



Undersea Breathing Systems, Inc.

43278

Tuesday, September 15, 1998

Docket Management Facility USCG- 1998-3786 - 20
Dep. of Transportation Room PL-401
400 Seventh Street
SW Washington, DC 20590-0001

Subject: Advance Notice# USCG-1998-3786-6

Dear USCG:

Thank you for the opportunity for comment on proposed amendments. In particular I would like to comment on 197.434 Surfaced-Supplied Mixed Gas Diving. At present the use of Nitrox has been included as a Mixed-Gas and therefore a decompression chamber must be ready for use at the dive location. Historically "Mixed-Gas" usage had this requirement since it's use was related to Helium and cold, long, arduous, dives. NOAA received a variance for the use of Nitrox without needing a chamber on site based on this difference. Presently NOAA, US Navy, EPA, NASA, State Fisheries, harvest divers and commercial companies are using Nitrox 28%-40% O₂ for dives between 40-130 feet. This is because it is safer than air and offers more bottom time. We request regulations be changed so as to NOT include Nitrox up to 40% as a Mixed Gas. This will enable contractors diving in shallow water to enjoy the safety benefits of Nitrox without incurring the additional and unnecessary expense of having a chamber on-site. I am attaching a copy of the B.C. Canada regulations where they have just inserted the words "mixed gases other than nitrox". The change for 197.434 to read "(a) When mixed-gas diving other than nitrox is conducted, a decompression chamber or....."

Sincerely,

Glenn Huebner

DEPARTMENT OF TRANSPORTATION
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- (5) A **separate** dive team member tends each diver in the water;
- (6) A standby diver is available while a diver is in the **water**; and
- (7) Each diver has a **diver-carried reserve** breath@ gas supply except when using a heavy-weight diving outfit or when diving **in** a physically confining **space**; and
- (f) The surface-supplied air diver has the equipment required by § 197.346(b) or (d).

§ 197.434 Surface-supplied mixed-gas diving.

The diving supervisor shall insure that-

- (a) **When mixed-gas diving is conducted, a decompression chamber or a closed bell meeting the requirements of § 197.332 is ready for use at the dive location;**
- (b) A diving stage is used except when a bell is **provided**;
- (c) **A bell is used for dives deeper than 220 fsw or when the dive involves in-water decompression times greater than 120 minutes, except when the diver is using a heavy-weight diving outfit or is diving in a physically confining space;**
- (d) **A closed bell is used for dives at depths greater than 300 fsw, except when diving is conducted in a physically-confining space;**
- (e) A **separate** dive **team member** tends each diver in the **water**;
- (f) A standby diver is available during all **nonsaturation** dives;
- (g) When **saturation** diving is **conducted**;
- (1) **A standby diver is available when the closed bell leaves the dive location until the divers are in saturation; and**
- (2) **A member of the dive team at the dive location is a diver able to assist in the recovery of the closed bell or its occupants, if required;**
- (h) **When closed bell operations are conducted, a diver is available in the closed bell to assist a diver in the water;**
- (i) When a diver is in a physically-confining space, another diver is stationed at the underwater point of entry and is line-tending the **diver**;
- (j) Each diving operation has a primary and **secondary** breathing gas supply meeting the requirements of § 197.346, and
- (k) **The surface-supplied mixed gas diver has the equipment required by § 197.346(b) or (d).**

§ 197.436 Liveboating.

- (a) During liveboating **operations**, the **person-in-charge shall** insure that-
- (1) Diving is not conducted in seas that impede station-keeping **ability** of **the** vessel;
- (2) Liveboating operations are not conducted-
- (i) From **1 hour after** sunset to **1 hour before** sunrise; **or**
- (ii) During periods of **restricted visibility**;
- (3) **The propellers of the vessel** are stopped before the diver enters or exits the **water**; and
- (4) **A boat is ready to be launched with crew in the event of an emergency.**
- (b) As used in **paragraph (a)(2)(ii)** of this section, "**restricted visibility**" means any condition in which vessel **navigational** visibility is **restricted** by fog, mist, **falling** snow, heavy **rainstorms, sandstorms** or any **other similar causes.**
- (c) **During** liveboating operations, the diving **supervisor** shall insure **that-**
- (1) Diving is not conducted at depths greater than **220** fsw;
- (2) Diving is not conducted in seas that impede diver mobility or work function;
- (3) A means is used to prevent the diver's hose **from** entangling in the propellers of the vessel;
- (4) Each diver carries a **reserve breathing** gas supply
- (5) A standby diver is available while a diver is in the **water**;
- (6) **Diving is not conducted with in-water decompression times greater than 120 minutes; and**
- (7) **The person-in-charge is notified before a diver enters or exits the water.**

PERIODIC TESTS AND INSPECTION OF DIVING EQUIPMENT

§ 197.450 Breathing gas tests.

The diving supervisor shall insure that-

- (4) **The** output of each air compressor is tested and meets the requirements of § 197.340 for quality and quantity by means of samples taken at the connection point to the distribution **system-**
- (1) Every 6 months; and
- (2) **After** every repair or modification.
- (b) Purchased supplied of breathing mixtures supplied **to a diver are** checked before being placed on line for-
- (1) **Certification** that the supply meets the **requirements** of § 197.340; and

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- (f) if **the** emergency apparatus/air supply is being used;
- (g) in the event of excessive **leakage** to a dry type of diving suit which may affect the diver's buoyancy.

Diving tables	24.21	<ul style="list-style-type: none">(1) Diving operations, repetitive dives, and treatment of divers, must be carried out in strict accordance with tables and procedures published or approved by the Defense and Civil Institute of Environmental Medicine (Canada), or other standard acceptable to the board.(2) Sport diving tables must not be used.(3) Diving computers must not be used in place of primary diving tables.
Decompression procedures	24.22	<ul style="list-style-type: none">(1) During diving operations which require decompression, a reserve breathing supply with sufficient reserve to bring divers to the surface with appropriate decompression stops must be available and ready for immediate use.(2) Whenever planned dives will exceed the no-decompression limit<ul style="list-style-type: none">(a) the divers must be equipped with a bailout bottle containing a minimum 1.4 m³ (50 ft³) of breathing medium,(b) an approved double lock hyperbaric chamber in operable condition with overriding outside controls and appropriate air facilities must be located so that travel time by available transport will not exceed 30 minutes,(c) if the planned decompression time will exceed 15 minutes the hyperbaric chamber must be on the dive site, and(d) a chamber operator must be available on the surface at the dive site or at the hyperbaric chamber.(3) A dive must not exceed the no-decompression limit if the hyperbaric chamber is occupied.
Diver care and transportation	24.23	<ul style="list-style-type: none">(1) The diving supervisor must ensure that on completion of decompression, the diver remains under observation in the general area of the hyperbaric chamber for a period of time to ensure the well-being of the diver.(2) If a diver shows signs of pressure related illness or requires therapeutic recompression, the diving supervisor must ensure that treatment is initiated immediately and a physician knowledgeable in hyperbaric medicine is notified.(3) If it is necessary to transport a diver suffering a diving ailment by air, provision must be made to furnish the patient with oxygen and the flight altitude must be prescribed by the attending physician or the diving supervisor.
Medical alert tag	24.24	A diver must wear a medical alert tag or bracelet stating the diver's status and indicating the possibility of decompression sickness or other diving illness, for at least 24 hours after completion of diving.
Hyperbaric chambers	24.25	Hyperbaric chambers must conform to standards acceptable to the board and must be provided with <ul style="list-style-type: none">(a) a means of extinguishing a fire,(b) an oxygen monitoring device,(c) an oxygen delivery system with a built-in breathing system (BIBS), and(d) an adequate supply of air, including an emergency reserve supply to complete any decompression and treatment procedures.
Breathing mediums	24.26	<ul style="list-style-type: none">(1) If air is used as the respirable medium in diving operations it must meet the requirements of CSA Standard CAN/CSA-Z2 15.242, Occupational Safety Code for Diving Operations, with the exception of the water vapour standard.(2) The air supplied by compressors for breathing air in diving operations must be tested at least annually to ensure that it meets the requirements of subsection (1).(3) If mixed gases in other than the normal proportions of respirable air are used for breathing by divers, the diving supervisor must ensure that<ul style="list-style-type: none">(a) the diving procedures, schedules of work and decompression are in accordance with the recommendations of a competent authority, and(b) prior written authorization has been received from the board to use <u>mixed gases other than nitrox</u> and that the authorization is kept on the dive site, available for inspection by an officer.



- CANADA - B.C.

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		<p>(4) The following requirements apply to operations using nitrox mixes:</p> <ul style="list-style-type: none">(a) procedures and mixes must be acceptable to the board;(b) <u>all workers involved with nitrox diving must be trained in the procedures to a standard acceptable to the board;</u>(c) <u>proof of training and a copy of the operating procedures must be readily available at each dive site.</u>
Breathing apparatus	24.27	<p>(1) All breathing apparatus and associated delivery systems must</p> <ul style="list-style-type: none">(a) be used, maintained, repaired and tested in accordance with the manufacturer's recommended procedures,(b) have air delivery systems that supply over bottom pressures and volumes to the diver in accordance with the manufacturer's specifications, and(c) not be modified unless the modification is approved by the manufacturer. <p>(2) Ail equipment must be correctly installed and tested for function before each use.</p> <p>(3) The breathing apparatus, accessories and applicable service records must be available for inspection by an officer, and service records must be available to workers on the dive site.</p> <p>(4) All pressurized components including tanks and associated fittings used in diving must meet the requirements of the <i>Power Engineers and Boiler and Pressure Vessel Safety Act</i> and pursuant regulations.</p>
Compressor intake	24.28	<p>The compressor intake must meet the manufacturer's recommended diameter to length ratio and must be located so that the breathing medium will not be contaminated by gasoline vapours, engine exhausts, or other objectionable impurities.</p>
Gauges and meters	24.29	<p>(1) Gauges and meter equipment must be tested every 6 months or whenever a malfunction is detected, and errors found must be corrected without delay.</p> <p>(2) If the equipment is removed from service, the specific problem with the equipment must be identified.</p>
Warning devices.	24.30	<p>When any diving activity is taking place, warning devices must be displayed as follows:</p> <ul style="list-style-type: none">(a) marker buoys must be used to display warning devices (flags, lights, lamps, or flares) to define the limits of the diving area, and boats other than those connected with the diving activity must be kept clear of the diving area;(b) in navigable waters the recognized diver's flag must be flown or prominently displayed, and the international code flag "Alpha" must be flown if required by the authority having jurisdiction;(c) flags and signals used for work site identification must only be displayed during active diving operations. <p>Note: The recognized diver's flag is a red square with a white diagonal stripe from the upper hoist to the lower fly. The international code flag "Alpha" is a white and blue flag with a forked tail.</p>
Rescue boat	24.31	<p>If divers are operating from floating equipment, a suitable power boat, ready for immediate use, must be available on the dive site, for rescue or escape.</p>
Hoists	24.32	<p>(1) If a hoisting device is required to lower or raise the diver it must not be used for any other purpose until the diver has been recovered.</p> <p>(2) All directions to the hoist operator must be given by either the diver, the diver's tender or the diving supervisor.</p>
Standby diver 2 4 3 3		<p>(1) A standby diver must be</p> <ul style="list-style-type: none">(a) on the dive site and able to render assistance at all times when diving operations are in progress,(b) trained and equipped to operate at the depths and circumstances of the dive, and(c) able to enter the water in one minute. <p>(2) A standby diver on the surface may also perform other duties provided such duties do not compromise the standby diver's ability to promptly render emergency assistance to the divers.</p> <p>(3) When the diving supervisor can assure that the depth of the dive will not exceed 18 m (60 ft) and no hazards are present, 2 divers in the water may act as standby for each other provided that</p>