



## **7. TDI – Extended Range Instructor Course**

### **7.1 Introduction**

This course provides the training and experience required to be certified to competently teach air dives to fifty five (55) msw / one hundred eighty (180) fsw that require staged decompression, utilizing Nitrox mixtures or oxygen during decompression. The objective of this course is to train Instructors in the proper techniques, equipment requirements, and hazards of deep air diving to a **maximum** of fifty five (55) msw / one hundred eighty (180) fsw and utilizing Nitrox mixtures or oxygen for staged decompression.

### **7.2 Qualifications of Graduates**

Upon successful completion of this course, graduates may teach technical diving activities utilizing custom Nitrox mixtures as long as:

1. The diving activities approximate those of training.
2. The areas of activities approximate those of training.
3. Environmental conditions approximate those of training.

Upon successful completion of this course, graduates are qualified to enroll in:

1. TDI Advanced Wreck Instructor Course.
2. TDI Entry Level Trimix Instructor Course.

### **7.3 Who May Teach**

Who may teach this course:

1. Any active TDI Extended Range Instructor Trainer may teach the course.

### **7.4 Student – Instructor Ratio**

Academic:

1. Unlimited, so long as adequate facility, supplies and time are provided to insure comprehensive and complete training.

Confined Water (Swimming pool-like conditions):

1. N/A

Open Water (Ocean, lake, quarry, spring, river or estuary):

1. A maximum of four (4) students per Instructor. However, it is the instructor's discretion to reduce this number as conditions dictate.



## **7.5 Student Pre-Requisites**

The student must:

1. Be a minimum age of twenty one (21).
2. Have a minimum of two hundred fifty (250) logged dives
3. Have a minimum of twenty five (25) extended range dives.
4. Show proof of certification as a TDI Extended Range Diver or equivalent.
5. Show proof of certification as a TDI Advanced Nitrox Instructor or equivalent.
6. Show proof of certification as a TDI Staged Decompression Instructor or equivalent.
7. Must have certified ten (10) students in Advanced Nitrox diver or Decompression Procedures Diver, a minimum of five (5) must be Decompression Procedures divers.

## **7.6 Course Structure and Duration**

Open Water Execution:

1. Six (6) dives with a minimum accumulated bottom time of one hundred (100) minutes.
2. All dives must be deeper than thirty (30) msw / one hundred (100) fsw with four (4) dives deeper than forty (40) msw / one hundred thirty (130) fsw.
3. No more than two (2) dives may be credited from previous training.

Course Structure:

1. TDI allows instructors to structure courses according to the number of students participating and their skill level.

Duration:

1. The minimum number of classroom and briefing hours is eight (8).

## **7.7 Administrative Requirements**

The following is the administrative tasks:

1. Collect the course fees from all the students.
2. Ensure that the students have the required equipment.
3. Communicate the training schedule to the students.
4. Have the students complete the Liability Release and Medical history forms.
5. The instructor must review the liability Release and Medical Forms before starting on the course.

Upon successful completion of the course the Instructor must:

1. Complete the Student Registration Form and send the Registration Form to TDI HQ.
2. Award Card.



## **7.8 Required Equipment**

The following are required for this course:

1. TDI Standards and Procedures Instructor Manual.
2. Recommended text: Deep Diving: An Advanced Guide to Physiology, Procedures and Systems, Revised 2nd edition 1995 by Bret Gilliam with John Crea.

The following equipment is required for each Instructor candidate

1. Bottom Mix cylinder(s)
  - A. Cylinder volume appropriate for the planned dive and candidate gas consumption.
  - B. Dual outlet valve or manifold required.
  - C. Labeled in accordance with TDI Standards.
2. Travel Mix Cylinder (recommended, not required)
  - A. Cylinder volume appropriate for planned dive and student gas consumption.
  - B. Labeled in accordance with TDI Standards.
3. Decompression Mix Cylinder(s)
  - A. Cylinder volume appropriate for planned dive and student consumption.
  - B. Labeled in accordance with TDI Standards.
4. Regulator(s)
  - A. Primary and primary redundant required on all bottom mix cylinders.
  - B. Submersible pressure gauges are required on all primary / bottom mix cylinders.
  - C. A contingency use long hose second stage should be designated and appropriately rigged to facilitate air sharing at depth if necessary.
5. Buoyancy compensator(s) adequate for equipment configuration.
6. Redundant depth and timing devices. Air decompression computers allowed for use as depth and timing devices.
7. Redundant light system adequate for the open water environment.
8. Jon-lines and other lines as dictated by site conditions
9. Ascent reel with lift bag/surface marker buoy
  - A. Adequate for maximum planned depth.
  - B. Minimum of twenty three (23) kg / fifty (50) lb lift bag.
10. Exposure suit adequate for the open water environment.
11. Two (2) Line cutting devices.
12. Underwater slate.

## **7.9 Required Subject Areas**

Instructor Trainers must use the current TDI Standards and Procedures Instructor Manual. In addition, Instructor Trainers may use any text or materials they feel best presents these topics.

1. History of Deep Air Diving.
2. Physics
  - A. Pressure Review.
  - B. Formulas for solving dive planning problems, MOD, best mix, etc.
3. Physiology
  - A. Hypoxia.



- B. Oxygen toxicity
  - I. Whole body.
  - II. Central Nervous System (CNS).
- C. Nitrogen narcosis.
- D. Nitrogen absorption and elimination.
- E. Carbon dioxide toxicity.
- F. Carbon monoxide toxicity.
- G. Hyperthermia.
- H. Hypothermia.
- 4. Decompression Option
  - A. Air.
  - B. Nitrox.
  - C. Oxygen.
- 5. Equipment Requirements
  - A. Twin cylinder or single cylinder options.
  - B. Stage cylinder options.
  - C. Regulator options.
  - D. Harness / BC options.
  - E. Computer / depth gauge / bottom timer options.
  - F. Ascent and navigation reels.
  - G. Lift bags for drifting or free decompression.
  - H. Lights.
  - I. Redundant mask and knife.
  - J. Jon-line or Garvin clips.
- 6. Dive Tables
  - A. Introduction and review of different models DCIEM, U.S. Navy recommended.
  - B. Introduction to computer generated tables.
- 7. Dive Computers
  - A. Mix adjustable.
  - B. O<sub>2</sub> integrated.
- 8. Dive Planning
  - A. Operational Planning
    - I. Support.
    - II. Teams.
  - B. Team Planning
    - I. Gas requirements.
    - II. Oxygen limitations.
    - III. Nitrogen limitations.
  - C. Emergency Planning
    - I. Omitted decompression.
    - II. Oxygen toxicity.
    - III. Decompression sickness.
    - IV. General.
- 9. Procedures
  - A. Bottom, Travel and Decompression Gas.
    - I. Normal operations.
    - II. Failure, loss or inadequate emergency procedures.



- III. Analyzing and logging.
- B. Descent
  - I. Methods of entry, down-lines or free descent.
  - II. Recognizing narcosis.
  - III. Breathing.
  - IV. Organization of equipment carried on diver.
- C. Ascent
  - I. Variable rates.
  - II. Trim and compensation.
- D. Support.
- E. Navigation
  - I. From shore.
  - II. From descent line.
  - III. From live aboard boat.

## **7.10 Required Skill Performance and Graduation Requirements**

The following skills must be completed by the Instructor candidate. The maximum depth of fifty five (55) msw / one hundred eighty (180) fsw should not be exceeded.

1. Properly analyze all gas mixtures to be used.
2. Demonstrate adequate pre-dive planning
  - A. Limits based on personal and team gas consumption.
  - B. Limits based on oxygen exposures at planned depths for actual mixes.
  - C. Limits based on nitrogen absorption at planned depth with actual mixes.
3. Demonstrate the proper procedures for switching and isolating a malfunctioning Regulator.
4. Demonstrate the proper navigational techniques for the specific dive.
5. On one (1) of the dives, demonstrate an ascent with the ascent reel and bag or a Jersey up-line and perform staged decompression.

In order to complete this course, students must:

1. Satisfactorily complete the TDI Extended Range Course written examination and be able to adequately explain each answer to a prospective student.
2. Demonstrate mature, sound judgment concerning training, dive planning and execution.
3. Demonstrate proficiency in every skill required in the Extended Range Diver course.
4. Demonstrate proficiency in teaching the TDI Extended Range Diver Program.
5. One graded presentation on an Extended Range topic.