



NAUI TECHNICAL WRECK PENETRATION

6 days

Costs include:
Extra coasts:

Boat Trips, Gas mixes
Equipment, Certification

OVERVIEW

• This course is to provide the diver with the skills and knowledge needed to gain experience and minimize risks in penetration wreck diving at depths beyond 130 fsw (40 msw). *(This course may be combined with the Decompression Techniques Course. The resulting course would require fourteen dives for certification.)*

QUALIFICATIONS OF GRADUATES

Upon successful completion of this course, graduates are considered competent to plan and execute penetration wreck 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 Technical Penetration Wreck divers or 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 certification as a Penetration Wreck Diver with at least 10 logged penetration wreck dives.

Minimum of 50 logged dives total.

- Certification in Technical NAUI EANx and Decompression Techniques.

COURSE POLICIES

- Classroom hours – eight are estimated
- Open water dives – eight (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).
- The maximum depth in this program may not exceed 165 fsw (50 msw).

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 regulator(s) are required on all primary cylinders. A five foot (1.5 meter) or longer 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 softwaregenerated proprietary decompression table is preferred over the use of a particular dive computer for decompression.*
 - 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, minimum of three
- A minimum of two line cutting devices
- Line reels (for penetration technique) including primary penetration reel and safety reel
- Additional optional student diver equipment as required
- Waterproof dive tables
- A redundant breathing gas system with a separate submersible pressure gauge for each cylinder used and adequate gas supply for planned dives considering reserves, gas supply loss scenarios, and decompression obligation.

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) , out of air sharing with five foot (1.5 meter) or longer hose through a restriction, locating a lost penetration line, siltout/black-water procedures, underwater navigation appropriate to the dive plan, deployment of lift bag or biodegradable Jersey up line for stage decompression. Students shall participate in a diver rescue simulation to include management of a diver experiencing underwater convulsions.

ACADEMIC REQUIREMENTS

• **Applied Sciences.** This is a review and continuation of the material covered in the NAUI Master Scuba Diver and Technical EANx Diver courses. Included are physics, physiology and medical aspects as applied to planned decompression diving, with special emphasis on mechanisms of bubble formation, a review of deep stop models and theory, inert gas perfusion and diffusion, equivalent narcosis depth (END), 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, 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 propulsion techniques, *i.e.*, antisilting, 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 and the off-phenomenon when using 100% oxygen.

• **Technical Wreck Dive Planning.** Coverage is to include redundant equipment configurations, also, exposure suits, coveralls, tools and the types and utilization of penetration lines. Dive procedures including self sufficiency, search patterns, equipment management, correct ballasting and buoyancy control, advance preparation for penetration, progressive penetration as compared to line penetration, penetration and considerations for confined space and options for exit. The risks and hazards associated with penetration wreck diving including vertigo and disorientation, silt-outs/ black water, entrapment and entanglement, cave-in, sharp and jagged objects, loss of breathing gas, loss of penetration line or direction relative to exit, loss of dive team integrity. Also shipwreck location and identification, archival research, federal, state and local regulations, information sources, types and use of hydraulic, pneumatic hand and cutting tools, archeological surveying techniques, historical preservation considerations. Additionally, contingency planning, recompression chamber locations and evacuation procedures, communication and the availability and use of emergency breathing gases.

EXAMINATIONS

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