

**Code of Practice for  
The Initial and Periodic  
Examination, Testing and  
Certification of Diving  
Plant and Equipment**



**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 018**

This revision of the earlier AODC document was prepared for IMCA, under the direction of its Diving Division Management Committee, by Crawford W Logan.

This guidance supersedes AODC 056 which has now been withdrawn.

**[www.imca-int.com/diving](http://www.imca-int.com/diving)**

*The information contained herein is given for guidance only and endeavours to reflect best industry practice. For the avoidance of doubt no legal liability shall attach to any guidance and/or recommendation and/or statement herein contained.*

# Code of Practice for the Initial and Periodic Examination, Testing and Certification of Diving Plant and Equipment

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## **I Introduction**

### **I.1 General**

In the UK sector of the North Sea, diving regulations were introduced during the 1970s which required diving plant and equipment to be examined and tested at set intervals and certificates produced to verify that this work had been carried out correctly. Other countries, particularly in the North Sea area, produced their own regulations but always with a similar theme.

In 1981 new diving regulations were produced in the UK which laid down these requirements in more detail but many of the requirements were not specific and were, therefore, open to misinterpretation.

In order to give some guidance to the offshore industry, AODC produced a document reference AODC 041 in May of 1986 which sought to clarify any interpretations necessary and to identify a common standard which could be applied by all parties. This followed a workshop organised by AODC and attended by approximately 200 representatives of diving contractors, ship owners, equipment manufacturers, oil companies, classification societies and government departments.

AODC 041 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.

After it had been in use for some years it was realised that AODC 041 needed to be expanded and revised and the Technical Committee of AODC carried out this task, publishing the new document AODC 056, which also incorporated the requirements of the main certifying authorities, in December 1991.

Again this document (AODC 056) was intended for use in the UK sector of the North Sea but was adopted by many clients and diving contractors for use world-wide.

With the increasing international nature of the offshore diving industry and the introduction of new diving regulations in the UK sector of the North Sea in 1998, IMCA members considered that the code of practice needed to be further revised and republished in its present form such that it reflected established good practice world-wide rather than the specific regulatory requirements of any one country.

### **I.2 Status of the Code**

This code offers examples of good practice. It gives advice on ways in which inspection and testing can be carried out safely and efficiently.

The code 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 code, was using safe and accepted practices.

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

It is also recognised that other codes or standards exist, such as the ADC Consensus Standards which are widely used in the Gulf of Mexico and by US based diving contractors. In the absence of specific local regulations, companies carrying out diving operations are free to use this IMCA code or any other suitable standard as the basis for their activities.

### 1.3 Work Covered by the Code

This code addresses the initial and periodic examination, testing and certification of all diving plant and equipment as utilised within the offshore diving industry.

It does not apply to one atmosphere submersible craft but does apply to any diving operations conducted from such craft.

The aim of the code is to provide a comprehensive reference source addressing the philosophy of the competent person and 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
- ◆ diving using mixed gas, closed bell or saturation techniques; or
- ◆ inside territorial waters where diving is being carried out in support of the oil and gas industry and the diving operation is not classed as civil, inland or inshore work.

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

- ◆ personnel involved in diving operations;
- ◆ clients' staff involved in the maintenance or repair of plant and equipment;
- ◆ client and contractor representatives;
- ◆ vessel owners and marine crews involved with diving operations;
- ◆ all personnel involved in QA and safety.

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.

### 1.4 National and Other Regulations

A number of countries in the world have national regulations which apply to offshore diving operations taking place within waters controlled by that country. In such cases national regulations **must** take precedence over this code and the contents of this code 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 that 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 IMO (International Maritime Organization) documents) that diving contractors either have to comply with or take serious note of.

### 1.5 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. This is the basis of the certification which the diving contractor normally 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 such as tools and divers' personal equipment, the only exception being the diver's underwater breathing apparatus.

## **I.6 Implementation**

Nothing contained in this document is new, rather it is a revision to recognise changes in good practice which have evolved over the years and thus it should be possible to implement the requirements of the code as soon as possible after publication.

## **I.7 Updating Arrangements**

This code is a dynamic document and the advice given in it will change with developments in the industry. It is intended to review this code and make any necessary improvements on a regular basis.

Any person with suggested improvements is invited to forward these, in writing, to IMCA ([imca@imca-int.com](mailto:imca@imca-int.com)).

## 2 Certification and Classification

### 2.1 General

Confusion has arisen in the past over the relationship between the requirements or regulations and those of insurance companies and classification societies. The position is unambiguous – **if there is a legal requirement then this cannot be varied by any classification or insurance society.**

The previous revision of this code (AODC 056) contained considerable detail on the requirements of the main classification societies. However, this revision does not do so for a number of reasons:

- ◆ Ongoing changes in requirements by a classification society would require further revisions of this code;
- ◆ Many of the requirements of such bodies rely on the discretion of their surveyors and thus can vary considerably;
- ◆ Most of the requirements are related to diving equipment which is classified. This is normally only the case with large saturation systems permanently installed in ships and may not be relevant to smaller or portable systems;
- ◆ The requirements of the main societies vary considerably and it can be confusing if two societies require quite different tests.

### 2.2 Certification

Diving plant and equipment must be certified that it complies with any relevant statutory requirements of the national authority of the country in which, or the flag state of the vessel or floating installation on which, it is being operated. Such certificates need to be issued by a competent person.

Certification confirms that a particular test or examination has been carried out at an identified time on a specific piece of equipment. It does not, in itself, confirm that a piece of equipment is fit for purpose or safe to use but it records what examination and testing has been carried out which is a major part of any assessment of the suitability and safety of a piece of equipment.

### 2.3 Classification

Diving plant built in accordance with a classification society's own rules, can, at the owner's request, be assigned a class. Each classification society's rules include its own requirements for the initial and periodic testing and examination of the plant and equipment as being in compliance with its rules. Classification will continue as long as the plant is found, upon examination at the prescribed surveys, to be maintained in accordance with the society's own rules.

Where a diving system is built to a classification society's rules, maintenance of class is often conditional upon compliance with any relevant statutory requirements of the national authority of the country in which, or the flag state of the vessel or floating installation on which, the diving plant is installed.

### 2.4 Classification Society Information

There are five main international classification societies who publish specific rules for diving equipment. This does not mean to say that other societies or insurers do not exist, merely that these five are recognised as the most commonly encountered bodies. They are:

- ◆ American Bureau of Shipping (ABS)
- ◆ Bureau Veritas (BV)
- ◆ Det Norske Veritas (DnV)
- ◆ Germanischer Lloyd (GL)
- ◆ Lloyds Register (LR)



The requirements of the classification societies for design, construction, initial and periodic testing of each item of plant or equipment group are given in detail within their own individual rules. It is felt, however, that some aspects should be highlighted in this document for those companies who use certifying authorities to carry out much of their examination and testing work.

There are a number of common requirements among the societies:

- ◆ Before construction of new equipment or major modifications can commence, all relevant plans and drawings must be stamped and dated as approved by the classification society concerned;
- ◆ After major system modification a classification society may require their initial/as-new tests to be repeated;
- ◆ Periodic recertification can be carried out on a continuous or distributed basis as agreed with the society concerned;
- ◆ The annual survey will include checking of maintenance records, in addition to any other requirements;
- ◆ All surveys after the annual survey will normally also include the requirements of the annual survey;
- ◆ Where a system has been classed prior to the latest revision of any rules, the rules used for the original classification still apply and the system need not be amended to meet the latest revision.

Each of the societies requires major surveys to be done at prescribed time intervals. These vary and a summary is:

- ABS: 3 years. May be extended to 4 years
- BV: 5 years. Man-riding systems only are to be surveyed at 4 yearly intervals.
- DnV: 5 years.
- GL: 4 years. May be extended to 5 years
- LR: 4 years.

One specific peculiarity of Lloyds Register requirements concerns the testing of pressure vessels. All other societies lay down their own testing standards but Lloyds states that testing should be carried out in accordance with the national code or standard to which the pressure vessel was designed and constructed. Definitive test pressures are therefore not given.

## **2.5 United States Coast Guard**

The United States Coast Guard (USCG) is in a somewhat unusual position. It is a government-run body which enforces diving regulations within the USA and its territories, but at other times it can act in a role very similar to that of a classification society.

IMCA wishes to make it clear that any certificate issued or endorsed by USCG has at least equal status to anything issued by a classification society.

## 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 plant inspection and maintenance.

Over the years legal drafters 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, without the requirement for 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 will 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 code requires the competent person to certify the design, construction and suitability of diving plant and equipment before it is put to use for the first time. That requires a high level of engineering expertise which will probably involve persons of chartered engineer status or equivalent, combined with a knowledge of diving techniques and practices and the environment in which the plant will be used. Availability of, or access to, adequate test facilities is also necessary to be able to satisfy these competent person requirements.

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. This level of competence would normally be met by a technician specialising in this type of work and in some cases may be met by the diving supervisor or the life support supervisor.

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 the associated lifting appliances and gear (or other parts of the diving equipment) must be carried out by a competent person who is neither the owner of the installation nor his employee.

Good practice requires that the diving plant and equipment is examined and sometimes functionally tested within a short period immediately before commencement of a dive. The competent person for this work should have an understanding of the application of the plant and equipment to the diving operation. This would normally be the diving or life supervisor or suitable persons under his control.

### **3.4 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 which 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.

### **3.5 Categories of Competent Person in this Code**

Four categories of competent person are referred to in this code. Within the detail sheets in the appendix, the category of person considered competent to carry out the examination and test is identified.

#### **Category 1**

A diving or life support supervisor duly appointed by the diving contractor.

Such an individual will be competent to carry out or supervise a number of types of examination and test, but may not be appropriate for other tests unless he has had additional specific training.

A diving supervisor (qualified in line with the IMCA scheme) is regarded as being competent to carry out certain tests e.g. pressure leak tests on pressure vessels, which may also be performed by any other competent person specialising in such work. This level of competence is justified by the supervisor's knowledge and experience of the sophisticated diving techniques used, together with the variety of plant and equipment necessary to implement them.

A life support supervisor (LSS) is also considered competent to carry out certain tests as defined in the detail sheets in the appendix. To be eligible for promotion to LSS, a life support technician (LST) should be qualified in accordance with the IMCA scheme. He will be appointed in writing by his company and will have specific responsibility for the control of the saturation complex. Dependent on the offshore structure of the company, he may be subject to direct supervision by a more senior person.

#### **Category 2**

A technician, certificated Class I Chief Engineer, or other person, all specialising in such work who may be an employee of an independent company, or an employee of the owner of the equipment (unless specific legal restrictions apply), in which case his responsibilities should enable him to act independently and in a professional manner.

#### **Category 3**

Normally a classification society or insurance company surveyor, but who may be an 'in-house' chartered engineer or equivalent (unless specific legal restrictions apply), or person of similar standing.

#### **Category 4**

The manufacturer or supplier of the equipment, or a company specialising in such work which has, or has access to, all the necessary testing facilities.

## **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 must be examined, tested and certified as suitable for use as necessary.

### **4.2 The Competent Person**

The competent person has a number of responsibilities.

Firstly he must satisfy himself that he is indeed competent to carry out the 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 competent person identifying any faults or problems.

### **4.3 The Diving or Life Support Supervisor**

The diving or life support supervisor must ensure that in-date certificates are available for plant and equipment and that the latter has been examined to the extent required within the designated period prior to commencement of a dive. With regard to this, the supervisor should confirm that these checks have been carried out and are recorded in the diving operations logbook under an appropriate signature.

## **5 Documentation**

### **5.1 General**

It is evident that all examinations and tests carried out need to be documented in order to demonstrate in the future exactly when they were carried out, by whom and exactly what work was carried out.

### **5.2 Major Test or Examinations**

This refers to the sort of tests carried out at extended intervals such as annual wire rope tests or five yearly pressure tests. These will almost invariably be carried out by a third party who will issue a formal certificate often authenticated with a stamp or similar marking.

### **5.3 Regular Examinations and Test**

This refers to those tests and examinations carried out at regular intervals (normally six months or less) and which may often be carried out by the diving or life support supervisors or one of the technicians employed by the diving contractor.

In the case of lifting gear and appliances, depth gauges and compressor purity tests, there must be a certificate signed by a competent person.

For all other equipment however there can be either a certificate signed by a competent person or a record of the examination by a competent person in the planned maintenance system. Where the PMS is computer-based and no signature is possible then provided the programme is only accessible by password, an entry on the computer by the competent person is adequate and no paper certificate is required.

### **5.4 Certification Register**

All certificates issued under the requirements of this code should be retained in a register for a minimum period of two or five years depending on the item of equipment and its application. This includes the six-monthly certificates which should be retained for two years.

It is important that more than one copy of the certificates exists. In normal circumstances this will mean that the original of a certificate is retained in the onshore offices of the diving contractor with a valid copy of the certificate offshore along with the equipment. In some circumstances, however, this may be reversed with the original offshore and a copy onshore. In either case the original of the certificate should be available for inspection, either onshore or offshore as the case may be, by any relevant authority or client.

For practical purposes the “when new, when first installed or when moved” certificates would normally be retained within the owner's/diving contractor's technical records onshore.

Although not a requirement of this code, the owner/diving contractor should consider retaining all past certificates, or incorporate the information into a database, thus maintaining a comprehensive history of each item of equipment. This historical record would normally be retained in the owner's/diving contractor's technical records onshore.

## 6 Planned Maintenance Systems (PMS)

### 6.1 General

It is a basic requirement of safety 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.

### 6.2 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;
- ◆ a card index system;
- ◆ a computer program, backed up by a hard or non corruptible copy.

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 is 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.

### 6.3 Relevance of PMS

While this code 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 this code unless an adequate PMS existed. In this respect, the PMS would normally be one of the matters considered by the competent person when deciding on the level of test and examination required in relation to any specific piece of plant and equipment.

## **7 Explanation Of This Document**

### **7.1 General**

Since this document is produced to give guidance and to minimise confusions, 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.

### **7.2 Examination**

This term is used to indicate where a competent person is required to look at a piece of plant or equipment in order to establish whether it is in a suitable condition, but is not required to subject it to any tests.

The word “examination” or “visual examination” refers to the situation where a competent person (often without the use of tools) will look closely at the item to establish if it is in good condition, free from obvious defects, apparently in working order and not subject to excessive corrosion or wear. He may then decide if any further, more detailed examination, or indeed testing, is required before issuing his certificate.

The competent person will issue his certificate after examination taking in to account any damage that has occurred and the likely future deterioration due to wear and tear, bearing in mind the age, condition, and foreseeable circumstances of use of equipment within the validity period of the inspection carried out.

If the competent person believes that an item of plant may become unsafe for use during the normal period of validity, then a shorter validity period can be specified.

### **7.3 Function Test**

This refers to the requirement that the competent person will carry out a simple test of operability on a piece of plant or equipment. He need not test it over the full range of movement/loading/pressure/ etc. to which it can be subjected but should test it under the typical conditions in which it will operate for most of the time.

This is very much a “does it work properly or not” type of test rather than simulating extremes of operation.

### **7.4 Testing**

In the detail sheets there are requirements for the competent person to carry out certain tests. These are normally specified such as 1.1 times maximum working pressure or 1.5 times safe working load. If they are not specified then they will be at the discretion of the competent person.

One area where specific values are normally not given is in the overpressure testing of cylinders, chambers, pressure vessels etc. This is because different national regulations, certification authorities and international standards can require different levels of test. The competent person will need to establish whether he is being asked to test and certify the item in accordance with such a requirement and if so that will dictate the level of overpressure to be applied.

The test medium will also affect the level of overpressure as it is normal to use a smaller overpressure for pneumatic or gas testing than if fluid or hydraulic testing is to be carried out. In normal circumstances the level of testing where an overpressure test is required will be at least 10% above the maximum normal safe working pressure for pneumatic testing and 25% above if hydraulic testing is carried out. The final decision, however, will always be that of the competent person carrying out the test and issuing the certificate.

## 7.5 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 code 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 however if, 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 all confirm the equipment is satisfactory before such an extension is issued.

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.

## 7.6 When New, When First Installed or When Moved

This category is intended to cover brand new equipment when it is first put in to service and is primarily intended to ensure that the equipment is properly designed and fit for the purpose for which it will be used. When equipment is first installed at a particular location, even if it has already been used elsewhere, it must meet the same standards as if it was new.

This will also apply to equipment which has been moved from one location to another, for example a diving system moved from one drill rig to another drill rig. However, this will only apply in so far as such movement has materially affected any item and, therefore, the status of its original certification.

## 7.7 Periods of Non-Use

In the case of permanently installed equipment during periods of non-use, in-date certification need not be maintained. If the validity of the certification has lapsed, however, examination, test and recertification of the equipment in compliance with all of the requirements of the “when in service” section of the detail sheets would be required prior to it being put to work.

In the case of portable or demobilised systems, in-date certification need not be maintained during periods of demobilisation. When remobilised, examination, test and recertification of the equipment in compliance the “when new, when first installed or when moved” section of the detail sheets as well as all of the requirements of the “when in service” section would be required. However, this will only apply in so far as such demobilisation and reinstallation would have materially affected any item and, therefore, the status of its original certification.

In all cases of plant or equipment which has not been in use, the competent person should take in to account the level of maintenance applied to the units during the period of non use, before deciding on the detailed extent of examination and testing he will require.

## 7.8 Pre-Dive Checks

While the detail sheets in this document do not specify any pre-dive checks, it is normal practice to carry out visual and functional examination as appropriate of the equipment within a short period prior to commencement of a diving operation.

In the case of diving chambers and other support systems, these tests should be carried out prior to placing divers in the chamber under pressure. In the case of the diving bell, appropriate examinations should be conducted both prior to first pressurisation and prior to each deployment into the sea.



Such examinations will normally be conducted in accordance with pre-established dive checklists appropriate to each site, and recorded in the diving operations logbook.

## **7.9 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.

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 effect the validity of the certification.

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.

As a general guide, replacement of one item with an identical or near identical item would not normally require recertification but even this will depend on the exact 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, apart from routine maintenance activities, should be recorded in a formal manner and details passed to the owner's/diving contractor's onshore offices.

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 recertification is considered necessary.

## 8 Index to Detail Sheets

### 8.1 General

This index should allow easy location of the correct detail sheet. Most commonly used terms in offshore diving are listed alphabetically with the appropriate detail sheet number identified.

It must be remembered however that many items of plant or equipment are covered on more than one detail sheet. For example, a decompression chamber is a pressure vessel, contains viewports, has pipework, contains electrical equipment and contains BIBS – plus it may have other items in it such as a fire extinguisher. In that case, reference needs to be made to all of the relevant detail sheets. All possible component parts are listed against the main items but only those which are relevant need apply and those which do not apply should be ignored.

### 8.2 Index

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'A' frame (man-riding)	Man-riding basket Lifting appliances and gear Hydraulic power unit Wire rope and termination	3 22.1 22.2 29.1
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Item	Component parts	Detail sheet
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	Gas reclaim system	17
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	Sanitary systems	27
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Dive control van (structure)	Structure and lift point	4
Diver heating	Electrical equipment	11
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Item	Component parts	Detail sheet
Diving bell	Analysers Man riding basket BIBS Personal breathing apparatus Communications equipment Cylinders Electrical equipment Emergency location equipment Gas reclaim system Gauges Diver heating system Lifting appliances Pipework Pressure vessel Viewports Umbilicals Wire rope Ballast release system Emergency survival packs	1, 2 3 5.2 5.3 6 10 11 12 17 18, 19, 20 21 22.1, 22.2 24.1, 24.2 25.1 25.2 28 29.1 30 33
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Filter housings	Compressors Seamless cylinders Pipework, valves etc. Pressure vessels, welded	7 9.1, 9.2 24.1 26
Fire fighting systems	Seamless cylinder Fixed fire fighting systems Portable fire fighting systems Pipework, valves etc. Welded pressure vessels	9.1, 9.2 15 16 24.1 26
Flexible hose	Umbilicals	28

Item	Component parts	Detail sheet
Gas blenders/mixers	Analysers Compressors, boosters Seamless cylinders Electrical equipment Gas reclaim, blenders and mixers Gauges Pipework systems Relief valves Welded pressure vessels	1, 2 7 9.1, 9.2 11 17 19, 20 24.1, 24.2 24.3 26
Gas control panel	Analysers Communications equipment Electrical equipment Gas reclaim system Gauges Pipework systems Relief valves	2 6 11 17 18, 19, 20 24.1, 24.2 24.3
Gas cylinders	Seamless, not taken under water – dry Seamless, not taken under water – wet Seamless, taken under water Gauges, indicating Pipework systems Relief valves Bursting discs	9.1 9.2 10 20 24.1, 24.2 24.3 24.4
Gas reclaim system	Analysers Compressors, boosters Seamless cylinders Electrical equipment Gas reclaim, blenders and mixers Gauges Pipework systems Relief valves Welded pressure vessels	1, 2 7 9.1, 9.2 11 17 19, 20 24.1, 24.2 24.3 26
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Hot water units	Electrical equipment Gauges, indicating Diver heating systems Pipework systems Relief valves Welded pressure vessels	11 20 21 24.1 24.3 26
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Item	Component parts	Detail sheet
Hyperbaric lifeboat (SOLAS-type)	Analysers Man riding basket BIBS Communications equipment Cylinders Electrical equipment Environmental control system Fire fighting system Gauges Pipework Pressure vessel Viewports Umbilicals Emergency survival packs	1, 2 3 5.2 6 9.1, 10 11 13 15, 16 18, 19, 20 24.1, 24.2 25.1 25.2 28 33
Hyperbaric lifeboat launch system	Wire rope and terminations Launch system (SOLAS type) Launch system (non SOLAS type)	29.1 32.1 32.2
Hyperbaric rescue chamber (non-SOLAS-type)	Analysers Man riding basket BIBS Communications equipment Cylinders Electrical equipment Fire fighting system Gauges Pipework Pressure vessel Viewports Umbilicals Emergency survival packs	1, 2 2 5.2 6 10 11 15, 16 18, 19, 20 24.1, 24.2 25.1 25.2 28 33
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Interlocks	Pipework systems	24.1
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Item	Component parts	Detail sheet
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Shower tank	Seamless pressure vessels Gauges, indicating Pipework systems Relief valves Welded pressure vessels	9.2 20 24.1 24.3 26
Surface chamber	See section on decompression chamber	-
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Umbilicals	Electrical equipment Umbilicals	11 28
Valves	Pipework systems Oxygen system pipework	24.1 24.2
Viewports	Viewports	25.2
Volume tank	Seamless cylinders (dry service) Seamless cylinders (wet service) Gauges, indicating Pipework systems Welded pressure vessels	9.1 9.2 20 24.1 26
Welding habitat	Analysers Non man riding basket BIBS Personal breathing apparatus Communications equipment Cylinders Electrical equipment Emergency location equipment Fire fighting systems Gas reclaim system Gauges Diver heating system Pipework Umbilicals Emergency survival packs	1, 2 4 5.2 5.3 6 10 11 12 15, 16 17 18, 19, 20 21 24.1, 24.2 28 33

<b>Item</b>	<b>Component parts</b>	<b>Detail sheet</b>
Wet bell	BIBS Personal breathing apparatus Communications equipment Cylinders Electrical equipment Gauges Diver heating system Lifting appliances Pipework Umbilicals Wire rope	5.2 5.3 6 10 11 18, 19, 20 21 22.1, 22.2 24.1, 24.2 28 29.1
Whips	Umbilicals	28
winch (man riding)	Lifting appliances Hydraulic power unit Wire rope and terminations	22.1 22.2 29.1
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Winch (umbilical)	Electrical equipment Lifting appliances Umbilicals	11 23 28
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## Appendix – Detail Sheets

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1	Disposable tube type gas analysers including hand operated pumps
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3	Man-riding basket (structure and lift point only)
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6	Communications equipment
7	Compressors, boosters and filtration units used for gas transfer at both high and low pressures
8	Cranes
9.1	Seamless gas cylinders and pressure vessels not taken under water – dry internal service
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10	Seamless gas cylinders taken under water
11	Electrical equipment
12	Diving bell emergency location system
13	Environmental control unit (integral test only)
14	External regeneration unit (integral test only)
15	Fixed firefighting systems, internal or external (integral test only)
16	Portable firefighting systems and extinguishers
17	Gas reclaim system, gas mixers and gas blenders
18	Depth gauges including caisson gauges if used to control decompression
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20	Indicating gauges
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22.2	Hydraulic power unit for lifting appliances used for man riding (integral test only)
23	Lifting appliances and gear (not used for man riding)
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25.1	Pressure vessels for human occupancy
25.2	Viewports used in pressure vessels for human occupancy
26	Welded pressure vessels (not for human occupancy)
27	Sanitary systems (integral test only)
28	Umbilicals - hose components only, including end terminations and fittings but excluding electrical components
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30	Bell ballast release systems
31	Underwater air lift bags
32.1	Hyperbaric evacuation launch systems (SOLAS or specially designed)
32.2	Hyperbaric evacuation launch systems (non dedicated)
33	Emergency survival packs and passive scrubbers



## Disposable Tube Type Gas Analysers including Hand Operated Pumps

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Examination and function test of pump plus check expiry date of tubes.	6 months	1, 2 or 4

## Analysers, Electrically Powered (Battery or Mains)

### When new, when first installed or when moved

Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Examine, confirm working properly and recalibrate to agreed specification	6 months	1, 2 or 4
NB Analysers are normally calibrated on a much more frequent basis but are not recertified each time.	Ongoing	Normally 1 or 2

**Note:**

- ◆ The examination of any analyser should also cover the integrity of any pipework connected to the analyser and providing the sample to it.

## Man-Riding Basket (Structure and Lift Point Only)

*NB This can be a dive basket, stage, gondola, inflatable boat lifting cradle, etc.*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4
Load test at 1.5 times SWL with MPI of lifting points or padeyes after test where appropriate	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination for damage/corrosion	6 months	2, 3 or 4
Load test at 1.25 times SWL with MPI of lifting points or padeyes after test where appropriate	12 months	2, 3 or 4

## Non-Man-Riding Basket (Structure and Lift Point Only)

*NB This can be a cargo or tool basket, control van, container, etc.*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination for damage/corrosion	6 months	2, 3 or 4
Load test at 1.1 times SWL with MPI of lifting points or padeyes after test where appropriate	2 years	2, 3 or 4

**Note:**

- ◆ In some parts of the world, such as the North Sea, there are specific requirements for examination and testing of containers which exceed the standards above.

**5.1****Personal Breathing Apparatus (not used under water)**

*NB This includes BA sets, smoke hoods, etc., but does not include the cylinders or any supply system pipework*

**When new, when first installed or when moved**

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

**When in service**

Examination/Test	Validity Period	Category of Competent Person
Visual examination and function test (including communications if fitted). Check to be made that cylinder (where appropriate) is fully charged.	6 months	1, 2 or 4

## 5.2

### Personal Breathing Apparatus (BIBS)

*NB This does not include the supply system pipework pressure testing*

#### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

#### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination and function test (including communications if fitted).	6 months	1, 2 or 4



## Personal Breathing Apparatus (used under water)

*NB This does not include the supply system pipework pressure testing or the cylinder*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination and function test at atmospheric pressure (including communications if fitted).	6 months	1, 2 or 4

## Communications Equipment

*NB This includes through water emergency, hard wire primary, sound powered secondary and audio recording equipment*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Examination and function test. Check condition of batteries (if applicable)	6 months	1, 2 or 4
NB Batteries are normally checked on a more frequent basis but do not need recertified each time.	Ongoing	1, 2 or 4

#### References:

- ◆ AODC 035 "Code of practice for the safe use of electricity under water"

## Compressors, Boosters and Filtration Units used for Gas Transfer at both High and Low Pressures

*NB This excludes receivers, volume tanks, storage bottles or cylinders, supply system pipework and ancillary systems*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination and function test	6 months	1, 2, 3 or 4
Check delivery rate and pressure	6 months	1, 2, 3 or 4
Check gas purity as appropriate	6 months	1, 2 or 4

#### References:

- ◆ DMAC 019 *"The effects of water vapour on diver physiology"*

#### Note:

- ◆ The amount of water vapour allowed in an air or gas sample in many international standards is related to air or gas which is to be stored at high pressure. This is done to reduce the problems of condensation and freezing of regulators. Such restrictions do not need to apply when samples of LP air or gas are analysed and the competent person can allow a higher water vapour content.

## Cranes

*See note below*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
No specific requirements	

### When in service

Examination/Test	Validity Period	Category of Competent Person
No specific requirements		

#### References:

- ◆ AODC 018 (Rev. 1) "Attachment of loads to lifting hooks during diving operations"

#### Note:

- ◆ If the crane is only used for deployment of plant and equipment in support of the diving operation then there are no specific requirements associated with diving and **what applies will be the requirements of the ship or installation's certifying authority.** The diving contractor need only ensure that relevant certification exists for the crane and is in date.
- ◆ If the crane is to be used for man - riding in support of the diving operation then it should meet the requirements of detail sheets 22.1, 22.2 and 29.1.

## Seamless Gas Cylinders and Pressure Vessels not taken under water – Dry Internal Service

*NB This includes both fixed and transportable gas storage cylinders and tubes and filter housings.  
It does not include welded pressure vessels or pressure vessels for human occupancy.*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
Manufactured in accordance with a recognised international code or standard and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
External visual examination	6 months	1, 2, 3 or 4
Thorough external visual examination and gas leak test to maximum working pressure.	2½ years	3 or 4
Thorough internal and external visual examination and gas leak test to maximum working pressure. If the competent person deems it necessary, an overpressure test to 1.1 times the maximum working pressure may be required	5 years	3 or 4

#### References:

- ◆ AODC 010 (Rev. 1) "Gas cylinders used in conjunction with diving operations in areas governed by UK regulations"

#### Notes:

- ◆ In many countries there are detailed national regulations concerning gas cylinders, particularly if these are transportable. Such regulations must be complied with, even if they conflict with or are more onerous than the recommendations given above.
- ◆ Hydraulic testing of large storage tubes subject to dry internal service is not recommended as it introduces moisture in to the system which may prove difficult to remove. In such cases pneumatic or gas overpressure testing may be substituted.
- ◆ If testing is not hydraulic and the competent person requires it then other testing such as wall thickness measurement or acoustic emission testing may also be required.
- ◆ Some national regulations, certifying authorities or gas cylinder codes may give no option but to apply hydraulic overpressure testing.
- ◆ In all types of overpressure testing suitable safety precautions must be taken to ensure the safety of all testing personnel and others.
- ◆ It is recommended that a pressure leak test is carried out after hydraulic test in order to detect any possible leakage of the pillar valve stem seals prior to return to service.

## Seamless Gas Cylinders and Pressure Vessels not taken under water – Wet Internal Service

*NB This includes driers, filter housings, gas recovery volume tanks, sanitary and shower tanks*

### When new, when first installed or when moved

*Note: All of the “when in service” requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
Manufactured in accordance with a recognised international standard and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
External visual examination	6 months	1, 2, 3 or 4
Thorough internal and external visual examination and gas leak test to maximum working pressure.	15 months	3 or 4
Thorough internal and external visual examination and overpressure test to 1.5 times the maximum working pressure followed by gas leak test to maximum working pressure.	5 years	3 or 4

#### References:

- ◆ AODC 010 (Rev. 1) “Gas cylinders used in conjunction with diving operations in areas governed by UK Regulations”

#### Notes:

- ◆ Hydraulic testing in situ may be impractical or undesirable. In such cases pneumatic or gas overpressure testing may be substituted.
- ◆ If testing is not hydraulic and the competent person requires it then other testing such as wall thickness measurement or acoustic emission testing may also be required.
- ◆ In all types of overpressure testing suitable safety precautions must be taken to ensure the safety of all testing personnel and others.

## Seamless Gas Cylinders taken under water

*Including filter housings*

*NB This category also applies to cylinders which are subject to extreme exposure although they may not be taken underwater to any appreciable depth. Examples would be cylinders mounted externally on a hyperbaric evacuation system or used in a small boat as part of a portable surface supplied system (SCUBA-replacement)*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
Manufactured in accordance with a recognised international code or standard and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
External visual examination	6 months	1, 2, 3 or 4
In addition, bail out bottles and suit/ABLJ inflation bottles should also have an internal visual examination	6 months	2 or 4
Thorough internal and external visual examination and gas leak test to maximum working pressure. If the competent person deems it necessary, a hydraulic overpressure test may be required	2 years	3 or 4
Hydraulic overpressure test to 1.5 times maximum working pressure plus the 2 yearly tests above.	4 years	3 or 4

#### References:

- ◆ AODC 010 (Rev. 1) "Gas cylinders used in conjunction with diving operations in areas governed by UK regulations"
- ◆ AODC 037 "Periodic examination of bail-out bottles"

#### Notes:

- ◆ In many countries there are detailed national regulations concerning gas cylinders, particularly if these are transportable. Such regulations must be complied with, even if they conflict with or are more onerous than the recommendations given above.
- ◆ Some national regulations, certifying authorities or gas cylinder codes may give no option but to apply hydraulic overpressure testing.
- ◆ In all types of overpressure testing suitable safety precautions must be taken to ensure the safety of all testing personnel and others.
- ◆ It is recommended that a pressure leak test is carried out after hydraulic test in order to detect any possible leakage of the pillar valve stem seals prior to return to service.
- ◆ The most recent test of the cylinder must be within two years previous to it being put to use under water. This applies also to bottles mounted externally on a hyperbaric rescue vessel or used in a small boat as part of a portable surface supplied system (SCUBA replacement).

## Electrical Equipment

### When new, when first installed or when moved

Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination, function test of unit (including protective devices) plus continuity and resistance testing of any cables	6 months	2, 3 or 4

#### References:

- ◆ AODC 035 "Code of practice for the safe use of electricity under water"



## Diving Bell Emergency Location System

### When new, when first installed or when moved

Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Physical examination for damage or deterioration and function test as outlined in IMCA D 008	6 months	1, 2, 3 or 4

#### References:

- ◆ AODC 019 "Guidance note on emergency diving bell recovery"
- ◆ Supplement to the IMO Code of Safety for Diving Systems – IMO Resolution A583(14)
- ◆ IMCA D 008 "Testing of through water communications"

## Environmental Control Unit (integral test only)

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination and function test. (This may require recalibration of the control system)	6 months	1, 2, 3 or 4

## External Regeneration Unit (integral test only)

*NB This excludes the pressure testing of the housing and pipework*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination and function test. (This may require recalibration of the control system)	6 months	1, 2, 3 or 4

## Fixed Firefighting Systems, Internal or External (integral test only)

*NB This excludes the supply system pipework and any ancillary equipment*

### When new, when first installed or when moved

Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4
Full function test	1, 2, 3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Partial function test to demonstrate operation of the system up to the pressure chamber or hull.	6 months	1, 2, 3 or 4
OR		
Simulated test using air or gas as the test medium	6 months	1, 2, 3 or 4

## Portable Firefighting Systems and Extinguishers

*NB This does not include pressure testing the cylinder*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination plus check if adequately filled	6 months	1, 2, 3 or 4

#### Notes:

- ◆ When on board a ship or installation the normal hand held portable extinguishers are the responsibility of the vessel owner and will have to meet different requirements to those above. These will normally be the requirements of the marine legislation of the flag state.
- ◆ When portable extinguishers are used inside deck chambers then the pressure cylinders will need to meet the requirements for wet internal service (see detail sheet 9.2).

## Gas Reclaim System, Gas Mixer and Gas Blenders

*NB This covers the integral test only and does not include any cylinders, the supply system pipework testing or the divers' breathing apparatus*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination and function test	6 months	1, 2 or 4

## Depth Gauges including Caisson Gauges if used to control decompression

*NB This refers only to gauges used to measure divers' depth accurately in order to provide information essential for decompression, saturation storage and transfer within a diving system*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination and calibration against a certified test instrument to an accuracy of $\pm 0.25\%$ of maximum scale value at a minimum of 5 points within the scale, then function test.	6 months	2, 3 or 4

#### References:

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

#### Notes:

- ◆ Gauges which do not calibrate to the required accuracy should be adjusted or replaced as necessary.
- ◆ The certificate issued should list the actual readings taken at each point, the gauge under test and details of the test instrument.

## Life Support Gauges

### including Caisson Gauges if used only to indicate depth to the divers

*NB This refers to gauges which read pressures critical to the life support function.  
Such gauges are bell and bail out charging panel and the last gauge monitoring pressure to the divers' breathing apparatus (including BIBS)*

#### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

#### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination and check by comparison only against a certified test instrument to an accuracy of $\pm 2.5\%$ of maximum scale value at a minimum of 4 points within the scale.	6 months	1, 2, 3 or 4

#### References:

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

#### Notes:

- ◆ For such gauges, there can be a certificate signed by a competent person or a record in the planned maintenance system stating details of the gauge tested and the test instrument plus confirmation that the gauge was found to be within the required accuracy.



## Indicating Gauges

*NB This refers to gauges whose purpose is to show if pressure is present in a supply system and, if so, the approximate magnitude of the pressure. They are neither depth gauges nor life support gauges (as in detail sheets 18 and 19)*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination for physical condition and Function Test throughout normal operating range.	6 months	1, 2, 3 or 4

#### References:

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

#### Notes:

- ◆ These types of gauges will not normally require any certification. Instead it will be acceptable to record the checks and the results in the planned maintenance system.
- ◆ Gauges which are inaccessible (such as inside the diving bell) may be checked by a diver under the supervision of a competent person.

## Diver Heating Systems (integral test only)

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination and function test. If the unit is electrically powered then continuity and resistance testing should be carried out.	6 months	1, 2, 3 or 4

## Lifting Appliances and Gear used for Man-Riding

*NB This includes bell or basket launch and recovery systems, winches, structures and heave compensators*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4
Winches to have an independent static load test on each brake system at 1.5 times maximum safe working load plus a dynamic test at 1.25 times maximum SWL. NDT to be carried out afterwards on critical areas.	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination and function test at maximum SWL. Independent static load test on each brake system at 1.25 times maximum SWL	6 months	2, 3 or 4
Independent static load test on each brake system at 1.5 times maximum SWL. NDT to be carried out afterwards on critical areas.	12 months	2, 3 or 4

#### Note:

- ◆ Testing of lifting appliances and gear is normally carried out as part of the integral system. If individual components have to be replaced such as strops or shackles then this does not require retesting provided the change is done on a like-for-like basis and the new component is supplied with its own relevant examination and proof load test certificate.

## Hydraulic Power Unit for Lifting Appliances used for Man-Riding (integral test only)

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
Visual examination, function test and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination and function test as an integral part of the overall lifting system	6 months	2, 3 or 4
Hydraulic fluid/oil analysis carried out or replacement of fluid/oil.	12 months	2, 3 or 4

**Note:**

- ◆ Significant water ingress into non water based hydraulic fluid systems will increase the likelihood of internal corrosion and increased wear. If there is evidence of such water ingress then steps should be taken to eradicate the water and any pressurised components within the hydraulic circuit such as rams, accumulators, tanks etc. should be tested as if subjected to wet internal service.
- ◆ The analysis of hydraulic fluid/oil is carried out partly to identify any metallic particles which could indicate excessive wear in some components. If the fluid/oil is replaced then it must be remembered that this check will not be available.

## Lifting Appliances and Gear (not used for man-riding)

*NB This includes winches and tuggers plus associated rigging*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4
Winches to have a static load brake test at 1.5 times maximum safe working load plus a dynamic test at 1.25 times maximum SWL. NDT to be carried out afterwards on critical areas.	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination and function test (including brakes) at maximum SWL	6 months	2, 3 or 4
Static load brake test at 1.5 times maximum SWL. NDT to be carried out afterwards on critical areas.	12 months	2, 3 or 4

#### Note:

- ◆ Testing of lifting appliances and gear is normally carried out as part of the integral system. If individual components have to be replaced such as strops or shackles then this does not require retesting provided the change is done on a like-for-like basis and the new component is supplied with its own examination and proof load test certificate.

## Pipework Systems, Valves, Regulators and Relevant Fittings

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
Visual examination and fit for purpose it will be used for	3 or 4
Internal pressure test to 1.5 times maximum working pressure of the system plus gas leak test at maximum working pressure of the system	3 or 4
Verify internal cleanliness appropriate to intended duty	2, 3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination	6 months	1, 2, 3 or 4
Gas leak test at maximum working pressure of the system	2 years	1, 2, 3 or 4

**Note:**

- ◆ It may not be appropriate in some cases to conduct the initial testing of a complete panel or assembly at 1.5 times maximum system working pressure. In such circumstances a suitable test protocol should be agreed with the competent person to verify the integrity of the components making up the panel or assembly.

## Oxygen System Pipework, Valves and Relevant Fittings

### When new, when first installed or when moved

Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.

Examination/Test	Category of Competent Person
Visual examination and fit for purpose it will be used for	3 or 4
Internal pressure test to 1.5 times maximum working pressure of the system plus gas leak test at maximum working pressure of the system	3 or 4
Verify internal cleanliness to oxygen standards	2, 3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination	6 months	1, 2, 3 or 4
Gas leak test at maximum working pressure of the system	2 years	1, 2, 3 or 4

#### References:

- ◆ AODC 029 "Oxygen cleaning"

#### Note:

- ◆ It may not be appropriate in some cases to conduct the initial testing of a complete panel or assembly at 1.5 times maximum system working pressure. In such circumstances a suitable test protocol should be agreed with the competent person to verify the integrity of the components making up the panel or assembly.

## Relief Valves

### When new, when first installed or when moved

Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4
Function test at required setting	2, 3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination	6 months	1, 2, or 4
Function test at required relief setting and followed by gas leak test to maximum working pressure (normally integral with equipment to which valve is fitted)	2½ years	2 or 4



## Bursting Discs

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination	6 months	1, 2, 3 or 4
Gas leak test to maximum working pressure (normally integral with equipment to which disc is fitted)	2½ years	1, 2, 3 or 4
Complete renewal	10 years	not applicable

## Pressure Vessels for Human Occupancy

*NB This includes any spool pieces, trunkings and clamps connected to such vessels*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
Manufactured in accordance with a recognised international standard and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination	6 months	1, 2, 3 or 4
Thorough internal and external visual inspection plus a gas leak test at full working pressure	2½ years	1, 2, 3 or 4
Internal overpressure test plus a gas leak test at full working pressure	5 years	3 or 4

#### Notes:

- ◆ In the case of diving bell which are to be used in either observation or bounce mode, an external pressure test has to be applied every 5 years.
- ◆ Hydraulic testing is not required for overpressure testing as pneumatic or gas overpressure testing may be substituted. If testing is not hydraulic and the competent person requires it then other testing such as wall thickness measurement or acoustic emission testing may also be required.
- ◆ In all types of overpressure testing suitable safety precautions must be taken to ensure the safety of all testing personnel and others.
- ◆ Some national regulations, certifying authorities or pressure vessel standards may give no option but to apply hydraulic overpressure testing.

## Viewports used in Pressure Vessels for Human Occupancy

### When new, when first installed or when moved

Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.

Examination/Test	Category of Competent Person
Manufactured in accordance with a recognised international code or standard and fit for the purpose it will be used for	3 or 4
Overpressure tested to 1.25 times maximum rated working pressure	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination in situ	6 months	1, 2, 3 or 4
Gas leak test as an integral part of the PVHO to which it is fitted	2½ years	1, 2, 3 or 4
Internal overpressure test plus a gas leak test as an integral part of the PVHO to which it is fitted	5 years	3 or 4
Complete renewal	10 years	not applicable

#### Reference:

- ◆ AODC 030 "Acrylic plastic viewports"

## Welded Pressure Vessels (not for human occupancy)

*NB This includes air receivers, filter housings, gas storage containers (but not gas cylinders), sanitary and shower tanks, volume tanks and submerged pressure housings*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
Manufactured in accordance with a recognised international code or standard and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination	6 months	1, 2, 3 or 4
Thorough internal and external visual inspection plus a gas leak test at full working pressure	2½ years	2, 3 or 4
OR		
Internal overpressure test plus a gas leak test at full working pressure	2½ years	2, 3 or 4

#### Notes:

- ◆ Vessels which form an integral part of a chamber complex may be tested integrally with it.
- ◆ If the pressure housing is exposed to external pressure (such as a bell battery pack) and is not pressure compensated then the competent person may also require an external pressure test.
- ◆ Hydraulic testing of large storage tubes or vessels subject to dry internal service is not recommended as it introduces moisture in to the system which may prove difficult to remove. In such a case pneumatic or gas overpressure testing may be substituted.
- ◆ If testing is not hydraulic and the competent person requires it then other testing such as wall thickness measurement or acoustic emission testing may also be required.
- ◆ In all types of overpressure testing suitable safety precautions must be taken to ensure the safety of all testing personnel and others.

## Sanitary Systems (integral test only)

*NB Excludes pressure vessels and any supply system pipework*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination and function test	6 months	1, 2, 3 or 4

## Umbilicals – Hose Components only including End Terminations and Fittings but excluding Electrical Components

*NB This includes excursion, main bell, wet bell and surface dive umbilicals plus deck hoses and flexible whips*

### When new, when first installed or when moved

*Note: All of the “when in service” requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer’s specification and fit for the purpose it will be used for	3 or 4
Hydro test at 1.5 times maximum rated working pressure or as recommended in manufacturing code or standard	3 or 4
Pressure leak test then verify internal cleanliness as appropriate to the intended duty.	1, 2, 3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination and function test	6 months	1, 2, 3 or 4
Pressure leak test to maximum rated working pressure	2 years	1, 2, 3 or 4

#### Notes:

- ◆ If excursion, surface dive or gas supply umbilicals are stored for more than six months they should be flushed prior to being re-used.
- ◆ In the case of hoses which are likely to be subjected to external pressure (for example gas recovery hoses) then the above internal pressure tests are adequate to test the integrity of end fittings provided the hose was originally designed and type tested to withstand external pressure.

## Wire Rope and Terminations (Man-Riding)

*NB Davit launching systems for hyperbaric lifeboats have different requirements (see detail sheet 32)*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4
Sample tested to destruction to prove adequate safety factor (normally 8 times safe working load)	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Static test at 1.25 times SWL plus function test at SWL as an integral part of the lifting system	6 months	3 or 4
Visual examination of visible section	6 months	3 or 4
Cut back beyond first sheave and test to destruction to prove safety factor.	12 months	3 or 4
Reterminate and apply static load test at 1.5 times SWL	12 months	3 or 4

**Note:**

- ◆ There have been a number of problems in the past with galvanised 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 galvanised dyeform rope is first put in to service and future destructive test results should be compared to that original figure, rather than to any claim (or test certificate provided) by the manufacturer.

## Wire Rope and Terminations (Non-Man-Riding)

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Function test at SWL as an integral part of the lifting system	6 months	3 or 4
Visual examination of visible section	6 months	3 or 4
Apply static load test at 1.5 times SWL	12 months	3 or 4



## Bell Ballast Release Systems

*NB This also includes lift wire, guide wire and umbilical release systems*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4
When new or following a major reft involving a material or design change which could affect the ballast release system, release systems should be function tested in air.	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination and function test of all mechanisms	6 months	2, 3 or 4
Overload test to 1.5 times the static load of the ballast weight in air. NDT carried out on all critical items	12 months	3 or 4
Dry function test of all components and release mechanisms	12 months	3 or 4
Test bell positive buoyancy and confirm this is in line with original requirement.	12 months	3 or 4

#### References:

- ◆ AODC 061 "Bell ballast release systems and buoyancy ascent in offshore diving operations"
- ◆ NB This reference should be consulted as it contains explanations in detail of some of the above test, which are only summarised here.

## Underwater Air Lift Bags

*NB This includes both parachute and totally enclosed type*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
Manufactured in accordance with a recognised code or standard or to manufacturer's standard specification and fit for the purpose it will be used for	3 or 4
Function test at SWL	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Thorough visual examination of body and strops, check integrity of shackles and master links, check operation of dump, relief and inlet valves	6 months	1, 2, 3 or 4
Load test to maximum safe working load	12 months	2, 3 or 4

#### References:

- ◆ IMCA D 016 Rev. 1 "Underwater Air Lift Bags"

#### Notes:

- ◆ Both types of bags should be inflated for inspection, using a test plug for the parachute type. Care should be exercised during this exercise.
- ◆ Testing of lifting appliances and gear is normally carried out as part of the integral system. If individual components have to be replaced such as strops or shackles then this does not require retesting provided the change is done on a like-for-like basis and the new component is supplied with its own examination and proof load test certificate.

## Hyperbaric Evacuation Launch Systems

*NB This refers to SOLAS-type or specially designed and dedicated launch systems*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
Manufacture to SOLAS requirements or with specified and approved deviations. Fit for the intended purpose.	3 or 4
Overload test in installation in accordance with IMO guidance at full outboard position	3 or 4

*Note: The above requirements have an **indefinite** validity unless the system has been modified.*

### When in service

Examination/Test	Validity Period	Category of Competent Person
Thorough visual examination	6 months	2, 3 or 4
Practice deployment	6 months	2, 3 or 4
Thorough visual examination and function test	12 months	2, 3 or 4
Falls should be turned end for end. Stainless steel falls need not be renewed unless there are signs of mechanical damage or deterioration. Other falls should be replaced every 5 years or earlier if there are signs of deterioration.	2½ years	2, 3 or 4

#### References:

- ◆ IMCA D 004 "The initial and periodic examination, testing and certification of hyperbaric evacuation launch systems"
- ◆ NB The above reference should be consulted as it contains considerably more detail on special situations than can be given here. It is also understood that at the time of publication of this document, there may be changes in the SOLAS requirements which would vary the testing needed.

## Hyperbaric Evacuation Launch Systems

*NB This refers to non-dedicated launch systems*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
Manufactured to a recognised international code or standard or built in accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination and static load test at 1.25 times maximum safe working load plus function test at SWL.	6 months	2, 3 or 4
Practice deployment	6 months	2, 3 or 4
Static load test at 1.5 times maximum SWL plus NDT of critical items.	12 months	2, 3 or 4

#### References:

- ◆ IMCA D 004 "The initial and periodic examination, testing and certification of hyperbaric evacuation launch systems"
- ◆ NB The above reference should be consulted as it contains considerably more detail on special situations than can be given here.

## Emergency Survival Packs and Passive Scrubbers

*This refers to units used in diving bells and in hyperbaric evacuation systems*

### When new, when first installed or when moved

*Note: All of the "when in service" requirements must also be complied with before the equipment can be put in to service.*

Examination/Test	Category of Competent Person
In accordance with manufacturer's specification and fit for the purpose it will be used for	3 or 4

### When in service

Examination/Test	Validity Period	Category of Competent Person
Visual examination for water ingress and integrity of packaging or container. Check condition of passive scrubber charge	6 months	1, 2 3 or 4
Diving bell survival packs should be unpacked, checked and repacked or returned to the suppliers for overhaul	12 months	2, 3 or 4
Hyperbaric evacuation system survival packs should be unpacked, checked and repacked or returned to the suppliers for overhaul	3 years	2, 3 or 4

#### References:

- ◆ IMCA D 017 "Lost bell survival"