



European Diving Technology Committee

Diving Industry
Personnel
Competence
Standards

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Document Preparation

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The preparation work and administration was carried out by Crawford Logan, the UK Industry representative on EDTC.

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1 Introduction

1.1 EDTC

The European Diving Technology Committee was formed in 1973 with the aim of promoting good standards for diving and co-ordinating, where possible, differing standards. Membership of the EDTC, at the time of publication of this guidance note is drawn from the countries and organisations listed below:

Austria	Ireland	Sweden
Belgium	Italy	Switzerland
Denmark	The Netherlands	Turkey
Finland	Norway	The United Kingdom
France	Portugal	
Germany	Spain	

The International Diving Schools Association (IDSA)

The International Marine Contractors Association (IMCA)

The International Association of Oil and Gas Producers (OGP)

1.2 Purpose

The intent of this document is to draw together all of the accumulated knowledge of the various member countries of EDTC in the area of competence requirements for the various grades of diving personnel.

The document provides a “high level” minimum set of competences that are required for a person to function safely and efficiently at the appropriate grade in the commercial diving industry. It covers most grades of personnel who work in the diving industry, both inshore and offshore, although there will be specialised situations (police, military, rescue etc) where other competences may be more relevant.

The document describes the required levels based on a progression in levels of education, training and ultimately, competence – for example from SCUBA diver right through to saturation/bell diver. Similar progression routes exist for most other grades of personnel within this document.

The document is intended to be the reference point for competence of diving personnel. It is intended that individual countries or organisation will use the relevant sections of this document in order to develop their own detailed standards.

2 Scope

2.1 Legal Status

This document has no legal status in any country. It is prepared as a guidance standard to promote commonality of requirements for the competence of various grades of diving industry personnel throughout Europe. This should assist with free movement of labour, assessment of suitability of one countries nationals by the authorities in another country etc.

2.2 Training and Competence

This document is largely based on the achievement of various competences by the person involved. The difference between training and competence needs to be understood.

Training is where a person is given formal instruction in a subject. This is normally defined as having to be a minimum of so many hours, or the task has to be repeated so many times. Such instructions take no account of the ability of the individual to learn something, meaning that a specific period of training may be far too short for one person to become fully competent while another person may be competent at something after a very short time.

Competence assessment however simply requires that the individual demonstrates that they know what is required of them and can carry out the necessary tasks properly. This may be tested by written or verbal examination or by carrying out a required task one or more times.

While competence will normally be gained as a result of formal training and education, it may also be gained by experience or by informal training.

2.3 Age of Personnel

Within this document, EDTC has set minimum ages for certain grades of personnel. Within any country that has minimum or maximum ages set by regulation then these will obviously take precedence over the EDTC limits.

EDTC considers that a person should not start working in the diving industry at any grade until they are aged at least 18. Some elements of training may be undertaken earlier than that, from the age of 16 onwards, however experience should only be gained from the age of 18.

For any post that can be considered “promoted” or “supervisory” EDTC considers that an element of maturity is required along with extensive experience. For that reason a minimum age of 24 has been chose.

3 Requirements for Training/Assessment Establishments

3.1 General

It is anticipated that any establishment used for formal training of diving industry personnel will be suitable for that purpose. Similarly any location or establishment used for assessment of competence should provide all the required facilities.

The guidance given below is general and will need to be interpreted on a case by case basis. Clearly what is required for the theoretical training or assessment of a diving supervisor will be very different from what is required to train/assess the practical attributes of a commercial diver.

3.2 Facilities

Classrooms and lecture areas should meet the following:

- ◆ Indoors, enclosed and weatherproof
- ◆ Enough space for the number of persons inside
- ◆ Means of heating/cooling to maintain a comfortable temperature
- ◆ Adequate lighting for reading
- ◆ Proximity to toilet and washing facilities
- ◆ Situated away from external noise sources or soundproofed
- ◆ Supplied with a separate chair for each person with suitable facilities for writing and spreading out of books or notes
- ◆ Supplied with necessary teaching aids

Practical areas used for training/assessment should meet the following:

For diver training/assessment

- ◆ Access to open water (not a tank, pond, small lake or other enclosed area)
- ◆ with a suitable depth of water for the type of diving intended.
- ◆ Access to an area (may be a tank, pond, small lake or sheltered water) suitable for training/ assessment of specific skills such as safe use of tools.
- ◆ Complete range of equipment as required for the type of diving
- ◆ Equipment in good condition and well maintained

For non-diver training/assessment

- ◆ Complete range of equipment as required for the type of diving
- ◆ Equipment in good condition and well maintained
- ◆ Workshops (if required) to meet requirements for classrooms as relevant

3.3 Instructor/Assessor Qualifications and Experience

It is not possible to set down specific requirements for instructors/assessors. Some individuals do not make good instructors while others are very good instructors but may not hold high qualifications. The list of requirements below should be used as a guide, but individuals can be considered separately.

- ◆ Normally an instructor/assessor should be qualified to a higher level than that which they are instructing/assessing. At the higher grades however, this may not be

possible, in which case the instructor/assessor should normally be qualified to the level at which they are assessing.

- ◆ They should have several years experience working at the level (or higher) that they are training/assessing. This experience should preferably be recent or else the person should have been working at training/assessing for the preceding several years
- ◆ They should either have formal training in instruction/assessment techniques or should have several years practical experience at such work
- ◆ They should have good communication and interpersonal skills

3.4 Safety Standards

As part of the training/assessment is for the individual to become used to and demonstrate their ability to comply with the safety standards and practices of the diving industry, all instruction/assessment, whether practical or theoretical, should be carried out to the normal safety standards of the country in which the instruction/assessment is taking place.

The instruction/assessment for particular grades of diving should also reflect the safety standards which that grade of diving would be subject to in real life. For example, offshore divers should be trained/assessed using normal offshore safety standards.

3.5 Documentation and Record Keeping

Any establishment which carries out training/assessment in line with this document would normally be expected to operate its management, control and documentation systems in line with a recognised standard such as ISO 9000. This should allow for ease of audit by an independent body, if required.

All assessments should be documented in sufficient detail that it can be demonstrated exactly who assessed each particular item, where and when this was done, how the assessment was carried out and the result. Such records should be retained for at least two full years from the date that the last item in the overall assessment was completed. Some countries may have specific requirements to retain such records for a longer period and if that is the case then the longer period should be complied with.

3.6 Auditing

Any organisation carrying out training/assessment to the competences laid out in this document would normally be expected to be carrying out its operations in line with a recognised quality standard such as ISO 9000.

Such a standard will normally require periodic audits of the operations, often by a third party not connected to the organisation being audited.

Internal audits by the organisation themselves are of course useful quality checks and demonstrate clear intent to comply with recognised standards but they do not replace the objectivity supplied by a third party audit.

4 Detailed Competence Standards

4.1 General

It will be realised that the minute detail of exactly what tasks should be instructed/assessed, how this should be done, the number of times it need be done etc. cannot be included in this document, if for no other reason than the extent of such information. It is also not for EDTC to suggest the detail of the competence assessment as that is a matter for individual national authorities, training establishments etc.

This document gives the “high level” competences required for each occupation without attempting to specify in detail the way in which these competences should be achieved.

Competences described as “Understand...” will normally be assessed by the individual being assessed having to provide either a written or verbal description of the topic and possibly answering questions.

Competences described as “Carry out, Prepare, Work as..., etc” will normally be assessed by the individual actually doing the task or activity, either alone or as part of a team, and being observed on how well they did the task. Visual or video observation by the assessor/instructor will often be supplemented by verbal questioning of the individual.

4.2 Commercial SCUBA Diver

Entry Requirements:

The entry requirements for a COMMERCIAL SCUBA DIVER are:

- ◆ At least 18 years old (this may be 21 in some countries) for actually working although some elements of training may be able to start after age 16
- ◆ Medically fit to work as a commercial diver
- ◆ Sufficient elementary education to be able to carry out the necessary calculations, communicate and understand written instructions etc.

Competences:

The competences required of a COMMERCIAL SCUBA DIVER are the ability (all in relation to a SCUBA diving operation) to :

4.2.1 Academic/Administrative Procedures

- ◇ Understand the statutory requirements of the country in which they are working
- ◇ Understand the rules, requirements and procedures of a typical employer
- ◇ Understand the need to monitor the health and safety of themselves and other members of the diving team
- ◇ Understand diving physics, physiology and medicine as it may effect them

4.2.2 Routine Diving Operations

- ◇ Work as a member of a diving team including developing suitable relationships with others in the team
- ◇ Understand and be able to assist in preparing a work plan for the dive
- ◇ Dive in open water, in a variety of conditions to a depth of at least 25 metres. The conditions which the diver should be able to cope with include:
 - Variations in visibility
 - Different surface entry conditions
 - The effect of currents and tides
 - Different seabed conditions
- ◇ Understand and be able to use decompression procedures
- ◇ Act as a surface attendant during a dive
- ◇ Use communication systems effectively, both as a diver and a surface attendant
- ◇ Be familiar with the safe use of a range of tools appropriate to the kind of tasks to be undertaken as a diver

4.2.3 Emergency Procedures

- ◇ Act as a surface standby diver
- ◇ Act as an in water standby diver (when divers are near enough to communicate and act as standby diver for each other)
- ◇ Carry out a self rescue as a diver in an emergency situation
- ◇ Act as a member of the surface team in an emergency

4.2.4 Equipment

- ◇ Prepare all the equipment which is needed

- ◇ Carry out the pre dive checks properly on all equipment
- ◇ Operate high pressure compressors properly, including checks, simple maintenance and testing for air purity
- ◇ Correctly charge up breathing air cylinders ready for use
- ◇ Assist another diver to dress correctly and put on all equipment ready to enter the water
- ◇ Dress themselves and don all equipment needed to enter the water as a diver
- ◇ Correctly remove all equipment and undress on completion of a dive
- ◇ Assist another diver to remove equipment and undress after a dive
- ◇ Carry out all necessary post dive equipment checks
- ◇ Correctly clean equipment after use, carry out simple maintenance and store ready for subsequent use

4.2.5 First Aid

- ◇ Understand how to provide first aid in a diving situation
- ◇ Demonstrate the ability to provide basic emergency procedures such as CPR (see definition)
- ◇ Assess the status of a diving casualty and establish their needs for assistance and treatment
- ◇ Assist in the treatment, under supervision, of diving related illness and conditions

4.2.6 Chamber Operations

- ◇ Understand the procedures for operating a two compartment compression chamber under supervision
- ◇ Understand the pre-dive procedures necessary for using a two compartment compression chamber
- ◇ Act as an inside attendant in a compression chamber
- ◇ Understand the conduct of a therapeutic recompression
- ◇ Understand the post dive checks and user maintenance needed after using a two compartment compression chamber

Note: The above competences are based on diving using compressed air as the breathing mixture. Divers intending to use different breathing mixtures or complex equipment such as rebreathers will require to demonstrate the additional competences necessary for these activities.

4.3 Surface Supplied Diver (Inshore)

Entry Requirements:

The entry requirements for a SURFACE SUPPLIED DIVER (INSHORE) are:

- ◆ At least 18 years old (this may be 21 in some countries)
- ◆ Medically fit to work as a commercial diver
- ◆ Sufficient elementary education to be able to carry out the necessary calculations, communicate and understand written instructions etc.
- ◆ Passed competence assessment for commercial scuba diver (Note: One European country does not require within their legislation that a diver be competent as a scuba diver in order to be a surface supplied diver)

Competences:

Note: In most European countries, surface supplied diving is carried out using lightweight helmets/masks while the diver wears a neoprene or rubber protective suit. The competences below are based on this type of operation.

In some countries however, “Standard Dress” is still used comprising a canvas/rubber suit which is fixed to a heavy (normally metallic) helmet. Such equipment requires different operational techniques and any diver using, or intending to use, this type of equipment will need to demonstrate the necessary competences specifically relevant to using that equipment

The competences required of a SURFACE SUPPLIED DIVER (INSHORE) are the ability (all in relation to a surface supplied diving operation) to :

4.3.1 Academic/Administrative Procedures

- ◇ Understand the statutory requirements of the country in which they are working
- ◇ Understand the rules, requirements and procedures of a typical employer
- ◇ Understand the need to monitor the health and safety of themselves and other members of the diving team
- ◇ Understand diving physics, physiology and medicine as it may effect them

4.3.2 Routine Diving Operations

- ◇ Work as a member of a diving team including developing suitable relationships with others in the team
- ◇ Operate under supervision a surface supplied dive panel with divers in the water
- ◇ Understand and be able to assist in preparing a work plan for the dive
- ◇ Dive in open water, in a variety of conditions to a maximum depth of 50 metres. The conditions which the diver should be able to cope with include:
 - Variations in visibility
 - Different surface entry conditions
 - The effect of currents and tides
 - Different seabed conditions
- ◇ Understand and be able to use decompression procedures
- ◇ Act as a surface attendant during a dive
- ◇ Use communication systems effectively, both as a diver and a surface attendant
- ◇ Be familiar with the safe use of a range of tools appropriate to the kind of tasks to be undertaken as a diver

4.3.3 Emergency Procedures

- ◇ Act as a surface standby diver
- ◇ Act as an in water standby diver (when divers are near enough to communicate and act as standby diver for each other)
- ◇ Carry out a self rescue as a diver in an emergency situation
- ◇ Act as a member of the surface team in an emergency

4.3.4 Equipment

- ◇ Prepare all the equipment that is needed
- ◇ Carry out the pre dive checks properly on all equipment
- ◇ Operate high and low pressure compressors properly, including checks, simple maintenance and testing for air purity
- ◇ Correctly charge up breathing air cylinders ready for use
- ◇ Carry out pre dive operational/function checks on a surface supplied dive panel
- ◇ Assist a diver to dress correctly and put on all equipment ready to enter the water
- ◇ Dress themselves and don all equipment needed to enter the water as a diver
- ◇ Correctly remove all equipment and undress on completion of a dive
- ◇ Assist another diver to remove equipment and undress after a dive
- ◇ Carry out all necessary post dive equipment checks
- ◇ Correctly clean equipment after use, carry out simple maintenance and store ready for subsequent use

4.3.5 First Aid

- ◇ Understand how to provide first aid in a diving situation
- ◇ Demonstrate the ability to provide basic emergency procedures such as CPR (see definition)
- ◇ Assess the status of a diving casualty and establish their needs for assistance and treatment
- ◇ Assist in the treatment, under supervision, of diving related illness and conditions

4.3.6 Chamber Operations

- ◇ Undertake a compression chamber dive to at least 40 metres but less than 50 metres
- ◇ Under supervision, operate a two compartment compression chamber
- ◇ Assist in the pre-dive procedures necessary for using a two compartment compression chamber
- ◇ Act as an inside attendant in a two compartment compression chamber
- ◇ Assist with the conduct of a therapeutic recompression
- ◇ Assist in the post dive checks and user maintenance needed after using a two compartment compression chamber

Note: Within some European countries, particularly those with very deep/cold water inshore, it may be necessary for a surface supplied diver (inshore) to be assessed for competences normally associated with a surface supplied diver (offshore) such as the use of hot water suits and diving from a wet bell.

4.4 Surface Supplied Diver (Offshore)

Entry Requirements:

The entry requirements for a SURFACE SUPPLIED DIVER (OFFSHORE) are:

- ◆ At least 18 years old (this may be 21 in some countries)
- ◆ Medically fit to work as a commercial diver
- ◆ Sufficient elementary education to be able to carry out the necessary calculations, communicate and understand written instructions etc.
- ◆ Passed competence assessment for surface supplied diver (inshore)

Competences:

The competences required of a SURFACE SUPPLIED DIVER (OFFSHORE) are those required for a surface supplied diver (inshore) plus the following. An already qualified surface supplied diver (inshore) need only obtain and demonstrate these additional competences in order to become a surface supplied diver (offshore)

4.4.1 Dynamic Positioning

- ◇ Understand the hazards of diving from a dynamically positioned vessel

4.4.2 Wet Bell Operations

- ◇ Undertake Wet Bell diving operations and in particular:
 - Check and prepare equipment for a wet bell diving operation
 - Dive in open water to 20m using a wet bell
 - As a diver diving from a wet bell, act in an emergency to recover dive partner
 - Act as surface standby diver during wet bell diving operations
 - Operate wet bell diver supply panel
 - Operate wet bell deployment and recovery systems
 - Carry out post dive equipment checks on wet bell system
 - Decontaminate and clean all relevant equipment on wet bell system

4.4.3 Hot Water Systems

- ◇ Undertake surface supplied diving operations using hot water suits and in particular:
 - Check and prepare diver's hot water suit equipment
 - Dress correctly in a hot water suit ready for entering the water
 - Assist another diver to dress correctly in a hot water suit ready for diving
 - Operate surface hot water supply system both as a diver and as a member of the dive team on the surface
 - Dive in open water to 20m dressed in a hot water suit
 - Undress correctly on completion of a diving operation wearing a hot water suit
 - Assist another diver to undress correctly on completion of a diving operation wearing a hot water suit
 - Carry out post dive checks on the hot water equipment
 - Decontaminate and clean relevant hot water equipment
 - Ensure proper care and storage of hot water equipment

4.5 Closed Bell/Saturation Diver (Offshore)

Entry Requirements:

The entry requirements for a CLOSED BELL/SATURATION DIVER are:

- ◆ At least 18 years old (this may be 21 in some countries)
- ◆ Medically fit to work as a commercial diver
- ◆ Sufficient elementary education to be able to carry out the necessary calculations, communicate and understand written instructions etc.
- ◆ Have been qualified as a surface supplied diver (offshore) for at least 1 year and have logged at least the following diving work:
 - At least 50 hours of bottom time (ie from leaving surface to start of ascent)
 - 10 hours of that bottom time at depths greater than 20 metres
 - 6 hours of that 10 hours at depths greater than 30 metres

Competences:

The competences required of a CLOSED BELL/SATURATION DIVER are the ability (in relation to a closed bell diving operation) to:

4.5.1 Academic/Administrative Procedures

- ◇ Understand the statutory requirements of the country in which operations are to take place
- ◇ Understand the laws of physics as they apply to diving using mixed gases
- ◇ Understand the need to monitor the health and safety of themselves and other members of the dive team
- ◇ Understand the rules, requirements and procedures of a typical employer

4.5.2 Routine Diving Operations

- ◇ Work as a member of the diving team including developing suitable relationships with others in the team
- ◇ Undertake a closed bell dive as a diver
- ◇ Act as a bell man during a bell dive
- ◇ Support a closed bell diving operation as part of the surface team
- ◇ Establish and maintain effective communications, both as a diver and as a member of the surface team
- ◇ Carry out at least one bell lock out at each depth of 100, 75 and 50 metres of sea water

4.5.3 Emergency Procedures

- ◇ Act in a self - rescue emergency situation
- ◇ As a Bellman, act in an emergency situation
- ◇ Act as a rescue diver
- ◇ Act from inside chamber in an emergency situation
- ◇ As a member of the support team, assist in a chamber complex emergency

4.5.4 Equipment

- ◇ Prepare a chamber complex for use

- ◇ Check and prepare the diver's equipment
- ◇ Carry out pre dive checks on the Bell (internal and external)
- ◇ Carry out post dive checks on chamber and closed bell
- ◇ Maintain a closed bell and chamber complex in accordance with checklist

4.5.5 Chamber Operations

- ◇ Follow routine chamber procedures
- ◇ Monitor internal chamber operations
- ◇ Monitor closed bell and chamber gas quality and gas system quality
- ◇ Operate the built in breathing system (BIBS)
- ◇ Live in saturation conditions for at least 36 hours (including decompression) commencing at a depth of at least 50 metres of sea water

4.5.6 First Aid

- ◇ Understand human physiology as it applies to mixed gas diving and saturation
- ◇ Assess and establish the needs of a diving casualty
- ◇ Demonstrate the ability to provide first aid in a bell diving situation
- ◇ Assist in treatment, under supervision, of diving related health conditions

4.6 Assistant Life Support Technician (Offshore)

Note: This title does not equate in any way with the use of “Life Support” in a medical context. It refers in the diving industry to personnel who monitor and control the environmental parameters inside the pressure chambers inhabited by divers. This job can also be described as an assistant chamber operator.

Entry Requirements:

As this is the basic entry grade, there are no specific entry requirements other than the required standard of medical fitness and a minimum age of 18.

Prior to appointment as an assistant LST an individual must successfully complete a basic training course covering the competences listed below.

Note: A bell diver has already obtained the necessary level of competence for an assistant LST as a result of their training/competence assessment. A bell diver can thus be appointed as an assistant LST without further assessment.

Competences:

The competences required of an ASSISTANT LIFE SUPPORT TECHNICIAN are:

4.6.1 Academic/Administrative Procedures

- ◇ Understand the following:
 - The main points of current legislation in the country concerned, relevant to diving
 - The main duties of employer and employee
 - The specific duties and responsibilities of all members of the diving team
 - The requirements of and procedures for testing, examining and certifying equipment
 - The requirements of diving operation logs
 - All relevant codes, guidance notes, safety notes or memoranda published by the relevant national governing bodies.

4.6.2 Principles of Saturation and the Equipment

- ◇ Understand the following aspects of typical saturation diving plant and equipment:
 - the construction and purpose of valves, fittings, gauges, regulators, hoses and pipework
 - how to carry out normal operations, maintenance and basic repairs on gas and fluid systems
 - the difference between various thread forms and the reasons for their use
 - the principles of chamber life support systems with priority on pre-operational checklists, monitoring during use, routine maintenance and basic repairs
 - the possible emergencies which could occur on life support systems and what actions should be taken
 - the operation, function testing and selection of gas supplies for BIBS and dump systems, including routine maintenance and repairs
 - pre and post dive checks of a chamber complex using checklists
 - the safe operation and design of hyperbaric sanitary systems, in particular safety interlock systems
 - the operation and design of medical locks, including various types of interlocks and safety devices
 - the correct procedures to be used and dangers involved with TUP

- the principles of operation of various items of equipment used in a typical diving system, such as compressors, gas reclaim systems and transfer pumps
- the use of various types of fire suppression systems including regular maintenance and checks
- the various substances and materials which are prohibited inside a chamber, such as medical preparations, combustible materials, etc.

4.6.3 Medical/First Aid

- ◇ Understand human physiology related to diving. In particular this will include:
 - The respiratory, circulatory, basic skeletal and nervous systems of the body
 - The problems of maintaining divers in thermal balance and the symptoms and treatment of hypo- and hyperthermia
 - The effects of gases on the body and their limits under pressure (in particular oxygen and carbon dioxide)
 - The effects of pressure on the body and the principles of decompression and therapeutic procedures
 - The causes and symptoms of decompression sickness, barotrauma and HPNS
 - The need for hygiene during saturation, the problems of bacterial growth in a chamber and methods of control, detection and treatment
 - The contents, requirements and maintenance of various types of diving medical kits.

4.6.4 Gas Systems

- ◇ Understand the following aspects in relation to gas systems:
 - The physical properties of liquids and gases and specifically the relationship as appropriate between depth, volume, pressure, temperature, partial pressure and solubility of gases
 - The need for purity of gases and the effects of impurities
 - Typical gas schematics including symbols, logic and functions.
 - Carrying out chamber operational procedures by calculation.
 - The principles of gas mixing and changes of mixture for heliox and nitrox
 - The basic properties of gases and potential problems encountered in their use
 - The principles and use of various types of gas analysers
 - Methods of identifying gas impurities likely to be found in hyperbaric atmospheres
 - The importance of oxygen cleanliness and the methods used to achieve it
 - Chamber emergency problems
 - The reasons for gas stratification and methods used to prevent it

4.6.5 Routine Operations

- ◇ Understand and be able to explain typical pressurisation and decompression procedures covering various options
- ◇ Understand and be able to explain typical tables for saturation, bounce and air diving
- ◇ Understand the need for, and be able to help to prepare, procedures for chamber operations and life support systems
- ◇ Demonstrate the ability, under supervision, to:
 - Maintain a legible and accurate record of all aspects of a saturation dive
 - Maintain a gas status board showing gas reserves and mixtures
 - Analyse stored gases and chamber atmosphere with various types of equipment

- Calibrate gas analysers
- Transfer diving gases around a system and put diving gases on line to chambers and control panels including the BIBS systems
- Monitor the chamber for depth, temperature and humidity using various types of equipment
- Calibrate that equipment
- Operate helium speech unscramblers, telephone emergency signals and other communications systems
- Compress and decompress a diving system using different schedules
- Operate a system of chamber management and housekeeping including routine schedules (such as meals, sanitation systems, medical locks, etc.)

4.7 Life Support Technician (Offshore)

Note: This title does not equate in any way with the use of “Life Support” in a medical context. It refers in the diving industry to personnel who monitor and control the environmental parameters inside the pressure chambers inhabited by divers. This job can also be described as a chamber operator.

Entry Requirements:

The entry requirements of an LST are:

- ◆ Qualified as an assistant LST
- ◆ Considered suitable by their employer
- ◆ Pass a written examination of theoretical knowledge
- ◆ Have logged at least 2400 panel hours as an assistant LST (If not a bell diver)

OR

- ◆ Have logged at least 360 panel hours as an assistant LST plus 5 years total diving experience, of which at least 3 must be as a bell diver.

Competences:

The competences required of a LIFE SUPPORT TECHNICIAN are the same as those for an assistant LST, but obviously all knowledge and understanding should be in more detail than that required of an assistant.

4.8 Life Support Supervisor (Offshore)

Note: This title does not equate in any way with the use of “Life Support” in a medical context. It refers in the diving industry to personnel who monitor and control the environmental parameters inside the pressure chambers inhabited by divers. This job can also be described as a chamber operations supervisor.

Entry Requirements:

The entry requirements of a LIFE SUPPORT SUPERVISOR are:

- ◆ Be a Minimum of 24 years old
- ◆ Qualified as a Life Support Technician
- ◆ Considered suitable by their employer
- ◆ Have logged at least 2400 panel hours as a Life Support Technician (unless qualified as a bell diving supervisor)
- ◆ Have a minimum of 4 years in the diving industry
- ◆ Have received formal training in leadership

Competences:

The competences required of a LIFE SUPPORT SUPERVISOR are those for a Life Support Technician plus:

- ◆ Ability to assume responsibility
- ◆ Have a suitable temperament to cope with emergencies

4.9 Air Diving Supervisor (Inshore)

Entry Requirements:

The entry requirements of an INSHORE AIR DIVING SUPERVISOR are:

- ◆ Be a Minimum of 24 years old
- ◆ Held a suitable surface supplied diving qualification for at least two years
- ◆ Have carried out a minimum of 200 surface supplied commercial dives
- ◆ Be considered suitable by their employer

Competences:

Note: In most European countries, surface supplied diving is carried out using lightweight helmets/masks while the diver wears a neoprene or rubber protective suit. The competences below are based on this type of operation.

In some countries however, "Standard Dress" is still used comprising a canvas/rubber suit which is fixed to a heavy (normally metallic) helmet. Such equipment requires different operational techniques and any supervisor intending to supervise this type of equipment will need to demonstrate the necessary competences specifically relevant to using that equipment.

He should also have carried out at least 100 surface supplied commercial dives as a diver using Standard Dress equipment

The competences required of an INSHORE AIR DIVING SUPERVISOR are the ability to:

4.9.1 Academic Knowledge

- ◇ Understand physics related to air diving. In particular this will include:
 - Basic calculations for the conversion of common units used in diving (examples are feet/metres, psi/bar/Pa, Kg/pound etc).
 - Basic physical units used in diving
 - Boyle's Law (calculating air volumes and diver's air consumption)
 - Dalton's Law (partial pressure of gases at various depths)
 - Charles' Law (the relationship between pressure changes and temperature changes)
 - Archimedes' Principle (calculating the buoyancy and lifting requirements of various objects)
 - Henry's Law (the effect of partial pressures on the solubility of gases in liquids and the corresponding effects on decompression)
 - The principles of heat transfer by conduction, convection and radiation.

4.9.2 Medical/First Aid

- ◇ Understand human physiology related to air diving. In particular this will include:
 - The respiratory, circulatory, basic skeletal and nervous systems of the body
 - The problems of maintaining divers in thermal balance and the symptoms and treatments of hypo- and hyperthermia
 - The effects of gases on the body and their limits under pressure (in particular, oxygen, carbon dioxide, carbon monoxide and nitrogen)
 - The effects of pressure on the body and the principles of decompression and therapeutic procedures
 - The causes and symptoms of decompression sickness and barotrauma
 - The contents, requirements and maintenance of various types of diving medical kits.

4.9.3 Leadership and Control

- ◇ Demonstrate an understanding of the requirement for a supervisor to exercise leadership and control. In particular this will include:
 - The ability to compile and supervise the use of pre- and post-dive check lists for all equipment under their control
 - The reporting of accidents occurring in the water or on the surface
 - Leadership and communication, including the role of a leader, communication and possible conflicts
 - Planning and organising work, including assigning work tasks and team building
 - Leadership in emergency and stress situations, including symptom recognition, preventative measures, courses of action and transfer of experience
 - Keeping accurate records of all operations under their control

4.9.4 Health and Safety

- ◇ Demonstrate familiarity with health and safety requirements. In particular this will include:
 - Familiarity with all relevant published codes of practice, guidance notes, safety notices, etc. affecting air diving operations
 - Familiarity with the statutory requirements of the country in which they are working
 - Safety on the surface, including the use of tools
 - Safety in the water, paying particular reference to currents and sea states etc.
 - Working methods of, and safe procedures for, commonly used tools and equipment
 - The responsibilities of all members of the diving team

4.9.5 Equipment and Procedures

- ◇ Demonstrate familiarity with the equipment used in air diving and the various operational requirements for such work. In particular this will include:
 - Construction of valves and fittings used in air diving equipment
 - Control panels and systems
 - Air and gas requirements, handling, purity, oxygen cleanliness and analysis
 - Surface supplied diving procedures and emergencies
 - Scuba limitations
 - Decompression and therapeutic procedures

Note: The above competences are based on diving used compressed air as the breathing mixture. If the diver is to use different breathing mixtures or complex equipment such as rebreathers then the supervisor will require to demonstrate the additional competences necessary for these activities.

4.10 Air Diving Supervisor (Offshore)

Entry Requirements:

The entry requirements for an OFFSHORE AIR DIVING SUPERVISOR are:

- ◆ Be a Minimum of 24 years old
- ◆ Hold a suitable offshore surface supplied diving qualification
- ◆ Have at least three years experience as an offshore air diver
- ◆ Have carried out a minimum of 200 offshore commercial air dives
- ◆ Have satisfactorily completed a suitable diving supervisor training scheme
- ◆ Have logged at least 200 hours offshore over at least 60 working days as a trainee supervisor
- ◆ Be considered suitable by their employer

Competences:

The competences required of an OFFSHORE AIR DIVING SUPERVISOR are the same as those for an Inshore Air Diving Supervisor plus the ability to:

- ◆ Demonstrate familiarity with the equipment used offshore in air diving and the various operational requirements for such work. In particular this will include:
- ◆ Control of chambers
 - ◇ Use and maintenance of BIBS systems
 - ◇ Operation and design of medical locks
 - ◇ Use of interlock systems
 - ◇ Wet bell procedures and emergencies
 - ◇ Chamber procedures and emergencies
 - ◇ Hot Water suit procedures and emergencies
 - ◇ Surface decompression procedures and emergencies
 - ◇ General safety requirements of dive support vessels used in air diving operation
 - ◇ Air diving from dynamically positioned vessels

4.11 Bell Diving Supervisor (Offshore)

Entry Requirements:

The entry requirements of a BELL DIVING SUPERVISOR are:

- ◆ Be a Minimum of 24 years old
- ◆ Hold a suitable offshore bell/saturation diving qualification
- ◆ Have at least three years experience as a bell diver
- ◆ Have carried out a minimum of 400 hours locked out of a bell
- ◆ Have satisfactorily completed a suitable bell diving supervisor training scheme
- ◆ Have acted as a trainee air diving supervisor on at least 10 offshore commercial air dives (unless already qualified as an offshore air diving supervisor)
- ◆ Have logged at least 350 hours offshore over at least 90 working days as a trainee bell diving supervisor (If already qualified as an offshore air diving supervisor this requirement is reduced to at least 150 hours offshore over at least 45 working days as a trainee bell diving supervisor)
- ◆ Have logged at least 360 panel hours working as an LST or assistant LST
- ◆ Be considered suitable by their employer

Competences:

The competences required of a BELL DIVING SUPERVISOR are the following:

- ◆ All of the competences required of an offshore air diving supervisor
- ◆ All of the competences required of an assistant LST and LST

PLUS

4.11.1 Administrative Procedures

- ◇ Be familiar with all relevant published codes, guidance notes, safety notes or memoranda affecting bell diving

4.11.2 Routine Operations

- ◇ The ability to efficiently run all types of diving operations
- ◇ The ability to supervise and have a sound working knowledge of:
 - bell launching systems
 - use of guidewires and weights
 - cross hauling
 - constant tension devices
 - umbilicals
- ◇ The ability to supervise the operation and control of:
 - diving bells
 - compression chambers
 - ancillary equipment
 - the bell mating trunking
 - medical locks

4.11.3 Gas Systems

- ◇ Be familiar with the composition, uses and mixing of breathing gas mixtures and the need for their constant monitoring
- ◇ Be familiar with the principles and function of inspired gas and diver heating systems

4.11.4 Emergency Procedures

- ◇ The ability to remain in charge at all times, including emergencies.
- ◇ Be conversant with all methods of diver evacuation and be able to relate them to a particular work site, both in respect of divers in a diving bell and dives under pressure in a decompression chamber.

4.12 Diving Superintendent

Entry Requirements:

The entry requirements of a DIVING SUPERINTENDENT/OFFSHORE MANAGER are very difficult to quantify precisely as there are several ways in which such a person may develop their career to the point at which they are considered for promotion to such a position.

The most likely routes to this position are:

- ◆ Be a very experienced diving supervisor, qualified as such for the type of diving involved
- ◆ Be considered suitable by their employer

There may be other acceptable routes to this position and each case will need to be judged on its own merits.

Competences:

The competences required of a DIVING SUPERINTENDENT/OFFSHORE MANAGER are the following:

4.12.1 Academic/Knowledge Requirements

- ◇ Be very knowledgeable about all relevant regulations, codes, guidance notes and safety notices or memoranda affecting the diving operations
- ◇ Be very knowledgeable about the diving techniques and equipment to be used
- ◇ The ability to understand in detail the technical aspects of the work to be carried out

4.12.2 Leadership and Control

- ◇ The ability to exert leadership over the personnel under their control
- ◇ The ability to communicate efficiently with all parties involved
- ◇ Have the necessary management skills to carry out the tasks required of them
- ◇ The ability to remain in charge at all times, including emergencies and unplanned happenings

4.13 Diver Medic

Note: This title is used in the diving industry to describe a person who has undergone a period of extra training in medical emergency techniques related to diving. They are functionally speaking diving emergency medical technicians. This function may be held by any member of the diving team.

Entry Requirements:

The entry requirements for a DIVER MEDIC are only that the person be capable of going under pressure in order to render assistance to an injured diver.

Competences:

The competences required of a DIVER MEDIC are the ability to:

4.13.1 Academic/Knowledge Requirements

Understand and have knowledge of:

- ◇ Relevant aspects of anatomy and physiology sufficient to meet the competence requirements below. Particular areas in which this understanding and knowledge need to be demonstrated are:
 - the musculo-skeletal system
 - nervous system
 - heart
 - blood vessels
 - circulation and blood
 - lungs, ears, sinuses and vestibular organs
- ◇ Relevant effects of changing pressure on the human body. In particular have sufficient understanding of the pathophysiology of decompression illness (DCI), including pulmonary barotrauma (PBT) and arterial gas embolism (AGE)
- ◇ The importance of personal routine hygiene, especially in saturation conditions
- ◇ Medical record keeping (including confidentiality)

4.13.2 Casualty Management

- ◇ Manage casualties in a hyperbaric environment including
 - recovery in to a diving bell
 - provide CPR (see definition) inside a diving bell
 - transfer from diving bell to living chamber
 - lost bell emergency procedures
 - hyperbaric evacuation
- ◇ Transfer medical information using a standard format
- ◇ Use various techniques for handling casualties including
 - minimising the effects of movement upon shock, fractures and other injuries
 - considering the effect of movement on possible vertebral column damage
 - recovery from the water
 - transfer under various conditions
 - transfer by helicopter
- ◇ Understand and have knowledge of signs and symptoms of the following diving illnesses and accidents. Have the ability to provide initial advanced first aid and assist in the management of them:

- squeeze and other barotrauma
- ear problems
- vomiting under water
- near-drowning
- secondary drowning
- CO₂ retention and poisoning
- CO poisoning
- Other gas contaminants
- O₂ toxicity
- anoxia and hypoxia
- N₂ narcosis
- high pressure nervous syndrome
- DCI, PBT and AGE
- thermal stress and performance
- hypothermia and hyperthermia
- maritime animal injuries
- recognition and first aid of dental problems
- underwater blast injury
- infections and insufficient hygiene in saturation
- skin and eye injuries

4.13.3 Practical Skills

- ◇ Use and maintain medical equipment available at the site of a diving operation
- ◇ Be able to carry out relevant diagnostic procedures such as:
 - gather an accurate medical history
 - elicit physical signs like pulse, respiratory rate, high and low thermometer reading, blood pressure.
 - perform a neurological assessment
- ◇ Be able to carry out advanced first aid techniques such as:
 - use appropriate clean and sterile techniques
 - suture open wounds
 - set up intravenous infusions and provide the parenteral administration of drugs
 - airway management (intubation)
 - insertion of pleural drains
 - catheterisation
 - provide cardiopulmonary resuscitation (CPR) (see definition)
- ◇ Administer oxygen, both at atmospheric pressure and while under increased pressure
- ◇ Properly use and understand the hazards of drugs and intravenous fluids in a hyperbaric environment (normally under instruction from a diving medical physician)

Retraining/Re-Assessment:

Since much of the competence of such an individual relies on regular application of the skills, retraining or re-assessment of competence will normally be required at regular intervals. In most European countries this will be at intervals no greater than every three years.

4.14 Hyperbaric First Aider

Note: This title describes a person capable of going under pressure in order to render assistance to an injured diver. They are functionally speaking assistant diving emergency medical technicians. This function may be held by any member of the diving team.

Entry Requirements:

The entry requirements for a HYPERBARIC FIRST AIDER are only that a person be capable of going under pressure in order to render assistance to an injured diver.

Competences:

The competences required of a HYPERBARIC FIRST AIDER are the ability to:

4.14.1 Academic

- ◇ Have sufficient understanding of the pathophysiology of decompression illness (DCI) and barotraumas as well as the assessment of the respective symptoms
- ◇ Understand the importance of personal hygiene

4.14.2 Casualty Management:

- ◇ Carry out various rescue and diver recovery procedures for an injured diver
- ◇ Communicate with a diving medical physician by telephone during an emergency situation
- ◇ Carry out simple neurological testing
- ◇ Carry out basic life support such as CPR (see definition) and airway maintenance
- ◇ Administer oxygen, both at atmospheric pressure and while under increased pressure
- ◇ Demonstrate skills in basic first aid procedures for both traumatic and medical disorders
- ◇ Prepare an injured diver for evacuation by ambulance or helicopter
- ◇ Prepare suitable incident reports to be used for risk analysis and medical care

Retraining/Re-Assessment:

Since much of the competence of such an individual relies on regular application of the skills, retraining or re-assessment of competence will normally be required at regular intervals.

4.15 Diving Equipment Technician

Entry Requirements:

The entry requirements for a DIVING EQUIPMENT TECHNICIAN are difficult to quantify precisely as there are several ways in which such a person may obtain the necessary initial skills to be considered suitable for such a position.

Technicians may have a background in and knowledge of electrical, electronic, mechanical or hydraulic engineering. Some may have knowledge and background in more than one of these areas.

The most likely entry routes are:

- ◆ Be a qualified and experienced tradesman in one of the above disciplines

OR

- ◆ Have gained relevant experience and qualifications in a military environment

OR

- ◆ As a result of extensive experience in previous employment, have a detailed knowledge in their chosen discipline

OR

- ◆ As a result of advanced academic education, have a detailed knowledge in their chosen discipline

In ALL cases the person must be at least 18 years of age and have the necessary standard of fitness to work in the area that diving will take place.

Competences:

The competences required of a DIVING EQUIPMENT TECHNICIAN are the ability to:

- ◆ Work efficiently when faced with breakdown situations
- ◆ Carry out planned maintenance to a designated schedule
- ◆ Accurately document work done
- ◆ Communicate clearly, on a technical level, with others by electronic means
- ◆ Understand the technical aspects of the equipment they are working on
- ◆ Understand all relevant legislation, regulations, codes, guidance notes and safety notices or memoranda affecting the equipment they are working on
- ◆ Understand the purpose of and the use intended for the equipment they are working on

4.16 Air Chamber Operator

Note: This title refers to diving operations where the ambient atmosphere inside the chamber is natural compressed air. It contains some of the competences of the life support technician in offshore diving.

Air Chamber Operators will ALWAYS work under supervision.

Entry requirements:

There are no specific entry requirements other than a minimum age of 18. Since the person is not intended to go under pressure there are no specific health or medical requirements.

Prior to appointment as an inshore chamber operator however an individual must successfully complete a basic training course covering the competences listed below and have logged 35 panel hours as a "chamber operator in training" under supervision.

Note: Offshore assistant LSTs and closed bell/saturation divers have already obtained the necessary level of competence and may be appointed as chamber operators without further assessment.

Competences:

The competences required as an AIR CHAMBER OPERATOR are the ability to understand the following:

- ◆ Main points of current legislation in the country concerned relevant to diving, including codes of practice, guidance notes, safety notes etc.
- ◆ Documentation and record keeping requirements during a diving operation
- ◆ Principles of compression chambers including the construction and purpose of valves, fittings, gauges, regulators, hoses, pipe work, pressure locks etc.
- ◆ Safety measures concerning prevention of fire, oxygen toxicity and decompression illness
- ◆ Operation and checking of air compressors, compressed air reserves,
- ◆ pneumatic circuits and control systems

4.16.1 Routine operations:

- ◇ Perform pre-dive chamber checks
- ◇ Compress and decompress a compression chamber using different schedules
- ◇ Carry out routine maintenance, calibration and repairs related to the operation of the chamber systems, including BIB systems.

4.16.2 Emergency procedures:

- ◇ Carry out, under supervision, the emergency procedures for fire alarm and medical emergency inside the chamber
- ◇ Carry out basic life support such as CPR (see definition) and airway maintenance
- ◇ Prepare appropriate incident reports

5 Documentation

This section identifies the records that need to be maintained and the other documentation that is required in order to meet the requirements of this document.

It is not intended that this document will give detailed instructions, layouts etc. of the documentation involved, rather that it gives an outline upon which a national government or training/assessment organisation can base their detailed documentation.

5.1 Individual Identification

It is obviously important that any records maintained, certificates issued etc clearly refer to a specific individual. This is particularly important when assessing an experienced person where cheating by an impostor is more likely.

Identification will normally be achieved by photographic means. It is suggested that organisations complying with this document should confirm at the start of any training/assessment that the candidate is indeed who they claim to be. This can be established by the provision of suitable official documentation bearing a photograph. Typical examples are passports, identity cards, military passes etc. The organisation would normally take a copy of such a document and lodge it in their files along with a number of photographs of the individual that can be subsequently affixed to certificates, etc.

5.2 Entry Requirements

Prior to any training/assessment taking place, it is clear that the requirements for entry are checked and validated. In order not to waste time, as much of this as possible should be checked well in advance of the individual commencing training/assessment.

A typical routine would be for the individual to be asked to send copies of their qualifications, certificates and log books (as relevant) to the organisation carrying out the training/assessment. These could then be checked to ensure that they met the minimum entry requirements. If there were any doubts about the validity of any of the documents, then this could be checked by telephone etc.

The individual would be instructed to bring the originals of all of these documents with them to the place where the training/assessment was going to take place. Upon arrival the original documents would be checked by a responsible person in the organisation and confirmed to match the copies sent earlier.

The organisation would then place a copy of all of these documents in to the individual's records, duly validated by the responsible person.

5.3 Certificates Issued

Upon the completion of any training/assessment based on the competences in this document, the individual should be issued with a certificate clearly stating what they have been assessed to do, the results of that assessment plus where, when and by whom it was carried out.

Certificates should carry a photograph with the name of the individual and should be designed such that they are not easy to alter.

If desired, a more detailed list of competences assessed with results and comments may accompany the certificate.

5.4 Record Keeping

Any establishment which carries out training/assessment in line with this document would normally be expected to operate its management, control and documentation systems in line with a recognised standard such as ISO 9000. This should allow for ease of audit by an independent body, if required.

It would be anticipated that a detailed record would be kept of all competence assessments. These should document in sufficient detail exactly who assessed each particular item, where and when this was done, how the assessment was carried out and the result.

5.5 Tests and Examinations

In the case of written tests or examinations, the answer paper from the individual, duly corrected and marked, should be placed in to the individual's record file.

5.6 Retention of Records

All records should be retained for at least two full years from the date that the last item in the overall assessment was completed.

Some countries may have specific requirements to retain such records for a longer period and if that is the case then the longer period should be complied with.

6 References

6.1 General

There are many different documents and publications in existence which have a bearing, directly or indirectly, to the competence standards of personnel who work in the commercial diving industry.

An exhaustive list would be difficult to produce however the references given below may assist in expanding this document in to the greater detail required for implementation.

6.2 Specific

The following references are given.

Note: The references below are the specific regulatory requirements of certain countries at the time of publishing of this document. Other countries may well have their own legal requirements which are not listed here. Similarly the references listed below may well have changed or been updated subsequently and thus it is suggested that a check is made with the legal authorities of any specific country if the subject of diving personnel competence to work in that country is being considered.

6.2.1 Denmark

- ◆ Consolidated Act No. 18 of the 7th January 2000 on Diving Equipment etc.
- ◆ Order No. 828 of the 1st September 2000 on the Safe Performance of Diving Operations
- ◆ Order No. 823 of the 5th of November 1999 on Diving Equipment
- ◆ Order No. 685 of the 12th of July 2000 on Offshore Diving Operations and Offshore Diving Equipment
- ◆ Order No. 476 of the 17th of June 1999 on Medical Examination of Divers
- ◆ Order No. 830 of the 1st of September 2000 on Diving Educations.

6.2.2 Sweden:

Statute book of the Swedish Work Environment Authority [NB Prior to 2001 this was The Swedish National Board of Occupational Safety and Health] Ordinance (AFS 993:57) Diving.

6.2.3 United Kingdom:

The Diving at Work Regulations 1997. Statutory Instrument 2776 of 1997, plus the relevant Approved Code of Practice (ACoP) for the type of diving being carried out.

6.2.4 Germany:

- ◆ BGV C23 - Current Legislation for Rules and Regulations for Safe Diving Operations dd. 01.01.2001
- ◆ Regulation governing the examination leading to the accredited qualification of Certificated Diver dd. 25.02.2000
- ◆ Recommendations of the Committee “Tiefbau” for Diving with Mixed Gas dd. 09.2001
- ◆ Safety Regulations for Diving in Contaminated Water dd. 09.2001
- ◆ BVOT – Mining Directive for Deep Drilling dd. 15.12.1981,

- ◆ Ordinance relating to Work in Compressed Air (Compressed air work regulations) dd. 4.10.1974, amended 19.6.1997
- ◆ BGI 690 Leaflet for the treatment of illnesses in Compressed Air (Diving and Compressed Air Work) dd. October 1996

6.2.5 France

- ◆ Decree No. 90-277 of 28 March 1990 relating to the protection of workers operating in a hyperbaric environment;
- ◆ Decree of 28 January 1991 defining the procedures for safety training of personnel taking part in hyperbaric operations (Journal Officiel of 2 March 1991);
- ◆ Decree of 28 March 1991 defining recommendations to medical doctors responsible for the medical supervision of workers operating in a hyperbaric environment;
- ◆ Decree of 20 August 1991 prescribing the conditions under which ,a derogation may be granted as regards the age limit for applying for a certificate of competence in hyperbaric operations (Journal Officiel of 30 August 1991);
- ◆ Decree of 15 May 1992 defining procedures to be used in a hyperbaric environment, as regards access, work duration, evacuation and organization of work;
- ◆ Order of 22 December 1995 relating to the safety training methods of some marine equipment companies operating in a hyperbaric environment.

6.2.6 Norway

Relevant Norwegian petroleum legislation for offshore work.

6.2.7 The Netherlands

Arbeidsomstandighedenwetgeving (the section covering diving) –in force from 1 January 2003.

6.2.8 Not Country-Specific:

- ◆ The various diving personnel training standards published by The International Diving Schools Association
- ◆ The various guidance documents published
 - The International Marine Contractors Association (IMCA)
 - The Diving Medical Advisory Committee (DMAC)
 - The Association of Offshore Diving Contractors (AODC) – note: this organisation became part of IMCA in 1995

7 Definitions

The following definitions clarify what is meant by various words, abbreviations or phrases used in this document, where these are sometimes used differently by various groups. Most terms used in this document do not require any definition to a knowledgeable reader.

Ambient Pressure	The external pressure to which the diver is subjected underwater or in a compression chamber.
Anoxia	A condition caused by a complete absence of oxygen.
Assessment	The process by which a check is made on an individual by a knowledgeable person to establish if that individual possesses the necessary competence.
Attendant	A person on the surface who monitors the length of umbilical or lifeline paid out to the diver in the water and as far as possible, the diver's actions during the dive. Also called a Tender.
Bail Out System	A reserve supply of breathing mixture carried by a diver.
Bell	A submersible compression chamber. See diving bell.
Bell Diving	A diving operation in which the divers are deployed from an enclosed diving bell.
Bell Handling Equipment	Equipment used for the launch and recovery of a diving bell and its mating to the deck compression chamber.
Bell Man	Common name for the diver who remains inside a diving bell to act as standby diver.
Bounce Diving	A form of bell diving in which the dive is terminated before the dissolved gases in the diver's tissue reach saturation and he is decompressed to atmospheric pressure.
Breathing Gas	General term for oxygen, air, oxygen-enriched air, nitrox or a mixed gas (see below) used in a diving operation for breathing by divers.
Competence	The ability to carry out a task safely and efficiently as well as being knowledgeable about the task.
Compression	A process by which a diver is subjected to progressively increasing pressure as he descends in the water or is pressurised inside a chamber
CPR	Stands for cardiopulmonary resuscitation. In the context of this document means the actions of a first aider in carrying out external cardiac massage coupled with assisting a casualty to breathe. It is a conventional term for what is known in medical terminology as "basic life support". It does not include what is known in medical terminology as "advanced life support".
Deck Compression Chamber	An appropriately equipped chamber on the surface in which routine decompression or therapeutic

	recompression can be carried out. Also known as a surface compression chamber.
Decompression	The process by which a diver is returned to atmospheric pressure so as to facilitate the safe discharge of dissolved gases in his tissues.
Decompression Illness	Potentially harmful effects due to excess gas in the bloodstream and tissues of the body.
Decompression Schedules	The procedures by which decompression is carried out. Commonly referred to as “Tables”
Diver	A person who has been trained and is competent to dive commercially using underwater breathing apparatus.
Diver Medic	This is terminology used in the diving industry to describe a person who has undergone training in advanced first aid.
Diving	A person is considered to be diving when they enter water or any other liquid and in order to survive in such an environment they breathe air or other gas at a pressure greater than atmospheric pressure.
Diving Bell	A submersible pressure vessel in which divers can be transported safely from the surface to the worksite under water and returned to the surface under pressure. The diving bell shall provide necessary life support to the divers using it.
Diving Contractor	The person, company or organisation responsible for the diving operation, whether or not actually the employer of the divers. (Note that in some European countries the diving contractor is legally defined – often as the employer of the divers)
Diving Depth	In surface diving this is the maximum depth to which the diver is exposed. In bell diving it can be this but may also be the most extreme actual depth (upwards or downwards) at which the diver works during his lock out from the diving bell.
Diving Manual	A comprehensive set of instructions and information issued by the diving contractor to enable all persons engaged in the diving operations under their control to carry them out safely and efficiently.
Diving Rules	Written rules, issued by the diving contractor, for regulating the conduct of all persons engaged in diving operations under their control.
Diving Supervisor	A trained person, appointed by the Diving Contractor to act as the leader of the diving team and be in control of the diving operation.
Diving System	The common name used to cover all pieces of equipment necessary to support a diving operation.
EDTC	The European Diving Technology Committee

Emergency	Any incident which may affect the health or safety of any person taking part in the diving operation.
Excursion Diving	The method of conveying divers in saturation to a work site which is deeper or shallower than the pressure (depth) to which they are saturated, performing work and returning them to the pressure (depth) of their original saturation.
Heliox	A breathing mixture of oxygen and helium.
Hyperbaric Evacuation System	Equipment that allows divers under pressure to be evacuated from the diving system in an emergency while remaining under pressure.
Hypoxia	A condition in which there is a lower oxygen content in the body than is needed to sustain complete consciousness.
Inshore	Can also be referred to as inland/inshore or onshore. This normally refers to activities taking place within a countries national boundaries and up to 12 miles off the coast. (In some countries this may be defined as at the high water line)
Life Support Supervisor	A person trained, and appointed by the Diving Contractor, to supervise life support functions for a diver or divers in a compression chamber. Note: this title does not equate in any way with the use of “Life Support” in a medical context.
Life Support System	The equipment installed in a diving system in order to keep the occupants alive. It includes breathing systems, temperature and humidity controls, waste disposal and toxic fume removal plus food and water supplies. Note: This should not be confused with the medical use of the term “Life Support”.
Life Support Technician	A person trained and competent to carry out life support functions for a diver or divers in a compression chamber. Note: this title does not equate in any way with the use of “Life Support” in a medical context.
Mixed Gas	A manufactured mixture of oxygen and one or more inert gases used as a breathing mix for diving. (A predetermined mixture of oxygen and nitrogen is not a mixed gas in the context of this definition) Diving using mixed gas should only be carried out from an enclosed diving bell.
Nitrox	A breathing mixture of oxygen and Nitrogen.
Offshore	This may be defined in national regulations. It normally refers to activities taking place on a countries continental shelf, outwith the 12 mile limit, and often associated with the oil and gas industry.
Onshore	Can also be referred to as inland or inshore. This normally refers to activities taking place within a

countries national boundaries and up to 12 miles off the coast. (In some countries this may be defined as at the high water line)

Recompression	The process by which a diver is given treatment in a compression chamber at increased pressure if he is thought to be suffering from a diving related illness. Can also be used to describe the process where a diver is subjected to increased pressure inside a compression chamber as part of some decompression procedures.
Saturation	A condition in which a diver is subjected to an ambient pressure, greater than atmospheric pressure, such that their body tissues and blood become equilibrated with the inert element of the breathing mixture.
SCUBA	Self contained underwater breathing apparatus (this term is reserved for open circuit demand apparatus. Other self contained apparatus such as mixed gas closed circuit should not be included in this category)
Stand By Diver	A diver who is appropriately positioned and dressed to render immediate assistance to a diver, in an underwater emergency.
Standard Dress	Diving equipment in which the diver wears a rigid helmet attached to a closed diving suit. The breathing mixture is normally supplied by a hose from the surface.
Stops	The planned periods during ascent, when the diver “stops” at specific depths or pressures during the decompression schedule, to allow the safe elimination of excess inert gases absorbed by the body.
Storage Depth	The depth equivalent pressure at which divers are kept in a deck compression chamber during a saturation dive.
Submersible Compression Chamber	Another name for a diving bell
Supervisor	See Diving Supervisor
Surface Compression Chamber	An appropriately equipped chamber on the surface in which routine decompression or therapeutic recompression can be carried out.
Surface Decompression	A decompression procedure in which a surface orientated diver returns to the surface and is recompressed in a surface compression chamber prior to final decompression.
Surface Orientated Diving	A diving operation, other than bell diving, where the diver enters the water at the surface, descends to his working depth and returns to the surface while fully exposed to variations in water pressure. The primary supply of breathing gas for the diver is supplied from the surface to the diver via an umbilical (surface supplied), or the diver carried all his own gas (SCUBA).

Surface Supplied Diving	A diving operation where the primary supply of breathing gas for the diver is supplied from the surface via an umbilical.
Tender	Popular name for an attendant.
Therapeutic Schedules	The procedure by which a diver who is suffering from decompression illness is treated. It involves recompression to a pressure to relieve the symptoms, followed by decompression using a special schedule.
Training	This refers to the process of formal instruction
Transfer Under Pressure	A technique by which a diver can be transferred from one compression chamber to another compression chamber in such a way that there is no change in pressure on the diver.
Trimix	A breathing mixture of three gases, one of which is oxygen. Commonly used to describe a suitable mixture of oxygen, helium and nitrogen.
Umbilical	A connecting link between the surface and a diver, between the surface and a diving bell, or between a diving bell and a diver, which can contain life support, surveillance, communications, power supply cables and a strength member.
Wet Bell	A device to transport two or more divers to/from the working depth. It cannot contain pressure and is fitted with an enclosed top in to which air can be used to provide a dry space in which a diver can put his head. It has a main supply umbilical from the surface and each diver has his own excursion umbilical that terminates in the wet bell.