16. Advanced Gas Blender Instructor

16.1 Introduction

This is the instructor level certification course for instructors wishing to teach the TDI Advanced Gas Blender course. This course involves the blending of nitrox and Trimix. The objective of this course is to train instructors to teach the proper preparation of nitrox and Trimix gasses for use in technical diving.

16.2 Qualifications of Graduates

Upon successful completion of this course, graduates may teach the TDI Advanced Gas Blender course

16.3 Who May Teach

Any active TDI Advanced Gas Blender Instructor Trainer may teach this course

16.4 Student to Instructor Ratio

Academic

1. Unlimited, so long as adequate facility, supplies and time are provided to ensure comprehensive and complete training of subject matter

Confined Water (swimming pool-like conditions)

1. N/A

Open Water (ocean, lake, quarry, spring, river or estuary)

1. N/A

16.5 Student Prerequisites

1. Minimum age (21
2. Certified TDI Advanced Gas Blender or equivalent
3. Certified as a TDI Nitrox Gas Blender Instructor or equivalent

16.6 Course Structure and Duration

Open Water Execution

1. No dives are required

Course Structure

1. TDI allows instructor trainers 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 6

16.7 Administrative Requirements

The following are the administrative tasks:

1. Collect the course fees from all the instructor candidates
2. Ensure that the instructor candidates have the required equipment
3. Communicate the training schedule to the instructor candidates
4. Have the instructor candidates:
    a. Complete the *TDI Liability Release and Express Assumption of Risk form*

Upon successful completion of the course the instructor trainer must:

1. Issue the appropriate TDI certification by submitting the appropriate *TDI Dive Leader Registration* form to TDI Headquarters

16.8 Required Equipment

The following are required for this course:

1. *TDI Advanced Gas Blending* Manual
2. *TDI Advanced Gas Blending* Instructor Guide
3. *TDI Advanced Gas Blending* PowerPoint presentation

16.9 Required Subject Areas

Instructor trainers must use the *TDI Advanced Gas Blender* Instructor Guide and the current *TDI Standards and Procedures* Manual, but may also use any additional text or materials that they feel help present these topics. The following topics must be covered during this course:

1. The Responsibility of the Gas Blender
2. Gasses of Diving
    a. Air
    b. Oxygen (O_2)
    c. Nitrogen
    d. Helium
    e. Other gases
3. Oxygen (O_2) Handling
    a. Oxygen (O_2) hazards
    b. Causes and prevention of oxygen (O_2) fires
    c. Oxygen (O_2) system design
    d. Local regulations for gas blending and handling
    e. Oxygen (O_2) compatible systems components
4. Gas Production
    a. Equipment
        i. Compressors
        ii. Cylinders
        iii. Filtration systems
        iv. Analog gauges
        v. Digital gauges
5. Mixing Techniques
    a. General considerations
    b. Continuous blending systems
    c. De-nitrogenated air systems
    d. Partial pressure blending
        i. Mathematics of partial pressure
        ii. Mixing by weight, optional
6. Oxygen Analyzing
    a. Procedures
    b. Oxygen (O_2) analyzers
7. Cylinder Handling and Sign Out

16.10 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate:

1. Satisfactorily complete the TDI Advanced Gas Blender course written examination and be able to adequately explain each answer to a prospective student
2. Demonstrate mature, sound judgment concerning training, and execution
3. Demonstrate proficiency in blending and analysis of nitrox and Trimix mixtures
4. Demonstrate proficiency in teaching the TDI Advanced Gas Blender program
5. Present a least 1 graded presentation on an advanced gas blending topic