



NAUI EXTENDED RANGE

6 days

Costs include: Boat Trips, Gas mixes, Manual
Extra costs: Equipment, Certification

OVERVIEW

- This course is to provide the training and experience necessary to understand the hazards of and utilize air or EANx for dives to 180 fsw (55 msw) that require stage decompression, utilizing EANx mixtures and/or oxygen during decompression. *(This course may be combined with the Decompression Techniques Diver Course. The resulting course would require twelve dives for certification.)*

QUALIFICATIONS OF GRADUATES

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

WHO MAY TEACH

This course may be taught by active status NAUI Instructors who:

- are certified as NAUI Extended Range Diver or its equivalent, and
- have completed the NAUI Technical Diving Instructor application process and received written approval to teach this course from the NAUI Training Department.

RATIOS

Open water supervision

- A maximum of four students per active NAUI Instructor is allowed. Assistants with specific technical diving experience are strongly recommended but do not increase the student-to-instructor ratio.

PREREQUISITES FOR ENTERING THE COURSE

- Minimum age of 21.
- Minimum of 100 logged dives, 30 of which are deeper than 100 fsw (30 msw), in the environment in which the course is being taught.
- Certification as a NAUI Technical EANx Diver and Decompression Techniques (or equivalent) is required.

COURSE POLICIES

- Classroom hours – eight are estimated
- Open water dives – six. All dives must be deeper than 100 fsw (30 msw) with two dives deeper than 130 fsw (40msw) and two dives deeper than 160 fsw 49 meters. Training depths shall not exceed 180 fsw (55 msw). (No dives are to exceed 130 fsw (40 msw) until a student has satisfactorily demonstrated equipment configuration and management during open water assessment dive(s).

EQUIPMENT

The following equipment is required for each student in addition to that required by “Policies Applying to All NAUI Diving Certification Courses – Equipment:”

- Depth gauge, compass and timing device or dive computer.
- Dive knife/tool, emergency signaling device, slate and pencil.
- Cylinders and regulators properly labeled and cleaned as required for breathing gas mixtures involved with a separate submersible pressure gauge for each cylinder used. Also, for primary cylinder(s), cylinder volumes appropriate for the planned dives and all students’ breathing gas consumption rates. Cylinders are to be equipped with dual outlet valve or manifold; isolator valve is recommended. The decompression mix cylinder(s) and cylinder volume must be appropriate for the planned dives and student breathing gas consumption rates and equipped with a submersible pressure gauge and prepared for back mount or for side- or front-mounting to a harness using clips. Primary and primary redundant regulators are required on all primary cylinders. A four to five foot (1 to 1.5 meter) second- stage hose should be designated and prepared for emergency air sharing.
- Oxygen analyzer (may be provided or rented for use during the course).
- Redundant Depth and Timing Devices
- Air and EANx dive computers are allowed for use as depth and timing devices and for dive planning. *Note: Because of a proliferation of decompression algorithms utilized in dive computers, the instructor’s choice of a standard dive table profile, e.g., DCIEM, USN, Buhlmann or software generated proprietary decompression table is preferred over the use of a particular dive computer for decompression.*
- 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, biodegradable up line, Jersey up line or other 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) and underwater navigation appropriate to the dive plan. Students shall participate in a diver rescue simulation to include management of a diver experiencing underwater convulsions during a screening dive that is in addition to the six required extended range dives and, on at least two of the required dives ascend with ascent reel and line 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, Technical EANx Diver and Decompression Techniques Diver courses. Included are 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), rates for ascent/descent, carbon dioxide toxicity, carbon monoxide toxicity, hyperthermia, hypothermia,

psychological considerations: task loading, stress, perceptual narrowing, dive time management, panic (remediation of specific subject knowledge as needed.) 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.

• **Extended Range Diving Equipment** – 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/BC plus dual BC systems, 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, U.S. Navy, Buhlmann, etc.), correct use of electronic multilevel dive computers for dive planning and decompression.

• **Extended Range Dive Planning** – This area provides the diver with the knowledge necessary to plan and safely execute extended range dives. Included is information regarding standard operations, *i.e.*, gas needs and requirements, oxygen toxicity limitations, nitrogen narcosis limitations, 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 breathing 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, recognizing breathing pattern fluctuations, options for configuring diver carried equipment; ascent – variable rate techniques and applying deep stop models and theory, diver trim, ballasting and buoyancy compensation; tethered or untethered decompression methods, use of Jersey 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 gasses versus surface supplied or rendezvous gas cylinder, shore based dive team support, plus contingency planning, chamber locations, evacuation procedures, communications and emergency breathing gases.

EXAMINATIONS

See “Policies Applying to All Courses; Evaluation and Documentation.”