



NAUI Technical Support Leader Specialty Course

Course Objective

The Technical Support Leader 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. Technical Support Leaders (TSL) will be able to provide assistance to teams of technical divers provided that the diving conditions and methods used approximate those in which the TSL was trained. The TSL will be able to shuttle equipment underwater, remove and replace staged decompression gases and equipment, monitor divers during ascent and decompression stops and assist with emergency evacuation. The TSL will be able to manage his/her own dive assistance plan in order to avoid staged decompression obligations and/or oxygen toxicity.

Course Prerequisites

The candidate must be a minimum of 18 years of age with NAUI Technical Nitrox certification and be a NAUI Instructor, NAUI Divemaster or NAUI Assistant Instructor. The candidate must show proof of 75 logged Dives with 10 dives below 100fsw (30msw) and 15 dives on Oxygen Enriched Air. The candidate must also have Oxygen Provider Certification as well as NAUI Rescue Diver certification or its equivalent.

Candidate Provided Equipment

- SCUBA gear appropriate to area
- Dive computer
- Timing device
- Compass
- U/W slate and pencil
- Emergency signaling device
- Cutting shears
- Cylinders properly labeled for breathing mixtures involved
- Appropriate SPG's for cylinders involved
- Regulators cleaned as required for breathing mixtures involved
- Jon lines
- Ascent reel and lift bag with 50 lb. (23kg.) of lift

Provided Equipment (specialized equipment)

- Oxygen analyzer
- Full facemask with hard or wireless underwater communication system
- Medical or Aviation grade oxygen cylinder with regulator and umbilical
- Decompression station bars
- Shackles for securing decompression bars
- First Aid Kit
- Resuscitation equipment.
- Buoys
- Stokes basket and/or stretcher

Administration

- Verification of candidate course prerequisites
- Technical Dive Waiver
- Medical History Form

Text and Materials

- NAUI Nitrox Textbook (#66006)
- Technical EANx, Staged Decompression and Extended Range (#66003)
- USN Diver Handbook
- NAUI Gas Management Planners
- NAUI Technical Dive Team Planner
- NAUI Trimix Diver Planner
- NAUI OCEANx Calculator (#35504)
- NAUI Risk Management Handbook (#12908)

Session One - Course Administration and Orientation

Length-3 classroom hours

Review of physics, physiology, and medical aspects as applied to Oxygen Enriched Air diving.

Objective: Candidate will be able to calculate % oxygen limits and track oxygen tolerance units using the NAUI dive planner and Oceanx calculator.

- I. Course Orientation and Paperwork
 - A. Course Overview
 1. Student introductions to each other
 2. Instructor introduction and qualifications
 3. Explanation of course objectives
 4. Review of course prerequisites
 5. Review of candidate equipment requirements
 6. Review of provided equipment
 - B. Technical Diver Waiver & Release
 - C. Student Record Folders
 - D. Diving Medical Exam
 - E. Verify Certifications and logbook
- II. Review Oxygen Physiology, Toxicity, and Tolerance
 - A. Hypoxia and Hyperoxia
 1. Uses and effects different levels of oxygen
 2. Oxygen Toxicity
 - a. Whole Body
 - b. CNS
 - c. Symptoms of toxicity
 - d. Dealing with toxicity
 - e. Underwater rescue for a diver in convulsion
 - B. Oxygen Tolerance Units
 1. UPTD's vs. OTU's
 2. Calculating OTU's with the OCEANx calculator
 3. Tracking OTU's on the NAUI Dive Planner
 - C. Oxygen Tolerance Limits
 1. Tracking oxygen exposure by formula
 2. Tracking oxygen exposure with the OCEANx calculator
 3. Tracking OTL's on the NAUI Dive Planner

Homework assignment: Fill out the NAUI Dive Planner for a dive to 150 fsw (46msw) for 40 minutes using OEA25 as bottom gas and 100% oxygen on the 20 foot (6meter) and 10 foot (3 meter) stop. Dive schedule may be planned as though the entire dive was made on air or the candidate may use a commercial PC decompression program.

Session Two - **Technical Dive Team Procedures and Techniques**

Length- 6 Classroom hours

Objective: The candidate will be able fill out the NAUI Tri-mix Team Planner, outline the steps involved in setting up a stationary decompression station , write a team emergency and evacuation plan and perform a field neurological exam.

- I. Pre-dive check
 - A. Inspect all gear
 1. Check oxygen supply for appropriate quantity
 2. Check oxygen regulator on the H cylinder
 3. Check hose fittings
 4. Check for cuts in hose
 5. Check manifold and control system
 6. Check oxygen second stage regulators for cleanliness and function
 7. Check Band Mask or Full Face Mask if applicable
 - a. Check non-return valve and valve operation
 - b. Communication
 - c. Spider and hood
 - d. Mask seals
 8. Check rigging line for decompression bars
 9. Check shackles on decompression bars
 10. Check buoys for decompression station
 11. Check stage cylinders for fill, gas content and appropriate clips
 - B. Connect oxygen decompression system
 1. Connect oxygen regulator to oxygen cylinder
 2. Connect oxygen hose to cylinder regulator
 3. Connect oxygen hose to manifold
 4. Connect oxygen clean second stages to manifold
 5. Connect decompression bars, lines and buoys with appropriate clips and hitches
 - C. Review special considerations for overhead environment (cave) decompression station rigging
 - D. Review special considerations for emergency drift decompression
 - E. Review Support Team responsibilities
 1. Team Members
 2. Players, i.e., crew, team leaders, boat captain, etc.
 3. Surface support team communication
 4. Underwater support team communication
 5. Support team ascent protocol
 - a. Depth limit
 - i. oxygen limit
 - ii. END limit
 - iii. No-decompression limits
 6. Rebreather Protocols
 - a. Tracking rebreather divers
 - b. Bail out procedures
 - c. Caustic Cocktail first aid procedures
 - d. Unconsciousness diver rescue
 7. Qualified rescue response divers
 8. In-water hydration

9. Written Emergency and Evacuation Procedures
 - a. Lost diver plan
 - b. Remote site in-water recompression procedures
 - i. Australian method
 - ii. Hawaiian method
 - c. Chamber locations and phone numbers
 - d. U.S. Coast Guard frequencies and phone numbers
 - e. Helicopter evacuation procedures
 - f. Omitted decompression procedures
 - i. U.S. Navy method
 - g. Boat handling basics as appropriate (where possible)
 10. Post dive
 - a. Neurological exam
 - b. Diver monitoring
 11. Communications equipment
 - a. Telephones
 - b. SSB Radio
 - c. VHF Radio
 - d. Communication protocol
 - e. Emergency radio frequencies and telephone numbers
- F. Protocols
1. Boat
 2. Dive site
 3. Local
 4. County
 5. State
 6. Federal
 7. NAUI

Homework assignment: Candidate will write an emergency and evacuation plan, fill out a tri-mix team plan, and write a check list for setting up a decompression station.

Session Three - **Two Dives: Rigging and water skills**

Objective: Candidates will work as a team and demonstrate the ability to rig a staged decompression station underwater that is appropriate to the dive location, analyze their own gas, plan and dive a support plan based on gas consumption rates, oxygen toxicity limits, and inert gas limits. The candidates will demonstrate the ability to dress in appropriate equipment and be ready to respond to an emergency in a timely manner. The candidates will demonstrate transport of staged gas cylinders to and from depth and location of divers simulating staged decompression.

Session Four-**Contingency Planning and Problem Solving**

Length- 3 Classroom hours

Objectives: The candidate will be able to fill out contingency dive plans based on the next longer dive time, the next deeper and longer time, and a bail-out plan based on an aborted mixed gas dive within no decompression limits. Candidates will be able to demonstrate problem solving based on altered bottom time profile, lost gas supply, increased decompression obligations, decreased decompression obligations, and loss or failure of ascent equipment.

- I. Contingencies
 - A. Oxygen supply
 - B. Out of gas procedures
 1. Normal ascent

2. Alternate gas source
 3. Emergency swimming ascent
 4. Buoyant Emergency Ascent (confined water only)
 5. Gas sharing
 - a. Team members
 - b. In-water support team
 6. Different Gas-Different Divers
- C. Accident Analysis
1. Common crisis
 2. Potential problems
 3. Solution scenarios
- D. Rescue response
1. Injury
 2. Gas depletion
 3. Gear malfunction
 4. Narcosis
 5. Hypo/hyperthermia
 6. Missing diver
 7. Entanglement
 8. Flooded dry suit
- E. Emergency Decompression
1. USN in-water omitted deco schedule
 2. In-water recompression
 - a. Preparing for use of full face mask with oxygen
 3. Surface oxygen
- F. Increased decompression profile
- G. Decreased decompression profile
- H. In-water convulsions
1. Wrong gas switch
 2. Exceed oxygen limits
 3. CO₂ loading

Session 5 - Open Water – Two dives

Objectives: Candidates will demonstrate rescue scenarios with a diver simulating underwater convulsion , a diver simulating catastrophic gas loss, lost diver procedures, and entrapment or entanglement. Divers will prepare and use a full face mask with surface supplied gas simulating a decompression emergency.