Helitrox Diver Course

OVERVIEW

- This course is to provide the training and experience necessary to gain the knowledge and understand the hazards of utilizing Helium for dives to maximum depth of 150 fsw (46 msw) that may require stage decompression, utilizing EANx mixtures and/or oxygen during decompression.

QUALIFICATIONS OF GRADUATES

- Upon successful completion of this course, graduates are considered competent to plan and execute Helitrox-based dives that may require stage decompression and utilize EANx and/or oxygen for stage decompression without direct supervision, provided the diving activities and the areas dived approximate those of training.

COURSE POLICIES

- Classroom hours- eight are estimated
- Open water dives- four. Training depths shall not exceed 150 fsw. (No dives are to exceed 60 fsw (18 msw) until a student has satisfactorily demonstrated equipment configuration and management during open water assessment dives(s). At least four dives are to be made using a Helitrox mixture (26% O_2 / 17% He), of which at least one is to be a repetitive dive.

EQUIPMENT

- NTEC Gear Configuration
- Oxygen analyzer, Helium analyzer (may be provided or rented for use during the course).
- Air and EANx dive computers are allowed for use as depth and timing devices and for dive planning.
- Air and EANx dive computers are allowed for use as depth and timing devices and for dive planning.
- Jon-lines and other rigging lines as dictated by conditions at the dive site.
- Ascent line reel and lift bag, with a minimum of 50 lb (23 kg) lift.
- Up-line that is adequate for maximum planned depth, and additional personal lines as needed.
- Redundant underwater lights if needed because of site conditions.

SKILL REQUIREMENTS

- The students are to analyze their own breathing gas mixture and to plan and safely execute each dive. Dive planning shall include limits based on gas consumption, oxygen toxicity exposures and inert gas absorption for each dive and breathing gas mixture. Each diver is to demonstrate switching and isolating a malfunctioning regulator, first in confined water, and following adequate practice, at a depth between 33 fsw (10 msw) and 66 fsw (20 msw). Each diver is to demonstrate underwater navigation appropriate to the dive plan. Students shall participate in a diver rescue simulation to include management of a diver experiencing underwater oxygen toxicity during a screening dive that is in addition to the four required dives. On at least two of the required dives ascend with ascent reel and lift bag and perform necessary or simulated stage decompression.

ACADEMIC REQUIREMENTS

- **Applied Sciences.** This area is a review and continuation of the material covered in the NAUI Master Scuba Diver, Nitrox Diver, and may include Technical EANx Diver, and Decompression Techniques Diver courses. Included are the NAUI Reduced Gradient Bubble Model theory and tables, physics, physiology and medical aspects as applied to planned decompression diving, with special emphasis on mechanisms of bubble formation, advantages of oxygen enriched air mixes for decompression, oxygen toxicity(whole body and CNS otu's/uptd's), hypoxia, nitrogen narcosis, tissue inert gas tension, inspired inert gas tension, "precautionary stops" compared to required stops, deep stop models and theory, equivalent narcosis depth (END) and equivalent air depth (EAD), rates for ascent/descent, carbon dioxide toxicity, carbon monoxide toxicity, hyperthermia, hypothermia, dive time management, psychological considerations, task loading, stress, perceptual narrowing, and panic Also to be covered are best mix and maximum operating depth mixture computations, plus decompression options using EANx and oxygen and the need for five minute air breaks every 20 minutes during stage decompression as well as the off-phenomenon when using 100% oxygen. Remediation of specific subject knowledge as needed.

NAUI Technical Equipment Configuration (NTEC).

- This area provides the diver with the knowledge necessary for selecting and configuring diving equipment for extended range diving. Included is information about single and twin cylinders, valves, regulators, harness/wing style back-mounted buoyancy compensator, dive computers/depth gauges/bottom timers, ascent and navigation line reels, lift bags for drifting or untethered decompression, preparation of surface-supplied decompression equipment, Jon-line and clips, appropriate ballast and buoyancy control during dive and stage decompression stops, a comparison of dive tables and computers, introduction and review of different decompression table models (DCIEM, RGBM based tables, U.S. Navy, Buhlmann, etc.), correct use of electronic multilevel dive computers for dive planning and decompression.

Helitrox Dive Planning.

- This area provides the diver with the knowledge necessary to plan and safely execute helitrox dives. Included is information regarding standard operations, i.e., gas needs and requirements, oxygen toxicity limitations, nitrogen narcosis limitations, and emergency planning, including omitted decompression, oxygen toxicity, decompression sickness, equipment failure. Also the following procedures, utilizing primary and decompression gas, normal operations, plan failure, emergency procedure contingencies for failure or inadequacies of procedure, analyzing and logging all reathing gases, safeguards to prevent the misuse of decompression supply regulators, preparation and deployment of decompression gear, descent, various methods of entry, use of descent lines or other descent technique decisions; recognizing the signs and symptoms of inert gas narcosis, oxygen toxicity, recognizing breathing pattern fluctuations, options for configuring diver carried equipment, variable ascent-rate techniques and applying deep-stop models and theory, diver trim, ballast and buoyancy compensation; tethered or untethered decompression methods, use of up-lines, line reels and lift bags, decompression bars and platforms, free drifting stage decompression or boat-based decompression station, a comparison of diver-carried decompression gases versus surface supplied or rendezvous gas cylinder, shore or boat based dive team support, contingency planning, chamber locations, evacuation procedures, communications and emergency breathing gases.