Closed Circuit Rebreather Air Diluent Instructor Program

- Welcome and Course Overview
- The TDI Instructor
- Dive Leader Risk Management
- Methods of Instruction
- Business Side of Diving
- Teaching the TDI Closed Circuit Rebreather Air Diluent Diver Program

The TDI Closed Circuit Rebreather Air Diluent Instructor Program is the first CCR instructor level TDI offers. Once the instructor completes this program and wishes to continue to the next CCR level they will have learned the basics of CCR use. If this is the first program an instructor is completing through TDI more time will need to be spent on the core topics listed below. Once an instructor has completed their initial TDI Closed Circuit Rebreather Air Diluent program, or any initial TDI Instructor program, they will need only to focus on the course specific content for future programs.

Objectives

The object of this program is to:

- Introduce the instructor to TDI
- Introduce the candidate to the TDI Instructor Guide and Student materials

- Demonstrate how to use the TDI Closed Circuit Rebreather Air Diluent materials to train a new diver
- Teach the instructor "How to Conduct" the TDI Closed Circuit Rebreather Air Diluent Diver program
- Demonstrate how to register and certify a new Closed Circuit Rebreather Air Diluent Diver

Prerequisites for TDI Closed Circuit Rebreather Air Diluent Instructor Program

See the current TDI Closed Circuit Rebreather Air Diluent Instructor standards for the prerequisites and requirements for this program.

Materials Required

Teaching any program with outdated materials is just asking for problems. The trainer must confirm that their materials are current and each instructor has the current materials with which to teach the program.

Instructor Trainer

- TDI Diving Rebreathers Diver Manual
- TDI Diving Rebreathers Knowledge Quest
- TDI Diving Rebreathers Instructor Guide
- TDI Diving Rebreathers PowerPoint Presentation®
- TDI Instructor Trainer Manual
- Unit specific manufacturer's user manual

Instructor Candidate

- TDI Diving Rebreathers Diver Manual
- TDI Diving Rebreathers Diver Knowledge Quest

- TDI Diving Rebreathers Instructor Guide
- TDI Diving Rebreathers PowerPoint Presentation®
- Unit specific manufacturer's user manual

Note: Prior to beginning the program the instructor candidate should review all instructor and diver materials and complete all knowledge quests and final exams so they are completely familiar with the subject matter and the support materials to teach the TDI Closed Circuit Rebreather Air Diluent Diver program.

The topics to be covered are:

- Welcome and Course Orientation
- The TDI Instructor*
- Dive Leader Risk Management*
- Methods of Instruction*
- Business Side of Diving*
- Courses a TDI Closed Circuit Rebreather Air Diluent Instructor Can Teach

*Core Topics: These core topics will be found in Part One of this manual; IT Information.

Welcome and Course Overview

Paperwork

- Instructor Registration Form
- Personal Information
- Liability Release
- Medical Statement

Let's Get to Know Each Other

Professional Staff

Participants

- Your name?
- What type of technical diving experience do you have?
- Which technical diving activities interest you the most?
- Why are you interested in becoming a technical instructor?

About This Program

Course Objective

- Develop the appropriate knowledge and skills that are expected of every dive professional

Subject Areas

- The TDI Instructor
- Dive Leader Risk Management
- Methods of Instruction
- Business Side of Diving

Structure and Schedule

- Independent Study
- Classroom Presentations
- Confined Water Training
- Open Water Training

Required Equipment

- Items you'll need for this course

Any Questions?

The TDI Instructor

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Refer to Instructor Trainer Manual Part 1 Instructor Training Process
Chapter 2-The SDI/TDI/ERDI Instructor

Dive Leader Risk Management

Refer to Instructor Trainer Manual Part 1 Instructor Training Process Chapter 3-Dive Leader Risk Management

Methods of Instruction

Refer to Instructor Trainer Manual Part 1 Instructor Training Process Chapter 4-Methods of Instruction

Business Side of Diving

Refer to Instructor Trainer Manual Part 1 Instructor Training Process Chapter 5-Business of Diving

Teaching the TDI Closed Circuit Rebreather Air Diluent Diver Program

- Program overview
  - Classroom requirements
    - Students are required to become familiar with: risks of closed circuit rebreathers, pre-dive tests and checks, scrubber packing, oxygen analysis, post-dive unit cleaning as they relate to the specific unit. Since this course may be the

first time a diver has been on a rebreather, it is best to explain the differences between open circuit equipment and closed circuit as well as their breathing characteristics and how all CCRs are not built or designed the same. An Instructor must be able to demonstrate instructor level knowledge on all topics and skills in the current TDI CCR Air Diluent standards.

- Pool / confined water requirements
  - 60 minutes of pool / confined water training is required. An instructor should take this opportunity to introduce divers to required skills for CCR diving, the differences of rebreather diving in a controlled environment or conduct a basic skill evaluation to help the students become better divers. This is the ideal setting to conduct buoyancy skills, trim and equipment configuration.
- Open Water Requirements
  - Seven dives with a minimum of 420 minutes of bottom time are required. If this program is conducted in conjunction with other allowed courses, the seven dives plus the required number of dives from the other program are required. For the dives it is best to take divers progressively deeper so they get a slower introduction to rebreather diving. The first couple of dives can be started in shallower waters so divers get a sense of how the rebreather performs and the differences from open circuit diving. This also allows an opportunity for the instructor to monitor the comfort level and abilities of the diver.

- Materials
  - Review all diver materials to make sure the instructor candidate is familiar with all diver materials and how they are supported by the instructor materials.
    - Diver Materials
      - Online

- Printed

- Required paperwork
  - Discuss in detail how the instructor should complete the required paperwork
  - The instructor candidate must be familiar with all forms and be able to answer any question a diver may have regarding the completion of those forms
    - Diver Training Folder
    - Waiver
    - Medical Questionnaire

- Complete a thorough review of the appropriate TDI Instructor manual including:
  - How to conduct:
    - Academic sessions
      - Cover helpful hints on how to teach more involved subjects
    - Pool/ Confined water sessions (if one is conducted)
      - Helpful hints on:
        - How to teach skills
        - Conducting an update / skill evaluation
        - Possible problems an instructor may experience
        - How to deal with those problems
    - Open water sessions
      - Helpful hints on:
        - How to conduct skills in open water vs pool/confined
        - Possible problems an instructor may experience in open water
    - How to deal with those problems

List of tips on how to teach various aspects of this program include:

History and evolution of rebreathers – the most important part of rebreather history is to demonstrate to divers that the technology is not new and many people have tried and tested these products to ensure safety.

Comparison of OC, SCR and CCR – for this topic the instructor should give a review of the major differences of the three systems and the benefits and risks of each. The objective should be to get the diver in the right mind-set for CCR diving.

Practical mechanics of the system – because rebreathers are so drastically different from open circuit equipment it is good to explain exactly how a rebreather works and the differences to open circuit. Explain the injection of oxygen (electronic or manual) to replenish metabolized oxygen, how the scrubber scrubs gasses through chemical reaction and the exothermic reaction it has.

Gas Physiology – this again is a review as the basics are covered in the open water diver course and again in the nitrox course. Covering the gases that circulate in the loop will be a very important discussion because in open circuit dives these are not as much of a concern. An important one here is a CO2 breakthrough and how it affects the diver.

Formula work and metabolic consumption – divers understand as the workload increases so do their respirations but they may not understand how that affects them on a rebreather. Provide examples of metabolic rate and oxygen consumed at low and high rates. This is a concept they would have never been exposed to.

Proper scrubber packing – since scrubber canisters are unique to each unit it is important to cover the specifics of the canister for the unit they will be certified on. Other topics would include: pre-packed and other designs of self-packing canisters.

Electronic or manual system design – cover the differences in these two system designs and the user interface as well as locations for manual injection buttons for O2 and diluent gasses.

Dive tables – all tables previously covered in other courses need to be

reviewed with the addition of the oxygen metabolic table.

Dive computers problem solving – it is encouraged that all divers use dive computers and further a constant PO2 computer. Systems equipped with dive computers should be covered in great detail.

Dive planning – planning a rebreather dive is nothing like planning an open circuit dive so lots of time needs to be spent on this topic. Divers need to know that scrubber duration as well as oxygen supply play a big role in the limits of their dives. These are two things they will have never encountered.

Emergency procedures – for this topic divers should learn both self and buddy emergency procedures, such as: signs and symptoms of CO2 build up, on-board and off-board bailout options, loss of O2 supply, loss of diluent supply, system flood to name a few.

List of academic / pool-confined water / open water topics for candidate to present:

As well as the topics above the following skills topics should be presented.

Pre-dive checks

Verify diluent and oxygen

Demonstrate correct pre-dive planning

Emergency procedures

Electronic system monitoring

Constant loop volume management

Post-dive cleaning of unit

Diver Maintenance of unit

Scheduling Options for this program

Courses can be scheduled with a one to one ratio, as a group or scheduled in conjunction with other TDI courses. Each of these will require different time commitments and scheduling logistics. A course with one air diluent CCR diver will take less time than if combined with another TDI course with a group.

Overview

The TDI Air Diluent CCR Instructor program is comprised of classroom sessions, confined water and dives. One day should be allotted for the academic session with up to three full days for the dives.

If this program is taught with any of the other allowed instructor programs, two full days for the classroom should be scheduled and the appropriate amount of days for the dives if two dives per day are scheduled. There may be times when the course can be completed in less time but it is always good to allot an extra day or two for make-up time or weather.

Classroom

You will need various pieces of equipment normally used for CCR diving as well as a complete unit that the diver will be certified to dive on. The instructor must be able to demonstrate to instructor level quality all academic topics in the current TDI CCR Air Diluent Diver Standards

Dives

Four dives are required for the instructor course. These sessions could be completed over three days but it is best to build in an extra day for delays and make-up.

Knowledge Quest Review Questions if applicable

No instructor level Knowledge Quest is available for this program, although the candidate should complete the diver level Knowledge Quest so they are familiar with the information.

Final Exam

No instructor level final exam is available for this program, although the candidate should complete the diver level final exam so they are familiar with the information.