

Ordinance on Safety and Health of Work under High Pressure

(Ministry of Labour Ordinance No. 40 of September 30, 1972)

(Last amended by: Ministry of Health, Labour and Welfare Ordinance No. 14 of 2018)

Pursuant to the provisions of the Industrial Safety and Health Act (Act No. 57 of 1972) and to implement said Act, the Ordinance for Prevention of Health Impediment due to High Pressure has been set forth as follows:

Chapter I General Provisions (Articles 1 and 1-2)

Chapter II Facilities

Section 1 Facilities for Work in Compressed Air Chambers (Articles 2 to 7-4)

Section 2 Facilities for Diving Work (Articles 8 and 9)

Chapter III Work management

Section 1 Operations Chief, etc. (Articles 10 to 12)

Section 2 Management of Work in Compressed Air Chambers (Articles 12-2 to 26)

Section 3 Management of Diving Work (Articles 27 to 37)

Chapter IV Medical Examinations and Prohibition of Employment of The Sick (Articles 38 to 41)

Chapter V Recompression Lock (Articles 42 to 46)

Chapter VI License

Section 1 License for Operations Chief for Work in Compressed Air Chamber (Articles 47 to 51)

Section 2 Diver's License (Articles 52 to 55)

Supplementary Provisions

Chapter I General Provisions

(Responsibilities of Employer)

Article 1 An employer shall endeavor to establish operation methods, improve working environment and take other necessary measures to prevent hazards or other health impairment including impairment due to compressed air, incurred by workers.

(Definitions)

Article 1-2 As used herein, the following terms shall have the meanings given below:

- (i) "High-pressure hazards" means decompression sickness due to high pressure, poisoning due to oxygen, nitrogen or carbon dioxide, or other health impairment due to high pressure.
- (ii) "Work in compressed air chambers" means work of operations in a compressed air chamber under Article 6(i) of the Order for Enforcement of Industrial Safety and Health Act (Cabinet Order No. 318 of 1972; hereinafter, "Order").
- (iii) "Diving work" means work under Article 20(ix) of the Order.
- (iv) "Work chamber" means a work chamber pressurized exceeding the atmospheric pressure for performing operations using the caisson method or other pneumatic engineering.
- (v) "Air-lock chamber" means a room in which a worker who engages in the work in compressed air chambers (hereinafter, "compressed air chamber worker") is treated with compression or decompression for entering or leaving a work chamber.
- (vi) "Inert gas" means a gas of nitrogen and/or helium.

Chapter II Facilities

Section 1 Facilities for Work in Compressed Air Chambers

(Air Volume of Work Chamber)

Article 2 The employer shall, when having a worker engage in work in a compressed air chamber, provide the work chamber with air volume of at least 4 m³ per worker who is actually engaging in the work in the compressed air chamber.

(Floor Area and Cubic Space of Air-Lock Chamber)

Article 3 The employer shall provide an air-lock chamber with a floor area and cubic space of at least 0.3 m² and 0.6 m³, respectively, per compressed air worker who has to be actually treated with compression or decompression in said air-lock chamber.

(Piping, etc., of Air Pipelines)

Article 4 (1) The employer shall provide air pipelines for supplying air to the work chamber or air-lock chamber of caissons or diving bells, such that said air pipelines lead to the work chamber or air-lock chamber without passing through a shaft.

(2) The employer shall, provide an air pipeline for supplying air to the work chamber, a check valve at a part proximity to the work chamber.

(Air Cleaning Equipment)

Article 5 The employer shall provide a device for cleaning the air to be supplied to the work chamber or air-lock chamber, between an air compressor and the work chamber or air-lock chamber.

(Exhaust Pipelines)

Article 6 (1) The employer shall provide each work chamber or air-lock chamber with exhaust pipelines dedicated to use for said each work chamber or air-lock.

(2) The exhaust pipelines for the purpose of decompression of a compressed air chamber worker in the air-lock chamber of caissons or diving bells shall be of an inside diameter not exceeding 53 mm.

(Pressure Gauge)

Article 7 (1) The employer shall, when a site for operating a valve or cock for the feeding of air to the work chamber has been arranged outside the caissons, diving bells, compressed shields, etc., provide a pressure gauge which indicates a gauge pressure (hereinafter, "pressure") level inside the work chamber.

(2) The employer shall, when the site of the preceding paragraph has been provided inside the caissons, diving bells, compressed shields, etc., have a worker who performs the work operating a valve or cock for regulating the feeding of air to the work chamber carry a portable pressure gauge.

(3) The employer shall, when a site for operating a valve or cock for applying compression or decompression to a compressed air chamber worker has been provided outside the air-lock chamber, provide a pressure gauge which indicates a pressure level within the air-lock chamber.

(4) The employer shall, when the site of the preceding paragraph has been provided inside the air-lock chamber, have a worker who performs the work operating a valve or cock for regulating the feeding of air to the air-lock chamber or the exhausting of air from the air-lock chamber carry a portable pressure gauge.

(5) The pressure gauge of any of the preceding paragraphs shall be of those with a scale of not more than 0.02 MPa.

(6) The employer shall, when performing a work in compressed air chambers (limited to a work in

compressed air chambers pressurized at least 0.1 MPa; the same applies to Article 12-2, Article 20-2 and Article 42(1)), provide the air-lock chamber with a self-recording pressure gauge.

(Automatic Warning Device for Abnormal Temperature)

Article 7-2 The employer shall, in case of an abnormal increase in the temperature of air discharged from the air compressor to be supplied to the work chamber and air-lock chamber or air which has passed through a cooling device attached to said air compressor, provide an automatic warning device to promptly notify it to the worker who operates said air compressor or any other concerned people.

(Observation Windows, etc.)

Article 7-3 The employer shall provide a means for confirming the conditions inside the air-lock chamber from outside, such as an observation window for making it possible to observe inside the air-lock chamber

(Evacuation Equipment, etc.)

Article 7-4 The employer shall, when working in a compressed air chamber, provide personal respiration protective equipment, fiber ropes and any other equipment necessary for having the compressed air chamber workers evacuate or be rescued in case of emergency.

Section 2 Facilities for Diving Work

(Air Reservoirs)

Article 8 (1) The employer shall provide a worker who engages in diving work (hereinafter, "diving worker") with an air reservoir to regulate the volume of fed air (when feeding air by an air compressor, per diving worker who receives air fed by said air compressor) and another air reservoir to store air needed in case of an accident (hereinafter, "backup air reservoir").

(2) The backup air reservoir shall meet the following requirements:

- (i) Air pressure inside the backup air reservoir is regularly at least 1.5 times as high as the pressure levels at the maximum diving depth; and
- (ii) The inside volume of the backup air reservoir is at least the value obtained by a calculation using a method specified by the Minister of Health, Labour and Welfare.

(3) Notwithstanding paragraph 1, when the air reservoir to regulate the volume of fed air of paragraph 1 meets the requirements for the backup air reservoir specified in the items of the preceding paragraph, or when the employer has a diving worker carry a backup cylinder (which is a cylinder storing air needed if an accident occurs) which meets said requirements, the employer is not required to provide a backup air reservoir.

(Air Cleaning Equipment, Pressure Gauge and Flow Meter)

Article 9 The employer shall, when feeding air to the diving worker using the air compressor, provide a device to clean the air to be fed, or, when having the diving worker use a pressure regulator, provide a pressure gauge for measuring air-feeding pressure, or, when neither of these is applicable, provide a flow meter for measuring a volume of feeding air.

Chapter III Work Management

Section 1 Operations Chief, etc.

(Operations Chief)

Article 10 (1) The employer shall, with regard to the work in compressed air chambers of Article 6(i) of

the Order, appoint one operations chief for work in compressed air chamber per work chamber, from among those who have a license for operations chief for work in compressed air chamber.

- (2) The employer shall have the operations chief for work in compressed air chamber perform the following matters:
- (i) Making a decision on how to carry out the work, and supervising directly compressed air chamber workers;
 - (ii) Inspecting devices for measuring concentrations of oxygen, carbon dioxide and harmful gases (including carbon monoxide, methane, hydrogen sulfide, and other gases other than carbon dioxide, which may induce explosion, fire or other risks, or health impairment; the same applies hereinafter);
 - (iii) Checking the number of compressed air chamber workers, when having said workers enter or leave the work chamber;
 - (iv) Keeping the pressure within the work chamber at an appropriate level by communicating with a worker who engages in the work of operating valves or cocks to regulate the volumes of the air to be fed to the said work chamber;
 - (v) Taking measures by communicating with a worker who performs the work operating a valve or cock for regulating the feeding of air to the air-lock chamber or the exhausting of air from the air-lock chamber, so that compression or decompression applied to a compressed air chamber worker is performed in compliance with the provisions of Article 14 or 18; and
 - (vi) Providing necessary measures in response to any abnormality incurred by a compressed air chamber worker in the work chamber or air-lock chamber.

(Special Education)

Article 11 (1) The employer shall, when having a worker engage in any of the following works, provide special education for said work:

- (i) Work operating the air compressor for supplying air to the work chamber and air-lock chamber;
 - (ii) Work operating valves or cocks for regulating air supply to the work chamber;
 - (iii) Work operating valves or cocks for regulating air fed to or exhausted from the air-lock chamber;
 - (iv) Work operating valves or cocks which regulate the air fed to the diving worker;
 - (v) Work operating the recompression lock; and
 - (vi) Work in compressed air chambers.
- (2) The special education of the preceding paragraph shall be provided with respect to the works given in the left column on the curriculum given in the right column of the table below:

Work	Curriculum
Work operating the air compressor for supplying air to the work chamber and air-lock chamber	<ul style="list-style-type: none"> (i) Matters concerning knowledge of pneumatic engineering; (ii) Matters concerning structure and handling of air-feeding facilities; (iii) Matters concerning knowledge of high-pressure hazards; (iv) Relevant laws and regulatory provisions; and (v) Skill practice concerning operation of an air compressor.
Work operating valves or cocks for regulating air supply to the work chamber	<ul style="list-style-type: none"> (i) Matters concerning knowledge of pneumatic engineering; (ii) Matters concerning air feeding and air exhausting; (iii) Matters concerning knowledge of high-pressure hazards; (iv) Relevant laws and regulatory provisions; and (v) Skill practice of regulating air feeding.
Work operating valves or cocks for regulating air fed to	<ul style="list-style-type: none"> (i) Matters concerning knowledge of pneumatic engineering; (ii) Matters concerning compression and decompression and how to

or exhausted from the air-lock chamber	ventilate; (iii) Matters concerning knowledge of high-pressure hazards; (iv) Relevant laws and regulatory provisions; (v) Skill practice concerning compression and decompression, and ventilation.
Work operating valves or cocks which regulate the air fed to the diving worker	(i) Matters concerning knowledge relating to diving work; (ii) Matters concerning air feeding; (iii) Matters concerning knowledge of high-pressure hazards; (iv) Relevant laws and regulatory provisions; and (v) Skill practice of regulating air feeding.
Work operating the recompression lock	(i) Matters concerning knowledge of high-pressure hazards; (ii) Matters concerning the emergency recompression technique; (iii) Matters concerning the emergency resuscitation technique; (iv) Relevant laws and regulatory provisions; and (v) Skill practice of operating an recompression lock and the emergency resuscitation technique.
Work in compressed air chambers	(i) Matters concerning knowledge of pneumatic engineering; (ii) Matters concerning facilities of pneumatic engineering; (iii) Matters concerning the prevention of rapid pressure drop, fire, etc.; (iv) Matters concerning knowledge of high-pressure hazards; and (v) Relevant laws and regulatory provisions.

(3) Besides matters set forth in Articles 37 and 38 of the Ordinance on Industrial Safety and Health (Ministry of Labour Ordinance No. 32 of 1972; hereinafter, "Ordinance") and in the preceding paragraph, matters necessary for the implementation of the special education of said paragraph shall be specified by the Minister of Health, Labour and Welfare.

(Diver)

Article 12 The employer shall not have any person engage in diving work unless the person has a diver's license.

Section 2 Management of Work in Compressed Air Chambers

(Work Plan)

Article 12-2 (1) The employer shall, when carrying out the work in compressed air chambers, set forth a plan for each work in compressed air chambers (hereinafter in this Article, "work plan") in advance of the work and carry out the work according to said work plan, for the prevention of high-pressure hazards.

(2) The work plan shall describe the following matters:

- (i) Composition of the components of the gas to be fed to the work chamber or air-lock chamber;
- (ii) A period of time from the commencement of compression to the commencement of decompression;
- (iii) The maximum pressure in said work in the compressed air chamber;
- (iv) Rates of compression and decompression; and
- (v) A pressure at which decompression is stopped, and a time period during which decompression is stopped under said pressure.

(3) The employer shall, when a work plan has been set forth, disseminate the work plan to concerned workers for the matters listed in the preceding paragraph.

(Prohibition of Entry)

Article 13 The employer shall prohibit entry into the air-lock chamber or the work chamber by persons other than those necessary to perform the work in the chamber, and post such prohibition on an easily viewable place outside the caissons, diving bells, compressed shields, etc.

(Rate of Compression)

Article 14 The employer shall, when applying compression to a compressed air chamber worker in the air-lock chamber, carry out the compression at a rate not exceeding 0.08 MPa/min.

(Limits of Partial Pressure of Gases)

Article 15 The employer shall, for the prevention of health impairment of a compressed air chamber worker due to oxygen, nitrogen or carbon dioxide, provide air feeding to the work chamber or air-lock chamber, ventilation or other necessary measures so that partial pressures of the gases listed in the items below are within the range of partial pressures as specified in the respective items in the work chamber and the air-lock chamber:

- (i) Oxygen: 18 kPa or more and 160 kPa or less (provided, however, that, when applying decompression to a compressed air chamber worker in the air-lock chamber, 18 kPa or more and 220 kPa or less.)
- (ii) Nitrogen: 400 kPa or less
- (iii) Carbon dioxide: 0.5 kPa or less

(Oxygen Exposure Limit)

Article 16 The employer, for the prevention of health impairment of a compressed air chamber worker due to oxygen, provide air feeding to the work chamber or air-lock chamber or other necessary measures so that oxygen exposure calculated by a method specified by the Minister of Health, Labour and Welfare with respect to a compressed air chamber worker does not exceed a value specified by the Minister of Health, Labour and Welfare.

(Control of Harmful Gases)

Article 17 The employer shall, for the prevention of hazards and health impairment of a compressed air chamber worker in the work chamber due to harmful gases, provide ventilation, measurement of harmful gases or other necessary measures.

(Rate of Decompression, etc.)

Article 18 (1) The employer shall, when applying decompression to a compressed air chamber worker in the air-lock chamber, carry out as prescribed below:

- (i) Rate of decompression shall not exceed 0.08 MPa/min; and
- (ii) With respect to all of the human body tissue compartments specified by the Minister of Health, Labour and Welfare (hereinafter in this Item, "half-saturated tissue") with an interval specified by the Minister of Health, Labour and Welfare, determine a pressure at which decompression stops and a time during which decompression stops under said pressure such that the partial pressure of (a.) below does not exceed the partial pressure of (b.) below, and stop decompression for at least said time:
 - a. Partial pressure of inert gas present within said half-saturated tissue which has been calculated by a method specified by the Minister of Health, Labour and Welfare; and

- b. Maximum partial pressure of inert gas allowable by said half-saturated tissue which has been calculated by a method specified by the Minister of Health, Labour and Welfare.
- (2) The employer shall not have any person who has undergone decompression engage in heavy-load work, for a period of 14 hours from the completion of said decompression.

(Exceptions to Provisions on Decompression, etc.)

Article 19 (1) The employer may, when having a compressed air chamber worker evacuate in an accident or be rescued due to health impairment, increase the rate of decompression as provided for in the preceding Article or reduce the time for stopping decompression as provided for in the preceding Article within the limits of necessity.

- (2) The employer shall, when the rate of decompression has been increased or the time for stopping decompression has been reduced according to the provision of the preceding paragraph, have said compressed air chamber worker enter into the recompression lock or air-lock chamber promptly after the evacuation or rescue, and increase the pressure applied to said worker up to the pressure equal to that of the work in compressed air chambers.
- (3) The provision of Article 14 shall apply mutatis mutandis to the rate of applying compression to the worker according to the preceding paragraph.

(Measures During Decompression)

Article 20 (1) The employer shall, when applying decompression to a compressed air chamber worker in the air-lock chamber, provide the following measures:

- (i) The illuminance at the surface of the floor of the air-lock chamber shall be at least 20 lux;
 - (ii) If the temperature of in the air-lock chamber is 10 °C or less, have the compressed air chamber worker use a blanket or other appropriate gear for keep the body warm.
 - (iii) If the time required for decompression exceeds one hour, have the compressed air chamber worker use a chair or other instrument for rest.
- (2) The employer shall, when applying decompression to a compressed air chamber worker in the air-lock chamber, fully inform said compressed air chamber worker of the time required for said decompression in advance.

(Recording, etc. of Work Conditions)

Article 20-2 The employer shall prepare a document recording the matters listed in Article 12-2(2) and a document describing the name of the compressed air chamber worker and time and date of decompression for each of the work in compressed air chambers, and keep these documents for a period of five years.

(Communication)

Article 21 (1) The employer shall, when carrying out a work in compressed air chambers, have a person present continuously in the vicinity of the air-lock chamber for communication or other necessary measures between a compressed air chamber worker and a person who operates the air compressor (hereinafter in this Article, "contact person").

- (2) The employer shall provide communication devices for enabling each of the compressed air chamber worker and a person who operates the air compressor to speak to the contact person.
- (3) The employer shall set forth a method for enabling communication in case of a failure of the communication devices of the preceding paragraph, and post said method on an easily viewable place for the compressed air chamber worker, the person who operates the air compressor, and the contact person.

(Inspection and Repair of Facilities)

Article 22 (1) The employer shall, when carrying out a work in compressed air chambers, inspect facilities prescribed below at least once in the interval prescribed below, and, if it has been found that any hazards or health impairment may occur on a compressed air chamber worker, provide repair or other necessary measures:

- (i) The air pipelines of Article 4, the exhaust pipelines of Article 6 and the communication devices of the preceding Article, (2): One day
 - (ii) The valves or cocks for regulating the feeding of air to the work chamber and the air-lock chamber: One day
 - (iii) The valves or cocks for regulating the exhausting of air from the work chamber and the air-lock chamber: One day
 - (iv) The cooling device attached to the air compressor for supplying air to the work chamber and the air-lock chamber: One day
 - (v) The equipment of Article 7-4: One day
 - (vi) The automatic warning device of Article 7-2: One week
 - (vii) The air compressor for supplying air to the work chamber and the air-lock chamber: One week
 - (viii) The pressure gauge of Article 7 or Article 26: One month
 - (ix) The device for cleaning air of Article 5: One month
 - (x) Circuits provided in the caissons, the diving bells, the compressed shields, etc.: One month
- (2) The employer shall, when having carried out the inspection and repaired or provided other necessary measures according to the preceding paragraph, record a summary thereof for each time, and keep the record for a period of three years.

(Inspection of Air-feeding Facilities Before Use)

Article 22-2 The employer shall, when using air-feeding facilities for the first time or using them again after disassembling them or making modifications on them or after a non-use period of at least one month, inspect functions of the air-feeding facilities to make sure that there is no abnormality. The employer shall not use the air-feeding facilities before the completion of said inspection.

(Measures for Responding to Accident)

- Article 23 (1) The employer shall, when hazards or health impairment are likely to be incurred by a compressed air chamber worker due to a failure of the air-feeding facilities, flooding or other accidents, have the compressed air chamber worker evacuate the caissons, diving bells, compressed shields, etc.
- (2) The employer shall, in the case of the preceding paragraph, inspect as to whether there is any abnormality in the air-feeding facilities, whether there is any abnormal sinking of the caissons, etc., whether there is any tilting in the facilities and other matters, and, unless it has been confirmed that hazards or health impairment are not likely to be incurred by the compressed air chamber worker, shall not let a person, other than those who are particularly assigned, enter into the caissons, diving bells, compressed shields, etc.

(Measures for Submerging by Exhausting Air)

- Article 24 (1) The employer shall, when causing caissons to submerge by exhausting air from the work chamber, have a compressed air chamber worker evacuate the caissons.
- (2) The employer shall, in the case of the preceding paragraph, inspect as to whether there is flooding, or whether there is releasing of harmful gases and other matters, and, unless it has been confirmed that hazards or health impairment are not likely to be incurred by the compressed air chamber worker, shall not let a person, other than those who are particularly assigned, enter into the caissons.

(Measures After Blasting Operations)

Article 25 The employer shall not, when blasting operations have been carried out in the work chamber, have a compressed air chamber worker enter into the chamber until air inside the work chamber is resumed to the state before blasting.

(Prevention of Burns, etc.)

Article 25-2 (1) The employer shall, when carrying out a work in compressed air chambers, besides fully informing workers of risks of burning burnables under a pressure exceeding the atmospheric pressure, provide the following measures with respect to caissons, diving bells and compressed shields, for the prevention of burns and other hazards of a compressed air chamber worker:

- (i) For lights, use lights with guards or other types of lights that are not likely to ignite burnables due to a damaged bulb;
 - (ii) For circuit switches, use those that do not throw sparks or arcs around; and
 - (iii) For heaters, use those that are not likely to serve as an ignition source for burnables due to elevated temperature.
- (2) The employer shall not, when carrying out a work in compressed air chambers, perform welding, cutting, and other work using either fire or arc (hereinafter in this Article, "welding works") inside the caissons, diving bells, compressed shields, etc.; provided, however, that this shall not apply to the case where welding works are inevitable due to the characteristics of the operations and are performed at a place under a pressure less than 0.1 MPa, or where welding works are carried out at a place specified by the Minister of Health, Labour and Welfare.
- (3) The employer shall, when carrying out a work in compressed air chambers, prohibit workers to bring fire or matches, lighters or other goods which may catch fire into the caissons, diving bells, compressed shields, etc., and post said prohibition on an easily viewable place on the exterior of the air-lock chamber. However, in the case where welding works are inevitable due to the characteristics of the operations and are performed at a place under a pressure less than 0.1 MPa, or where welding works are carried out at a place specified by the Minister of Health, Labour and Welfare according to the preceding paragraph, fire or matches, lighters or other goods which may catch fire which are necessary for said welding works may be brought into the caissons, diving bells, compressed shields, etc.

(Limits concerning Digging Down Cutting Edge)

Article 25-3 The employer shall not, to prevent hazards of a compressed air chamber worker due to rapid sinking of the caissons, dig down the cutting edge of the caissons deeper than 50 cm.

(Equipment Carried by Operations Chief for Work in Compressed Air Chamber)

Article 26 The employer shall have the operations chief for work in compressed air chamber carry a portable pressure gauge, a flashlight, a measurement device for measuring concentrations of oxygen, carbon dioxide and harmful gases, and signal equipment in case of emergency.

Section 3 Management of Diving Work

(Application mutatis mutandis of Work Plan, etc.)

Article 27 The provisions of Articles 12-2 and 20-2 shall apply mutatis mutandis to diving works (limited to diving works in a depth of 10 m or more; the same applies in Article 42(1)), and the provisions of Articles 15, 16 and 18 shall apply mutatis mutandis to diving workers. In this case, the terms in the left column of the table below shall be replaced with the terms in the right column thereof,

respectively:

Article 12-2(1)	work in compressed air chamber	diving work
Article 12-2(2)(i)	fed to the work chamber or air-lock chamber	fed to the diving worker, or filled in a cylinder
Article 12-2(2)(ii)	the commencement of compression	the commencement of descending
	the commencement of decompression	the commencement of ascending
Article 12-2(2)(iii)	pressure	pressure at the maximum depth
Article 12-2(2)(iv)	compression and decompression	descending and ascending
Article 12-2(2)(v)	A pressure at which decompression is stopped	A pressure at the depth at which the ascending is stopped
	a time period during which decompression is stopped	a time period during which ascending is stopped
Article 15	in the work chamber and the air-lock chamber	at the time that the diving worker inhales
	air feeding to the work chamber or air-lock chamber, ventilation	air feeding to the diving worker, air supply from a cylinder
Article 15(i)	applying decompression to a compressed air chamber worker in the air-lock chamber	having the diving worker ascend while providing necessary measures for preventing drowning
Article 16	air feeding to the work chamber or air-lock chamber	air feeding to the diving worker, air supply from a cylinder
Title of Article 18	Decompression	Ascending
Article 18(1)	applying decompression to a compressed air chamber worker in the air-lock chamber	having the diving worker ascend
Article 18(1) (i)	decompression	ascending
	0.08 MPa	10 m
Article 18(1)(ii)	a pressure at which decompression stops	a pressure at a depth at which ascending is stopped
	a time during which decompression stops	a time during which ascending is stopped
	stop decompression	stop ascending
Article 18(2)	decompression	ascending
Article 20-2	listed in Article 12-2(2)	listed in Article 12-2(2) which apply mutatis mutandis in Article 27 with necessary replacements
	the compressed air chamber worker	the diving worker

(Amount and Pressure of Feeding Air)

Article 28 (1) The employer shall, when feeding air to a diving worker by an air compressor or manual air pump, set an amount of feeding air under the pressure at the depth where the diving worker is present to at a rate of at least 60 L/min for each diving worker.

(2) Notwithstanding the provision of the preceding paragraph, the employer shall, when having a diving worker use a pressure regulator, use an air compressor capable of performing air feeding, for each diving worker, at a rate of at least 40 L/min at the depth where the diving worker is present, and set an air-feeding pressure to at least the pressure obtained by adding 0.7 MPa to the pressure at the depth where the diving worker is present.

(Diving Work Carried Out with Air Supplied from Cylinder)

Article 29 The employer shall, when having a diving worker to be supplied with air from a cylinder (except for those emergency use; the same applies in Articles 34, 36 and 37 below) which the diving worker carries, provide the following measures:

- (i) Inform the diving worker of the actual air-supplying capacity of the cylinder used for the diving work, immediately before the diving worker starting descending; and
- (ii) Provide a person for monitoring whether there is any abnormality present in the diving worker.

(Pressure Regulator)

Article 30 The employer shall, when having the diving worker be supplied with air from a cylinder filled with air under a pressure 1 MPa or more, have the diving worker use a pressure regulator employing a two-step or more decompression system.

Article 31 Deleted.

(Special Provision for Ascending, etc.)

Article 32 (1) The employer may, when having a diving worker ascend due to an accident, increase the rate of ascending, within the limits of necessity, the rate of ascending specified in Article 18(1)(i) applied mutatis mutandis in Article 27 with necessary replacements, or reduce the time for stopping ascending is stopped specified in Item (ii) of said Article 18(1).

(2) The employer shall, when the rate of ascending has been increased or the time for stopping ascending has been reduced according to the preceding paragraph, have the diving worker enter into the recompression lock promptly after the ascending, and increase the pressured applied to the diving worker up to the pressure equal to that in the maximum depth in the diving work, or have the diving worker descend again until the maximum depth in the diving work.

(3) The provision of Article 14 shall apply mutatis mutandis to the rate of compression in the case that the diving worker is entered into the recompression lock to apply compression according to the provision of the preceding paragraph.

(Life Line)

Article 33 (1) The employer shall, when carrying out a diving work, provide a life line to be used by diving workers for descending and ascending and have the diving workers use it.

(2) The employer shall attach to the life line of the preceding paragraph a wooden tag or fabric or the like indicating the depth, every three meters.

(Inspection and Repair of Facilities, etc.)

Article 34 (1) The employer shall, when carrying out a diving work, inspect diving equipment prescribed

below prior to the diving, and, if it has been found that any hazards or health impairment may occur on a diving worker, provide repair or other necessary measures, according to the diving works prescribed below, respectively:

- (i) Diving work using air feeding by an air compressor or manual air pump: Diving apparatus, air pipelines, signal ropes, life line and pressure regulator.
 - (ii) Diving work carried out by receiving air fed by a cylinder (except cylinders carried by diving workers): Diving apparatus, air pipelines, signal ropes, life line and the pressure regulator of Article 30.
 - (iii) Diving work carried out by receiving air fed by a cylinder carried by diving workers: Diving apparatus and the pressure regulator of Article 30.
- (2) The employer shall, when carrying out a diving work, inspect facilities prescribed below at least once in the interval prescribed below, and, if it has been found that any hazards or health impairment may occur on a diving worker, provide repair or other necessary measures, according to the diving works prescribed below, respectively:
- (i) Diving work using air feeding by an air compressor or manual air pump:
 - a. Air compressor or manual air pump: One week
 - b. The device to clean the air of Article 9: One month
 - c. The hydro barometer of Article 37: One month
 - d. The hydro watch of Article 37: Three months
 - e. The flow meter of Article 9: Six months
 - (ii) Diving work carried out by receiving air fed by a cylinder:
 - a. The hydro barometer of Article 37: One month
 - b. The hydro watch of Article 37: Three months
 - c. Cylinder: Six months
- (3) The employer shall, when having carried out the inspection and repaired or provided other necessary measures according to the preceding two paragraphs, record a summary thereof for each time, and keep the record for a period of three years.

Article 35 Deleted.

(Contact Person)

Article 36 The employer shall, when carrying out a diving work using air feeding by an air compressor or manual air pump or a diving work carried out by receiving air fed by a cylinder (except cylinders carried by diving workers), have a person present for communication with diving workers (in the next Article, "contact person") for every two or less diving workers, and have said person perform the following matters:

- (i) Communicate with the diving workers, and thereby to have them perform descending and ascending appropriately;
- (ii) Communicate with the person who engages in the work of operating valves or cocks for regulating the feeding of air to the diving workers, and thereby to have said person to feed air in an amount necessary for the diving workers;
- (iii) Promptly contact the diving workers, if there is a risk of hazards or health impairment on the diving workers due to a failure of the air-feeding facilities or other accidents;
- (iv) In the case of a diving work carried out by using a helmet-type diving apparatus, confirm that the helmet of the diving workers are securely connected to the pedestal immediately before starting descending.

(Devices, etc. to be Carried by Diving Workers)

- Article 37 (1) The employer shall, when carrying out a diving work using air feeding by an air compressor or manual air pump or a diving work carried out by receiving air fed by a cylinder (except cylinders carried by diving workers), have diving workers carry signal ropes, hydro watch, hydro barometer and a sharp knife. However, in the case where diving workers and the contact person have been made to be able to communicate each other by communication devices, the employer may have the diving workers not to carry signal ropes, hydro watch and hydro barometer.
- (2) The employer shall, when carrying out a diving work which is carried out by receiving air fed by a cylinder carried by a diving worker, have the diving worker carry a hydro watch, a hydro barometer and a sharp knife and put on a lifejacket or buoyancy controller.

Chapter IV Medical Examinations and Prohibition of Work of the Sick

(Medical Examinations)

- Article 38 (1) The employer shall carry out a medical examination by the physician for the items listed below, on a worker who regularly engages in work in compressed air chambers or diving work (hereinafter, "work under high pressure"), when said worker is employed or transferred to said work, and also periodically at an interval of six months after starting said work:
- (i) Checking of past history and previous experiences in work under high pressure;
 - (ii) Examination of subjective or objective symptoms such as articular pain, waist pain, pain in lower extremities, ear ringing, etc.;
 - (iii) Examination of motor functions of upper and lower extremities;
 - (iv) Examination of the eardrum and hearing acuity;
 - (v) Measurement of blood pressure, and examination of urinary sugar and protein levels; and
 - (vi) Measurement of pulmonary capacity.
- (2) The employer shall, if the physician finds it necessary as a result of the medical examinations of the preceding paragraph, have the worker receive additional medical examinations of the following items by the physician:
- (i) Checking of working conditions;
 - (ii) Pulmonary function test;
 - (iii) Electrocardiographic examination; and
 - (iv) Examination into articles with direct radiography.

(Results of Medical Examinations)

Article 39 The employer shall, based on the medical examinations of the preceding Article (including medical examinations received by the worker in the proviso to Article 66(5) of the Act; in the next Article, "medical examinations for work under high pressure"), prepare a medical examination card for each individual for the workers engaging in the work under high pressure (Form 1), and keep the card for a period of five years.

(Hearing of Advice by Physician, etc., on Results of Medical Examinations)

- Article 39-2 A hearing of the advice by a physician pursuant to the provision of Article 66-4 of the Act, based on the results of medical examinations for work under high pressure shall be carried out as prescribed as follows:
- (i) To carry out within three months from the day on which the medical examinations for work under high pressure were implemented (in the case of proviso to Article 66(5) of the Act, from the day on which said worker submitted the document certifying the results of the medical examinations to the employer); and
 - (ii) To describe the advice of the physician in the personal card of the medical examinations for

work under high pressure.

- (2) The employer shall, if the physician requests to provide information on the work of a worker which is necessary for the hearing of the advice of the preceding paragraph, provide it promptly.

(Notice of Results of Medical Examinations)

Article 39-3 The employer shall notify, without delay, a worker who has undergone a medical examination of Article 38 of the results of the medical examination.

(Report of Results of Medical Examinations)

Article 40 The employer shall, when having implemented a medical examination of Article 38 (limited to periodical ones), submit, without delay, a report of the results of medical examinations for work under high pressure (Form 2) to the Chief of the competent Labour Standards Inspection Office who has the jurisdiction over the address of the service of the employer.

(Prohibition of Work of the Sick)

Article 41 The employer shall prohibit any workers who have developed any of the following diseases from engaging in work under high pressure for a period required by the physician:

- (i) Decompression illness and other diseases due to high pressure or its aftereffects;
- (ii) Pulmonary tuberculosis, and other respiratory tuberculosis, or acute infections in the upper respiratory tract, pneumoconiosis, emphysema of the lungs, and other diseases of the respiratory system;
- (iii) Anemia, valvular disease of the heart, sclerosis of the coronary arteries, hypertension, and other diseases in the blood or circulatory systems;
- (iv) Psychoneurosis, chronic alcoholism, neuralgia, and other psychoneurotic diseases;
- (v) Meniere's disease, or otitis media and other otological diseases involving stricture of the auditory canal;
- (vi) Arthritis, rheumatism, and other diseases in the organs of locomotion; and
- (vii) Asthma, excessive obesity, Basedow's disease or other allergic diseases; endocrine disorder, disorder of metabolism, or nutrition diseases.

Chapter V Recompression Lock

(Installation)

Article 42 (1) The employer shall, when carrying out a work in compressed air chambers or diving work, install a recompression lock necessary to provide a first-aid for a compressed air chamber worker or diving worker, or provide measures for allowing the use thereof.

- (2) The employer shall, when installing a recompression lock, avoid a place falling under any of the following items:

- (i) Places in which dangerous substances (which mean dangerous substances listed in Appended Table 1 of the Order; the same applies hereinafter), explosives or a large amount of combustible substances are handled or stored, and vicinities of these;
- (ii) Places which may cause floods, snowslide, or landslide.

(Prohibition of Entry)

Article 43 The employer shall prohibit a person other than those who need to enter from entering the place in which a recompression lock has been installed and a place in which the recompression lock is operated, and post these prohibitions on an easily viewable place.

(Use of Recompression Lock)

Article 44 (1) The employer shall use a recompression lock as prescribed below:

- (i) Before starting a work of each day, inspect operating conditions of the air-feeding facilities, air-exhausting facilities, communication devices and a warning device of the recompression lock, and if any abnormality has been found, immediately repair or replace;
 - (ii) When carrying out compression, do not use pure oxygen;
 - (iii) Except when it is necessary for entering or leaving, keep the doors between the main chamber and the antechamber closed and keep the pressure inside these chambers equal; and
 - (iv) Have a person who operates the recompression lock keep monitoring the conditions of the compression and decompression and whether there is any abnormality.
- (2) The employer shall, when having used the recompression lock, prepare a document recording conditions of the compression and decompression for each use, and keep the document for a period of five years.

(Inspection)

Article 45 (1) The employer shall inspect the recompression lock at the time of installation and, subsequently, once in an interval of not exceeding one month, for the matters prescribed below, and if any abnormality has been found, immediately repair or replace:

- (i) Operational conditions of the air-feeding facilities and the air-exhausting facilities;
 - (ii) Operational conditions of communication devices and warning devices;
 - (iii) Any short circuits or leakage of electricity; and
 - (iv) Any damaged electric mechanical equipment or wirings or any other abnormalities.
- (2) The employer shall, when having carried out the inspection pursuant to the preceding paragraph, record the results thereof, and keep the record for a period of three years.

(Prohibition of Bringing In Dangerous Substances)

Article 46 The employer shall prohibit bringing dangerous substances or other substances which may catch fire or explode or may serve as an ignition source for burnables due to elevated temperature into the recompression lock, and post the prohibition at the entrance of the recompression lock.

Chapter VI License

Section 1 License for Operations Chief of Work in Compressed Air Chamber

(Person Qualified for License)

Article 47 A license for operations chief of work in compressed air chamber shall be issued by the Director of the Prefectural Labour Bureau to a person as specified below:

- (i) A person who has engaged in a work in compressed air chambers for at least two years and has passed a license examination for operations chief of work in compressed air chamber; or
- (ii) Other person specified by the Minister of Health, Labour and Welfare.

(Disqualification for the License)

Article 48 The person prescribed by the Ordinance of the Ministry of Health, Labour and Welfare set forth in Article 72(2)(ii) of the Act pertaining to the license for operations chief of work in compressed air chamber shall be under 20 years of age.

Article 49 Deleted.

(Subjects of Examination, etc.)

Article 50 A license examination for operations chief of work in compressed air chamber consists of an academic test with respect to the subjects prescribed below:

- (i) Pneumatic engineering;
- (ii) Air feeding and air exhausting;
- (iii) High-pressure hazards; and
- (iv) Relevant laws and regulatory provisions.

(Details of License Examination)

Article 51 In addition to those set forth in Article 71 of the Ordinance and the preceding two Articles, matters necessary for the license examination for operations chief of work in compressed air chamber shall be specified by the Minister of Health, Labour and Welfare.

Section 2 Diver's License

(Person Qualified for License)

Article 52 A diver's license shall be issued by the Director of the Prefectural Labour Bureau to a person as specified below:

- (i) A person who has passed the license examination for diver; or
- (ii) Other person specified by the Minister of Health, Labour and Welfare.

(Disqualification for the License)

Article 53 The person prescribed by the Ordinance of the Ministry of Health, Labour and Welfare set forth in Article 72(2)(ii) of the Act pertaining to the diver's license shall be under 18 years of age.

(Persons provided for by the Ordinance of the Ministry of Health, Labour and Welfare pursuant to Article 72(3) of the Act)

Article 53-2 Persons provided for by the Ordinance of the Ministry of Health, Labour and Welfare pursuant to Article 72(3) of the Act pertaining to the diver's license shall be those who cannot properly perform descending and ascending necessary for appropriately operating the work concerning the license due to the mental or physical disorder.

(Consideration of Supplementary Measures, etc. for Disability)

Article 53-3 The Director of the Prefectural Labour Bureau shall, when finding that the applicant for the diver's license falls under the person prescribed by the preceding Article, and when going to decide whether or not grant the license to said person, take into account the supplementary means for disability which is utilized by said person or conditions that the disability is supplemented or the level of disability is reduced due to the medical treatment which the said person is actually receiving.

(License with Conditions Attached)

Article 53-4 The Director of the Prefectural Labour Bureau may grant a diver's license to a person who has mental or physical disability with restrictions of type of work which the said person can operate, and with other necessary conditions attached for the operation.

(Subjects of Examination, etc.)

Article 54 A license examination for diver consists of an academic test with respect to the subjects prescribed below:

- (i) Diving work;
- (ii) Air feeding, descending and ascending;

- (iii) High-pressure hazards; and
- (iv) Relevant laws and regulatory provisions.

(Details of License Examination)

Article 55 In addition to those set forth in Article 71 of the Ordinance and the preceding Article, matters necessary for the license examination for diver shall be specified by the Minister of Health, Labour and Welfare.

Supplementary Provisions (Ministry of Health, Labour and Welfare Ordinance No. 14 of February 9, 2018)

(Date of Enforcement)

1 This Ordinance shall be in effect from the date of promulgation.

Form 1 (Related to Article 39)

Form 2 (Related to Article 40)

Form 2 (Related to Article 40)