

Health and Safety Authority

CODE OF PRACTICE FOR OFFSHORE DIVING

(Safety, Health and Welfare at Work (Diving) Regulations 2018)

22nd October 2018

Acknowledgments

This Code of Practice is based on the Health and Safety Executive (United Kingdom) Approved Code of Practice and Guidance for Commercial Diving Projects Offshore. The Authority would like to thank the Health and Safety Executive (UK) and the Irish Maritime Administration within the Department of Transport, Tourism and Sport for their assistance in the development of this Code of Practice.

PUBLIC CONSULTATION

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FOREWORD

The Health and Safety Authority with the consent of Pat Breen, Minister of State at the Department of Business, Enterprise and Innovation, publishes this Code of Practice entitled “Code of Practice for Offshore Diving” in accordance with Section 60 of the Safety, Health and Welfare at Work Act 2005.

The Code of Practice provides practical guidance as to the observance of the provisions of the Safety, Health and Welfare at Work (Diving) Regulations 2018 (S.I. No.254 of 2018).

This Code of Practice comes into operation on 1 May 2019.

Notice of the publication of this Code of Practice was published in the Iris Oifigiuil of 2018.

As regard the use of Codes of Practice in criminal proceedings, Section 61 of the 2005 Act provides as follows:

“61.—(1) Where in proceedings for an offence under this Act relating to an alleged contravention of any requirement or prohibition imposed by or under a relevant statutory provision being a provision for which a code of practice had been published or approved by the Authority under section 60 at the time of the alleged contravention, subsection (2) shall have effect with respect to that code of practice in relation to those proceedings.

(2) (a) Where a code of practice referred to in subsection (1) appears to the court to give practical guidance as to the observance of the requirement or prohibition alleged to have been contravened, the code of practice shall be admissible in evidence.

(b) Where it is proved that any act or omission of the defendant alleged to constitute the contravention—

- (i) is a failure to observe a code of practice referred to in subsection (1), or
- (ii) is a compliance with that code of practice,

then such failure or compliance is admissible in evidence.

(3) A document bearing the seal of the Authority and purporting to be a code of practice or part of a code of practice published or approved of by the Authority under this section shall be admissible as evidence in any proceedings under this Act.”

Dr. Marie Dalton
Secretary to the Board
Health and Safety Authority

1. Introduction

1.1 Background

1.1.1 Offshore diving can be a pressurised and dangerous work environment and can present a unique combination of occupational health and safety issues. Serious incidents can occur unless appropriate planning has been carried out and safety measures are in place.

1.1.2 This Code of Practice specifically relates to all offshore diving projects as described in paragraph 2.3 of this Code of Practice.

1.2 Status and Scope of the Code of Practice

1.2.1 This Code of Practice is published by the Health and Safety Authority under Section 60 of the Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005) - the "2005 Act" - and with the consent of Pat Breen, Minister of State at the Department of Business, Enterprise and Innovation.

1.2.2 The aim of this Code of Practice is to provide practical guidance on the safe management of diving at work. The Code of Practice provides assistance on the observance of the requirements of the Safety, Health and Welfare at Work (Diving) Regulations 2018 (referred to in this Code of Practice as the "Diving Regulations"). It is targeted at clients, diving contractors, diving supervisor, divers and other people who may be involved in offshore diving projects as described in paragraph 2.3.

1.2.3 Diving at work is covered by a wide range of legislation. In addition, to the Safety, Health and Welfare at Work (Diving) Regulations 2018 and the 2005 Act, other health and safety legislation such as the:

- Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2016 (S.I. No. 299 of 2007 as amended);
- Safety, Health and Welfare (Construction) Regulations 2013 (S.I. No. 291 of 2013);
- Safety, Health and Welfare (Offshore Installations) Act 1987 (No. 18 of 1987) and associated Regulations, may also apply.

1.2.4 It should not be assumed that compliance with the Diving Regulations means that all aspects of the law are complied with. The Diving Regulations need to be read in the general context of the Safety, Health and Welfare at Work Act 2005 and associated Regulations and any other relevant statutory provisions. It is essential to place the safe management of diving projects in the context of the overall safe management of work as detailed in the Safety Statement, required under Section 20 of the 2005 Act.

1.2.5 In addition, the requirements of the Merchant Shipping Acts and associated regulations apply to all vessels being utilised in connection with diving at work. Compliance with this Code of Practice in no way removes the obligation to comply with the applicable Merchant Shipping legislation.

1.3 References to Legislation and Standards

1.3.1 As legislation is always under regular review, where reference is made in this Code of Practice to legislation other than the Diving Regulations, the status of this legislation should be checked on the Attorney General's website at www.irishstatutebook.ie.

1.3.2 A list of national, European and international standards relevant to diving is available in the diving section of the Health and Safety Authority's website at www.hsa.ie. As standards are also under regular review, the status of such standards can also be checked at www.nsai.ie.

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2. Definitions

2.1 The definitions given here are for the Diving Regulations and this Code of Practice only and selected terms are explained in their context. Other terms used in this Code of Practice are defined in Appendix 1. The Safety, Health and Welfare at Work (Diving) Regulations 2018 are made under the Safety, Health and Welfare at Work Act 2005. Definitions in the Safety, Health and Welfare at Work Act 2005 are not in general redefined in the Diving Regulations.

2.2 “Diver” means a person who dives in the course of their work.

2.3 “At work” means that there is a contract of employment and divers are working in the context of an employer-employee relationship. It can mean working as an employee or as a self-employed person. The phrase covers divers who dive as part of their duties as an employee. It also covers divers who are in business for themselves, during the time that they devote themselves to work as a self-employed diver. Diving does not have to be the main work activity of the employee or the self-employed person.

2.4 Offshore diving projects means all diving projects –

(a) at sea outside the State’s territorial seas adjacent to the State (generally 12 nautical miles from the low water line) which is subject to the Safety Health and Welfare at Work Act 2005. This will for example, include all diving operations in the State’s designated area of the continental shelf undertaken in connection with offshore installations, wells and pipeline works;

(b) at sea off, or in connection with, offshore installations, pipelines and cable works within the State’s territorial seas;

(c) in connection with alternative energy resources such as structures generating power from wind, waves, tide or currents;

(d) where closed bell or saturation diving techniques are used;

(e) from vessels maintaining station by use of dynamic positioning;

(f) involving diving operations at depths greater than 50 metres.

2.5 “Competent person” means, taking account of Section 2(2) of the 2005 Act, that a person, having regard to the task (diving and/or working while diving) he or she is required to perform and taking account of the size or hazards (or both of them) of the undertaking in which he or she embarks, the person possesses sufficient training, qualifications, experience and knowledge appropriate to the nature of the work and as appropriate, diving method to be undertaken.

2.6 “Person” is as defined in the Interpretation Act 2005.

- 2.7 “Diving operation” is the portion of a diving project identified in the diving project plan which can be safely supervised by one diving supervisor. An operation can be made up of either a number of dives or even a single dive. It will normally be clear what this portion of work is, but factors such as the task, the site conditions and the diving techniques to be used, all contribute to making the decision. For example, a 28 day diving project might be made up of 40 diving operations. Members of a dive team are engaged in a diving operation from the time they start preparing plant, equipment or personnel for diving until any associated decompression is completed.
- 2.8 “Diving project” is the term used for the overall diving job - regardless of its duration. Depending on the size of the diving project, it can be made up of one or more diving operations. A diving project can apply to both a continuous period of elevated pressure, as in saturation diving, and to a number of diving operations, possibly taking place over several days, where the divers are not under continuous elevated pressure. The diving project does not necessarily finish once the last diver has returned to atmospheric pressure. Most decompression procedures require the diver to remain in close vicinity of a compression chamber for a specified time in case there is need for treatment of symptoms of decompression illness. The diving project is only completed once that time period has expired.
- 2.9 “Compression chamber” means as appropriate, recompression chambers, decompressions chambers, hyperbaric chambers and hyperbaric oxygen therapy chambers, all of which are terms that reflect the different purposes for which chambers are designed.
- 2.10 “Inland” means the internal or inland waters of the State.
- 2.11 “Inshore” means within the territorial seas of the State generally twelve nautical miles from the low water mark).
- 2.12 “Offshore Installation”, “Pipeline” and “Pipeline Works” are as defined in the Safety, Health and Welfare (Offshore Installations) Act 1987.
- 2.13 “Submersible compression chamber” means a manned compression chamber which is used underwater to support divers. It is technically a pressure vessel for human occupancy which is used to transport divers under pressure either to or from the underwater worksite. It may also be known as a closed bell, closed diving bell or diving bell.
- 2.14 “Closed bell diving” is the term used for diving using a submersible compression chamber.

3. Application

3.1 The Diving Regulations apply to any diving project in which a person who dives is at work. This includes all places of work and work activities where diving projects are carried out and to which the Safety, Health and Welfare at Work Act 2005 applies.

3.2 Diving does not have to be the main work activity of the employee or the self-employed person. The Diving Regulations apply to any diving project when at least one person is at work.

3.3 The Diving Regulations and this Code of Practice apply to diving projects in support of:

- (a) Gas, oil or offshore installations and floating structures;
- (b) Pipeline and cable works whether inshore or offshore;
- (c) Alternative energy resources such as structures generating power from wind, waves, tide or currents.

3.4 The Diving Regulations and this Code of Practice apply to all diving projects whether inshore, inland or offshore, that involve diving operations:

- (a) Deeper than 50 metres;
- (b) From vessels maintaining station by use of dynamic positioning;
- (c) Using closed bell or saturation diving techniques.

3.5 For diving operations not covered by paragraphs 3.3 and 3.4, the Code of Practice for Inland Diving and Inshore Diving will apply.

3.6 The Diving Regulations and this Code of Practice do not apply to:

- (a) Environments such as scientific clean rooms subject to an internal pressure of less than 100 millibars above local ambient atmospheric pressure;
- (b) Maintenance or testing work on an aircraft which may necessitate working in the body of the plane while pressurised;
- (c) Work carried out in any compressed air where the primary purpose is either to keep ground water out or to make a structure stable. For example, working in raised pressure environments out of water such as in caissons which is covered by the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013);
- (d) The use of emergency breathing systems in helicopter underwater escape and escape training (HUET); and

- (e) Submersible craft including the use of atmospheric diving suits.

3.7 The use of hyperbaric chambers within diving projects is covered by the Diving Regulations. However, those receiving hyperbaric treatment at a hospital or other place are outside the scope of the Regulations. This is to avoid duplication of responsibilities when another Authority is involved in the medical treatment of a diver.

3.8 Where hyperbaric treatment is to be given in a compression chamber provided by a person other than the diving contractor for that diving project, the arrangements for this should be covered in the diving project plan. The Diving Regulations do not apply to the hyperbaric treatment provided by that other person.

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4. Duties of Persons

4.1 The main duties under the Diving Regulations are placed on the diving contractor but other people, for example clients, divers, people in control of the dive site, diving vessel operators, other people's employees, may also have general duties under Regulation 5 of the Diving Regulations to ensure a safe diving project.

4.2 The actions and activities of people, other than the dive team, may affect the safety of the dive team, and therefore they may have responsibilities for ensuring that the Diving Regulations and this Code of Practice are complied with for those matters under their control. Such people include:

- (a) the client who has placed a contract with a diving contractor to deliver a diving project. The client is the person who commissions the diving project and will usually be the operator or owner of a proposed or existing installation, pipeline or cable where diving work is going to take place, or a contractor acting on behalf of the owner or operator. If the owner or operator appoints an on-site representative, he or she should be satisfied that that person is competent for the task;
- (b) the main contractor/project supervisor for the construction stage (PSCS) of a construction project carrying out work for the client and overseeing the work of the diving contractor;
- (c) a consultant acting for the client, operator, owner or contractor;
- (d) a master of a vessel or floating structure from which diving is to take place, who controls the vessel or floating structure and who has overall responsibility for the safety of the vessel or floating structure and all personnel on it;
- (e) the manager of an offshore installation from or near which a diving project is carried out;
- (f) a superintendent, or other similar person, provided by the diving contractor who may or may not be a member of the dive team, but nevertheless has a responsibility to ensure that the diving project is conducted safely because he or she is in overall control of the project. Such a person must be competent for the task (see paragraph 2.4); and
- (g) any other person whose acts or omissions may affect the safety of the diving project.

4.3 The people listed above should consider carefully the actions required of them to comply with the Diving Regulations. They should, where relevant/appropriate:

- (a) take reasonable steps to ensure that any diving contractor selected is capable of complying with the Diving Regulations;
- (b) make available to the diving contractor the results of any risk assessments undertaken by other persons, under other relevant legislation, that could affect the health and safety of the dive team;
- (c) agree to provide facilities and extend all reasonable support to the diving supervisor or diving contractor, in the event of an emergency. The diving project plan should reflect this;
- (d) consider whether any known underwater or above water items of plant under their control may cause a hazard to the dive team. Such items may include ships propellers, water intakes or discharge points causing suction or turbulence, gas flare mechanisms that may activate without warning or plant likely to start automatically. The diving contractor should be informed of the location and nature of such hazards. This information should be provided in sufficient time so that it can be taken into account by the diving contractor when preparing the risk assessment before producing the diving project plan. The diving contractor should also be provided in good time, with details of any changes to this information occurring before or during the course of the diving project;
- (e) ensure that suitable facilities and time are available to the diving contractor to allow for a familiarisation programme;
- (f) consider whether other work activities in the vicinity may affect the safety of the diving project; for example, they may need to arrange for the suspension of loading or unloading of vessels, seismic operations, scaffolding work or similar activities;
- (g) ensure that they have a formal control system in place to cover diving activities, for example, a permit-to-work and/or permit-to-dive system;
- (h) provide the diving contractor with details of any possible substance likely to be encountered by the dive team that would be a hazard to their health, for example drill cuttings on the seabed, presence of impressed current anti-corrosion systems or naturally occurring radioactive materials. This information should be provided in writing and in sufficient time to allow the diving contractor to carry out the relevant risk assessment and if necessary, to take appropriate action;
- (i) keep the diving supervisor informed of any changes that may affect the supervisor's diving operation, for example, vessel movement, so that diving can be suspended if the diving site is, or may be, endangered; and

- (j) co-operate with other people involved in or connected with the diving project in order to protect persons at work from accident or injury.

4.4 When diving from a dynamically positioned (DP) vessel, the responsible person on the DP control panel should inform the diving supervisor of any possible change in position-keeping ability as soon as it is known.

4.5 Other groups of people, for example harbour masters, may have authority over the dive under legislation other than the Diving Regulations.

4.6 The duties under Regulation 5 of the Diving Regulations extends to clients, diving contractors, diving supervisors, divers and people involved in the diving project whether directly or indirectly, for example, crane operators and maintenance personnel. They should ensure that their tasks and how they undertake them do not affect the safety of the dive team.

4.7 The Master and crew of any vessel used in diving work must ensure that the operation of the vessel complies with relevant Maritime legislation. The vessel must be suitable for the numbers of person and equipment carried and not be overloaded.

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5. Duties of Clients

5.1 The client is the person who commissions the diving project. The client has a general duty to take reasonable measures to ensure compliance with the Diving Regulations and this Code of Practice under Regulation 5 and also has specific duties under Regulation 6 of the Diving Regulations.

5.2 The client should clearly define the scope of the project including any health and safety specifications for the work. The client must appoint, in writing, one competent diving contractor for every diving project. The diving contractor has overall responsibility and control of the diving project.

5.3 The client must receive written confirmation from the diving contractor that they accept the appointment. No diving work must go ahead without a diving contractor being appointed.

5.4 Although likely to be a rare event under this Code of Practice, a client may appoint themselves to be the diving contractor for the diving project if they are competent to do so. In such a case, the requirement for written appointment and confirmation is not required but the self-appointment must be recorded, for example, in the diving project plan.

5.5 The client must be satisfied that the diving contractor they plan to appoint and who they actually appoint is competent. The client should make reasonable enquiries about competence especially with regard to adequate training, knowledge, experience and resources for the work to be performed. However, the client would not be expected to evaluate and monitor diving skills.

5.6 The extent of these enquiries will depend on the scale, complexity, hazards and any particular risks of the diving project. Such enquiries may include, but are not limited to, enquiring and seeking proof about the following:

- Membership of professional or industry bodies or trade associations, for example the International Marine Contractors Association (IMCA);
- Knowledge of diving and the work task particularly in relation to the nature of the project;
- Safety and health knowledge, qualifications and training e.g. knowledge of the Diving Regulations, formal health and safety training;
- Evidence of a good safety record and regulatory compliance e.g. enquiring about accidents or incidents, notices issued by the Health and Safety Authority or other regulatory bodies, any prosecutions;
- Sufficient staff with qualifications, training and experience in the method of diving and work task being carried out;

- The resources they intend to use on the project, including equipment;
- Evidence of a functioning safety management system e.g. an up to date Safety Statement; and
- References from previous clients.

5.7 The client must co-operate with the diving contractor. They must also provide the diving contractor with information about any known hazards which could affect the safety of the diving project of which they are aware of or could be aware of if they made reasonable enquiries.

5.8 Any plant or equipment provided by the client for the purposes of the diving project must be readily available for use, safe to use, of sound construction and suitable material, in good working order, well maintained and fit for purpose.

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6. Duties of Diving Contractor

6.1 The diving contractor has the main responsibility and duties under the Diving Regulations for ensuring that a safe diving project is carried out.

6.2 The Diving Regulations require that one diving contractor is appointed for each diving project. The diving contractor will normally be the employer of the divers engaged in the diving project or a person who manages the diving project for a fixed or other sum and supplies equipment, labour or both, whether the diving contractor's own labour or another person's.

6.3 The diving contractor's general responsibilities are to ensure that:

- (a) the diving project is properly and safely planned, managed and conducted;
- (b) a diving project plan is prepared which includes emergency plans and procedures (see Section 7 "Diving Project Plan and Risk Assessment", Section 11 "Emergency and First Aid Arrangements" and Appendix 2). The diving project plan should be authorised and dated by a responsible person acting on behalf of the diving contractor;
- (c) risk assessments have been carried out as required under Section 19 of the Safety, Health and Welfare at Work Act 2005 and under the Diving Regulations (see Section 7 "Diving Project Plan and Risk Assessment");
- (d) the place from which the diving is to be carried out is suitable and safe;
- (e) the diving supervisor and dive team are fully briefed on the diving operation that they will be involved in and aware of the contents of the overall diving project plan;
- (f) there are sufficient personnel in the dive team to enable the diving project to be carried out safely (see Section 10 "Dive Teams and Associated Working Practices");
- (g) the personnel are competent and qualified (see Section 10 Dive Teams & Associated Working Practices, Section 13 "Diving Supervisors" and Section 14 "Divers");
- (h) diving supervisors are appointed in writing and the extent of their control documented (see Section 13 "Diving Supervisors");
- (i) where appropriate, a suitable mobilisation and familiarisation programme is completed by all the members of the dive team. Other personnel involved in the dive project, for example ship's crew, may also need to complete the programme (see paragraphs 10.28 - 10.30);

- (j) adequate arrangements exist for first aid and medical treatment (see Section 11 “Emergency and First Aid Arrangements”);
- (k) suitable and sufficient breathing gas, plant and equipment is provided and as appropriate is correctly maintained, inspected, examined and tested (see Section 8 “Diving Methods” and Section 12 “Plant and Equipment”);
- (l) the divers are medically fit to dive (see Section 15 “Fitness to Dive”);
- (m) diving operation records are kept containing the required details of the diving project (see paragraph 6.10 and Appendix 3);
- (n) suitable and sufficient Personal Flotation Devices (PFDs) or lifejackets are available and worn on board the dive vessel/floating installation when required;
- (o) a clear reporting and responsibility structure is laid down in writing; and
- (p) all other relevant legislation is complied with.

6.4 The Diving Regulations require that the name of the diving contractor is identified in the diving project plan. The name should also be clearly identified on all diving project records, and also be notified in writing to the other personnel with responsibility for any location from or in the vicinity of which diving projects are carried out. Account must be taken of Section 21 of the 2005 Act which requires employers who share a place of work to co-operate.

6.5 The diving contractor must ensure that a risk assessment is carried out and a diving project plan prepared (see Section 7 “Diving Project Plan and Risk Assessment”). Diving contractors should ensure that they have adequately assessed and provided for any health and safety problems that might arise.

6.6 After studying the risk assessment, the diving contractor must determine how many diving operations the diving project is to be broken down into and must appoint a diving supervisor(s) to supervise each operation (see Section 13 “Diving Supervisors”).

6.7 A diving operation is the proportion of the diving project that can be safely supervised by one diving supervisor at any one time (see paragraph 2.6). Factors to consider in determining whether a diving operation can be safely supervised by one person would include the work task, the site location and conditions, the number of people in the team and the method of diving.

6.8 For each diving project, the diving contractor must evaluate how much of the project can be supervised safely by one person, taking account of both routine operations and emergencies. Enough diving supervisors must be appointed to cover the entire diving project. For example, if a diving project is taking place over such an area or time-scale that it cannot be safely controlled by one diving supervisor; it should be divided into separate

diving operations with further supervisors being appointed for every identified diving operation. Written appointments should clearly define the times and areas of control.

6.9 The diving contractor has responsibility for ensuring that all parts of a diving project are managed in such a way as to ensure the safety of the people involved in it. If there is more than one diving operation being conducted at the same time as part of the diving project, the diving contractor has a responsibility to ensure that there is proper co-ordination.

6.10 The diving contractor must keep the diving operation record for 2 years after the date of the last entry in the record.

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7. Diving Project Plan and Risk Assessment

7.1 Pre-planning is critical to the safety and success of any dive project. All dive projects must be well planned, organised, managed and conducted.

Risk Assessment

7.2 The diving contractor is responsible for planning the diving project and for ensuring that a risk assessment is carried out and a diving project plan prepared. The diving contractor must identify the hazards and assess the risks and put in place control measures to eliminate or reduce the risk to as low a level as possible.

7.3 In conducting the risk assessment, account must be taken of the general principles of prevention (Schedule 3 of the 2005 Act). Diving should be avoided where the level of risk cannot be controlled to an acceptable level. The use of alternative means should be considered for carrying out the work task, for example, use of a Remotely Operated Vehicle (ROV).

7.4 Where diving cannot be avoided, the diving contractor must carry out a detailed risk assessment of the work that is to be carried out, assess the time necessary to carry out certain tasks and prepare a project plan which is copied to the diving supervisor. The diving supervisor should use the risk assessment and make it site and date specific taking account of any changing circumstances. The client will usually be involved in the production of the site specific risk assessment.

7.5 The site specific risk assessment must identify site-specific hazards and their risks. The risk assessment should be based on site specific information e.g. turbine/cable maps and take into account the diving activity and the location. Tidal restrictions and access and egress arrangements to and from vessels may also need to be considered.

7.6 As a matter of safe working practice, the project risk assessment should be reviewed at regular intervals, even if the risk is minimal to ensure that the risk assessment is still adequate and does not need to be revised.

7.7 A risk assessment made under the Diving Regulations will cover, in part, the obligation to make an assessment under the Safety, Health and Welfare at Work Act 2005. There will be no need to repeat those aspects of the assessment, so long as they remain valid, in any other assessment that is carried out. However, all significant risks not covered by the diving project risk assessment (including risks to members of the public arising from the diving project or diving activities) must be covered by the risk assessment carried out under the Safety, Health and Welfare at Work Act 2005, or in any assessment required to be carried out under any other statutory provisions.

7.8 Some examples of common hazards are given in Section 9. However, this is not an exhaustive list of all hazards or all measures needed to control risk and in special circumstances, or if certain contingencies arise, more stringent safeguards may be needed.

Diving Project Plan

7.9 The diving project plan should record the outcome of the planning carried out in preparing the risk assessment. It must include all information and instructions for divers and others taking part in or associated with the diving project which are necessary to protect the health and safety of all those taking part in the diving project.

7.10 The diving project plan must cover the general principles of the diving techniques to be used as well as the needs of the particular operation. It must also provide contingency procedures for any foreseeable emergency for example, lost bell recovery, retrieval of injured and/or unconscious divers from the water etc. (see Section 11 “Emergency and First Aid Arrangements”). In preparing the project plan consideration should be given to the matters detailed in Appendix 2, as appropriate.

7.11 The diving project plan may also include a diving contractor’s standard operating rules and generic risk assessments. The plan may also need to consider the interface with other operations that are ongoing e.g. crane operations, transition piece works or barge operations.

7.12 All documents should show the date upon which they were prepared. Details should be provided on when and how reviews of the plan, the dive site and the specific risk assessments will be conducted.

8. Diving Methods

Diving Methods

8.1 Diving using Self Contained Underwater Breathing Apparatus (SCUBA) has inherent limitations and difficulties, such as limited breathing gas supplies, and is unsuitable for diving activities covered by this Code of Practice.

8.2 Surface-supplied diving can be used for depths up to 50 metres under this Code of Practice (see also paragraph 11.18).

8.3 Closed bell diving methods and techniques should be used when diving deeper than 50 metres. In such cases, a submersible compression chamber with its associated equipment and facilities must be available at the dive site (see also paragraph 9.2.4).

Use of Breathing Gases (Compressed Air or Gas Mixtures)

8.4 Divers breathing a mixture of oxygen and nitrogen under pressure, whether compressed natural air or an artificial mixture, are at risk of both oxygen toxicity and nitrogen narcosis as the depth increases. The maximum depth for breathing gases of compressed air or oxygen and nitrogen is 50 metres of water. The recommended maximum partial pressure for oxygen is 1.4 bar. This does not apply to therapeutic recompression.

Quantity of Breathing Gases

8.5 The quantities of gases required for diving operations, including primary, secondary and therapeutic treatments, should be calculated and procedures for the provision of them stated when planning a diving project. Allowances should be made for instance for leakage, wastage and contingencies.

8.6 The diving supervisor must not allow a diving operation to take place unless there is an adequate quantity of breathing gas for all divers engaged in the diving operation. Diving should be stopped if the quantity of gas acceptable for safety purposes falls below an agreed minimum.

8.7 Divers must have an adequate independent alternative (secondary) source of breathing gas which must be readily available for immediate use in the event of failure of the primary supply (see also paragraph 8.17).

8.8 Where the breathing gas is supplied via an airline/hose and compressor, there must be an adequate reserve supply of breathing gas in the event of the failure of the compressor.

8.9 Where a closed diving bell is being used, a reserve supply of breathing gas must be readily available for immediate use by divers located inside or outside of the bell in the event of an emergency such as failure of surface supplies.

8.10 There must be sufficient breathing gas to enable the standby diver to reach the working diver and to enable both divers to return to a place of safety, carrying out any appropriate decompression procedures during their return.

8.11 Where a closed diving bell is being used, there must be sufficient breathing gas to enable the standby diver to reach the working diver and to enable both divers to return to the bell and then to surface in the bell and to start appropriate decompression procedures at the surface (see also paragraph 11.9).

Quality of Gases

8.12 Procedures for checking and maintaining gas purity standards should be provided.

Contents of Gas Mixes

8.13 Breathing gases should comply with appropriate national, European or International Standards. Breathing gases coming from suppliers should be clearly marked to indicate contents, colour-coded and accompanied by an analysis certificate. The contents should not be accepted as correct until a competent member of the dive team has analysed at least the oxygen content. This analysis should be conducted on delivery and immediately before use of the gas. Records of analysis should be kept.

Levels of Oxygen in Helium and Nitrogen

8.14 Pure helium or nitrogen should not be used in diving operations except as a calibration gas or for a specific operational requirement. A small percentage of oxygen should be present in helium or nitrogen. The industry norm is 2%.

8.15 When an oxygen-helium or oxygen-nitrogen mixture is used as the diver-worn reserve supply it should contain a percentage of oxygen that allows it to be breathable over the largest possible depth range.

Divers' Breathing Gas Supply Systems

8.16 Each diver's breathing gas should be of the correct composition, temperature and flow for all foreseeable situations. This includes independent primary and secondary supplies. Gas supplies should be arranged so that interruption of supplies to one diver will not affect the other divers' supplies.

8.17 Whatever type of breathing apparatus is in use, each diver should carry an independent alternative supply of breathing gas that can be quickly switched to the breathing circuit in an emergency. This should have sufficient capacity to allow the diver to reach a place of safety.

8.18 An on-line oxygen analyser with a suitable alarm, for example an audible Hi-lo alarm, should be fitted to the diver's gas supply line in the dive control area, even if the breathing

medium is compressed air. This will assist in preventing the diver being supplied with the wrong percentage of oxygen. In addition, a carbon dioxide analyser with a suitable alarm should be fitted in all saturation diving projects using gas reclaim plant.

Emergency Breathing Gas Cylinders for Diving Basket

8.19 When a diving basket is used by surface-supplied divers, emergency breathing gas cylinders should be supplied in the basket in a standard layout. This allows divers to access the cylinders rapidly in an emergency.

Oxygen

8.20 Pressurised oxygen can fuel a serious fire or cause an explosion; it must therefore be stored and handled correctly. Any gas mixtures containing more than 25% oxygen by volume should be handled as if it were pure oxygen.

8.21 Any materials used in plant intended to carry oxygen should be cleaned of hydrocarbons to avoid explosions. Formal cleaning procedures for such plant should be provided by the diving contractor, together with written confirmation that such procedures have been followed.

Exposure Limits for Surface-Orientated Diving

8.22 Diving carries an inherent risk of decompression illness (DCI). The incidence of DCI drops if the length of time that a diver spends at any particular depth is limited. Recognised decompression tables should be used such as U.S. Navy or Canadian Diving Tables. As decompression according to recognised tables does not eliminate all risk of DCI, conservative diving practices should be followed.

8.23 When breathing oxy-nitrogen mixtures with oxygen percentages higher than in natural air, the equivalent air depth should be established. It is this equivalent air depth that should be used to establish bottom time limits.

Length of Diver's Umbilical

8.24 The length of the diver's umbilical in relation to the worksite should be included in the diving project plan, particularly where an emergency situation might require rapid location and recovery of a diver.

8.25 Where a diver's movement needs to be limited due to the presence of underwater hazards, an in-water tender or other means of limiting diver movement may be required.

8.26 When a diving bell is being used from a dynamically positioned vessel, fouling and snagging hazards in relation to umbilical length should also be considered.

Diver Monitoring

8.27 Diving supervisors should monitor divers' breathing patterns and receive verbal reports from divers of their condition.

Saturation Diving

Transfer Under Pressure

8.28 The transfer of divers or equipment into or out of the saturation chamber, or between chambers under pressure, increases the risk of catastrophic depressurisation. Internal doors, that is those between the transfer chamber and the trunking to the diving bell and those separating living chambers within the chamber complex, should be kept closed at all times except when divers are passing through them.

Duration of Saturation Exposure

8.29 When planning a dive, consideration should be given to the previous saturation exposures of each diver and the time that they have spent at atmospheric pressure since completing their last saturation dive.

8.30 Because of the effects of long periods under pressure on the diver's health, safety and efficiency, divers should not be in saturation for a continuous period of more than 28 days including decompression.

8.31 Saturation diving should be planned so that each period spent in saturation by the diver is followed by a surface interval of equal duration. Shorter periods at atmospheric pressure may be acceptable, but only in consultation with the diving contractor's hyperbaric medical adviser.

9. Hazards Associated with Diving

9.1 Divers can be exposed to environmental hazards, physiological and psychological hazards associated with the process of diving and hazards associated with the equipment. Additional hazards may also be associated with the actual work being carried out. Outlined below are some common hazards which should be considered during the risk assessment process. It should be noted that this is not an exhaustive list of all hazards that may be encountered. The type of dive, the frequency of diving and the type of work being carried out may all increase the risk associated with diving.

9.2 Environmental Hazards

Restricted Surface Visibility

9.2.1 Restricted surface visibility may affect the safety of the operation, for example when diving in darkness, heavy rain or fog. The diving project plan should identify when an operation should be suspended because of restricted visibility. For example, visibility should be good enough to enable speedy location and recovery of a diver in the water, to locate a positively buoyant diving bell, to ensure surface vessel or supporting surface personnel such as tenders or riggers are safe and to access medical assistance.

Sea State

9.2.2 Rough seas especially when working from a support vessel or floating structure, can affect both the safety of the crew and the divers. Consideration needs to be given to the environmental limits for diving and diver recovery.

Temperature

9.2.3 Excessive heat or cold can affect the diver's thermal balance as well as affecting diving equipment. Appropriate Personal Protective Equipment (PPE) and clothing should be provided for the type and duration of the diving project.

9.2.4 External body heating should be available for dives greater than 50 metres whilst for dives greater than 150 metres, active gas heating should be available (see also paragraph 9.5.12).

9.2.5 Cooling may be required if working in a hot environment.

Underwater Currents

9.2.6 Currents may impose limitations on a diver's operational ability and safety. Tide meters and tide tables may provide information on the current at different depths and can be used to help assess diving conditions. A diver operating from a bell will be able to operate better in currents than a surface-orientated diver as their umbilical is shorter and as it is deployed in the horizontal plane it is not affected by water movement as much.

Water Quality

9.2.7 Divers may be exposed to chemical or biological contaminated water, for instance from industrial effluent being released in the area of the dive or from man-made and natural petroleum products. These may result in obscured vision, infections and possible toxic effects on the diver under pressure. In addition certain pollutants may cause material damage to equipment. The dumping of industrial effluent should not take place when diving operations are being carried out. Appropriate procedures should be in place to protect the diver from poor water quality and prevent pollutants from entering the diving bell. Where appropriate, protective vaccinations should be provided.

Weather

9.2.8 Adverse weather conditions may affect the safety of a diving operation and the diving project plan should identify when an operation should be suspended. For instance, bad weather may make working on deck hazardous for the diving crew whilst wind speed and direction can make station-keeping difficult for support vessels or floating structures. Electrical storms or lightning may be a hazard to personnel and equipment.

9.3 Site Hazards

Access and egress

9.3.1 A means capable of supporting the diver should be provided for entering and exiting the water. There should also be a means to assist an injured diver from the water or into a bell.

Floating Structures

9.3.2 Diving from a floating structure can be hazardous to divers due to rotating propellers and thrusters. An ROV or other alternative method of carrying out the task should be used if the diver's umbilical or the diver cannot be prevented from coming in contact with a thruster or propeller.

Water Flow, Intakes and Discharges

9.3.3 Divers are vulnerable to water flow, suction or turbulence whether natural or caused by water intakes or discharges. Other differential pressure situations such as blanked pipelines or void spaces also pose a significant hazard. Where any intakes or discharges, are known or suspected, suitable measures, including where practical physical or mechanical isolation, should be taken to ensure that these cannot be operated while a diver is in the water. Measures to protect the diver should be part of a safe system of work, for example, a permit-to-work system.

9.3.4 Water movement due to for example, proximity to vessel or floating structure thrusters can affect the diver's ability to remain in position and needs to be considered.

Underwater Obstructions

9.3.5 Lines associated with the diving operations such as equipment lines, DP taut wires etc. need to be considered in relation to the diver's safety.

Vessels

9.3.6 Moored vessels are vulnerable to collision. The vessel must be cognisant of the International Regulations for Preventing Collisions at Sea (COLREGs).

9.4 Work/Task Related Hazards

Abrasive Cutting Discs

9.4.1 The adhesive used in cutting discs tends to degrade under water causing the discs to break during use. Only dry discs not previously exposed to water should be used, and only those discs required for use by a diver at any one time should be taken under water.

Chemicals

9.4.2 Improper handling, use and storage of chemicals used in life support systems can have a detrimental effect on divers. For example, compromised seals on carbon dioxide absorbents can allow moisture to enter shortening the shelf-life. Such chemicals should be closely inspected on delivery and used and stored in accordance with the manufacturer's guidelines. Where exposure to chemicals may occur, the risk assessment must comply with the requirements of the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001 and 2015.

Debris

9.4.3 Debris such as wire debris on the seabed, may make it difficult for divers to operate safely if not collected.

Dive Support Vessels

9.4.4 An appropriate Code Flag A (Alpha) should be deployed when divers are in the water or appropriate marine lighting.

Dynamically Positioned Vessels

9.4.5 Diving from dynamically positioned vessels can be hazardous to divers because of the presence of rotating propellers and thrusters. Practical steps should be taken to prevent a diver or their umbilical coming in contact with a thruster or propeller.

9.4.6 Any vessel operating on dynamic positioning should meet industry technical and operational standards and maritime requirements.

Electricity

9.4.7 Divers often come into contact with plant, including battery powered equipment, operated by or carrying electricity. Battery-operated equipment used inside compression chambers can also be a hazard. Care should be taken to ensure that the divers and other members of the dive team are protected from the risk arising from the use of electricity, in particular from any shock hazard.

9.4.8 Recharging lead-acid batteries generates hydrogen which can present an explosion hazard in confined spaces. Adequate ventilation should be provided.

Explosives/Blasting

9.4.9 All importation of explosives is regulated and licenced by the Department of Justice and Equality and information is available at www.justice.ie. Appropriate safe systems of work must be in place to protect divers if blasting operations are being carried out. Explosives should not be detonated while the diver is in the water.

Falling Objects

9.4.10 Dropped items, loads or equipment such as scaffolding can seriously endanger divers. Appropriate procedures must be in place to ensure that there is appropriate separation between divers and any overhead/over-side work or lifting activities.

Flat-Bottomed Vessels

9.4.11 Precautions to help the diver avoid disorientation when working beneath a flat-bottomed vessel should be considered.

High-Pressure Water Jetting

9.4.12 Even an apparently minor accident with this equipment has the potential to cause a serious internal injury to the diver. Infection can also occur if bacteria are injected into tissues. The equipment should be suitable for the environment, only used for their intended purpose and the operator should be trained. Safe operating procedures must be followed when using such equipment and account taken of any instructions, maintenance procedures and Personal Protective Equipment recommended by the manufacturer.

Hours of work

9.4.13 As part of the risk assessment, the effects of working time, such as fatigue (see paragraphs 9.5.4 – 9.5.7), on the level of risk to which workers may be exposed should be evaluated. Diving contractors should ensure that they have adequately assessed and provided for any health or safety problems that may arise.

9.4.14 Diving personnel should be allowed to develop a regular work and sleep pattern and have a minimum rest period of 12 hours involving no work e.g. no diving or carrying out pre

or post dive checks. Appropriate refreshment breaks should be allowed to reduce diver dehydration and fatigue.

Remotely Operated Vehicle (ROV) Operations

9.4.15 There are a number of safety considerations that should be taken into account when divers are working with, or in the vicinity of, ROVs. These include, for example, entanglement of umbilicals, physical contact and electrical hazards. Possible solutions include restricting umbilicals in length, employing guards and electrical trip mechanisms. All ROV thrusters should be fitted with thruster guards.

Lifting Operations

9.4.16 Diving projects will often require the use of lifting equipment including cranes, lift bags etc. The diving project plan should address the risks associated with lifting operations and specify how they will be planned, supervised and carried out in a safe manner by competent people. As a general rule, divers should not stand or pass under a suspended load. Consideration should be given to potential for the diver's umbilical to become trapped, tangled or squeezed during lifting operations. All workers involved in the lifting operation must be briefed on the plan, for example, crane operators on all shifts etc.

Lift Bags

9.4.17 The use of lift bags underwater can be hazardous, for example the uncontrolled ascent or descent of a load. Manufacturers' instructions, maintenance specifications, testing requirements and periodicity of inspection should be followed.

Medical and Equipment Locks and Diving Bell Trunkings

9.4.18 The inadvertent release of any clamping mechanism holding together two units under internal pressure may cause fatal injury to personnel both inside and outside the units. Suitable safety devices, for example pressure indicators and interlocks, should be provided to ensure that clamps cannot be released under pressure or the system pressurised before such clamps are fully secured.

Oxy-Arc Cutting and Burning Operations

9.4.19 There are dangers in the use of oxy-arc cutting and burning underwater, for example explosions from trapped gases, and the trapping of a diver by items after cutting. Safe operating procedures should be followed.

Piling Operations

9.4.20 If there is any possibility of piling operations in the vicinity of a diving project, guidelines for diver safety should be in place.

Pipelines

9.4.21 Pipeline systems may be under pressure test or have a pressure lower than the pressure at the diver work location. Divers should not be permitted to work on pipeline systems which are under test. Where lines are suspected of being damaged or defective, divers should not approach the lines until safe to do so. A permit-to-work system must be in place when working on any pipelines in order to ensure that any risk is isolated or immobilised.

Radiation

9.4.22 Divers must be protected from health and safety risks caused by any device emitting electromagnetic or ionising radiation.

Seismic Operations and Sonar Transmissions

9.4.23 If there is any possibility of sonar or seismic activity in the vicinity of a diving project, guidelines for diver safety should be in place.

9.5 Medical and Physiological Considerations

9.5.1 Working in remote and often harsh or extreme environments can be physiologically and mentally demanding. Consideration must be given to such issues in relevant risk assessments.

Altitude Changes

9.5.2 Restrictions on travelling and/or flying after diving should be contained in the diving contractor's generic risk assessment. If these factors are relevant to a particular project they should be identified in the diving project plan and be in accordance with the decompression tables being used and/or industry guidance.

Decompression Illness

9.5.3 Divers are at risk of decompression illness (DCI). It is difficult to treat DCI if access to recompression facilities is not immediately available (see paragraph 11.18). The diving contractor should identify the arrangements in place for the treatment of decompression illness. Divers should remain close to suitable recompression facilities after completion of their dive in accordance with the decompression tables being used.

Fatigue

9.5.4 Fatigue is a result of prolonged mental or physical exertion. It can affect people's performance and impair their mental alertness, which could in turn endanger the safety of the dive team.

9.5.5 Factors to be taken into account include:

- (a) working patterns (for example, availability of rest and refreshment breaks);
- (b) the nature and demands of the job;
- (c) the working environment; and
- (d) sleep deprivation.

9.5.6 A review of the risk assessment should be carried out when planning increases to the existing limits on hours of work, or before making any significant changes to working arrangements.

9.5.7 Measures which can control or mitigate undesirable effects on health and safety caused by fatigue include:

- (a) providing adequate staffing levels and relief systems to avoid regular working to excessive hours;
- (b) designing shift systems to minimise the potential for health and safety problems;
- (c) ensuring that all personnel receive adequate rest periods, particularly at busy times;
- (d) allowing regular short breaks during shifts; and
- (e) having contingency plans for unforeseen events.

Infections

9.5.8 With saturation diving, the closed environment, temperature, humidity, helium environment etc. contribute to enhanced microbial growth. Sources of microbial contamination can be introduced into the chamber via equipment, food, materials, the fresh water supply, seawater and even the divers themselves. The diver should be free from infection before entering the chamber. In addition, good personal hygiene, cleaning and disinfection of the chamber and equipment, control of humidity, prompt lock out of used clothes and towelling can reduce the risk of infection.

Noise

9.5.9 Divers may be exposed to noise both above and below water. High noise levels, for example from pile driving, concrete breaking or plant and machinery may cause stress, affect concentration, affect communication and disguise sounds of approaching dangers or warnings, besides affecting hearing. Noise can also arise from the environment (wind and ocean noise) and also as a result of self-generated breathing noise associated with breathing apparatus and helmets. Where applicable, noise levels should be assessed in accordance with the provisions of Chapter 1 of Part 5 of the Safety, Health and Welfare at Work

(General Application) Regulations 2007 to 2016 (commonly known as the Noise Regulations) and the risks managed.

9.5.10 When selecting voice communications systems, diving helmets, tools, plant and equipment, account should be taken of the Noise Regulations, as certain systems or designs may have increased noise levels.

Thermal Stress

9.5.11 Excessive heat and cold can affect the health, safety and efficiency of divers and the dive team. Appropriate Personal Protective Equipment and procedures should be provided to maintain thermal balance. For example, divers may be provided with suitable passive or active heating, such as thermal undergarments and a well-fitting 'dry' diving suit, or hot-water suit. 'Wet' suits have limited application for diving under this Code of Practice.

9.5.12 External body heating must be provided for divers diving at depths exceeding 50 metres. In addition, divers who breathe oxygen and helium mixtures require active heating. Their inspired breathing gas will require active heating for dives greater than 150 metres. Means of respiratory gas heating and external body heating must be provided for diving at depths exceeding 150 metres.

Vibration

9.5.13 Hand-arm vibration (HAV) may be caused by the use of work equipment such as hand held power tools and processes which transmit vibration into employee's hands and arms. Where mechanical vibrations may occur, the level of exposure should be assessed in accordance with the provisions of Chapter 2 of Part 5 of the Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2016 (commonly known as the Vibration Regulations).

10. Dive Teams and Associated Working Practices

Dive Teams

10.1 The diving contractor must specify the size and composition of the dive team based on the details of the diving project, including the diving depth, duration and continuity of the project and the risk assessment. There must be a sufficient number of competent and, where appropriate, qualified personnel to operate all the diving plant and equipment and to provide support functions to the dive team. This may require additional deck support personnel and other management or associated technical support personnel, for example project engineers or vessel maintenance technicians.

10.2 The diving contractor and the diving supervisor must satisfy themselves that each diver is a competent person (see paragraph 2.4) in relation to the specific tasks required during a particular diving operation. Previous experience of a similar task may demonstrate competence. Reliable evidence should be sought to establish the diver's experience.

10.3 On-the-job or other training may be necessary for individuals to gain competence. Such training must be under the direct supervision of a competent person. When an inexperienced diver is gaining experience in a dive team, the other team members and the diving supervisor will need to be aware of this and provide advice and support (see also paragraph 10.27).

10.4 All people in the dive team have a responsibility to co-operate with the diving supervisor and to follow any reasonable directions and instructions that the diving supervisor gives.

Overall Management

10.5 The diving contractor should provide a clear reporting and responsibility structure in the diving project plan which takes into account that certain individuals, for example diving supervisors, have specific responsibilities that cannot be changed.

10.6 On projects where more than one diving supervisor is required, dedicated personnel may be needed to provide safe management control. These personnel may be called senior supervisors or superintendents, and may or may not perform "hands-on" duties as part of the dive team.

Dive Team Size

10.7 The required size of the dive team will depend on the risk assessment which should take into account the number of hours to be worked each day, the type of diving, the diving method, apparatus and the techniques to be used, any decompression requirements, the surface and underwater plant, the safe systems of work being used and the appropriate number required for safety.

Minimum Team Size for Surface-Supplied Diving

10.8 The **minimum** team size normally required to conduct a surface supply dive safely within the scope of this Code of Practice is 5 - a diving supervisor, a working diver, a standby diver (see paragraph 10.15 – 10.17), a tender (see paragraphs 10.13 and 10.14) for the working diver and a tender for the standby diver. Additional personnel may be required to operate or maintain specialised plant or equipment, for example winches, and to assist in an emergency.

Minimum Team Size for Closed Bell Diving

10.9 A closed bell diving project normally requires at a minimum two operations; the first when the divers are in the bell or in the water under the control of a diving supervisor and a second under the control of a life-support supervisor when the divers are in the saturation chambers. The **minimum** team size normally required is 9 - a diving supervisor, a relief diving supervisor, a life-support supervisor, a life support technician, 2 divers inside the bell, a diver on the surface, a tender for the surface diver and an equipment technician.

10.10 During closed bell diving operations two members of the on-shift team should be competent to supervise. One of these persons should be the diving supervisor for the operation and the other should be in, or in the vicinity of, the dive control and able to provide assistance or relief as required. In agreement with the diving supervisor, the relief supervisor may take short (30 minutes) meal/comfort breaks. Any changeover of diving supervisor should be noted in the diving operation record and the relevant people notified, for example the divers and deck crew.

10.11 Divers in saturation should be given at least 12 continuous hours of rest in each 24-hour period. To prevent “ratcheting”, divers should only take part in one bell run routine of no more than 8 hours in any 24-hour period.

10.12 Bell runs should not exceed 8 hours from “lock-off” to “lock-on”. This is taken to be from when the clamp is first taken off until the clamp is reconnected ready for equalisation at the end of the bell run:

- In a two-person bell, each diver should spend no more than 4 hours out of the bell in the water;
- In a three-person bell, two divers may ‘lock-out’ together. The third person will undertake the duties of bellman and should remain dry unless called upon to ‘lock-out’ in an emergency. Each diver may spend up to a total of 6 hours out of the bell in the water so long as an adequate refreshment break is taken within 4 hours of the start of the ‘lock-out’. The intention of the refreshment break is to ensure adequate hydration of a diver and to reduce fatigue.

Tenders

10.13 The diving contractor must be satisfied that the tender is competent. The tender should be familiar with the diving method, procedures and the techniques to be used and the emergency plans and procedures for the project.

10.14 For umbilicals or lifelines that are tended from the surface, at least one tender is required for each diver in the water. For umbilicals tended from a basket or stage, one tender is required for every two divers in the water. In depths of less than 50 metres, a tender may not be required if an effective mechanical handling system for the umbilical is fitted to the bell or basket.

Standby Diver

10.15 A standby diver should be in immediate readiness to provide any necessary assistance to the diver, whenever the diver is in the water. There should be one standby diver for every two divers in the water.

10.16 The standby diver should be dressed to enter the water, but need not be wearing a mask or a helmet. The equipment should, however, be immediately to hand.

Standby Diver for Surface-Supplied Diving

10.17 For surface-supplied diving, the standby diver should remain on the surface.

Standby Diver for Closed Bell Diving

10.18 When using a standby diver from a closed bell, the standby diver should remain inside the bell.

10.19 All closed bell diving operations must have the capability of deploying a surface standby diver in an emergency unless effective alternative means are available to ensure that assistance can be rapidly provided at all depths within the working range of a surface diver.

Life-Support Personnel

10.20 Competent and qualified life-support personnel are needed to look after divers living in saturation. When divers are living in saturation, at least one life-support person should be present at, and at least one other life-support in the vicinity of, the life-support control point at all times.

10.21 A separate life-support supervisor must be appointed in writing by the diving contractor if the life-support control is remote from the diving control. Saturation diving supervisors may act as life-support supervisors provided they are qualified and competent to do so.

Overlapping Functions

10.22 Individuals in a dive team may carry out more than one duty, provided that they are competent to do so and that their different duties do not interfere with each other or affect the safety of the dive team. For example, divers may carry out other associated duties while waiting to dive, such as acting as tenders or standby divers, or operating and attending to plant.

Surface Compression Chambers

10.23 The controls of a compression chamber should only be operated by people competent to do so. Such competence will be achieved by a combination of training and experience. The training of divers and life-support technicians for the offshore sector will have covered the operation of such chambers. The degree of supervision provided should reflect the experience of the operator.

10.24 Diving supervisors may exercise full control over the operation of a surface compression chamber provided that they are able to clearly see and hear what is happening either directly or by video and audio links. If the diving supervisor cannot exert this level of control, responsibility for that part of the diving project must be given to another diving supervisor.

Personnel Not Employed by the Diving Contractor

10.25 Personnel who are not employed by the diving contractor must be carefully considered for competence and suitability before being included in the dive team. Such personnel can create a hazard if they are unfamiliar with the diving contractor's procedures, rules and diving plant and equipment.

10.26 As an example, when a diving system forms an integral part of a vessel and the maintenance technicians are employed by the vessel owner, these personnel, whose principle duties will be associated with the diving project, may form part of the dive team. Such an arrangement should be confirmed in writing, together with the responsibilities of these individuals.

Trainees

10.27 While being trained for a particular role within a dive team, a trainee is not competent for that role. However, they may during that training be considered for another role in the dive team provided that they are competent for that task. For example, a diver may form part of a dive team while training as a diving supervisor. The trainee must be under direct supervision of a competent person. They should not be allowed to take on the functions of the person training them unless the trainer remains in control, is present to oversee their actions and the safety of the diving operation is not affected.

Familiarisation

10.28 When arriving at a dive site before the start of a diving project, all members of the dive team should familiarise themselves with the diving project, plant and equipment and any other relevant details, for example the deck layout of a ship.

10.29 A familiarisation programme should be included in the diving project plan. The personnel carrying out any explanations or training should be identified and their names recorded in the diving project plan. Satisfactory completion of the training by each individual in the dive team should be recorded.

10.30 The time required for familiarisation will depend on the experience of each individual and whether that individual has previously carried out the same job in that location. For example, a diver returning to the same offshore worksite after a period of leave may only require a few minutes to become acquainted with any changes since their leave. A diving supervisor arriving at an unfamiliar saturation diving worksite may require many hours or even days to become familiar with the site.

Communications

10.31 All divers in the water require a communication system that allows direct voice contact with the diving supervisor on the surface and vice versa. A speech processing system is required for divers who are breathing gas mixtures containing helium because it distorts speech.

10.32 All communications should be recorded, and the recording kept until 48 hours after the diver has returned to the surface or the saturation living chamber. If an incident occurs during the dive, the communication record should be retained for any subsequent investigation.

10.33 The communication system(s) must be tested to ensure it is functioning correctly. A malfunctioning communication system may impact on rescue of a distressed diver.

10.34 Appropriate communications must be in place with personnel on the surface and equipment operators for example, personnel on the vessel bridge or platform, the crane driver, winch operators, ROV supervisor etc.

10.35 The diving supervisor should not pass over the total communications responsibility with the diver to anyone other than another appointed diving supervisor.

10.36 If other personnel require to speak to the diver, the diving supervisor must be able to hear the diver's voice communications and breathing pattern, when the other person is joined in the communications link. The communication system must allow the diving supervisor to disconnect the other person immediately, if the direct link between the diver and diving supervisor is interrupted or in the event of an emergency.

10.37 Diving supervisors must be able to see the divers inside the bell or compression chamber during saturation or closed bell diving operations, for example, via viewing ports or underwater cameras.

Use of Checklists

10.38 A diving project will involve sequences of different steps, some of which may be complex. There is a risk that steps may be omitted or taken out of sequence. A suitable way to ensure the thoroughness of such sequences is the use of prepared checklists that require relevant personnel to tick a box to demonstrate correct completion. Diving contractors will need to prepare and authorise the use of such checklists.

PUBLIC CONSULTATION

11. Emergency and First Aid Arrangements

11.1 The diving contractor must ensure that emergencies are planned for and documented emergency procedures are in place. These will form part of the diving project plan. In addition, the diving contractor must ensure that before any diving takes place, there are adequate emergency and first aid arrangements in place.

11.2 The diving contractor must also ensure that there is suitable and sufficient plant and equipment available, whenever needed, to carry out any action which may be necessary in the event of an emergency that occurs during the course of, or is connected with the diving project.

Emergency Plans and Procedures

11.3 Emergency plans and procedures should cover the actions required of each member of the diving team in the event of an emergency. Documented plans and procedures should take account of Appendix 2. Where appropriate, plans and procedures should be available for dealing with an injured or unconscious diver, breakage or failure of equipment such as hot water supply failure, communication failure, loss of pressure in a chamber or bell, dropped diving bell, sudden decompression of a saturation system, fire in a chamber or around the dive system, approach of adverse/severe weather, loss of main power source, damage to an installation or pipeline, evacuation from a sinking vessel or fixed/floating structure and hyperbaric evacuation of divers.

11.4 Particular problems exist if a diver becomes seriously ill or is badly injured while under pressure. Medical care in such circumstances is difficult and the diving contractor, in conjunction with the company's medical adviser, should prepare plans and procedures for such situations.

11.5 In an emergency people tend to revert to their native language. If team members do not speak the same language, this can cause an obvious risk. The diving project and emergency plan should state the language that is to be used during the diving project. All team members should be able to communicate clearly with each other at all times, particularly during emergencies.

Closed Bell Emergency Plans

11.6 An emergency plan and procedures should exist for the location and recovery of a lost or severed closed bell. This should identify the role of the diving contractor and other personnel, and the provision of specific equipment such as locators.

11.7 Plant and equipment and documented procedures should be provided to enable the diving bell to be rescued if the bell is accidentally severed from its lifting wires and supply umbilical.

11.8 The bell should be equipped with a relocation device using the International Maritime Organisation (IMO) agreement recognised frequency to enable rapid location if the bell is lost.

11.9 In line with the Diving Regulations, the diving supervisor must ensure that the emergency supplies of appropriate breathing gas held on the bell is capable of supporting the lives of at least 3 divers for at least 24 hours.

11.10 The bell will require an alternative method for returning to the surface if the main lifting gear fails. If weight shedding is employed, the weights should be designed so that the divers inside the bell can shed them. This design should ensure that the weights cannot be shed accidentally.

Hyperbaric Evacuation

11.11 In an emergency, divers in saturation cannot be evacuated by the same methods as other crew members. Special arrangements and procedures should be made to evacuate them safely while keeping them under pressure, for example in a chamber or lifeboat capable of being removed from the worksite to a safe location while maintaining life support for a minimum of 72 hours. The exact design of such equipment and its method of deployment will depend on a number of factors including the facilities available, the number of divers to be evacuated and the location of the worksite. Such equipment should be maintained, tested and serviced regularly.

11.12 Additional safety requirements may be necessary for those personnel conducting the evacuation.

11.13 Emergency situations should be identified taking account of the geographical area of operation, the environmental conditions, the proximity of other vessels and the availability and suitability of any onshore or offshore facilities.

11.14 Periodic training exercises should be carried out to test the operation of the hyperbaric evacuation system and the efficiency of the personnel responsible for the hyperbaric evacuation of the divers. Such exercises should not be carried out with divers under pressure in the hyperbaric chamber.

11.15 Hyperbaric evacuation systems should comply with the requirements of International Maritime Organisations Guidelines and Specifications for Hyperbaric Evacuation Systems.

Emergency Markings on Hyperbaric Rescue Systems

11.16 In an emergency it is possible that personnel with no specialised diving knowledge will be the first to reach a hyperbaric rescue system. To ensure that rescuers provide suitable assistance and do not accidentally compromise the safety of the occupants, the IMO instructions should be followed and the IMO standard set of markings should be clearly

visible when the system is afloat. All diving team members should be familiar with the emergency arrangements.

Liaison with a Doctor

11.17 The situation where a member of the dive team is injured or becomes ill but a doctor is not available at the work site should be considered. This should include, for example, an arrangement to allow the personnel at the site to communicate by radio or telephone with the diving contractor's medical adviser and the pre-agreement of a suitable method of transferring information from the site to a doctor.

Therapeutic Recompression

11.18 A 2-person 2-compartment chamber should be available at the worksite to provide suitable therapeutic recompression treatment for all diving projects within the scope of this Code of Practice.

Treatment of Patients in a Compression Chamber

11.19 A seriously ill or injured diver in a hyperbaric chamber cannot be treated in the same way as at atmospheric pressure. If the required treatment cannot be administered by the personnel at the worksite, trained medical staff and specialised equipment should be transported to the casualty. Treatment should be given to the injured diver inside the compression chamber. The diver should not be decompressed or transferred to any other location until in a stable condition.

First Aid Arrangements

11.20 Because emergency medical services are not immediately available, for diving within the scope of this Code of Practice, **all** divers should have an in-date first aid qualification.

11.21 For all diving projects under the Diving Regulations, the minimum required standard of first aid is as specified in Chapter 2 of Part 7 of the Safety, Health and Welfare at Work (General Application) Regulations 2007 (commonly known as the First Aid Regulations) and associated guidance.

11.22 The diver training programme includes training in diving physiology and medicine. The ability to use those skills and knowledge forms an integral part of the diver competence assessment. At the time of their diver training, trainees will also be taught and assessed for a separate first aid qualification to the standard required by the First Aid Regulations and associated guidance. Trainees will also be trained in oxygen administration.

11.23 The first-aid qualification is only valid for two years. Divers should satisfactorily complete a refresher course in the first aid qualification before their certificate has run out.

11.24 At least one person in the dive team, other than the diver in the water, should be qualified to a higher standard of first aid (diving medic standard). This person should not be

the diving supervisor because of their need to be in direct control of the operation at all times. There are situations where additional members of the dive team should be qualified to diver medic standard. This will include situations where the diver requiring first aid is inside a compression chamber and emergency medical assistance cannot be provided by normal emergency medical services. The diving contractor's risk assessment should consider the numbers required to be qualified to this standard.

Medical Equipment

11.25 A minimum amount of medical equipment is required at a diving site to provide first aid and medical treatment for the dive team. This minimum will depend on the method and type of diving and what is agreed with the diving contractor's medical adviser.

Accidents and Dangerous Occurrences

11.26 Notifiable accidents and prescribed dangerous occurrences should be reported to the Health and Safety Authority in accordance with Part 14 of the Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2016 (commonly known as the Reporting of Accidents and Dangerous Occurrences Regulations) and associated guidance.

11.27 Certain accidents or incidents which occur at sea must also be reported to the Department of Transport, Tourism and Sport under Maritime Safety legislation.

12. Plant and Equipment

12.1 Plant and equipment can be a hazard if it is inappropriate for the work that is being carried out, poorly/not maintained or generally unsafe to use. The incorrect selection of equipment, incorrect use of equipment and poor design can also have detrimental effects on the diver's health and safety.

12.2 Plant and equipment used in diving includes life support systems (for example, surface-orientated air diving systems, surface supplied mixed diving equipment, hyperbaric evacuation systems, saturation diving systems), communication equipment, Personal Protective Equipment (diving suits, masks, helmets etc.), general purpose tools, gas storage cylinders, compression chambers, compressors and so on. In addition, there may be other plant and equipment associated with the diving project such as lifting equipment.

12.3 The diving contractor must ensure that sufficient plant and equipment, which is suitable for the use to which it will be put, is provided for the diving project. All plant and equipment must be suitable for the environment that it is used in for example, operating in a potentially flammable area.

12.4 The plant and equipment must be available, whenever needed, to carry out the diving project safely and to carry any action which may need to be taken in a reasonably foreseeable emergency.

12.5 Suitability can be assessed by the evaluation by a competent person, clear instructions or statements from the manufacturer or supplier, physical testing, or previous use in similar circumstances. All items of equipment worn by the diver should, wherever possible, comply with relevant national, European or international standards.

12.6 Gas Storage and Marking

Storage of Gases

12.6.1 Gases stored in high-pressure cylinders are hazardous. Gas storage areas should be adequately protected, for example, by the provision of fire deluge systems. Gases used for diving within the scope of this Code of Practice should be handled with appropriate care.

Storage Cylinders

12.6.2 Gas cylinders should be suitable in design, fit for purpose and safe for use. Each cylinder should be inspected, examined and tested by a competent person. Cylinders used for diving within the scope of this Code of Practice may be subject to special conditions, for example, when being used underwater, and therefore need special care. Cylinders should be checked upon delivery and before use to ensure that they are fit for purpose.

Marking and Colour-Coding of Gas Storage

12.6.3 Accidents have occurred because of wrong gases or gas mixtures being used in a diving project. The diving contractor should ensure that all gas storage units comply with relevant national, European or international standards for colour coding and marking of gas storage cylinders, quads and banks. Where appropriate, pipework should also be colour-coded.

12.7 Closed Diving Bells

12.7.1 Divers should be able to enter and leave the bell without difficulty and it should be possible to recover an unconscious diver in an emergency. Divers should also be able to transfer under pressure from the bell to a surface compression chamber and vice versa.

12.7.2 The bell requires:

- (a) doors that can be opened from either side and act as pressure seals;
- (b) valves, gauges and other fittings (made of suitable materials) to indicate and control the pressure within the bell. The external pressure will also need to be indicated to both the divers in the bell and the diving supervisor at the surface;
- (c) adequate equipment, including reserve facilities, to supply an appropriate breathing gas to divers in and working from the bell;
- (d) equipment to heat and light the bell;
- (e) adequate first aid equipment and lifting plant, to enable a person in the bell to lift an unconscious or injured diver into the bell; and
- (f) lifting gear to lower the bell to the depth of the diving project, maintain it at that depth and raise it to the surface, without the occurrence of excessive lateral, vertical or rotational movement.

12.7.3 The main umbilical system of a diving bell should be fitted with suitable protective devices that will prevent uncontrolled loss of the atmosphere inside the diving bell if any or all of the components in the umbilical are ruptured.

12.8 Lifting Plant and Equipment

Lifting Plant to Carry Personnel

12.8.1 Particular safety standards should be applied when using lifting equipment to carry personnel, including any wires used for secondary or backup lifting. These wires should be non-rotating and have an ultimate breaking strain that is at least 8 times that of the normal working load. Different ratios of breaking strain to working load may be necessary in accordance with appropriate national, European or international standards.

Winches

12.8.2 Winches should be provided with independent primary and secondary braking systems. It is recommended for hydraulic winches that the secondary system operates automatically whenever the operating lever is returned to neutral or on loss of power. Both braking systems should be tested separately by a competent person.

12.8.3 In line with Regulation 47 of the Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2016, winches should not be fitted with a pawl and ratchet gear where the pawl has to be disengaged before lowering.

Diving Baskets and Wet Bells

12.8.4 A basket or wet bell, used in support of surface-supplied diving, should be able to carry at least two divers in an uncramped position. It should be designed to prevent the diver falling out and to prevent spinning and tipping. The basket should be fitted with suitable overhead protection and handholds.

12.8.5 A secondary means of recovering the divers should be provided.

12.9 Maintenance, Inspection, Examination and Testing of Plant and Equipment

12.9.1 Diving plant and equipment is used under extreme conditions, including frequent immersion in salt water. Plant and equipment that is used in water will require more regular maintenance, periodic inspection and where appropriate examination, testing and/or replacement.

12.9.2 Notwithstanding the general requirements relating to the use of work equipment in Chapter 2 of Part 2 of the Safety, Health and Welfare at Work (General Application) Regulations 2007 (commonly known as the Use of Work Equipment Regulations), the Diving Regulations require that the diving contractor ensures that plant and equipment used during the diving operation is in good working order and maintained in safe working condition.

12.9.3 In certain cases, plant and equipment, used in connection with some of the diving methods under this Code of Practice will fall under maritime safety legislation and requirements, for example, hyperbaric evacuation systems and saturation diving systems.

Planned Maintenance System

12.9.4 The diving contractor should establish a written planned maintenance schedule and system for plant and equipment. The maintenance arrangements should be detailed as part of the diving contractor's safety management system. Maintenance arrangements should take into account passage of time, usage, operating conditions and the manufacturer's specifications and periodicity.

12.9.5 Under the Diving Regulations, the diving contractor must ensure that records of maintenance of plant and equipment are kept. The records should identify the item of plant or equipment along with any unique identifying numbers, the date of the check, any limitations as to use, any repairs or modifications carried out and the signature of the competent person who carried out the maintenance.

12.9.6 Any damaged or defective plant or equipment should be immediately removed from use and clearly identified in order to preclude its use.

Inspection, Examination and Testing

12.9.7 The diving contractor must ensure that plant and equipment has been inspected, examined and tested.

12.9.8 The frequency and extent of inspection, examination and testing required for all items of plant used in a diving project should be in accordance with the relevant statutory provisions and national, European or international standards and should also take account of the manufacturer's specifications and periodicity.

12.9.9 All inspection, examinations and tests must be carried out by or under the close supervision of a competent person.

12.9.10 Records of any inspections, examinations or tests must be maintained for five years from the date of inspection, in accordance with Regulation 30 of the Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2016. In line with this Regulation, records should be made available for inspection and upon request, to users of the work equipment.

Pre-Dive Visual Inspection

12.9.11 All diving plant and equipment should be inspected immediately before use by a competent person to ensure that it is of an acceptable standard for the method of diving and work being undertaken, not damaged or suffering from deterioration

12.9.12 In addition, immediately prior to each dive every diver must carry out a pre-dive visual inspection and check of their equipment. Any defects detected should be immediately reported to the diving supervisor.

Cylinders Used Underwater

12.9.13 Divers' emergency gas supply cylinders and other cylinders used underwater can suffer from accelerated corrosion and must be regularly maintained, inspected, examined and tested. Ingress of water not only may cause corrosion but may also affect the quantity of gas in the cylinder to ensure the diver's safety.

Diving Bell and Basket Lift Wires

12.9.14 Frequent immersion in salt water, shock loading from waves, passing over multiple sheaves can cause wear and deterioration to the lift wires of diving bells and baskets if they are not properly maintained. Specialised advice on maintenance must be followed to ensure that wires remain fit for purpose.

Lift Bags

12.9.15 The inspection, examination and testing should be in accordance with manufacturers' instructions, maintenance specifications, testing requirements and periodicity of inspection.

PUBLIC CONSULTATION

13. Diving Supervisors

13.1 The diving supervisor is responsible for and in immediate charge of the diving operation. The diving supervisor has a duty to direct the diving operation safely.

Appointment of Diving Supervisor(s)

13.2 A competent diving supervisor or where applicable, competent diving supervisors must be appointed in writing by the diving contractor.

13.3 The diving contractor must provide each person whom they propose to appoint as a diving supervisor with a copy of any part of the diving plan that relates to the diving operation which the diving supervisor will supervise.

13.4 The diving supervisor must accept the appointment in writing. If a diving supervisor does not agree with the size or complexity of the portion of the diving project allocated to them as an operation to supervise, the diving supervisor should not accept the appointment and raise the matter with the diving contractor.

13.5 A diving supervisor should not participate in a diving operation that they consider to be unsafe because, for example, in the diving supervisor's opinion, it is too large for one person to supervise safely or, for example, the diving supervisor knows that they are not competent to supervise.

13.6 A diving supervisor should only hand over control of the diving operation to another diving supervisor who has been appointed in writing by the diving contractor. When a diving supervisor hands over supervisory responsibilities to another diving supervisor, this should be recorded in the diving operation record.

13.7 When more than one diving supervisor is on duty at the same time, for example, with simultaneous diving operations, the diving contractor should specify in the diving project plan, the areas and duration of the project that are controlled by each diving supervisor. In particular, each diving supervisor must have immediate overriding control of all safety aspects for the diving operation for which they are appointed. The diving contractor may also need to provide a management structure in the diving project plan.

13.8 During a continuous saturation diving project two diving supervisors should be on each shift and will, therefore, be able to act as relief for each other. The name of the diving supervisor in control should be recorded in the diving operation record with handovers for relief, or other purposes, also recorded.

Competence

13.9 Any person appointed as a diving supervisor under the Diving Regulations and supervising diving operations under this Code of Practice must be competent to carry out the role (see paragraph 2.4).

13.10 The diving supervisor should be competent in the type of diving techniques and method to be used during the diving operation. For example, a diving supervisor qualified to take charge of an air operation only is not qualified to take charge of a bell operation, whereas a closed bell diving supervisor is qualified to take charge of both types of operation.

13.11 The diving supervisor must have adequate practical and theoretical knowledge and experience of the diving method and techniques to be used in the diving operation for which they have been appointed.

13.12 The diving contractor must consider the competence of a person before appointing them as a diving supervisor. When considering competence, the diving contractor should consider for instance such questions as whether the person is knowledgeable, practical, reliable; capable of conducting the diving operation in a safe manner; capable of managing members of the diving team appropriately and remaining calm and acting effectively in an emergency.

13.13 The diving contractor will be in a good position to decide on a person's competence if the person has worked for the company for some time. If the diving contractor does not know the person, it will be necessary for the diving contractor to make appropriate enquiries concerning the person's knowledge and experience.

13.14 The diving supervisor should possess a certificate of qualification to supervise in the type of operation which they are to supervise. Such certification schemes are run by the offshore industry.

13.15 Diving supervisors do not have to have a certificate of medical fitness to dive or to be qualified in first aid. However, the diving contractor must assess the first aid capabilities of other personnel in the dive team and the role that the diving supervisor would play in an emergency.

Duties of the Diving Supervisor

13.16 The diving supervisor has specific duties under the Diving Regulations. They must ensure:

- (a) that the diving operation that they are supervising is carried out safely and without risk to those involved or to those who may be affected by the diving operation and in line with relevant legal requirements and the diving project plan;
- (b) that they do not allow a diver to dive if in their opinion the diver is not fit and competent (see paragraph 15.15);
- (c) the contents of the diving project plan which relate to the diving operation which they are supervising is brought to the attention of those taking part;

- (d) all plant and equipment has undergone the relevant inspections, examinations and tests and is readily available for use;
- (e) all plant and equipment, unless intended to be mobile, is secured;
- (f) there is an adequate quantity of breathing gas (both primary, secondary and therapeutic) for the diving operation. The quantity of breathing gas supplied must be sufficient for all the divers engaged in the diving operation and be sufficient for the standby diver and diver to safely return to a place of safety in an emergency (see Section 8 “Diving Methods”);
- (g) that compressors are safely set up and there is an adequate reserve of breathing gas in the event of failure of the compressor (see paragraph 8.8).

Responsibility of the Diving Supervisor

13.17 The diving supervisor with responsibility for the operation is the only person who can order the start of a dive. Other relevant parties, such as a ship’s master or the offshore installation manager, can however tell the diving supervisor to terminate a dive for safety or operational reasons.

13.18 There will be times, for example, during diving operations from a vessel using dynamic positioning techniques that the diving supervisor must liaise closely with other personnel, such as the vessel master or the officer of the watch. In such circumstances, the diving supervisor should recognise that the master of the vessel has responsibility for the overall safety of the vessel and its occupants.

13.19 To ensure that a diving operation is carried out safely, diving supervisors must conduct the diving operation in accordance with the requirements of the diving project plan and the site specific risk assessment. They should ensure that:

- (a) so far as is reasonably practicable, the diving operation that they are being asked to supervise complies with the requirements of the Diving Regulations and this Code of Practice;
- (b) the proposed dive site and the water and weather conditions are suitable;
- (c) the risk assessment is still current for the prevailing circumstances on the day of and during the dive;
- (d) they understand their own areas and levels of responsibility and who is responsible for any other relevant areas;
- (e) the personnel that they are to supervise are competent to carry out the work required of them. They should also check, so far as is reasonably practicable, that these personnel are fit, and in possession of all necessary and appropriate certificates;

- (f) the diving project plan and arrangements for dealing with foreseeable emergencies are clearly understood by all those engaged in the diving operation. This would normally be ensured by carrying out a pre-dive briefing session with all those involved and, if appropriate, suitable training;
- (g) the plant and equipment that they propose to use for any particular operation is adequate, safe, properly certified and maintained. They should ensure that the plant and equipment is adequately inspected by themselves, if competent to do so or by another competent person before its use. Such inspections should be documented, for example on a prepared checklist, and recorded in the diving operation record;
- (h) the possible hazards from complex or potentially hazardous plant and equipment have been evaluated and are fully understood by all relevant parties and that, if required, training or familiarisation is given. This should be carried out as part of the risk assessment during the planning of the operation and should be documented. If the situation changes, the risk assessment should be re-evaluated. Diving supervisors should ensure that documentation on the risk assessment of the plant and equipment is available and follow any guidance contained in the documentation, for example manufacturer's instructions;
- (i) all relevant people, including the Irish Coast Guard, are aware that a diving operation is to start or continue. The diving supervisor should also obtain any necessary permission before starting or continuing the operation;
- (j) they have adequate means of communication with any personnel under their supervision. So long as they have such communication they do not need to be able to operate physically every control under their responsibility. For example, a diving supervisor should be able to supervise adequately the raising and lowering of a diving bell if there is a direct audio link with the winch operator, even though the winch may be located where the diving supervisor cannot see it or have ready access to it;
- (k) they are able to see divers in the bell or the compression chamber during saturation operations;
- (l) proper records of the diving operation are maintained. This must include the particulars in Appendix 3, as appropriate; and
- (m) they maintain the diving operation record throughout the diving operation for which they are responsible.

13.20 The diving supervisor, being cognisant of paragraph 13.17, is entitled to give reasonable orders in relation to health and safety to any person taking part in the diving operation. These orders, directions or rules must be reasonable in the context of the

supervisor's duty and take precedence over any company hierarchy. For instance, these orders could include instructing unnecessary personnel to leave a control area or instructing personnel to operate plant or equipment.

13.21 The diving supervisor remains in overall control when a diver inside a deck chamber requires medical treatment, whether medical personnel are present or are communicating by long distance.

PUBLIC CONSULTATION

14. Divers

Duties

14.1 Divers have specific duties under the Diving Regulations. They must not dive unless they are fit to do so, hold a valid certificate of medical fitness (see Section 15 “Fitness to Dive”), are competent to undertake the dive and carry out any associated work task (see paragraph 2.4). They must also maintain a daily record of their dives in a personal log-book which must include the particulars set out in Appendix 4.

14.2 Under Regulation 10(3) of the Diving Regulations, all people, including divers, have a general duty to comply with any instructions applicable to them in the diving project plan.

Competence

14.3 Under the Diving Regulations, the diving contractor must be satisfied that the diver is competent in the method of diving that is safe to be used and in the type of work that is to be carried out. In any particular situation the absolute legal obligation is to match the competence of the diver to the method and type of dive involved.

14.4 Under the Diving Regulations, if the diving supervisor is not satisfied with the diver’s competence to dive, they must not permit the diver to dive.

14.5 A basic level of diving competence may be assumed from a diver who has an appropriate commercial diving qualification. For some tasks, such as underwater inspection, certificates issued by diver training organisations or independent bodies will confirm a diver’s competence.

14.6 Divers can gain knowledge of unfamiliar tasks or plant by, for example, looking at the diving project specifications, the plant to be operated, the area to be worked and any other relevant factors.

14.7 Where a diver is competent in the method of diving but is being trained to carry out a task underwater, such training must be under the direct supervision of a diver who is competent in both the method of diving and the underwater task.

Diver’s Personal Log-book

14.8 All divers must maintain a diver’s personal log-book. On every day that a diver takes part in a diving project they must record in their personal diver’s log-book the particulars set out in Appendix 4.

14.9 The log-book must be retained for at least two years after the last entry.

Safe Pass

14.10 Where diving is carried out in support of construction work as defined by the Safety, Health and Welfare at Work (Construction) Regulations 2013, a Safe Pass Registration Card will be required.

14.11 Where inspection of any building, edifice or structure is carried out underwater and the work does not fall within the definition of construction work as defined by the Safety, Health and Welfare at Work (Construction) Regulations 2013, in general a Safe Pass Registration Card will not be required.

PUBLIC CONSULTATION

15. Fitness to Dive

Certificate of Medical Fitness

15.1 Diving at work requires a high degree of physical and mental fitness. The Health and Safety Authority approves doctors to carry out diving medical examinations and assessments (known as Approved Medical Examiners of Divers - AMEDs). These medical examiners are selected for approval based on their training in diving physiology and their knowledge of diving. This approval is for a limited period of five years.

15.2 All divers at work must have a valid certificate of medical fitness to dive issued by an approved medical examiner of divers. The certificate of medical fitness to dive is a statement of the diver's fitness to perform work underwater, and is valid for as long as the doctor certifies, up to a maximum of 12 months.

15.3 The medical examination and assessment look at the diver's overall fitness to dive. These include the main systems of the body – cardiovascular system, respiratory system and central nervous system – as well as the ears, nose and throat, vision, dentition, and the person's capacity for exercise.

15.4 If a diver who is considered unfit to dive due to a medical condition dives, they may impair the safety of themselves and other members of the dive team. They may also aggravate the existing medical condition and increase the likelihood of developing long term health problems.

15.5 No diver should dive in contravention of any conditions, limitations or restrictions imposed on them. The certificate of medical fitness to dive does not mean that the diver is currently medically fit nor does it mean that the diver is competent to undertake any particular diving work task.

15.6 Where an annual medical examination is carried out less than a month before the expiry of the current medical certificate to dive, the start date of the new certificate may begin from the expiry date of the current certificate.

15.7 Every diver or person who is likely to be subject to hyperbaric conditions as routine rather than in an emergency, must have a valid certificate of medical fitness to dive.

15.8 In line with Section 64(1) of the 2005 Act, an inspector of the Authority may require records, such as a Certificate of Medical Fitness to dive, to be produced. Forging or using a document with the intent to deceive is an offence under the 2005 Act.

15.9 Further details of approved medical examiners of divers and guidance on medical checks are available at www.hsa.ie.

General Fitness to Dive

15.10 Under the Diving Regulations, a diver must not take part in a diving project if unfit to do so and must immediately inform the diving supervisor if they are unfit or become unfit to dive during the diving project.

15.11 Divers must not dive if they are not in good health or are in any way unfit (physically or mentally) to do so. Even a minor illness, such as a common cold or a dental problem, can have serious effects on a diver under pressure and should be reported to the diving supervisor before the start of a dive.

15.12 Divers who consider themselves unfit for any reason, for example, due to fatigue, minor injury, recent medical treatment, recent illness, routine medications, or who become unfit to dive or unwell during the diving project must not go or remain under water and must inform the diving supervisor.

15.13 Under the Diving Regulations, if the diving supervisor is of the opinion that the diver is not fit to dive; the diving supervisor must not permit the diver to dive.

15.14 Divers who have suffered an incident of DCI should record details of the treatment they received in their diver's personal logbook. They should show this to the diving supervisor before taking part in their first dive after the treatment, in order that a check can be made of their fitness to return to diving.

15.15 The diving supervisor should seek guidance from the diving contractor or the company's medical adviser if there is doubt about a diver's fitness to dive.

Fitness Checks Prior to Diving

15.16 Before saturation exposure, the diving supervisor should ensure that a diver has had a medical check within the previous 24 hours. This will confirm, so far as is reasonably practicable, the diver's fitness to enter saturation. The medical check will be carried out by a nurse, doctor or diving medic. The content of the medical check and the format of the written record may be decided by the diving contractor and should be specified in the diving contractor's diving plan.

15.17 Before any dive not involving saturation, the diving supervisor should ask the divers to confirm that they are fit to dive and record this confirmation in the diving operation record.

Appendix 1 – Glossary of Terms and Abbreviations

Terms

Bottom Time

The duration of a dive from the time of leaving the surface to the commencement of ascent to the surface.

Continuous Saturation Diving Project

Continuous saturation diving project will exist when less than eight hours separate the return to living chambers of one team of divers and the departure from the living chamber of another team of divers.

Decompression

The process by which a diver is returned to atmospheric pressure so as to facilitate the safe discharge of dissolved gases in their tissues.

Diving Bell

A pressure vessel for human occupancy which is used to transport divers under pressure to or from the underwater worksite. It is also known as a closed diving bell, closed bell or submersible compression chamber.

Dynamically Positioned Vessel

A vessel that is held in position through the use of its propulsion system.

Hazard

A hazard is anything with the potential to cause harm such as work materials, equipment, work methods/practices, poor work design or exposure to harmful agents such as chemicals, noise or vibration. This may include water, environmental factors, plant, equipment, methods of diving and other aspects of work organisation.

Life Support Technician

A person trained and appointed by the Diving Contractor to supervise life support functions for a diver(s) in a compression chamber.

Lock-Off

When a diving bell under pressure is disconnected from the compression chamber.

Lock-On

When a diving bell under pressure is reconnected to the compression chamber.

Permit-to-Work System

A formal written system used to control certain types of work which are identified as involving significant risk.

Ratcheting

The practice of cycling the whole dive team in less than 24 hours and then immediately recommencing the cycle to gain work time.

Risk

A risk is the possibility that someone or something will be harmed by an identified hazard. The level of the risk is determined by the likelihood that harm will occur, the severity of possible injury or damage and the numbers of people who might be affected by the risk.

Risk Assessment

A risk assessment is a careful examination of what may cause harm and an evaluation of precautions that can be taken to prevent harm.

Saturation Diving

A diving technique used during diving operations where the diver has reached the full saturation state for the pressure and breathing gas being used. When this state has been reached the time required for decompression is not further increased in relation to the duration of the dive.

Saturation Chamber

A compression chamber that is used for a saturation dive and which is equipped to permit divers to remain at greater than atmospheric pressure for an unlimited period of time.

Saturation Dive

A dive performed after a diver's body is fully saturated with nitrogen.

Surface Compression Chamber

An appropriately equipped chamber on the surface in which routine decompression or therapeutic recompression can be carried out.

Surface-Orientated Diving

A diving operation, other than closed bell diving, in which the diver enters the water at the surface, descends to the working depth and returns to the surface while fully exposed to variations in water pressure.

Superintendent

A senior supervisor, usually appointed on projects requiring more than one supervisor.

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.

Wet Bell

A diving basket with a dome and main supply umbilical from the surface providing, as a minimum, breathing gas to a manifold inside the wet bell and diver excursion umbilicals terminating at the wet bell. It is not a pressurised vessel and may also be known as an open bottom bell.

Abbreviations

AMED

Approved Medical Examiner of Divers

DCI

Decompression illness

DP

Dynamically Positioned

IMO

International Maritime Organisation

ROV

Remotely Operated Vehicle

SCUBA

Self-Contained Underwater Breathing Apparatus

PUBLIC CONSULTATION

Appendix 2 – Diving Project Plan

The diving project plan must take account of relevant national standards and guidelines on safety and health, where such exist. In their absence, account should be taken of relevant European and international standards and guidelines. In particular, the following matters must be considered-

1. Planning

- (a) Environmental conditions including:
 - Meteorological conditions including forecasted and prevailing conditions.
 - Tidal Information (including local tide tables and indications of anticipated speed of tidal current) and water currents in inland waterways.
 - Potential vessel traffic and proposed shipping movements.
 - Underwater hazards of the diving site including any culverts, penstocks, sluice valves or areas where differences in hydrostatic pressure may endanger the diver.
 - Air and water temperatures and surface waves.
 - Bed conditions.
- (b) Depths and type of operation.
- (c) Diving equipment available and suitability of plant and equipment.
- (d) Availability, qualifications and competency of personnel.
- (e) Effects of air transport after diving.

2. Preparations

- (a) Consultation with the client and master of any vessel from which diving operations are to be carried on and with any other person who has control of the site of the project, lifting equipment, shipping movement or information related to the safety of the diving operation.
- (b) Selection of breathing gases and equipment.
- (c) Check of plant and equipment.
- (d) Allocation of personnel.
- (e) Briefing the dive team.
- (f) Personal fitness of divers for underwater operations.
- (g) Precautions against cold in and out of the water.
- (h) Communications and signalling.
- (i) Precautions against underwater hazards of the diving site.
- (j) Availability of suitable Personal Flotation Devices/Lifejackets for use when travelling to and from the dive site or in emergency situations.

3. Procedures during diving

- (a) Responsibilities of diving supervisor, dive team and others.

- (b) Use of all types of personal diver's equipment and plant.
- (c) Supply of gases and gas mixtures, including maximum and minimum partial pressures of gases.
- (d) Operations in relation to submersible compression chambers.
- (e) Working in different locations and varying altitudes.
- (f) Operations and use of equipment under water.
- (g) Limits on depth and time under water.
- (h) Descent of divers and descent of submersible compression chambers (as appropriate).
- (i) Ascent and recovery of divers and submersible compression chambers (as appropriate).
- (j) Compression and decompression.
- (k) Control in relation to changing environmental conditions.
- (l) Maintenance of logbooks.
- (m) Transfer to compression chamber.
- (n) Display of correct flags and signals.
- (o) Awareness of and avoidance of obstruction to other vessels or water users in the vicinity.

4. Emergency Procedures

- (a) Emergency communications and signalling.
- (b) Emergency assistance under water and on the surface.
- (c) Therapeutic recompression.
- (d) First aid equipment, personnel and arrangements.
- (e) Medical assistance.
- (f) Calling in assistance of emergency services including advance liaison with those services where appropriate.
- (g) Precautions in event of evacuation.
- (h) Provision of emergency electrical supplies.
- (i) Suspension of diving.
- (j) Easy access to personal flotation devices or lifejackets.

Appendix 3 – Required Particulars for Diving Operation Records

The following required particulars are to be included in the diving operation record for all diving projects

1. Name, business address, e-mail address and telephone number(s) of the client.
2. Name, business address, e-mail address and telephone number(s) of the diving contractor.
3. The date and time to which the entry relates or the dates and times during which the diving operation was carried on.
4. Name of the diving supervisor or supervisors and the times and dates for which he or she is acting in that capacity in respect of that diving operation. (An entry must be completed daily by each diving supervisor for each diving operation).
5. Location of the diving operation, including as appropriate the name or other designation of any craft, vessel, work site or installation from which diving is taking place.
6. Names and respective duties of the divers and other persons taking part in the diving operation including names of personnel operating any diving plant or equipment.
7. Purpose or nature of the diving operation.
8. Breathing apparatus and breathing gas used by each diver in the diving operation.
9. The time at which each diver leaves atmospheric pressure and returns to atmospheric pressure and their bottom time.
10. Maximum depth which each diver reached.
11. Procedures followed in the course of the diving operation including as appropriate, details of the decompression schedule including details of the pressures (or depths) and the duration of time spent by divers at those pressures (or depths) during decompression.
12. Emergency support and first aid arrangements.
13. Particulars of any emergency or incident which occurred during the diving operation, including any action taken and details of any decompression sickness, illness, discomfort or injury suffered by any of the divers and the treatment given.
14. Details of the pre-dive inspection of all plant and equipment being used in the diving operation. Confirmation that all equipment used has been checked immediately prior to the dive and conforms to the maintenance schedule.

15. Any defect discovered or recorded in the functioning of any plant or equipment used in the diving operation.
16. Particulars of any relevant environmental conditions or factors affecting the diving operation.
17. Any other factors likely to affect the safety or health of any persons engaged in the operation.
18. Any relevant Code of Practice that applies to the diving operation.
19. Name and signature of the diving supervisor completing the record.
20. Affix company stamp (if appropriate).

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Appendix 4 – Required Particulars for the Diver’s Personal Log-Book

1. Name and address of the diver. (Names and addresses should be printed and in block capitals).
2. Signature of the diver and a verified photograph of the diver.
3. Date to which entry relates.
4. Name and address of the diving contractor.
5. Name and signature of the diving supervisor(s) for that dive.
6. Location of the diving project, including the name of any vessel or installation from which diving is taking place.
7. Dive number and running total of dive time.
8. The maximum depth reached on each occasion.
9. The time on each occasion that the diver leaves the surface, the bottom time, and the time the diver reached the surface.
10. Where the dive includes time spent in a compression chamber, details of any time spent outside the chamber at a different pressure.
11. Breathing apparatus and breathing gas used by the diver.
12. Any decompression schedules followed by the diver on each occasion.
13. Any work done by the diver on each occasion, and the plant (including any tools) used in that work.
14. Any episode of barotrauma, discomfort or injury suffered by the diver including details of any decompression illness and the treatment given.
15. Any emergency or incident which occurred during the diving operation.
16. Any other factor relevant to the diver’s health or safety.
17. Affix company stamp (where appropriate) after the record has been signed by the diver and diving supervisor(s).