

NAUI Technical Support Leader (TSL)

OVERVIEW

The NAUI Specialty Course is designed to train knowledgeable NAUI Instructors, Divemasters, and Assistant Instructors who are also technical divers to act as part of a support team for technical diving and training activities.

This is a review and continuation of the skills demonstrated in NAUI Technical courses. Included is mastery of NAUI Technical Equipment Configuration (NTEC), gear inspection, oxygen requirements and safeguards, decompression systems utilized in technical dive team applications, review of overhead environment consideration, and emergency (drift) decompression considerations. Also to be covered is a complete review of support team responsibilities for each member of the team e.g. crew, team members/leaders, and boat captains. Surface support team communications and underwater support team communications methods and protocols are to be reviewed. Support team dive ascent protocols for depth limits (oxygen, equivalent narcotic depth (END), and no decompression limits), rebreather protocols (tracking divers on rebreathers, bail out procedures, caustic cocktail first aid, unconscious diver rescue), diver emergency response and in water hydration all are to be covered. Written emergency and evacuation procedures to include lost diver plan, remote site in-water recompression procedures, chamber locations with phone numbers and radio calls, helicopter evacuations, omitted decompression procedures and boat handling techniques all are to be reviewed and demonstrated.

A NAUI Technical Support Leader (TSL) is qualified to provide assistance to teams of technical divers during training or post-certification diving activities, provided diving conditions and methods approximate those in which the TSL was trained. These duties may include shuttling of equipment, removal and replacement of staged decompression gases and equipment, rigging and setting up of decompression stations and gases, monitoring divers during ascent and staged decompression stops and assist with emergency evacuation. An active status NAUI TSL is qualified to assist an active-status NAUI Technical Instructor in technical training dives. Note: Maximum depth attained and gases used by the TSL shall not exceed the qualifications of technical diver certification held by the TSL.

ACADEMIC REQUIREMENTS

This is a review and continuation of the material covered in the NAUI Master Scuba Diver course. Included are 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, 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 toxicity, otu's/uptd's), hypoxia, nitrogen narcosis, tissue inert gas tension, inspired inert gas ascent/descent, carbon dioxide 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., anti-silting; best mix and maximum operating depth mixture computations plus decompression.

The following texts shall be used (an asterik * denotes recommended but not required texts):

“Technical Support Leader” presentation and text by Tim O’Leary

“Physics, Physiology and Decompression Theory for the Technical and Commercial Diver” by Bruce Wienke *

SCOPE OF COURSE

- The maximum depths and gasses utilized by the TSL shall not exceed the scope/limitations of the technical diver-level certification/qualifications held by the student (i.e. a Trimix level I certified diver may only participate in dives to a maximum depth of 200 fsw)
- At least 4 open water dives are required for certification (Two dives/sessions are to include dive planning, gear rigging, technical dive team support/response, and decompression stage rigging. Two dives/sessions are to include emergency response and rescue/evacuation)
- Maximum PO₂ is 1.2 atm for working portions of the dive

SKILL REQUIREMENTS

The students are to analyze their own breathing as 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) to eight foot (2.5 meter) hose through a simulated restriction, locating a lost penetration line, silt-out/black-water procedures, underwater navigation appropriate to the dive plan, and deployment of lift bag. Each diver shall participate in and demonstrate expertise in NAUI Technical Equipment Gear Configuration (NTEC), teamwork, in-water staged decompression rigging, transportation of decompression gas cylinders and location of divers conducting staged decompression. Each diver will also participate in a diver rescue simulation to include management of a diver experiencing oxygen toxicity under water, out of gas, lost diver and missed decompression scenarios. 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. Emphasis will be placed on the NAUI Trimix team planner.

EQUIPMENT REQUIREMENTS

For purposes of safety, uniformity of instruction and functionality, gear configurations for water work and training exercises must be the same for instructors and students. Standardized rigging of bottom and stage cylinders, isolation manifolds, cylinder gauges, inflators, primary regulators, and backup regulators is crucial to the safety, success and effectiveness of technical diver training. NTEC specific configurations of technical diving equipment, that is, its organization and placement on the diver, are presented in NAUI support materials for each technical course.

Oxygen and helium analyzers are required (may be provided or rented for use during the course).

Cylinders:

- Double cylinders with a dual manifold and isolation valve. DIN valves are mandatory. Your cylinders may be steel or aluminum; aluminum cylinders are recommended if diving in a wetsuit. You should be able to physically manage your choice of cylinders.
- At least 1 stage cylinder of 40 ft³ or greater for decompression gas with stage rigging. The cylinder should be oxygen clean. Use of steel stages is prohibited. DIN valves are recommended.
- Argon and/or air inflation systems for drysuit diving are necessary. Helitrox is inappropriate for suit inflation. Six to 13 ft³ aluminum/steel cylinders are acceptable for this purpose.

Regulators:

- Back cylinder configuration: two first stages with each supplying one second stage. The primary regulator's first stage is attached to the right post of the manifold and has a 7-foot hose leading to the second stage.

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The low-pressure inflator to the BCD wings should come off of the primary first stage (right post). The back up regulator is attached to the left post and supports the one SPG (no consoles).

- Oxygen cleaned regulator and SPG for the stage bottle.
- Argon regulator: first stage must have an over pressure relief valve.

Buoyancy Compensators:

- Standard single bladder wings of 55-lb lift are adequate for most individuals diving double tanks. For single tanks 35-40-lb lift is usually appropriate. NAUI discourages the use of overly large, dual bladder wings and the bungie cord used to control them. A stainless steel or aluminum backplate is recommended.

Instrumentation:

- Each diver needs one depth device and one timing device. A wrist mounted digital bottom timer/depth gauge is the best choice for technical diving.
- Compass

Exposure Suits:

- A dry suit with a separate suit inflation system is required. The inflation first stage must be equipped with an over pressure relief valve.

Other Equipment:

- Mask/fins (no snorkel).
- One cutting device required, with two recommended.
- Underwater writing device such as a slate or wetnotes.
- Two lift bags (50 to 100 lb lift) and one primary reel with at least 200 ft of line.
- One safety reel or spool with at least 100 ft of line.
- Two lights (3 lights if in wreck penetration standards)

PREREQUISITES FOR ENTERING THE COURSE

Age. Minimum is 18 years. **Certification:** At least one of the following: NAUI Technical EANx Diver, Active status NAUI Instructor, NAUI Divemaster, or NAUI Assistant Instructor, or **equivalent level**. These requirements can be modified or amended during pre-course interview and/or screening dive.

- Medical clearance and physically fit
- Nonsmoker
- Minimum of 75 logged dives with at least 10 (beyond certification) below 100 fsw, with at least 30 dives utilizing EANx
- Prior assistance in open water portions of at least two (2) entry level or continuing education diver courses
- Oxygen Provider or equivalent certification (current)
- NAUI Rescue Diver or equivalent

For pricing see the NAUI Training Rate Sheet.