International Maritime Organization

Diving Systems

Code of Safety for Diving Systems 1995

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Foreword

The Code of Safety for Diving Systems was originally adopted by the IMO Assembly at its thirteenth session (November 1983). Recognizing the need to update the Code and take into account amendments adopted by the Maritime Safety Committee since its adoption, the Assembly adopted a revised version, the Code of Safety for Diving Systems, 1995, at its nineteenth session (November 1995) by resolution A.831(19).

Contents

Code of Safety for Diving Systems, 1995

PREAMBLE

1 This Code* has been developed to provide a minimum international standard for the design, construction and survey of diving systems on ships and floating structures engaged in diving operations, in order to enhance safety of divers/personnel. The Code accepts that interchangeability of equipment or the addition or deletion of components is reasonable and common practice and that this Code should not inhibit this.

2 The intent of the Code is also to facilitate the international movement and operation of diving systems.

3 Throughout the development of the Code, it was recognized that it must be based upon sound design and engineering principles and experience gained from operating such systems; furthermore, that design technology of diving systems is complex and that the Code should be re-evaluated and revised as necessary. To this end the Organization will periodically review the Code, taking into account both experience and the latest technical developments.

4 Any existing diving system which complies with the provisions of the Code should be considered eligible for issuance of a certificate in accordance with this Code.

5 The Code is not intended to prohibit the use of an existing system simply because its design, construction and equipment does not conform to the requirements of this Code. Many existing diving systems have operated successfully and safely for extended periods of time and their operating history should be considered in evaluating their suitability.

6 The Code does not include requirements for diving operations or the procedures for control of diving operations.

7 The Code has been developed for fixed diving systems. However, any temporary diving systems which comply with the provisions of the Code may be certificated In accordance with the Code.

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* The Code of Safety for Diving Systems, 1995, comprises the annex to resolution A.831(19), the text of which is reproduced at the end of this publication.

Chapter 1
General

1.1 Purpose

The purpose of this Code is to recommend design criteria and construction, equipment and survey standards for diving systems so as to minimize the risk to divers, personnel, ships and floating structures having such systems on board and to facilitate the international movement of such ships and floating structures in the context of diving operations.

1.2 Application

The Code applies to new fixed diving systems which are certificated more than 12 months after the date on which the Assembly of the Organization adopts this Code. However, any existing system which complies with the provisions of the Code should be considered eligible for issuance of a certificate in accordance with this Code.

1.3 Definitions

For the purpose of this Code the terms used have the meanings defined in the following paragraphs unless expressly provided otherwise.

1.3.1 *Administration* means the Government of the State whose flag a ship or floating structure which carries a diving system is entitled to fly or in which the ship or floating structure is registered.

1.3.2 *Bottle* means a pressure container for the storage and transport of gases under pressure.

1.3.3 *Breathing gas/breathing mixture* means all gases/mixtures of gases which are used for breathing during diving operations.

1.3.4 *Certificate* means Diving System Safety Certificate.

1.3.5 *Surface compression chamber* means a pressure vessel for human occupancy with means of controlling the pressure inside the chamber.

1.3.6 *Depth* means the water depth or equivalent pressure to which the diver is exposed at any time during a dive or inside a surface compression chamber or a diving bell.

1.3.7 *Diving bell* means a submersible compression chamber, including its fitted equipment, for transfer of diving personnel under pressure between the work location and the surface compression chamber.

1.3.8 *Diving system* means the whole plant and equipment necessary for the conduct of diving operations.

1.3.8.1 *Fixed system* means a diving system installed permanently on ships or floating structures.

1.3.8.2 *Temporary system* means a diving system installed on ships or floating structures for a period not exceeding one year.

1.3.9 *Evacuation system* means a system whereby divers under pressure can be safely evacuated from a ship or floating structure to a position where decompression can be carried out.

1.3.10 *Handling system* means the plant and equipment necessary for raising, lowering and transporting the diving bell between the work location and the surface compression chamber.

1.3.11 *Hazardous areas* are those locations in which an explosive gas-air mixture is continuously present, or present for long periods (zone 0); in which an explosive gas-air mixture is likely to occur in normal operation (zone 1); in which an explosive gas-air mixture is not likely to occur, and if it does it will only exist for a short time (zone 2).

1.3.12 *Life support system* means the gas supply, breathing gas system, decompression equipment, environmental control system and equipment required to provide a safe environment for the diving crew in the diving bell and the surface compression chamber under all ranges of pressure and conditions they may be exposed to during diving operations.

1.3.13 *Living compartment* means the part of the surface compression chamber which is intended to be used as the main habitation for the divers during diving operations and which is equipped for such purpose.

1.3.14 *Main components* of a diving system include the surface compression chamber, diving bell, handling system and fixed gas storage facilities.

1.3.15 *Mating device* means the equipment necessary for the connection and disconnection of a diving bell to a surface compression chamber.

1.3.16 *Maximum operating depth* of the diving system is the depth, in metres or feet, of seawater equivalent to the maximum pressure for which the diving system is designed to operate.

1.3.17 *Organization* means the International Maritime Organization (IMO).

1.3.18 *Pressure vessel* means a container capable of withstanding an internal maximum working pressure greater than or equal to 1 bar.

1.3.19 *Umbilical* means the link between the diving support unit and the diving bell and may contain surveillance, communication and power supply cables, breathing gas and hot water hoses. The hoisting and lowering strength member may be part of the umbilical.

1.3.20 *Category A machinery spaces* are those spaces and trunks to such spaces as defined in the International Convention for the Safety of Life at Sea, 1974, as amended.

1.4 Exemptions

An Administration may exempt any system which embodies features of a novel kind from any of the provisions of the Code, so that the research and development into such novel features is not restricted by the Code. Any such system should, however, comply with safety requirements which, in the opinion of that Administration, are adequate for the operation intended and are such as to ensure the overall safety of the system. The Administration allowing any such exemptions should list the exemptions on the Certificate.

1.5 Equivalents

Where the Code requires that a particular fitting, material, appliance, apparatus, item or type of equipment should be fitted or carried in a system, or that any particular provision should be made, or any procedure or arrangement complied with, the Administration may allow alternative arrangements in that system, provided that the Administration is satisfied that such alternatives are at least as effective as the requirements of the Code.

1.6 Surveys and certification

1.6.1 Each diving system should be subject to the surveys specified below:

.1 An initial survey before any fixed system is put into service or before the Certificate required under this section of the Code is issued for the first time, which should include a complete and thorough examination of the diving system, equipment, fittings, arrangements and material and which should be such as to ensure their full compliance with the applicable provisions of the Code.

.2 A renewal survey at intervals specified by the Administration, but not exceeding five years, which should be a complete and thorough examination to ensure that the diving system, equipment, fittings, arrangements and material fully comply with the applicable provisions of the Code.

.3 An annual survey within three months before or after each anniversary date of the Diving System Safety Certificate so as to ensure that the diving system, fittings, arrangements, safety equipment and other equipment remain in compliance with the applicable provisions of the Code and are in good working order. Such annual survey should be endorsed on the Certificate issued under the provisions of this section.

1.6.2 An inspection, either general or partial according to the circumstances, should be made every time a defect is discovered or an accident occurs which affects the safety and certification of the diving system or whenever a significant repair or alteration is made. The inspection should be such as to ensure that the repairs or alterations carried out have been done effectively and are in all respects in full compliance with the applicable provisions of the Code.

1.6.3 Surveys and inspections should be carried out by officers of the Administration. The Administration may, however, entrust the surveys either to surveyors nominated for the purpose or to organizations recognized by it. In every case the Administration concerned should fully guarantee the completeness and efficiency of the surveys.

1.6.4 After any survey or inspection under this section has been completed no significant change should be made in the diving system without the agreement of the Administration or any person or organization duly authorized by it, except the replacement of equipment and fittings for the purpose of repair or maintenance.

1.6.5 A Certificate should be issued either by the Administration or any person or organization duly authorized by it after survey or inspection to a diving system which complies with the requirements of the Code. In every case the Administration should assume full responsibility for the Certificate.

1.6.6 The Certificate should be drawn up in the official language of the Administration in the form corresponding to the model given in the appendix to the Code. If the language used is neither English nor French, the text should include a translation into one of these languages.

1.6.7 Any exemptions granted under 1.4 should be clearly noted on the Certificate.

1.6.8 A Certificate should be issued for a period specified by the Administration, and should not exceed five years from the date of issue.

1.6.9 An extension of the validity of the Certificate may be granted for a maximum period of five months at the discretion of the Administration, subject to an annual survey being carried out.

1.6.10 A Certificate would cease to be valid if significant alterations have been made to the diving system without the agreement of the Administration or any person or organization authorized by it, except for the replacement of such equipment or fittings for the purpose of repair or maintenance, or if surveys and inspections as specified by the Administration under the provisions of 1.6.1 have not been carried out.

1.6.11 Each main component of the diving system should be stamped with an official number or other distinctive identification which should be given on the Certificate.

1.6.12 Limiting operating parameters, including vessels' motion and environmental conditions, should be shown in the Certificate.

1.7 Control

1.7.1 Every diving system, issued with a Certificate under section 1.6, is subject, whilst under the control of an Administration other than that which has issued the Certificate, to control by officers duly authorized by that Administration for verification that the Certificate is valid. Such Certificate should be accepted unless there are clear grounds for believing that the condition of the diving system or its equipment does not correspond substantially with the particulars of that Certificate. In that case, the officer carrying out the control may take such steps as will allow the system to operate on a temporary basis without undue risk to the divers and the personnel on board. In the event of this control giving rise to intervention of any kind, the officer carrying out the control should inform the Administration or the Consul or, in his absence, the nearest diplomatic representative of the State in which the ship or floating structure is registered, in writing forthwith of all circumstances on the basis of which intervention was deemed to be necessary.

1.7.2 Nothwithstanding 1.7.1, the provisions of 1.6 are without prejudice to any rights of the coastal State under international law to impose its own requirements relating to the regulation, surveying and inspection of diving systems engaged, or intending to engage, in diving operations on those parts of the sea-bed and subsoil over which that State is entitled to exercise sovereign rights.

Chapter 2
Design, construction and survey

2.1 General

2.1.1 As far as reasonable and practicable, a diving system should be designed to minimize human error and constructed so that the failure of any single component (determined, if necessary, by an appropriate risk assessment) should not lead to a dangerous situation.

2.1.2 Diving systems and components thereof should be designed for the conditions under which they are certificated to operate.

2.1.3 Materials for diving system components should be suitable for their intended use.

2.1.4 All components in a diving system should be designed, constructed and tested in accordance with international or national standards* recognized by the Administration or proprietary specifications acceptable to the Administration.

2.1.5 In the design of pressure vessels, including accessories such as doors, hinges, closing mechanisms and penetrators, the effects of rough handling and accidents should be considered in addition to design parameters such as pressure, temperature, vibration, operating and environmental conditions.

2.1.6 All components in a diving system should be so designed, constructed and arranged as to permit easy cleaning, disinfection, inspection and maintenance.

2.1.7 A diving system should include the control equipment necessary for safe performance of diving operations.

2.2 Surface compression chambers

2.2.1 A diving system should, as a minimum, include either one surface compression chamber with two separate compartments, or two interconnected separate chambers so designed as to permit ingress or egress of personnel while one compartment or chamber remains pressurized. All doors should be designed so that locking mechanisms, if provided, can be operated from both sides.

2.2.2 Where a surface compression chamber is to be used in circumstances which a person is intended to remain under pressure for a continuous period of more than 12 hours, it should be so arranged as to allow

* Such as those of a recognized classification society which has rules for diving systems acceptable to the Administration.

most divers to stand upright and to stretch out comfortably on their bunks. The smaller of the two compartments should be large enough for at least two persons. One of these compartments should be a living compartment.

2.2.3 The living compartment and other compartments intended to be used for decompression should have a lock through which provisions, medicine and equipment may be passed into the chamber while its occupants remain under pressure.

2.2.4 Locks should be designed to prevent accidental opening under pressure and, where necessary, interlocks should be provided for this purpose.

2.2.5 Each pressure compartment should have view ports to allow observation of all occupants from the outside.

2.2.6 A surface compression chamber should provide a suitable environment and facilities for the persons who use it, having regard to the type and duration of the diving operation. Where the chamber is intended to be occupied for more than 12 hours, toilet facilities should also be provided. Toilet facilities capable of discharging the waste to the outside should be fitted with suitable interlocks.

2.2.7 The diving system should be capable of allowing the safe transfer of a person under pressure from the diving bell to the surface compression chamber (and vice versa).

2.3 Diving bells

2.3.1 A diving bell should:

.1 be provided with adequate protection against mechanical damage during handling operation;

.2 be equipped with one extra lifting point designed to take the entire dry weight of the bell including ballast and equipment as well as the weight of the divers staying on in the bell;

.3 be equipped with means whereby each diver using the bell is able to enter and leave it safely as well as with means for taking an unconscious diver up into a dry bell;

.4 be fitted with a manifold at a suitable point close to the main lifting attachment which should include connections for the following services:

$\frac{3}{4}$ inch NPT (female) – for hot water

$\frac{1}{2}$ inch NPT (female) – for breathing mixture

The manifold should be clearly marked and suitably protected.

2.3.2 Diving bell doors should be so designed as to prevent accidental opening during normal operations. All doors should be so designed that locking mechanisms, if provided, can be operated from both sides.

2.3.3 A diving bell should provide a suitable environment and facilities for the persons who use it, having regard to the type and duration of the diving operation.

2.3.4 Each diving bell should have view ports that as far as practicable allow an occupant to observe divers outside the bell.

2.3.5 Diving bells should be so designed as to provide adequate space for the number of occupants envisaged, together with the equipment.

2.4 Other pressure vessels not intended for human occupancy

2.4.1 Special attention should be paid to the design and choice of material for the construction of pressure vessels containing oxygen.

2.4.2 Oxygen and gases with an oxygen volume percentage higher than 25% should be stored in bottles or pressure vessels exclusively intended for such gases.

2.5 Pipes, valves, fitting and hoses

2.5.1 Pipe systems should be so designed as to minimize the noise inside the diving bell and surface compression chamber during normal operation.

2.5.2 A surface compression chamber should be equipped with such valves, gauges and other fittings as are necessary to control and indicate the internal pressure and safe environment of each compartment from outside the chamber at a centralized position.

2.5.3 Valves, gauges and other fittings should be provided outside the bell as necessary to control and indicate the pressure and safe environment within the diving bell. The external pressure on the diving bell should also be indicated inside the bell.

2.5.4 All pipe penetrations on chambers should be fitted with two shutoff devices as close to the penetration as practicable. Where appropriate, one device should be a nonreturn valve.

2.5.5 All surface compression chambers and diving bells which may be pressurized separately should be fitted with overpressure alarms or pressure-relief valves. If pressure-relief valves are fitted, a quick-operating manual shutoff valve should be installed between the chamber and the

pressure-relief valve and should be wired opened with a frangible wire. This valve should be readily accessible to the attendant monitoring the operation of the chamber. All other pressure vessels and bottles should be fitted with a pressure-relief device.

2.5.6 Piping systems which may be subjected to a higher pressure than designed for should be fitted with a pressure-relief device.

2.5.7 All materials used in oxygen systems should be compatible with oxygen at the working pressure and flow rate.

2.5.8 The use of high-pressure oxygen piping should be minimized by the fitting of pressure-reducing devices, as close as practicable to the storage bottles.

2.5.9 Flexible hoses, except for umbilicals, should be reduced to a minimum.

2.5.10 Hoses for oxygen should, as far as practicable, be of fire-retardant construction.

2.5.11 Piping systems carrying mixed gas or oxygen under high pressure should not be arranged inside accommodation spaces, engine-rooms or similar compartments.

2.5.12 Exhaust lines should be fitted with an anti-suction device on the inlet side.

2.5.13 Gases vented from the diving system should be vented to the open air away from sources of ignition, personnel or any area where the presence of those gases could be hazardous.

2.5.14 All high-pressure piping should be well protected against mechanical damage.

2.5.15 Piping systems containing gases with more than 25% oxygen should be treated as systems containing pure oxygen.

2.5.16 Oxygen systems with pressure greater than 1.72 bar must have slow-opening shutoff valves except pressure-boundary shutoff valves.

2.6 Breathing gas supply, storage and temperature control

2.6.1 Each surface compression chamber and diving bell should be fitted with adequate equipment for supplying and maintaining the appropriate breathing mixtures to its occupants at all depths down to maximum operating depth. When adding pure oxygen to the chamber, a separate piping system should be provided.

2.6.2 In addition to the system mentioned in 2.6.1, each surface compression chamber and diving bell should contain a separately controlled built-in breathing system for oxygen, therapeutic gas or bottom-mix gas with at least one mask per occupant stored inside each separately pressurized compartment and means should be provided to prevent any dangerous accumulation of gases.

2.6.3 The diving bell should be designed with a self-contained breathing gas system capable of maintaining a satisfactory concentration of breathing gas for the occupants for a period of at least 24 hours at its maximum operating depth.

2.6.4 Oxygen bottles should be installed in a well-ventilated location.

2.6.5 Oxygen bottles should not be stored near flammable substances.

2.6.6 The diving system and breathing gas storage facilities should not be sited in machinery spaces if the machinery is not associated with the diving system. Where, due to the requirements of diving operations, systems are sited in hazardous areas, the electrical equipment should comply with the requirements for such equipment in hazardous areas. Diving systems should not be permitted in hazardous areas designated as zone 0.

2.6.7 A diving system should include adequate plant and equipment to maintain the divers in safe thermal balance during normal operations.

2.6.8 There should be means to maintain the divers within the diving bell in thermal balance in an emergency for at least 24 hours. Such requirements may be satisfied by the use of passive means carried in the bell.

2.6.9 For piping systems and gas storage bottles/pressure vessels the following colour code should be used:

Name	**Symbol**	**Colour code**
Oxygen	(O_2)	White
Nitrogen	(N_2)	Black
Air	(Air)	White and black
Carbon dioxide	(CO_2)	Grey
Helium	(He)	Brown
Oxygen–helium mix gas	(O_2–He)	White and brown

In addition, each bottle/pressure vessel should be marked with the name and symbol given above of the gases it contains. The marking and colour coding of the gas storage bottles should be visible from the valve end.

2.7 Handling system for diving bells

2.7.1 A diving system should be equipped with a main handling system to ensure safe transportation of the diving bell between the work location and the surface compression chamber.

2.7.2 The handling system should be designed with adequate safety factors considering the environmental and operating conditions, including the dynamic loads which are encountered while handling the diving bell through the air–water interface.

2.7.3 The handling system should enable smooth and easily controllable handling of the diving bell.

2.7.4 The lowering of diving bells under normal conditions should not be controlled by brakes, but by the drive system of the winches.

2.7.5 If the energy supply to the handling system fails, brakes should be engaged automatically.

2.7.6 In the event of single component failure of the main handling system, an alternative means should be provided whereby the bell can be returned to the surface compression chamber. In addition, provisions should be made for emergency retrieval of the bell if the main and alternative means fail. If this involves buoyant ascent, the bell should have sufficient stability to maintain a substantially upright position and means should be provided to prevent accidental release of the ballast weights.

2.7.7 Handling systems and mating devices should enable easy and firm connection or disconnection of a diving bell to a surface compression chamber, even under conditions where the support ship or floating structure is rolling, pitching or listing to predetermined degrees.

2.7.8 Where a power actuating system is used for mating operations, an auxiliary power actuating system or an appropriate means should be provided to connect a diving bell to a surface compression chamber in the event of failure of the normal power actuating system.

2.8 Interface between diving system and the ship or floating structure

2.8.1 The diving system and breathing gas facilities should be arranged in spaces or locations which are adequately ventilated and provided with suitable electric lighting.

2.8.2 When any part of the diving system is sited on deck, particular consideration should be given to providing reasonable protection from the sea, icing or any damage which may result from other activities on board the ship or floating structure.

2.8.3 Provision should be made to ensure that the diving system and auxiliary equipment are securely fastened to the ship or floating structure and that adjacent equipment is similarly secured. Consideration should be given to the relative movement between the components of the system. In addition, the fastening arrangements should be able to meet any required survival conditions of the ship or floating structure.

2.9 Fire prevention, detection and extinction

2.9.1 All materials and equipment used in connection with the diving system should be, as far as is reasonably practicable, of fire-retardant type in order to minimize the risk of fire and sources of ignition.

2.9.2 Spaces in the interior of ships or floating structures in which the diving system or its auxiliary equipment is carried should be provided with structural fire protection in a way similar to control stations* bounding main zones.

2.9.3 Interior spaces containing diving equipment such as surface compression chambers, diving bells, gas storage, compressors and control stands should be covered with an automatic fire detection and alarm system and a suitable fixed fire-extinguishing system.

2.9.4 Portable fire extinguishers of approved types and designs should be distributed throughout the space containing the diving system. One of the portable fire extinguishers should be stowed near the entrance to that space.

2.9.5 When pressure vessels are situated in enclosed spaces, a manually actuated water spray system having an application rate of 10 l/m^2 per minute of the horizontal projected area should be provided to cool and protect such pressure vessels in the event of external fire. When pressure vessels are situated on open decks, fire hoses may be considered as providing the necessary protection.

2.9.6 Each compartment in a surface compression chamber should have a suitable means of extinguishing a fire in the interior which would provide rapid and efficient distribution of the extinguishing agent to any part of the chamber.

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* *Control stations* as defined in regulation II-2/3 and referred to in regulation II-2/20 of the International Convention for the Safety of Life at Sea, 1974.

2.10 Electrical system

2.10.1 All electrical equipment and installation, including power supply arrangements, should be designed for the environment in which they will operate to minimize the risk of fire, explosion, electrical shock and emission of toxic gases to personnel, and galvanic action of the surface compression chamber or diving bell.

2.10.2 In the event of failure of the main source of electrical power supply to the diving system an independent source of electrical power should be available for the safe termination of the diving operation. It is admissible to use the ship's emergency source of electrical power as an emergency source of electrical power if it has sufficient electrical power capacity to supply the diving system and the emergency load for the vessel at the same time.

2.10.3 The alternative source of electrical power should be located outside the machinery casings to ensure its functioning in the event of fire or other casualty causing failure to the main electrical installation.

2.10.4 Each surface compression chamber and diving bell should have adequate means of normal and emergency lighting to allow an occupant to read gauges and operate the system within each compartment.

2.11 Control system

2.11.1 The diving system should be so arranged as to ensure that centralized control of the safe operation of the system can be maintained under all weather conditions.

2.11.2 As a minimum, facilities should be provided at the central control position to monitor the values of the following parameters for each occupied compartment:

Parameters	Compartments	
	Surface compression chamber	Diving bell
Pressure or depth[1]	•	•[2]
Temperature[1]	•	
Humidity	•	
Oxygen partial pressure[1]	•	•
CO_2 partial pressure	•	•

[1] These parameters should be indicated continuously.
[2] Pressure or depth both inside and outside the bell should be indicated.

2.11.3 Provision should be made within the bell for an independent means of monitoring oxygen and carbon dioxide levels.

2.12 Communications and relocation system

2.12.1 The communication system should be arranged for direct two-way communication between the control stand and

- diver in water
- diving bell
- each compartment of the chambers
- diving system handling positions
- dynamic positioning room
- bridge, ship's command centre or drilling floor.

2.12.2 Alternative means of communication with divers in the surface compression chamber and diving bell should be available in emergency.

2.12.3 Each surface compression chamber and diving bell should be connected to a speech unscrambler when used with gas systems including helium.

2.12.4 A self-contained through-water communication system should be provided for emergency communication with diving bells when operating under water.

2.12.5 A diving bell should have an emergency locating device with a frequency of 37.5 kHz designed to assist personnel on the surface in establishing and maintaining contact with the submerged diving bell if the umbilical to the surface is severed. The device should include the following components:

.1 *Transponder*

.1.1 The transponder should be provided with a pressure housing capable of operating to a depth of at least 200 m containing batteries and equipped with salt water activation contacts. The batteries should be of the readily available "alkaline" type and, if possible, be interchangeable with those of the diver and surface interrogator/receiver.

.1.2 The transponder should be designed to operate with the following characteristics.

Common emergency reply frequency	37.5 kHz
Individual interrogation frequencies:	
- channel A	38.5 $\pm$ 0.05 kHz
- channel B	39.5 $\pm$ 0.05 kHz

Receiver sensitivity	+15 dB referred to 1 μbar
Minimum interrogation pulse width	4 ms
Turnaround delay	125.7 $\pm$ 0.2 ms
Reply frequency	37.5 $\pm$ 0.05 kHz
Maximum interrogation rates:	
- more than 20% of battery life remaining	Once per second
- less than 20% of battery life remaining	Once per 2 seconds
Minimum transponder output power	85 dB referred to 1 μbar at 1 m
Minimum transducer polar diagram	-6 dB at $\pm 135^{\circ}$ solid angle, centred on the transponder vertical axis and transmitting towards the surface
Minimum listening life in water	10 weeks
Minimum battery life replying at 85 dB	5 days

.2 *Diver-held interrogator/receiver*

.2.1 The interrogator/receiver should be provided with a pressure housing capable of operating to a depth of at least 200 m with pistol grip and compass. The front end should contain the directional hydrophone array and the rear end the three-digit LED display readout calibrated in metres. Controls should be provided for "on/off receiver gain" and "channel selection". The battery pack should be of the readily available "alkaline" type and, if possible, be interchangeable with that of the interrogator and transponder.

.2.2 The interrogator/receiver should be designed to operate with the following characteristics:

Common emergency reply frequency	37.5 kHz
Individual interrogation frequencies:	
- channel A	38.5 kHz
- channel B	39.5 kHz
Minimum transmitter output power	85 dB referred to 1 μbar at 1 m

Transmit pulse	4 ms
Directivity	±15°
Capability to zero range on transponder	
Maximum detectable range	more than 500 m

2.12.6 In addition to the communication systems referred to above, a standard bell emergency communication tapping code should be adopted, as given below, for use between persons in the bell and rescue divers.

A copy of this tapping code should be displayed inside and outside the bell and also in the dive control room.

Bell emergency communication tapping code

Tapping code	Situation
3.3.3	Communication opening procedure (inside and outside)
1	Yes or affirmative or agreed
3	No or negative or disagreed
2.2	Repeat please
2	Stop
5	Have you got a seal?
6	Stand by to be pulled up
1.2.1.2	Get ready for through water transfer (open your hatch)
2.3.2.3	You will NOT release your ballasts
4.4	Do release your ballast in 30 minutes from now
1.2.3	Do increase your pressure
3.3.3	Communication closing procedure (inside and outside)

Chapter 3
Evacuation system

3.1 Evacuation

An evacuation system should be provided having sufficient capacity to evacuate all divers under pressure, in the event of the ship having to be abandoned, and should be in accordance with the provisions of this Code.*

* Refer to the Guidelines and specifications for hyperbaric evacuation systems adopted by the Organization by resolution A.692(17).

Appendix
Model form of Diving System Safety Certificate

DIVING SYSTEM SAFETY CERTIFICATE

(Official Seal)

Issued under the provisions of the
CODE OF SAFETY FOR DIVING SYSTEMS, 1995
(adopted by the IMO Assembly resolution A.831(19))

Name of ship . . . . . .

Official number of ship . . . . . .

Under the authority of the Government . . . . . .

. . . . . .
(full official designation of the country)

by . . . . . .
(full official designation of the competent person or organization authorized by the Administration)

Distinctive identification and its location for each main component . . . . . .
. . . . . .
. . . . . .
. . . . . .
. . . . . .
(number or other identification)

Date on which the diving system was certificated for the first time . . . . . .
. . . . . .

THIS IS TO CERTIFY:

1 That the above-mentioned system has been duly surveyed and tested in accordance with the applicable provisions of the Code of Safety for Diving Systems, 1995

2 That the survey showed that the design, construction, equipment, fittings, communication system, arrangements and materials of the system and the conditions thereof are in all respects satisfactory and that the system complies with the relevant provisions of the Code.

3 That the diving system is designed and constructed for a maximum operating depth of ....

4 That the diving system and its main components are designed in accordance with the following limiting operating parameters:

....

....

....

5 That, in accordance with section 1.4, the provisions of the Code are modified in respect of the system in the following manner:

This Certificate is valid until .... day of .... 19 . .

Issued at .... 19 . .
(place of issue of certificate)

The undersigned declares that he is authorized by the said Government to issue this certificate.

....
(Signature of official issuing the certificate and/or seal of issuing authority)

(Seal or stamp of issuing authority, as appropriate)

SURVEYS

THIS IS TO CERTIFY THAT, at a survey required by section 1.6 of the Code, this system was found to comply with the relevant provisions of the Code.

Annual survey

Place . . . . . Date . . . . . .
Signature and seal of issuing authority

Place . . . . . Date . . . . . .
Signature and seal of issuing authority

Place . . . . . Date . . . . . .
Signature and seal of issuing authority

Place . . . . . Date . . . . . .
Signature and seal of issuing authority

Place . . . . . Date . . . . . .
Signature and seal of issuing authority

Endorsement for the extension of the Certificate

The diving system fully complies with the relevant provisions of the Code and this Certificate shall, in accordance with paragraph 1.6.9 of the Code, be accepted as valid until . . . . . .

Signed . . . . . .
(Signature of authorized official)

Place . . . . . .

Date . . . . . .

(Seal or stamp of the Administration, as appropriate)

Resolution A.831(19)

Adopted on 23 November 1985

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety,

RECALLING ALSO that it adopted resolution A.536(13) on the Code of Safety for Diving Systems,

RECALLING FURTHER that, by resolution A.583(14), it adopted amendments to the Code in order to reflect the latest improvements in safety measures for diving systems,

NOTING that the Maritime Safety Committee, at its sixty-fifth session, approved amendments to resolution A.536(13) following a general revision of the Code,

RECOGNIZING the need for a revised text of the Code of Safety for Diving Systems which incorporates all the amendments approved since its original adoption, for easier implementation of its provisions,

HAVING CONSIDERED the recommendation made by the Maritime Safety Committee at its sixty-fifth session,

1. ADOPTS the Code of Safety for Diving Systems, 1995, set out in the annex* to the present resolution;

2. INVITES Governments concerned to:

   (a) take appropriate steps to apply the Code as early as possible;

   (b) consider the Code as a minimum international standard for the design, construction and survey of diving systems;

   (c) introduce the Code into national legislation; and

   (d) inform the Organization of measures taken with regard to the application of the Code;

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* See page 1.

3. AUTHORIZES the Maritime Safety Committee to amend the Code as necessary in the light of further developments and experience gained from the implementation of the provisions contained therein;

4. REVOKES resolutions A.536(13) and A.583(14).

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