examination in last 6 months	A		
7.20		Function test at required relief setting followed by gas leak test at maximum working pressure in last 2½ years	A		
8	**Breathing Apparatus**				
8.1	BA Provision	Emergency breathing apparatus fitted with communications must be available for the chamber operator so that he may perform his duties in a smoky or polluted atmosphere	A		
8.2	Umbilical Supply	If umbilical supplied from a compressor then the air intake for the compressor must be situated in a pollution free zone. A BA set should also be available in case of umbilical supply failure or to allow escape	A		
8.3	BA Testing *D 018, Sheet 5.1 & 9.1*	Visual examination and function test (including communications) in last 6 months. Check made at same time that cylinder is fully charged	A		
8.4		External visual examination of cylinder plus gas leak test to maximum working pressure in last 2½ years	A		
8.5		Internal and external visual examination of cylinder plus gas leak test to maximum working pressure in last 5 years (possible overpressure test)	A		

Diver Launch and Recovery System (LARS)

This section should be considered along with the section on Diving Basket (or Wet Bell) as there is an interface point between the sections.

Where there is more than one launch and recovery system, a table should be completed for each one.

Note: It is evident that this section will only apply if a mechanical launch and recovery system is in use. Where divers can enter and leave the water without needing a mechanical system then this section will not apply.

Item	Description	Requirement	Need	Response	Certificate Issue Date
1	**General**				
Note: While some components of the launch and recovery system can be tested and certified as individual units, it is normally a requirement that the overall LARS is tested as a composite unit. If individual components are replaced, this may require a retest of the whole system. This is a decision for the competent person.					
1.1	Testing	A full company approved load test procedure should be provided for the system identifying all components included in the testing such as, but not limited to, A frame; sheaves; wire rope terminations; winches etc. This should include a diagram showing the critical areas that are to be subjected to NDE	A		
1.2	Weight	The weight of the diving basket (or wet bell) plus any other components to be lifted, should have been physically checked by weighing. This will be in air for baskets (or wet bells) plus in water for a wet bell. The diving basket (or wet bell) should be in working condition, that is fully manned (weights to simulate divers) and equipped. The results should be recorded	A	Weight in air is _____ kg Weight in water (wet bell) is _____ kg Weight in air (guide wire weight) _____ kg	
1.3	Marking	The safe working load (SWL) must be clearly marked on every winch and on the A frame, guide wire weight or similar	A		
1.4	Suitability	Each of these SWLs must be greater than or equal to the weight of the fully manned and equipped diving basket (or wet bell) in air, or greater than the load they will have to handle if they do not directly lift the diving basket (or wet bell)	A		
1.5	Design Parameters (manufactured post 1 January 2014)	For any system manufactured after 1 January 2014, documentation should be available showing clearly the designed SWL which should be equal to or greater than the SWL in 1.3 above. Note: The auditor is not being asked to confirm the adequacy of the calculations, merely that they are present	A		
1.6	Design Parameters (manufactured pre 1 January 2014)	For systems manufactured before 1 January 2014, documentation should be available from a competent person (IMCA D 018 category 3 or 4) confirming that, on the basis of their investigations, the system is suitable for a SWL which should be equal to or greater than the SWL in 1.3 above (Note this requirement to be effective from 1 January 2015 onwards). Note: The auditor is not being asked to confirm the adequacy of the investigations, merely that documentation is present	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
2	**Man-Riding Winches**				
2.1	Suitability	Only winches deemed suitable for man-riding by the manufacturer (or a competent person) should be used	A		
2.2	Operating Lever	The winch raise/lower control must be designed to return to the neutral position when released by the operator	A		
2.3	Marking	The raise and lower positions of the operating lever must be clearly marked	A		
2.4	Main Brake	An automatic brake must be fitted which will come on when the operating lever is returned to the neutral position or if there is a loss of power to the winch	A		
2.5	Secondary Brake	A secondary braking system must also be fitted for use in case the main brake fails. This may be automatic or manually operated	A		
2.6	Clutch	If any sort of clutch mechanism is fitted to the winch, there must be a positive means of preventing it becoming disengaged during operation	A		
2.7	Operating Instructions	A notice giving the operating instructions for the winch, including the actions necessary if power is lost, should be displayed where the winch operator can see it	A		
2.8	Secondary Power	An independent (secondary) source of power to the winch must be available in case of failure of the primary power	A		
2.9	Drum Capacity	The winch drum must be able to accept the full length of wire being used. This means that there should be a clear space between the outside of the top layer of wire and the edge of the drum flange of at least 2.5 times the wire diameter	A		
2.10	Guarding	Unless access is physically restricted, guards should be fitted to the winch and drum to stop anything (clothing, fingers etc) being drawn in to the machinery	B		
2.11	Wire Spooling	Arrangements should exist to ensure that the wire being recovered on to any man-riding winch is correctly spooled. In most cases this will be that the fleet angle of the wire is such that it automatically spools correctly. If that is not the case then this may require a mechanical spooling device	B		
2.12	Line Out	There should be a method by which the winch operator can see how much of the lift wire has been paid out. This may be by a line-out meter or at its simplest by marking the wire at the operational depth	B		
2.13	Winch Testing *D 018, Sheet 22.1*	Visual examination and function test at maximum SWL. Independent static load test on each brake system at 1.25 times maximum SWL in last 6 months	A		
2.14		Independent static load test on each brake system at 1.5 times maximum SWL plus a dynamic test at 1.25 times maximum SWL followed by NDE of critical areas in last 12 months	A		
3	**Main Lift Wire**				
3.1	Type	The lift wire should be non-rotating	A		
3.2	Connection	The connection of the wire to the basket (or wet bell) must be of a suitable type. It should have two retaining means (for example a nut locked with a split pin) for the removable pin	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
3.3	Lubrication	Unless the wire is to be renewed every 2 years, it should be pressure lubricated every 6 months	B		
3.4	Wire Testing *D 018, Sheet 29.1*	There have been a number of problems in the past with high tensile bell wire ropes which appear to lose strength even when properly stored. For this reason a test to destruction should be carried out when any high tensile bell wire rope is first put in to service to establish the actual minimum breaking force of the wire at that time. Provided the test result does not fall below the manufacturer's MBF, future destructive test results should be compared to that original figure (the base value), rather than to any claim (or test certificate) provided by the manufacturer. If the test to destruction when the wire is first put into service does indicate a MBF below that of the manufacturer, then the manufacturer's MBF should always be adopted as the base value against which to monitor future deterioration in breaking force. However if the result falls 10% below the MBF then the rope should be discarded. The sample tested to destruction should prove an adequate safety factor exists. This is normally 8 times the SWL	A		
3.5		Static test at 1.25 times SWL plus function test at SWL as an integral part of lifting system in last 6 months. Visual examination of visible section at same time	A		
3.6		Cut back a length of rope (see 3.9 below) and test to destruction to prove an adequate safety factor in last 12 months	A		
3.7		Re-terminate and apply static load test at 1.5 times SWL in last 12 months	A		
3.8	Certificate Retention	As it is necessary to be able to trace the testing history of a main lift wire, all certification, including original manufacturers certificate, initial test certificate (3.4 above) and any annual test certificates (3.6 above) should be available for inspection	A		
3.9	Note: Refer to IMCA SEL 022/M 194, section 13. This guidance refers to bell wire ropes but is equally applicable to surface diving main lift wires	There should be an annual removal of a length of wire rope from just beyond the first sheave from the bell termination with the bell below the surface, allowing for swell, to be discarded. A length sufficient to provide test samples for two tensile tests should be cut from the bell end adjacent to the termination. In certain circumstances the competent person may waive the recommendation to cut all the way back to the first sheave. In systems where there is a single vertical fall directly from the winch to the bell it will be necessary to cut right back to the winch. A sample should be tested to destruction to verify that the required factor of safety is maintained. Should the test prove unsatisfactory due to problems with test procedures or where the wire rope fails within a length equal to six wire rope diameters (6d) from the base of the socket or cone, a second test may be carried out. This alternative test should not be used as a way of avoiding discard where a valid test is performed which indicates low strength. The ultimate strength test to be carried out on a sample from the part subject to the most severe dynamic loading will be used to verify that a factor of safety of 8:1 is still being maintained and if not the wire rope should be discarded. Even if the factor of safety is being maintained but the result falls 10% below the base value adopted following the test carried out when the rope was first put into service, it should be discarded. One of the tensile test samples should be dismantled and the internals examined			
4	**Secondary Recovery**				
4.1	Provision	There must be a secondary means of recovering the diving basket (or wet bell) from depth and bringing it back to its deployment position. This must be independent of the main recovery system	A		
4.2	SWL	The secondary recovery system must have a certified SWL which is at least equal to the weight of the fully loaded basket (or wet bell) in air (see 1.2 above)	A		
4.3	Another Use	If the secondary recovery system has another use (for example guide weight deployment) then it must have a certified SWL covering at least the weight required above PLUS its main task	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
4.4	Demonstration	In the last 12 months the secondary recovery system must have been demonstrated to be able to recover the fully loaded basket (or wet bell) to the surface and bring it on board	A		
Note: Where a winch is used for secondary recovery from the water to the deck it should meet all of the man-riding requirements given in 4.5 to 4.18 below.					
4.5	Suitability	Only winches deemed suitable for man-riding by the manufacturer (or a competent person) should be used	A		
4.6	Operating Lever	The winch raise/lower control must be designed to return to the neutral position when released by the operator	A		
4.7	Marking	The raise and lower positions of the operating lever must be clearly marked	A		
4.8	Main Brake	An automatic brake must be fitted which will come on when the operating lever is returned to the neutral position or if there is a loss of power to the winch	A		
4.9	Secondary Brake	A secondary braking system must also be fitted for use in case the main brake fails. This may be automatic or manually operated	A		
4.10	Clutch	If any sort of clutch mechanism is fitted to the winch, there must be a positive means of preventing it becoming disengaged during operation	A		
4.11	Operating Instructions	A notice giving the operating instructions for the winch, including the actions necessary if power is lost, should be displayed where the winch operator can see it	A		
4.12	Secondary Power	An independent (secondary) source of power to the winch must be available in case of failure of the primary power	A		
4.13	Drum Capacity	The winch drum must be able to accept the full length of wire being used. This means that there should be a clear space between the outside of the top layer of wire and the edge of the drum flange of at least 2.5 times the wire diameter	A		
4.14	Guarding	Unless access is physically restricted, guards should be fitted to the winch and drum to stop anything (clothing, fingers, etc.) being drawn in to the machinery	B		
4.15	Wire Spooling	Arrangements should exist to ensure that the wire being recovered on to any man-riding winch is correctly spooled. In most cases this will be that the fleet angle of the wire is such that it automatically spools correctly. If that is not the case then this may require a mechanical spooling device	B		
4.16	Line Out	There should be a method by which the winch operator can see how much of the lift wire has been paid out. This may be by a line-out meter or at its simplest by marking the wire at the operational depth	B		
4.17	Winch Testing *D 018, Sheet 22.1*	Visual examination and function test at maximum SWL. Independent static load test on each brake system at 1.25 times maximum SWL in last 6 months	A		
4.18		Independent static load test on each brake system at 1.5 times maximum SWL plus a dynamic test at 1.25 times maximum SWL followed by NDE of critical areas in last 12 months	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
Note: Where a wire rope is used for secondary recovery to the deck, it must meet the requirements of 4.19 to 4.27 below. (Note: Certain configurations, such as double reeving through a guide weight, may not require the use of non-rotating wire.)					
4.19	Type	The lift wire should be non-rotating	A		
4.20	Connection	The connection of the wire to the pad eye (or similar) must be of a suitable type. It should have two retaining means (for example a nut locked with a split pin) for the removable pin	A		
4.21	Lubrication	Unless the wire is to be renewed every 2 years, it should be pressure lubricated every 6 months	B		
4.22	Wire Testing *D 018, Sheet 29.1*	There have been a number of problems in the past with high tensile bell wire ropes which appear to lose strength even when properly stored. For this reason a test to destruction should be carried out when any high tensile bell wire rope is first put in to service to establish the actual minimum breaking force of the wire at that time. Provided the test result does not fall below the manufacturer's MBF, future destructive test results should be compared to that original figure (the base value), rather than to any claim (or test certificate) provided by the manufacturer. If the test to destruction when the wire is first put into service does indicate a MBF below that of the manufacturer, then the manufacturer's MBF should always be adopted as the base value against which to monitor future deterioration in breaking force. However if the result falls 10% below the MBF then the rope should be discarded. The sample tested to destruction should prove an adequate safety factor exists. This is normally 8 times the SWL	A		
4.23		Static test at 1.25 times SWL plus function test at SWL as an integral part of lifting system in last 6 months. Visual examination of visible section at same time	A		
4.24		Cut back a length of rope (see 4.27 below) and test to destruction to prove an adequate safety factor in last 12 months	A		
4.25		Re-terminate and apply static load test at 1.5 times SWL in last 12 months	A		
4.26	Certificate Retention	As it is necessary to be able to trace the testing history of a main lift wire, all certification, including original manufacturer's certificate, initial test certificate (4.22 above) and any annual test certificates (4.24 above) should be available for inspection	A		
4.27	Note: Refer to IMCA SEL 022/M 194, section 13. This guidance refers to bell wire ropes but is equally applicable to surface diving main lift wires	There should be an annual removal of a length of wire rope from just beyond the first sheave from the bell termination with the bell below the surface, allowing for swell, to be discarded. A length sufficient to provide test samples for two tensile tests should be cut from the bell end adjacent to the termination. In certain circumstances the competent person may waive the recommendation to cut all the way back to the first sheave. In systems where there is a single vertical fall directly from the winch to the bell it will be necessary to cut right back to the winch. A sample should be tested to destruction to verify that the required factor of safety is maintained. Should the test prove unsatisfactory due to problems with test procedures or where the wire rope fails within a length equal to six wire rope diameters (6d) from the base of the socket or cone, a second test may be carried out. This alternative test should not be used as a way of avoiding discard where a valid test is performed which indicates low strength. The ultimate strength test to be carried out on a sample from the part subject to the most severe dynamic loading will be used to verify that a factor of safety of 8:1 is still being maintained and if not the wire rope should be discarded. Even if the factor of safety is being maintained but the result falls 10% below the base value adopted following the test carried out when the rope was first put into service, it should be discarded. One of the tensile test samples should be dismantled and the internals examined.			

Item	Description	Requirement	Need	Response	Certificate Issue Date
5	**Guide Wires**				
5.1	Provision	A system should be provided to restrict excessive lateral or rotational movement of the basket or wet bell in the water. This will normally take the form of two guide wires stabilised with a weight	B		
5.2	Winch(es)	If the winch(es) is designated as man-riding, for example as a secondary recovery method for the basket or wet bell, then it must meet all the requirements in 4.5 to 4.18 above Note: It is not necessary to record the detailed information here if it is already completed in 4.5 to 4.18 above	A		
5.3	Non Man-Riding	If the winch(es) is not designated as man-riding then it is required only to meet the normal standards for lifting equipment applying at the site	B		
5.4	Wire Rope(s)	If the wire rope(s) is designated as man-riding, for example as a secondary recovery method for the basket or wet bell, then it must meet all the requirements in 4.19 to 4.27 above Note: It is not necessary to record the detailed information here if it is already completed in 4.19 to 4.27 above	A		
5.5	Non Man-Riding	If the wire rope(s) is not designated as man-riding then it is required only to meet the normal standards for lifting equipment applying at the site	B		
6	**Hydraulics**				
6.1	General	The handling system may be powered by hydraulics. If so this system should be well maintained and should not be exposed in such a way that physical damage is likely. There should be no obvious leaks of hydraulic oil	B		
6.2	Power Requirements	An assessment must be available of the maximum hydraulic power required for normal and emergency launch and recovery modes. This requires an itemised list	A		
6.3	Redundancies	The various redundancies available should be stated and explanations available as to how the transfer from one system to another is made	A		
6.4	Hoses	All hoses must be suitable for the purpose, properly installed and protected from damage	A		
6.5	Securing	All hoses must be appropriately supported and secured at intervals not exceeding 2m	A		
6.6	Hose Identification	It must be possible to identify all hoses and their latest test date. Such as by means of a hose register or PMS record	B		
6.7	Hydraulics Testing *D 018, Sheet 22.2*	Visual examination and function test as an integral part of the handling system within the last 6 months	A		
6.8		Intercooler/heater (if fitted) checked for function and flow in the last six months	A		
6.9		Hydraulic fluid/oil batch no, type and grade plus date originally filled to be available	A		
6.10		Hydraulic fluid/oil analysed OR completely replaced within the last 12 months	A		
6.11	Relief Valves	Pressure relief valves may or may not be fitted within the hydraulic system. If they are fitted then they should comply with the testing requirements detailed below			
6.12	Relief Valve Testing	Visual examination in last 6 months	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
6.13	*D 018, Sheet 24.3*	Function test at required relief setting followed by gas leak test at maximum working pressure in last 2½ years	A		
7	**Pneumatic Hoses**				
Note: Often, the handling system is powered by pneumatics. If the winch(es) are pneumatic then the requirements listed in 6.1 to 6.12 above are not relevant and instead the requirements of this section should be substituted.					
7.1	Suitability	All hoses must be suitable for the purpose, properly installed and protected from damage	A		
7.2	Security	All hoses must be appropriately supported and secured at intervals not exceeding 2m	A		
7.3	Damage	All hoses should be well maintained and there should be no obvious damage to any of them	A		
7.4	Identification	It must be possible to identify all hoses for their safe working pressure and latest test date. Such as by means of a hose register or PMS record	B		
7.5	End Restraints	All pneumatic hoses (HP and LP) must be secured at the connection point with a whip-check device (tie backs) attached to a secure fixed point. The type of whip-check used will differ depending on the pressures involved. A tie back needs to be considered for its length, material and security	A		
7.6	Hose Testing *D 018, Sheet 28*	Visual examination and function test in last 6 months	A		
7.7		Pressure leak test to maximum rated working pressure in last 2 years	A		
8	**Electric Winches**				
Note: Normally, the handling system is powered by hydraulics or it is pneumatic. If however the winch(es) are electrically powered then the requirements listed in 6.1 to 6.12 above are not relevant and instead the requirements of this section should be substituted.					
8.1	General	The electrical system should be well maintained and should not be exposed in such a way that physical damage is likely. There should be no obvious damage to any of the cables or components	B		
8.2	Power Requirements	An assessment must be available of the maximum electrical power required for normal and emergency launch and recovery modes. This requires an itemised list	A		
8.3	Redundancies	The various redundancies available should be stated and explanations available as to how the transfer from one system to another is made	A		
8.4	Cables	All cables must be suitable for the purpose, properly installed and protected from damage	A		
8.5	Support	All cables must be appropriately supported and where relevant fastened in to cable trays or similar	A		
8.6	Cable Identification	It must be possible to identify all cables and their latest test date. Such as by means of a PMS record	B		
8.7	Electrical Testing *D 018, Sheet 11*	Visual examination, function test of unit (including protective devices) plus continuity and resistance testing of all cables within the last 6 months	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
9	**Communication**				
9.1	General	The diving supervisor must have a means of verbal communication to/from the winch driver. This should be dedicated and hard wired where they are remote from each other	A		
9.2	Comms Testing *D 018, Sheet 6*	The communications must have been function tested in the last 6 months in addition to normal pre-dive checks	A		
10	**Overall Testing**				
10.1	General	It is normal that the launch/recovery system is load tested as a complete unit rather than as individual components. This should happen at the intervals given below but also if the unit is relocated to a different work site or any of the major components are replaced, altered or repaired. The certificate for the overall test should state clearly all the component parts which were tested			
10.2	Overall Testing *D 018, Sheet 22.1*	Visual examination and function test of complete system at maximum SWL. Independent static load test on each brake system at 1.25 times maximum SWL in last 6 months	A		
10.3		Independent static load test on each brake system at 1.5 times maximum SWL plus a dynamic test at 1.25 times maximum SWL followed by NDE of critical areas in last 12 months	A		
11	**Firefighting**				
11.1	Availability	Suitable firefighting arrangements must be made for the handling system area. This may be by means of permanent ship or platform provided equipment or by means of portable extinguishers etc. It should be capable of dealing with any type or size of foreseeable fire hazard	A		
11.2	Unmanned areas	Consideration should be given to the provision of a fire detection system in any unmanned areas	C		
11.3	Firefighting Testing *D 018, Sheet 15 & 16*	Whether fixed or portable it should be in accordance with manufacturer's specification and fit for the purpose it will be used for	A		
11.4		If it is a portable system then it must have had an external visual examination and check that any indicating device reads within the acceptable range within last 6 months	A		
11.5		If this is a fixed system then the nozzles, valves, pipework, etc. must have been visually examined in the last 6 months	A		
11.6		If this is a fixed system it must be function tested to demonstrate operation of the system OR had a simulated test using air or gas as the test medium in the last 12 months	A		
11.7		If an automatic detection/activation system is fitted then a function test to demonstrate correct operation must have been carried out in the last 12 months	A		
12	**Standby Diver**				
12.1	General	A surface standby diver must be provided with a suitable means of entry to and exit from the water in the event that he is required to perform a rescue. If this involves the use of a mechanical handling system, basket etc. then the system for the standby diver must meet the same requirements as that for the working diver and a separate set of record sheets should be completed for that system	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
13	**Breathing Apparatus**				
13.1	Breathing Apparatus	Emergency breathing apparatus, fitted with communications, must be available for the winch driver and any other personnel required for the safe recovery of the divers in an emergency. If umbilical supplied, any air intakes for the supplying compressor must be in a pollution free area	A		
13.2	Umbilical Supply	If umbilical supplied from a compressor then the air intake for the compressor must be situated in a pollution free zone. A BA set should also be available in case of umbilical supply failure or to allow escape	A		
13.3	BA Testing *D 018, Sheet 5.1 & 9.1*	Visual examination and function test (including communications if fitted) in last 6 months. Check made at same time that cylinder is fully charged	A		
13.4		External visual examination of cylinder plus gas leak test to maximum working pressure in last 2½ years	A		
13.5		Internal and external visual examination of cylinder plus gas leak test to maximum working pressure in last 5 years (possible overpressure test)	A		

Diving Basket

Where there is more than one basket, a table should be completed for each one.

Item	Description	Requirement	Need	Response	Certificate Issue Date
1	**General**				
1.1	Location	The basket must be located such that it is easy for the diver(s) to get in and out as well as to remove an unconscious diver from the basket to the deck	A		
1.2	Lighting	If diving is to take place at night, the deck and launching area in the vicinity of the basket must be well illuminated	A		
1.3	Structure and Lift Point	For any basket manufactured after 1 January 2014, documentation should be available showing clearly the designed SWL which should be equal to or greater than the gross weight marked on it (see 1.12 below)	A		
1.4		Paint work/coating should be in good condition and the structure should be free from excess corrosion	A		
1.5	Capacity	Should be able to carry two divers comfortably	A		
1.6	Diver Retention	Should have a gate or chains to prevent divers falling out	A		
1.7	Hand Holds	Must be fitted with suitable internal hand holds for divers	A		
1.8	Injury Prevention	Should be fitted with protection at the top to prevent injury to the divers from dropped objects	A		
1.9	Securing a Diver	A means should be fitted such that each of the working divers can be secured in the basket if unconscious	B		
1.10	Lifting Point	There must be a secure point to attach the lift wire to. This can be a pad eye, a shackle point or a captive ring	A		
1.11	Secondary Point	There must be a suitable place to attach a secondary lift wire if the main lift point fails. (The secondary lift wire does not need to be fitted)	B		
1.12	Weight Marking	The gross weight of the basket, fully equipped with divers and equipment should be clearly marked on it. The tare weight (i.e. unladen) should also be marked on it	A		
1.13	Load Testing *D 018, Sheet 3*	Visual examination of lifting points and main structure (including secondary lift point) in last 6 months for damage/corrosion	A		
1.14		Load test of lifting point (this also applies to secondary lift points) at 1.5 times gross weight of the basket, fully equipped with divers and equipment with NDE of lifting points or pad eyes before and after test in last 12 months	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
2	**Emergency Cylinder**				
2.1	Cylinder	There should be one (or more) emergency air cylinder fitted in the basket and securely mounted	A		
2.2	Contents Gauge	It should be fitted with a contents gauge (indicating type only) and a first stage regulator	A		
2.3	Emergency Air	The cylinder should be fitted with a first stage regulator. There should then be a double connection, one side of which should be fitted with an obviously accessible valve and a length of hose which is rigid enough to be pushed up inside the neck seal of a diving helmet. An alternative arrangement (for example snap connects on the line, matching those on a helmet) may be acceptable, subject to a suitable risk assessment	B		
2.4	Mouthpiece and Mask	The other side of the double connection should go to a suitable means of allowing a diver to breathe if he needs to remove his helmet. This could be a normal second stage regulator and demand valve with a mouthpiece and mask or by means of a full face mask	B		
2.5	Colour Coding	The cylinder should be colour coded for breathing air, have the contents permanently marked on it and have the last test date stamp marked with a small patch of distinctive colour to aid its location	A		
2.6	Cylinder Testing *D 018, Sheet 10.1*	External visual examination in last 6 months	A		
2.7		Internal and external examination plus gas leak test to maximum working pressure in last 2 years (possible overpressure test)	A		
2.8		Hydraulic overpressure test to 1.5 times maximum working pressure (or the factor required by the design code or standard if different) plus the 2 yearly tests above, within the last 4 years	A		
2.9	Gauge Testing *D 018, Sheet 20*	Visual examination and function test of pressure indicating gauge in last 6 months	A		
2.10	Pipework Testing *D 018, Sheet 24.1*	Internal pressure test of all valves, pipework, fittings, etc. to 1.5 times maximum working pressure when new	A		
2.11		Visual examination of pipework/fittings in last 6 months	A		
2.12		Gas leak test of pipework and fittings at maximum working pressure in last 2 years	A		
2.13	Hose Testing *D 018, Sheet 28*	Visual examination and function testing in the last 6 months	A		
2.14		Pressure leak test to maximum rated working pressure in last 2 years	A		
2.15	Relief Valves	Pressure relief valves may or may not be fitted to any first stage regulator. If they are fitted then they should comply with the testing requirements detailed below			
2.16	Relief Valve Testing *D 018, Sheet 24.3*	Visual examination in last 6 months	A		
2.17		Function test at required relief setting followed by gas leak test at maximum working pressure in last 2½ years	A		

Wet Bell

Note: A dive basket fitted with a dome is not a wet bell. A wet bell requires a dome and main supply umbilical from the surface providing (as a minimum) air to a manifold inside the wet bell and diver excursion umbilicals terminated at the wet bell.

Item	Description	Requirement	Need	Response	Certificate Issue Date
1	**General**				
1.1	Location	The wet bell must be located such that it is easy for the diver(s) to get in and out as well as to remove an unconscious diver from the wet bell to the deck	A		
1.2	Lighting	If diving is to take place at night, the deck and launching area in the vicinity of the wet bell must be well illuminated	A		
1.3	Structure and Lift Point	For any wet bell manufactured after 1 January 2014, documentation should be available showing clearly the designed SWL which should be equal to or greater than the gross weight marked on it (see 1.12 below)	A		
1.4		Paint work should be in good condition and the structure should be free from excess corrosion	B		
1.5	Capacity	Should be able to carry at least two divers in an uncramped position	A		
1.6	Diver Retention	Should have a gate or chains to prevent divers falling out	A		
1.7	Hand Holds	Must be fitted with suitable internal hand holds for divers	A		
1.8	Injury Prevention	If the dome is of the acrylic type then there should be protection at the top to prevent breakage or injury to the divers from impact damage	A		
1.9	Securing a Diver	Needs a suitable means for supporting the working diver (or each of them if there are two) with their heads in the air space if unconscious	A		
1.10	Lifting Point	There must be a suitable secure point to attach the lift wire to. This can be a pad eye, a shackling point, a captive ring or similar	A		
1.11	Secondary Point	There must be a suitable place to attach a secondary lift wire if the main lift point fails. (The secondary lift wire does not need to be fitted)	B		
1.12	SWL	The gross weight of the wet bell, fully equipped with divers and equipment should be clearly marked on it. The tare weight (i.e. unladen) should also be marked on it	A		
1.13	Load Testing *D 018, Sheet 3*	Visual examination of lifting points and main structure (including secondary lift point) in last 6 months for damage/corrosion	A		
1.14		Load test of lifting point (this also applies to secondary lift points) at 1.5 times the gross weight of the basket, fully equipped with divers and equipment with NDE of lifting points or pad eyes before and after test in last 12 months	A		
1.15	Buoyancy	A test should have been carried out to demonstrate that the wet bell, fully outfitted and without divers, remains negatively buoyant when the dome is fully filled with air. Its in-water weight during this test should be noted on the certificate	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
2	**Air Cylinder(s)** – *Note: Nitrox may be used in place of air in certain circumstances. If this is being used, then substitute 'nitrox' for the word 'air' in the following section*				
2.1	Cylinders	There should be two (or more) air cylinders fitted to the wet bell and securely mounted	A		
2.2	Colour Coding	The cylinders should be colour coded for breathing air, have the contents permanently marked on it and have the last test date stamp marked with a small patch of distinctive colour to aid its location	A		
2.3	Cylinder Testing *D 018, Sheet 10.1*	Cylinder external visual examination in last 6 months	A		
2.4		Internal and external examination plus gas leak test to maximum working pressure in last 2 years (possible overpressure test)	A		
2.5		Hydraulic overpressure test to 1.5 times maximum working pressure (or the factor required by the design code or standard if different) plus the 2 yearly tests above, within the last 4 years	A		
3	**Air Sources/Supplies** – *Note: Nitrox may be used in place of air in certain circumstances. If this is being used, then substitute 'nitrox' for the word 'air' in the following section*				
3.1	Sources	Sufficient sources of air (or gas), of breathing quality, must be available and suitably arranged so that if the on line source to the diver fails, an alternative source can be immediately switched on	A		
3.2	Adequacy	Each of the sources should be able to provide adequate pressure and flow rates to all divers that they may be required to supply at the maximum depth of the intended diving operation	B		
3.3	To the Diver(s)	The air supply to each diver must be arranged so that if one line fails then this does not significantly interfere with another diver's gas supply. This is further explained in IMCA D xxx (in preparation)	A		
3.4	Working Diver(s) Sources	There should be a primary air sources for each working diver plus a secondary source. Note: The diver's bail-out is not the secondary source	A		
3.5	One Working Diver	For one diver working in the water this requires two sources, one connected as a primary source for the diver and the other as an independent and separate secondary source	A		
3.6	Two Working Divers	For two divers working in the water at the same time this requires at least three sources, connected either as a separate primary source for each diver with a common secondary or else a common primary source feeding both divers but with independent and separate secondary sources to each diver	A		
3.7	Wet Bell Onboard Sources/Supplies	In a wet bell it is acceptable that the secondary source is provided from the on-board cylinders, provided that there is either one diver remaining in the wet bell to switch the sources over manually or else that the switchover is automatic (for example a shuttle valve)	B		
3.8	Adequacy of Onboard Source	If this is the method of supply then it should be able to provide adequate pressure and flow rates to all divers that they may be required to supply at the maximum depth of the intended diving operation. The supply should also be sufficient to allow for all required in water decompression	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
4	**Outfitting**				
4.1	Pipework	Cylinders should be valved and connected up in such a way that this onboard air source is available to the divers as back-up or for blowdown of the enclosed top section	A		
4.2	Contents Gauge	The system should be fitted with a contents gauge(s) (indicating type only)	A		
4.3	Gauge Testing *D 018, Sheet 20*	Visual examination and function test of pressure indicating gauge in last 6 months	A		
4.4	Pipework Testing *D 018, Sheet 24.1*	Internal pressure test of all valves, pipework, fittings, etc. to 1.5 times maximum working pressure when new	A		
4.5		Visual examination of pipework/fittings in last 6 months	A		
4.6		Gas leak test of pipework and fittings at maximum working pressure in last 2 years	A		
4.7	Lighting	Should be fitted with sufficient lighting to allow the divers to see and operate all controls	B		
4.8	Electrical Testing *D 018, Sheet 11*	Visual examination, function test plus continuity and resistance tests of all cables and electrical equipment in last 6 months	A		
4.9	Gauges	If the wet bell is used for decompression then a suitable depth gauge should be provided	B		
4.10	Gauge Calibration *D 018, Sheet 18 or 19 (as appropriate)*	All gauges must have been visually examined, function tested in situ, calibrated and/or tested (as relevant) to the required accuracy in the last 6 months	A		
4.11	Relief Valves	Pressure relief valves may or may not be fitted to any first stage regulator or elsewhere in the pipework. If they are fitted then they should comply with the testing requirements detailed below			
4.12	Relief Valve Testing *D 018, Sheet 24.3*	Visual examination in last 6 months	A		
4.13		Function test at required relief setting followed by gas leak test at maximum working pressure in last 2½ years	A		
5	**Main Umbilical**				
5.1	Fitting	The wet bell should be fitted with a main supply umbilical carrying all necessary air/communications/power/etc. to the bell. (see separate section for details of umbilical system)	A		

Wet Bell Main Umbilical

Item	Description	Requirement	Need	Response	Certificate Issue Date
1	**General**				
1.1	Suitability	The umbilical must be suitable for the intended use. This means it must be robust and able to be handled by the intended deployment system. It must also contain a sufficient number and diameter of hoses and cables to provide all supplies safely at the maximum depth to which it will be used	A		
1.2	Handling	There should be a suitable means of safely handling the umbilical in such a way that it is not exposed to damage	A		
1.3	Length Paid Out	A means to identify how much umbilical has been paid out is required to avoid the deployment of excess length. This could be achieved by means of a line-out counter on an umbilical winch or by physical marking for length at least every 10 metres (33 feet) using a recognised system which allows easy visual identification of the length paid out	B		
1.4	Umbilical Marking	If the marking is by means of physical marking using a recognised system then the details of this system should be displayed at the umbilical handling point on a board or other readily readable means	B		
2	**Fitting**				
2.1	Attachment	The umbilical should be securely attached to the wet bell by means of a strength member or strain relief fitting so that the individual connections are not subject to load	A		
2.2	Arrangement	The leads of the hoses and cables at the wet bell end should be arranged to avoid chafing or kinking	A		
3	**Umbilical Winch**				
3.1	Braking System	If an umbilical winch is used then it should be fitted with a mechanical braking system to stop the umbilical paying out under load when the winch motor is in use (over running), in neutral or at rest	B		
4	**Testing**				
4.1	Electrical Components *D 018, Sheet 11*	Visual examination, function test, continuity and resistance testing carried out in last 6 months	A		
4.2	Hose Components *D 018, Sheet 28*	When new, hydro test to 1.5 times maximum working pressure or as recommended	A		
4.3		Visual examination and function test in last 6 months	A		
4.4		Pressure leak test to maximum working pressure in last 2 years	A		
5	**Spare** – *If a spare umbilical is carried offshore then it should meet the following:*				
5.1	Certification	Tested and certified as in 4 above	A		
5.2	Storage	Stored offshore in suitable conditions, normally as per the manufacturer's instructions	B		
5.3	Pre-use Testing	Leak tested at intended working pressure (and flushed through if necessary) before use	A		
6	**Secondary Recovery**				
6.1	Intention	The umbilical should only be used as a means of secondary recovery if it is specifically designed for that purpose. If so it must be tested in line with the requirements in the handling system section	A		

Diver Heating System

Note: This section will only apply to a diving system that uses hot water for diver heating.

Item	Description	Requirement	Need	Response	Certificate Issue Date
1	**General**				
1.1	Suitability	The equipment used to generate and supply the hot water to the diver should be suitable for the purpose	A		
2	**Redundancy**				
2.1	Requirement	Whether there is a need for back-up power and hot water will depend on whether the diver can be safely recovered to the surface in the event of loss of heating. This should be stated in the site specific operating procedures	B		
2.2	Alternative Source	If redundancy is required, there must be an alternative source for supplying heat to the diver	A		
2.3	Electrical Back-Up	If electricity is required to generate heating or pump it to the diver then there must be a back-up system in the event of primary failure (such as the vessel losing main power). This must be able to function for as long as it takes to recover the diver(s) to safety	A		
3	**Temperature**				
3.1	Monitoring	The diving supervisor must have a display showing the temperature of the water being supplied to the diver	A		
3.2	Alarm	A hi-lo temperature alarm (audible and visible) must be fitted to alert the diving supervisor if pre-set upper and lower limits are exceeded	A		
4	**Oil-Fired Heaters**				
4.1	Location	Oil fired heaters should be located such that they present no risk to the dive system in the event of fire	A		
4.2	Air Intake Pollution	Their position must also present no risk in terms of pollution or contamination of air supply intakes to the vessel or any breathing air compressors	A		
4.3	Spill Tray	They should be fitted with a spill tray which drains off to a safe area (to reduce risk of fire or pollution)	A		
4.4	Fuel Supply	Where possible the fuel supply should be hard piped	B		
4.5	Shut Off Valve	The local tank filler should be fitted with a dead-mans handle or automatic shut off valve which closes when the tank is full	B		
4.6	Overflow	The local tank must be fitted with an overflow system with a capacity greater than the filling supply system (i.e. capable of allowing a rate of overflow greater than the filling rate)	A		
4.7	Overflow Dump	The overflow system must dump to a safe area	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
5	**Firefighting**				
5.1	Provision	All hot water machines need to have suitable provision of firefighting equipment in their vicinity. This may be by means of permanent ship or platform provided equipment or by means of portable extinguishers etc. It must be capable of dealing with any type or size of foreseeable fire hazard	A		
5.2	Fire Detection	If any hot water machines are situated in enclosed and unmanned areas then consideration should be given to fitting a fire detection system. This should be particularly considered for oil-fired units	C		
5.3	Firefighting Testing *D 018, Sheet 15 & 16*	Whether fixed or portable it should be in accordance with manufacturer's specification and fit for the purpose it will be used for	A		
5.4		If it is a portable system then it must have had an external visual examination and check that any indicating device reads within the acceptable range within last 6 months	A		
5.5		If this is a fixed system then the nozzles, valves, pipework, etc. must have been visually examined in the last 6 months	A		
5.6		If this is a fixed system it must be function tested to demonstrate operation of the system OR had a simulated test using air or gas as the test medium in the last 12 months	A		
5.7		If an automatic detection/activation system is fitted then a function test to demonstrate correct operation must have been carried out in the last 12 months	A		
6	**Testing**				
6.1	Hot Water System *D 018, Sheet 21*	Visual examination and function test in last 6 months	A		
6.2	Pipework *D 018, Sheet 24.1*	Pressure test to 1.5 times maximum working pressure when new	A		
6.3		Visual examination in last 6 months	A		
6.4		Gas (or fluid) leak test at maximum working pressure in last 2 years	A		
6.5	Gauges *D 018, Sheet 20*	Visual examination and function test of any indicating gauges in last 6 months	A		
6.6	Electrical *D 018, Sheet 11*	Visual examination, function test, continuity and resistance tests of all electrics in last 6 months	A		
6.7	Pressure Vessels *D 018, Sheet 9.2*	External visual examination in last 6 months	A		
6.8		Internal and external examination plus gas (or fluid) leak test to maximum working pressure in last 15 months	A		
6.9		Internal and external examination plus overpressure test to 1.5 times maximum working pressure (or the factor required by the design code or standard if different) plus gas (or fluid) leak test to maximum working pressure in last 5 years	A		
6.10	Relief Valves	Pressure relief valves may or may not be fitted to any pressure vessel. If they are fitted then they should comply with the testing requirements detailed below			

Item	Description	Requirement	Need	Response	Certificate Issue Date
6.11	Relief Valve Testing *D 018, Sheet 24.3*	Visual examination in last 6 months	A		
6.12		Function test at required relief setting followed by gas leak test at maximum working pressure in last 2½ years	A		

Divers' Umbilicals

*This section applies to both excursion umbilicals used with a wet bell and to surface diving umbilicals but does **not** apply to a wet bell main umbilical, which has its own separate section.*

Item	Description	Requirement	Need	Response	Certificate Issue Date
1	**General**				
1.1	Construction	The umbilical(s) should be suitable for the tasks intended. They should be robust and made up from components designed for use in an umbilical	A		
1.2	Stowage	Adequate umbilical stowage should be provided. This should allow the umbilical to be coiled up away from risk of damage and such that minimum bend radius of components is not compromised	B		
1.3	Marking	Umbilicals should be marked for length at least every 10 metres (33 feet) using a recognised system which allows easy visual identification of the length paid out	A		
1.4	Marking System	Details of this recognised system should be displayed at the umbilical tending point on a board or other readily readable means	B		
1.5	Security	The diver's end of the umbilical should be fitted with a means which allows it to be securely fastened to the diver's safety harness without putting any strain on the individual whip ends	A		
1.6	High O_2 Content Marking	Any hoses carrying O_2 in greater concentration than 25% must be identified as O_2 clean and be O_2 compatible	A		
1.7	Oxygen Service	All hoses must be cleaned for oxygen service when used for gas mixes containing more than 25% oxygen. This may be demonstrated by means of a suitable procedure to ensure cleanliness which is applied when any components are new or after there has been any significant alteration	A		
2	**Length**				
2.1	Record of Length	The length of the diver's umbilical which it is permissible to pay out will normally be dictated by some outside factor such as the bail-out endurance (depending on depth/distance) or the distance to the nearest thruster on a DP vessel. This maximum length should be clearly identified for each diving operation and arrangements should preferably be made to ensure that this is the maximum length of umbilical which can be paid out	A		
2.2	Standby Diver Umbilical Length	The standby diver's umbilical should be 2 metres (6½ feet) longer than the working diver(s) umbilical	B		
3	**Testing**				
3.1	Electrical Components *D 018, Sheet 11*	Visual examination, function test, continuity and resistance testing carried out in last 6 months	A		
3.2	Hose Components *D 018, Sheet 28*	When new, hydro test to 1.5 times maximum working pressure or as recommended	A		
3.3		Visual examination and function test in last 6 months	A		
3.4		Pressure leak test to maximum working pressure in last 2 years	A		

Divers' Personal Equipment

This section covers divers' helmets (or masks), bail-out bottles and other parts of the diver's emergency breathing supply. It does not cover other items such as suits, harnesses, gloves etc. which should meet normal standards for personal protective equipment.

Item	Description	Requirement	Need	Response	Certificate Issue Date
1	**Helmets (or Masks)**				
1.1	Marking	Each helmet (or mask) should be indelibly marked with a unique serial number	B		
1.2	Condition	All helmets (or masks) should be in good condition with no obvious defects	A		
1.3	Type	The helmet (or mask) must be of a type which is suitable for the intended diving operation	A		
1.4	Safety	Helmets should be fitted with a means to stop them becoming detached from their clamp while in use and this means should be manufacturer approved. Similarly masks should be fitted with a means to stop the hood becoming detached from the face plate while in use (in addition to the normal clamp) and this means should be manufacturer approved	A		
1.5	Maintenance	Each helmet (or mask) must be subject to regular planned maintenance and a record of such maintenance should be available, using manufacturer's information where relevant. This maintenance should also include any neck dam. Records of the maintenance should identify the person(s) carrying it out and their competence to do so	A		
1.6	Impact Protection	Divers working in the splash zone, or close to the surface, who are NOT wearing a rigid helmet should be provided with head protection. This will also apply to the standby	A		
1.7	Helmet Testing *D 018, Sheet 5.3*	Visual examination and function test at atmospheric pressure in last 6 months	A		
1.8		Inspected and tested in line with manufacturer's recommendations in last 12 months	A		
2	**Emergency Gas Supply (Bail-Out) Cylinders**				
2.1	Provision	Every diver, including the standby, must be provided with a reserve source of air carried in a bail-out cylinder or similar	A		
2.2	Endurance	The cylinder(s) must have sufficient endurance to allow the diver to return to a place of safety. This will normally mean that a calculation should be available showing that the capacity of the cylinder(s) at the depth of diving will allow breathing air for 1 minute for every 10 metres horizontal excursion plus (if using surface umbilicals) 1 minute for every 10 metres of depth. This calculation should be carried out using 40 l/min as a minimum consumption	A		
2.3	Marking	Each cylinder should be correctly colour coded and marked with the name of the contents	A		
2.4	Test Date	The last test date stamp on each cylinder should be painted over with a small patch of distinctive coloured paint to aid location. If this is inaccessible then the cylinder serial number should be visible or else stencilled in a visible location	B		
2.5	Cylinder Testing – Seamless Cylinders *D 018, Sheet 10.1*	External and internal visual examination in last 6 months	A		
2.6		External and internal visual examination plus gas leak test to maximum working pressure in last 2 years (possible overpressure test)	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
2.7		Hydraulic overpressure test to 1.5 times maximum working pressure (or the factor required by the design code or standard if different) plus the 2 yearly tests above, in last 4 years	A		
2.8	Cylinder Testing – Composite Cylinders D 018, Sheet 10.2	External and internal visual examination in last 6 months	A		
2.9		External and internal visual examination plus gas leak test to maximum working pressure in last 12 months (possible overpressure test)	A		
2.10		Hydraulic proof pressure test to the pressure marked on the cylinder OR volumetric expansion test as appropriate to the design of the cylinder in last 5 years. In either case plus the 6 and 12 monthly tests above	A		
3	**Whips and Connectors** – *The above two sections cover the mask/helmet and the bail-out cylinder. This section covers the connections between these items and other parts of the diver's emergency breathing system*				
3.1	Provision	Suitable connections, fittings etc. must be provided to allow the bail-out cylinder to supply emergency breathing air to the diver's mask/helmet if needed	A		
3.2	Contents Gauge	It should be fitted with a contents gauge (indicating type only) and a first stage regulator	A		
3.3	Condition	All whips, hoses, gauges, fittings etc. must be in good condition with no obvious defects	A		
3.4	Type	All hoses, fittings, whips, gauges etc. must be of a suitable type and pressure rating for the purpose. In particular, care should be taken to ensure that items of lower pressure rating than required are not used. This is particularly important for the first stage regulator	A		
3.5	Maintenance	All items forming part of the diver's emergency air supply system should be subject to regular inspection and maintenance. Records of such maintenance should be available	A		
3.6	Hose Testing *D 018, Sheet 28*	Visual examination and function testing at full working pressure in the last 6 months	A		
3.7		Pressure leak test to maximum rated working pressure in last 2 years	A		
3.8	Gauge Testing *D 018, Sheet 20*	Visual examination and function test of pressure indicating gauge in last 6 months	A		
3.9	Pipework Testing *D 018, Sheet 24.1*	Internal pressure test of all valves, pipework, fittings etc. to 1.5 times maximum working pressure when new	A		
3.10		Visual examination of pipework/fittings in last 6 months	A		
3.11		Gas leak test of pipework and fittings at maximum working pressure in last 2 years	A		
3.12	Relief Valves	Pressure relief valves may or may not be fitted to any first stage regulators. If they are fitted then they should comply with the testing requirements detailed below			
3.13	Relief Valve Testing *D 018, Sheet 24.3*	Visual examination in last 6 months	A		
3.14		Function test at required relief setting followed by gas leak test at maximum working pressure in last 2½ years	A		

Compressors

Note: Auditors should record the name and asset or identification number of each compressor to be audited.

Where there is more than one compressor then there should be a clear statement in the Response and Certificate Issue Date columns as to the status of each one. This is simple if this document is held electronically but for hard copy may require a separate section to be completed for each compressor.

Item	Description	Requirement	Need	Response	Certificate Issue Date
1	**General**				
1.1	Listing	A detailed list should be available of each compressor forming part of the diving system. This should specify the make, type and model as well as the intended use of each	B		
1.2	Location	All compressors must be located in a suitable area. This means that any personnel working on the compressor must not be exposed to any hazard while doing so	A		
1.3	Protection	Similarly the compressor itself should be protected from obvious physical damage	A		
1.4	Intakes	The intakes of all compressors must be sited in an area where they are not exposed to any pollution – particularly exhaust fumes	A		
1.5	Access	Each compressor must be easily accessible to diving personnel, both for routine maintenance and in an emergency	A		
1.6	Suitability	Each compressor must be in accordance with the manufacturer's specification and fit for the purpose it will be used for (as per IMCA D 018, Detail Sheet 7)	A		
1.7	Instructions	Each compressor must have a manufacturer's, or similar, operating manual. Detailed operating instructions taken from this manual must be available at the site	A		
1.8	Visibility	Where possible these instructions should be visible beside each compressor	C		
1.9	Signs	If appropriate, there should be warning signs stating that a compressor may start, vent or stop automatically and care should be taken	B		
1.10	Oxygen Service	Any compressor or pump intended for pumping oxygen or any gas mixture containing more than 25% oxygen must be designed for that purpose	A		
2	**Maintenance**				
2.1	Planned Maintenance	Each compressor must have a detailed planned maintenance schedule showing what work has to be done and the intervals this work has to be carried out	A		
2.2	Records	Detailed records must be available of all maintenance activities including the PMS carried out as required in 2.1 above	A		
2.3	Filters	All filters must be checked at the intervals specified in the planned maintenance system and the filters should be cleaned or replaced as required	A		
2.4	Visible Date	The date of the last inspection of each filter should be clearly visible on it along with the date when its next service is due	B		

Item	Description	Requirement	Need	Response	Certificate Issue Date
3	**Firefighting**				
3.1	Provision	All compressors need to have suitable provision of firefighting equipment in their vicinity. This may be by means of permanent ship or platform provided equipment or by means of portable extinguishers etc. It must be capable of dealing with any type or size of foreseeable fire hazard	A		
3.2	Fire Detection	If any compressors are situated in enclosed and unmanned areas then consideration should be given to fitting a fire detection system	C		
3.3	Firefighting Testing *D 018, Sheet 15 & 16*	Whether fixed or portable it should be in accordance with manufacturer's specification and fit for the purpose it will be used for	A		
3.4		If it is a portable system then it must have had an external visual examination and check that any indicating device reads within the acceptable range within last 6 months	A		
3.5		If this is a fixed system then the nozzles, valves, pipework, etc. must have been visually examined in the last 6 months	A		
3.6		If this is a fixed system it must be function tested to demonstrate operation of the system OR had a simulated test using air or gas as the test medium in the last 12 months	A		
3.7		If an automatic detection/activation system is fitted then a function test to demonstrate correct operation must have been carried out in the last 12 months	A		
4	**Safety Devices**				
4.1	Solenoid Switches	Solenoid switches may be fitted to automatically stop the compressor if it overheats or malfunctions. An alarm for this may be fitted in dive control	C		
4.2	Cracked Plate Detector	A diaphragm type compressor must be fitted with a cracked plate detector which will automatically stop the compressor in the event of failure	A		
4.3	Testing *D 018, Sheets 7 & 17*	Visual examination and function test of safety devices in last 6 months	A		
4.4	Explosion Protection	Any compressor used for gas transfer, and not intended for use with gases containing over 25% oxygen, should be fitted with a protective device which will shut the compressor down if the oxygen percentage entering the compressor exceeds 25%	B		
4.5	Testing *D 018, Sheet 7*	Visual examination and function test of safety devices in last 6 months	A		
4.6	Enclosed Space Ambient Atmosphere	If using a nitrox membrane compression or oxygen booster system with an oxygen content above 25% mounted within an enclosed space, then an oxygen analyser with audio/visual alarm must be sited in the area with a link external to the enclosed space or to dive control to warn of any rise of oxygen levels outside pre-set parameters due to gas leakage in to the area	A		
4.7	Analyser Testing *D 018, Sheet 2*	Analysers should be examined, function tested and calibrated in situ within the last 6 months	A		
4.8	Relief Valves	A relief valve should be fitted to any pressure container (e.g. an air receiver) if it could be over pressured	B		

Item	Description	Requirement	Need	Response	Certificate Issue Date
4.9	Relief Valve Testing *D 018, Sheet 24.3*	Visual examination in last 6 months	A		
4.10		Function test at required relief setting followed by gas leak test at maximum working pressure in last 2½ years	A		
5	**Pipework**				
5.1	Suitability	All pipework (rigid or flexible), valves, fittings etc. should be suitable for the purpose, properly installed and protected from damage	A		
5.2	Security	All flexible hoses other than charging whips must be appropriately supported and secured at intervals not exceeding 2m	A		
5.3	Identification	It must be possible to identify all flexible hoses for their safe working pressure and latest test date. Such as by means of a hose register or PMS record	A		
5.4	End Restraints	All gas supply hoses (HP and LP) must be secured at the connection point with whip-check devices attached to a secure fixed point. The type of whip-checks will differ depending on the pressure of gas. A tie back needs to be considered for its length, material and security	A		
5.5	High O_2 Content Marking	Any pipework or flexible hoses carrying O_2 in greater concentration than 25% must be identified as O_2 clean and be O_2 compatible	A		
5.6	Oxygen Service	All pipework must be cleaned for oxygen service when used for gas mixes containing more than 25% oxygen. This may be demonstrated by means of a suitable procedure to ensure cleanliness which is applied when any components are new or after there has been any significant alteration	A		
5.7	Testing *D 018, Sheet 24.1 and 24.2*	Pressure test to 1.5 times maximum working pressure when new	A		
5.8		Visual examination in last 6 months	A		
5.9		Gas leak test at maximum working pressure in last 2 years	A		
6	**Air Receivers**				
6.1	Suitability	All air receivers must have been manufactured to a recognised international code or standard and be fit for the purpose they will be used for	A		
6.2	Testing *D 018, Sheet 26*	Visual examination in last 6 months	A		
6.3		Internal and external inspection OR internal overpressure test plus (in both cases) gas leak test to full working pressure in last 2½ years	A		
7	**Electrics**				
7.1	Integrity	All electrical supplies should be properly connected using suitable equipment	A		
7.2	Electrical Testing *D 018, Sheet 11*	Visual examination, function test plus continuity and resistance tests in last 6 months	A		

Item	Description	Requirement	Need	Response	Certificate Issue Date
8	**Operational Testing**				
8.1	Compressor Testing *D 018, Sheet 7*	Visual examination and function test of compressor in last 6 months	A		
8.2		Check of delivery rate and pressure of compressor in last 6 months	A		
8.3		Check of output purity of compressor against a suitable standard in last 6 months	A		

High Pressure Air and Gas Storage

This section refers to any bulk high pressure gas or air storage which forms part of the air diving system. This will include HP air storage banks or quads, HP oxygen storage quads and any treatment gas storage. Since it is not envisaged that any gas mixes other than compressed natural air might be stored in enclosed compartments, no requirements are listed below for this eventuality.

Item	Description	Requirement	Need	Response	Certificate Issue Date
1	**General**				
1.1	Quantity	There must be sufficient sources available to comply with the requirements of IMCA D 050	A		
1.2	Location	All HP storage should be located in a suitable place where there is a minimal risk of damage occurring	A		
1.3	Oxygen	Oxygen (or mixes containing over 25% oxygen) must be stored in the open and well clear of any fire hazards	A		
1.4	Marking	Cylinders and quads must be colour coded and marked with the name and chemical symbol of the contents in accordance with IMCA D 043 or a recognised local national standard	A		
1.5	Test Date	The last test date stamp on each cylinder should be painted over with a small patch of distinctive coloured paint to aid location. If this is inaccessible then the cylinder serial number should be visible or else stencilled in a visible location	B		
1.6	Condition	Each cylinder should be in good condition and free from serious corrosion	A		
1.7	Guarding	Any transportable quad of gas cylinders should have protective guarding fitted to it as laid out in IMCA D 009	B		
1.8	Gas Supply Hose Restraints	All gas supply hoses (HP and LP) must be secured at the connection point with whip-check devices attached to a secure fixed point. The type of whip-checks will differ depending on the pressure of gas. A tie back needs to be considered for its length, material and security	B		
2	**Testing**				
2.1	Cylinder Testing *D 018, Sheet 9.1*	External visual examination in last 6 months	A		
2.2		External visual examination and gas leak test to maximum working pressure in last 2½ years	A		
2.3		Internal and external visual examination and gas leak test to maximum working pressure in last 5 years (possible overpressure test and/or NDE followed by a gas leak test to maximum working pressure)	A		
2.4	Pipework Testing *D 018, Sheet 24.1 & 24.2*	Pressure test to 1.5 times maximum working pressure when new	A		
2.5		Internal cleanliness verified to appropriate standard	A		
2.6		Visual examination in last 6 months	A		
2.7		Gas leak test at maximum working pressure in last 2 years	A		
2.8	Lifting Equipment (Quad Slings etc.) Testing *D 018, Sheet 23*	Visual examination in last 6 months	A		
2.9		Load test at 1.5 times maximum SWL or alternative examination/testing as required by the competent person in last 12 months	B		
2.10	Relief Valves	Pressure relief valves may or may not be fitted to any gas storage. If they are fitted then they should comply with the testing requirements detailed below			

Item	Description	Requirement	Need	Response	Certificate Issue Date
2.11	Relief Valve Testing *D 018, Sheet 24.3*	Visual examination in last 6 months	A		
2.12		Function test at required relief setting followed by gas leak test at maximum working pressure in last 2½ years	A		
3	**Firefighting**				
3.1	Provision	All HP gas or air storage needs to have suitable provision of firefighting equipment in the vicinity. This may be the normal ships or platforms equipment or dedicated equipment. It must be capable of dealing with any type or size of foreseeable fire hazard and able to provide cooling for the cylinders	A		
3.2	Fire Detection	If any HP gas or air storage is situated in enclosed and unmanned areas then consideration should be given to fitting a fire detection system	C		
3.3	Firefighting Testing *D 018, Sheet 15 & 16*	Whether fixed or portable it should be in accordance with manufacturer's specification and fit for the purpose it will be used for	A		
3.4		If it is a portable system then it must have had an external visual examination and check that any indicating device reads within the acceptable range within last 6 months	A		
3.5		If this is a fixed system then the nozzles, valves, pipework, etc. must have been visually examined in the last 6 months	A		
3.6		If this is a fixed system it must be function tested to demonstrate operation of the system OR had a simulated test using air or gas as the test medium in the last 12 months	A		
3.7		If an automatic detection/activation system is fitted then a function test to demonstrate correct operation must have been carried out in the last 12 months	A		
4	**Gas Content Status**				
4.1	State Boards	A record must be kept in a designated place of the contents and pressure of each cylinder or quad. These records must be updated daily when the system is in use	A		
4.2	Minimum Quantities	This record should also show clearly the minimum quantities required from 1.1 above	B		
5	**Oxygen and Gas Mixes with Over 25% Oxygen**				
5.1	Signs	Fire hazard warning signs should be erected in the vicinity of any stored oxygen or mixes over 25% oxygen	A		
5.2	Pressure	The pressure of oxygen or mixes containing over 25% oxygen should be regulated down at the quad or cylinder to a maximum of 40 bar (600 psi)	B		
5.3	Pipework	Oxygen should be hard piped wherever possible. Only flexibles compatible with oxygen should be used and they should be kept as short as possible	B		