part 3

TDI Leadership Standards

Contents

Revision History

Revision Number	Date	Changes
2.0	11/12/2001	Reformatted
2.1	02/04/2002	1st Quarter 2002 Updates
2.2	10/10/2002	Updated with latest Training Updates.
3.0	08/15/2003	Updated with latest Training Updates.
3.1	12/19/2003	Editorial changes and minor updates.
5.0	11/19/2004	Minor updates.
6.0	10/13/2005	Major updates and new standards added
7.0	10/27/2006	Editorial changes and training updates
8.0	11/13/2007	Minor editorial changes
9.0	12/01/2008	Minor updates and clarifications to standards
10.0	12/31/2009	Updated with 2009 training updates. Minor Edits
11.0	01/01/2011	Updates and major edits
12.0	01/01/2012	Minor edits
12.1	01/15/2012	Added KISS GEM Level 1 Instructor Standard
12.2	06/01/2012	2.3 Added Definitions
12.3	08/15/2012	Added Helitrox Instructor #10, Poseidon Discovery MK VI / SE7EN Air Diluent #26, Air Diluent Decompression Procedures #27 and Mixed Gas #28 Instructor levels
13.0	01/01/2013	Modified Instructor Trainer prerequisites
13.1	04/01/2013	#29 Added Hollis Explorer CCR Air Diluent Instructor
13.2	07/01/2013	#22 Added KISS GEM Sidekick Instructor #31 Added Rebreather Full Cave Diver Instructor
13.3	10/01/2013	# 8.5.2 Added the following: Minimum certification of TDI Advanced Nitrox Instructor or equivalent (unless Advanced Nitrox Instructor course is taught in conjunction with Deco Procedures Instructor)
14.0	01/01/2014	No Changes

Revision History

Revision Number	Date	Changes
14.1	04/01/2014	Replaced MK VI with MK VI / SE7EN throughout Leadership Standards 1.2 Rebreather Matrix 32.9 Standardize the TDI IT in water requirements with SDI and ERDI IT levels 32.10 Clarified requirements for upgrading to the IT level for TDI programs.
14.2	10/01/2014	5.3 Deleted 1. A TDI Instructor Trainer who is also a TDI Advanced Nitrox and Decompression Procedures Instructor 23.5 and 24.5 Added to the perquisites: If the rebreather is a TDI approved sidemount rebreather, the student must hold the TDI Sidemount Instructor certification or equivalent
15.0	01/01/2015	No Changes
15.1	04/01/2015	23.5 and 24.5 added: Provide proof of a minimum of 100 logged dives and a minimum of 100 hours on the specific unit Be a certified rebreather diver (not unit specific) for a minimum of 12 months
15.2	08/01/2015	1.2 Rebreather Matrix: Clarified Advanced Mixed Gas rating for MKVI/ SE7EN unit Added the following rebreather units to list: JJ, Liberty and Triton
15.3	11/01/2015	Page Two: Headquarters information updated
16.0	01/01/2016	No Changes
16.1	4/01/2016	Changes to #32 Instructor Trainer
16.2	10/01/2016	3.8.4 Added TDI Divemaster Slate to required materials
17.0	01/01/2017	1.2 Added Defender CCR ratings to list

Revision History

Revision Number	Date	Changes
18	01/01/2018	2.1 Changed wording to allow digital materials, Clarified passing scores on exams and procedure when conducting leadership programs in sequence 2.3 Added definition of prerequisites 3.7 Clarified correct form to submit for processing a TDI Divemaster 3.8 Updated required equipment 3.10 Updated Required Skills and Graduation Requirements 8.5.5 Added: or 10 SDI Advanced Adventure Diver or equivalent 9.2 Under Qualification Changed Entry Level Trimix to Trimix 23 Changed name to Air Diluent from Basic 24 Changed name to Air Diluent from Basic 24.5.2 added "or equivalent" 27 Changed name to Air Diluent from Basic 28 Changed name to Air Diluent from Basic 29 Changed name to Helitrox Deco from Mixed Gas 31.5 Added information for how a Full Cave Instructor can administratively upgrade
19.0	01/01/2019	Added “or eLearning” to all applicable courses Removed medical requirement from non-diving courses Clarified CPR, first aid and oxygen provider certification requirements 1.1 Corrected errors in table 2.1 Added medical form requirement to this section, clarified what paperwork must be submitted and what must be retained by the instructor, clarified administrative upgrades 2.2 Added reference 3.3 Clarified who may teach 3.5.6 Clarified prerequisites 3.10 Clarified skill performance and graduation requirements 9.5.4 Clarified prerequisites 10.1 Added +/- 5% to allowable He percentage 10.5 Clarified prerequisites 11.6 Deleted Open Water Execution item 2. 11.8 Clarified required equipment 11.10 Clarified required skills Removed Poseidon-specific standards, sections 27, 28 and 29 32.11 Clarified Adv. Trimix IT requirements Formatting updated

Revision History

Revision Number	Date	Changes
0120	01/01/2020	2.1.2 Defined the valid term for a physician signed medical 7.8 Added items 3 and 4 8.8 Added items 3 and 4 9.8.2 "or eLearning added at end of item 10.1 Helium percentage changed from "20" to "35" 12.8 Item 1, remove "Entry Level", item 1 and 2, add "or eLearning" to end of item 17.8 Under Required Reading, Replaced all instances of "TDI Diving in Overhead Environments" with "TDI Cavern Diver", Replaced "Instructor Resource CD" with "Digital Instructor Resource" 24.1 & 24.2 Depth changed from " 45 metres / 150 feet" to "40 metres / 130 feet" 24.8 Under "Required Material", Added items 4-7. Under "Optional Material", item 2 changed to " TDI Rebreather Cue Cards", items 4-9 removed Added new instructor standard 25. Helitrox Diluent CCR Decompression Procedures Instructor – Unit Specific. All following standards renumbered 30. (Formerly 29) TDI Instructor Trainer Standards rewritten
0121	01/01/2021	No Changes
0221	02/01/2021	International Training Crossover Course Standards added
0122	01/01/2022	2.1 Bolded line expanded upon 2.5 Item 11 added 6 New standard were added for "TDI Sidemount Instructor", all subsequent sections renumbered 17.5 (18.5) Minimum courses changed from "TDI" to " SDI/TDI/ERDI" 17.6.5 (18.6.5) Maximum depth changed to 40 metres/130 feet 17.8.5, 18.8.5, 19.8.5 (18.8.5, 19.8.5, 20.8.5) Removed specified long hose length 21 New Standard added for " DPV Cave Diver Instructor" all subsequent sections renumbered 26.5.3 (28.5.3) Instructor level prerequisite changed, renumbered subsequent item 1 as item 4 28 Explorer Rebreather Instructor Standard removed, all subsequent sections renumbered 29.3 (30.3)Item expanded upon

1. Course Overview Matrix

1.1 All Courses

	Course Name	Minimum Age	Number of Required Dives	Student to Instructor Ratio	Prerequisite Certification and Dives
3	Technical Divemaster	18	4 dives with a minimum accumulated bottom time of 100 minutes	4 to 1	SDI Divemaster, current CPR and first aid certification, medical examination, proof of 50 logged open water dives, technical diver certification
4	Non-Diving Instructor	21	N/A	N/A	See course description
5	Intro to Tech Instructor	18	4 dives with a minimum accumulated bottom time of 100 minutes	4 to 1	SDI Open Water Scuba Instructor, Advanced Nitrox diver, Decompression Procedures diver
6	Sidemount Instructor	18	3 dives with a minimum accumulated bottom time of 90 minutes	4 to 1	SDI Open Water Scuba Instructor, TDI Sidemount Diver
7	Nitrox Instructor	18	None 2 dives recommended	N/A	Open water instructor Nitrox certification 10 logged nitrox dives
8	Advanced Nitrox instructor	18	4 dives and 100 minutes bottom time All 4 deeper than 23 m / 75 ft 2 dive deeper than 30 m /100 ft	6 to 1	Nitrox instructor, Advanced Nitrox diver, 25 logged nitrox dives
9	Decompression Procedures Instructor	18	4 dives 100 minutes bottom time	4 to 1	Advanced nitrox instructor, Decompression Procedures diver, 150 logged dives

10	Extended Range Instructor	21	4 dives all deeper than 30 m /100 ft 2 dives deeper than 40 m /130 ft	4 to 1	Extended Range diver certification, Advanced Nitrox instructor, Decompression Procedures instructor and 25 extended range dives and issued 10 student certifications for Adv. Nitrox and Deco. Procedures, minimum of 5 must be Deco. Procedures
11	Helitrox Instructor	21	4 dives minimum of 100 minutes bottom time	4 to 1	Trimix or Helitrox diver, Advanced Nitrox and Decompression Procedures instructor
12	Advanced Wreck Instructor	21	6 dives and 100 minutes bottom time	4 to 1	Decompression procedures diver certification, advanced wreck diver certification and advanced nitrox instructor – 200 logged dives with 50 logged as wreck dives and 25 penetration wreck dives
13	Trimix Instructor	21	4 dives 2 deeper than 45 m/150 ft 100 minutes bottom time	4 to 1	Trimix diver certification, Advanced Nitrox instructor, Decompression Procedures instructor, 250 logged dives 20 logged Trimix dives
14	Advanced Trimix Instructor	21	4 Dives with a minimum accumulated bottom time of 100 minutes 2 dives must be deeper than 70 m/230 ft	4 to 1	Minimum certification as a TDI Advanced Trimix Diver, TDI Extended Range Instructor or TDI Trimix Instructor or equivalent, proof of 250 logged dives 30 of those dives with Trimix and 20 dives deeper than 55 m/180 ft
15	Gas Blender	21	N/A	N/A	Nitrox gas blender
16	Advanced Gas Blender Instructor	21	N/A	N/A	Advanced gas blender, Nitrox gas blender instructor
17	Oxygen (O_2) Equipment Services Technician Instructor	21	N/A	N/A	TDI Services Technician Proof of VIP certification and repair certification
18	Cavern instructor	21	2 dives	3 to 1	Nitrox instructor Full cave diver certification 100 logged cave dives
19	Introduction to Cave Instructor	21	2 dives	3 to 1	Cavern instructor 150 logged cave dives
20	Cave Instructor	21	2 dives	3 to 1	Intro to cave instructor 200 logged cave dives

21	DPV Cave Diver Instructor	21	3 supervised DPV cave dives	2 to 1	TDI Full Cave Dive Instructor for at least 1 year Taught at least 5 TDI Full Cave Diver courses 50 logged non-training DPV Dives Co-Teach at 1 TDI Full Cave DPV Course with an active TDI DPV Cave Diver Instructor
22	Semi-Closed Rebreather Instructor	18	4 dives	6 to 1	Rebreather diver, nitrox instructor 10 rebreather logged dives
23	KISS GEM Level 1 Instructor	18	5 dives with a minimum accumulated bottom time of 200 minutes	4 to 1	TDI KISS GEM Level 1 Diver, TDI Nitrox Instructor, or equivalent 200 logged dives, 50 using nitrox Assist with at least 1 TDI KISS GEM diver course 50 logged rebreather dives on approved units, with 50 accumulated hours 25 dives and 25 hours on KISS GEM
24	KISS GEM Sidekick Instructor	21	5 dives with a minimum accumulated bottom time of 200 minutes	4 to 1	TDI KISS GEM Level 1 Diver TDI Nitrox Instructor, or equivalent 200 logged dives, 50 using nitrox Assist with at least 1 TDI KISS GEM Sidekick diver course 50 logged rebreather dives on approved units, with 50 accumulated hours 25 dives and 25 hours on KISS GEM
25	Air Diluent CCR Instructor - Unit Specific	21	4 dives	4 to 1	Proof of 100 unit specific dives 250 verified logged dives with 100 on nitrox TDI Unit Specific Diver, Advanced Nitrox instructor
26	Air Diluent CCR Decompression Procedures Instructor - Unit Specific	21	4 dives	4 to 1	Proof of 100 unit specific dives, 250 verified logged dives with 100 on nitrox TDI Unit Specific Diver certification or equivalent TDI Adv. Nitrox and Deco Proc Instructor

27	Helitrox Diluent CCR Decompression Procedures Instructor - Unit Specific	21	4 dives	2 to 1	TDI Unit Specific Rebreather Diver TDI Advanced Nitrox Instructor TDI Decompression Procedures Instructor or Helitrox Deco Procedures Instructor 250 verified logged dives, 100 being on nitrox 100 logged dives and a minimum of 100 hours on the specific unit Certified Rebreather Diver (not unit specific) for a minimum of 12 months TDI Sidemount Instructor certification if unit is a TDI approved sidemount rebreather
28	Mixed Gas CCR Instructor Unit Specific	21	4 dives	2 to 1	TDI Air Diluent CCR Deco Proc Instructor with 15 students taught and one year teaching experience on the unit specific CCR
29	Advanced Mixed Gas CCR Instructor Unit Specific	21	4 dives	2 to 1	TDI Mixed Gas CCR Instructor with 10 mixed gas students taught and one year teaching experience on the unit specific CCR, 30 mixed gas dives on the unit specific rebreather with 15 logged beyond 65m/215ft
30	Rebreather Full Cave Diver Instructor	21	Participate in 2 each supervised TDI Rebreather Cavern, Introductory to Cave and Full Cave dives	6 to 1	Scuba Instructor for 2 years TDI Rebreather Full Cave Diver or equivalent 200 Full cave dives, 100 must be with rebreather TDI CCR ADDP Instructor or equivalent 1 year rebreather teaching experience Issued 25 rebreather diver certs at any level, Assisted with 3 courses each of the three levels of the TDI Rebreather Cave training Recommended by a TDI Rebreather Cave Instructor
31	Instructor Trainer	21	N/A		See Course Description
32	International Training Crossover	18	N/A	N/A	Open Water instructor rating from recognized agency

1.2 Rebreather Training Courses

TDI offers training on the following CCR units:

Unit	Air Diluent	Air Diluent Decompression	Helitrox	Mixed Gas	Advanced Mixed Gas
Copis	✓	✓	✓	✓	✓
Defender	✓	✓	✓	✓	✓
Discovery MK VI / SE7EN	✓	✓	✓	✓	✓ (SE7EN only)
Evolution	✓	✓	✓	✓	✓
Hammerhead	✓	✓	✓	✓	✓
Inspiration	✓	✓	✓	✓	✓
JJ	✓	✓	✓	✓	✓
KISS	✓	✓	✓	✓	✓
Liberty	✓	✓	✓	✓	✓
Mark 15	✓	✓	✓	✓	✓
Megalodon	✓	✓	✓	✓	✓
Optima	✓	✓	✓	✓	✓
Ouroboros	✓	✓	✓	✓	✓
Pathfinder	✓	✓	✓	✓	--
Prism Topaz / Prism2	✓	✓	✓	✓	✓
Pelagian	✓	✓	✓	✓	✓
rEvo	✓	✓	✓	✓	✓
Sentinel	✓	✓	✓	✓	✓
SF2	✓	✓	✓	✓	✓
Submatix 100	✓	✓	✓	✓	✓
Titan	✓	✓	✓	✓	✓
Triton	✓	✓	✓	✓	✓

The air diluent, air diluent decompression procedures, mixed gas and advanced mixed gas CCR instructor course standards contained in this manual are unit specific to the above CCRs.

2. Leadership Course Standards

These following standards apply to all TDI Leadership Courses.

2.1 Administrative

Instructor trainers must ensure that all students complete the following forms – *for each and every leadership course and leadership specialty* the student participates in. They are:

1. *TDI Liability Release and Express Assumption of Risk Form*
2. *TDI Medical Statement* Form signed by a licensed physician, unless a course standard specifically states otherwise. A physician-signed medical is valid for up to 12 months with no change in medical condition unless a longer valid term is indicated on a specific medical form
3. The appropriate *TDI Dive Leader* form must be completed and submitted to TDI Headquarters for processing of leadership credentials. A copy of the *TDI Dive Leader* Form and all other course records must be retained for a minimum of 7 years

Leadership level registrations, including upgrades and crossovers, are not complete until SDI/TDI/ERDI Headquarters has verified and processed the individual's documentation and credentials. An individual may not function at the level(s) being registered until they have received verification of their certification level(s) from the SDI/TDI/ERDI Headquarters. Verification can be achieved by: checking online profile, email or verbal notification from SDI/TDI/ERDI Headquarters. Certain

instructor ratings have an administrative upgrade procedure; those procedures are typically found in the diver level standard for the course.

All TDI instructors are required to have their own *TDI Standards and Procedures* and any required materials for any diver or leadership level course they conduct or take

Note: All leadership level final exams require an 80 percent or better score, and 100 percent remediation

1. When TDI Leadership level courses are conducted consecutively, such as, divemaster followed by instructor, or any combination, instructors, or instructor trainers, must ensure that registration forms, *for each level of training* are submitted, and approval is received *before* the next phase of training is commenced. This ensures that the leadership certification prerequisites for each level are met.

2.2 Accidents

Hopefully a member will never have to do this; if the member was involved in an accident or simply witnessed an accident, the *TDI Accident Report* Form must be completed, and faxed or emailed to TDI Headquarters immediately after the accident occurred. Please refer to TDI Standards Part 1, Section 6.4.8

2.3 Definitions

Assistant or Assisted by = A person who is assisting a primary and certified instructor, IT staff instructor or instructor trainer for a course that they, the "assistant", is not certified to teach. Assistants can be used for the purposes of additional supervision and to increase ratios where standards and environmental conditions allow. Assistants listed on registrations will receive experience credits for courses they have assisted with only if listed on the initial registration form.

Co-Teach or 2nd Instructor = A person who is certified to teach the course taking place and is working together with an also certified instructor, IT staff instructor or instructor trainer. The 2nd instructor will receive equal credit for the course if listed on the initial registration form.

Student Prerequisites = conditions that must be met by students prior to beginning a course. These cannot be completed during the course unless specifically outlined in the standard. Conditions listed here cannot be waived by the instructor. Written standards waivers for prerequisites may be issued by the HQ training department depending on the course, dive site, and the specific prior experience of course participants.

2.4 Confined Water Training

1. Confined water training must be conducted in a swimming pool or a confined body of water with the following conditions:
2. Approximately 3 metres / 10 feet of visibility
3. Calm surface conditions
4. Easy access to depths that allow students to stand with their head above water
5. Depths that allow skills, as defined in the confined water lesson guide, to be adequately demonstrated
6. Equipment appropriate for the training site
7. Confined water training sites, other than pools, must be approved by TDI Headquarters

2.5 Open Water Training

The instructor, with the following considerations, must carefully choose an open water training site:

1. Body of water similar to the regional diving conditions (ocean, lake, etc)
2. Swimming pools are not considered an open water environment
3. Water clarity
4. Temperature above and below the water
5. Weather conditions
6. Water access
7. Equipment adequate for the conditions
8. Thermal protection appropriate for the conditions
9. A complete briefing that includes:
    a. The dive site
    b. Water conditions
    c. Skills to be performed
    d. Entry/Exit to be used
    e. Emergency procedures
10. A complete debriefing that includes:
    a. Performance of divers as a whole
    b. Areas that need improvement
    c. Environmental observations
    d. Question and answers
11. Team diving concepts are to be emphasized on all open water dives in all TDI courses

2.6 Required Subject Area for All TDI Instructor Courses

1. Review of the Instructor Package
2. History of TDI
3. Regional Offices
    a. Locations
    b. Rules for teaching in other areas of the world
4. TDI Code of Ethics and Conduct
5. Products and Procedures
    a. How to place an order
    b. How to fill out student registrations
    c. Yearly renewals
6. Liability and Insurance
    a. Risk management
    b. Waivers and releases
7. Filling out an Accident Report

Note: Cylinder capacities used in the TDI Standards are based on manufacturer values or generalized conversions and are NOT exact conversions from metric to imperial due to variance in cylinder volume and working pressures. If you use metric cylinders, please use the metric size cylinder listed; likewise, if you use imperial cylinders, please use the imperial size cylinder listed, I.E. 3 litres / 18 cubic ft.

3. Technical Divemaster

3.1 Introduction

This program is designed to develop the skills and knowledge necessary for an individual to lead certified technical divers in the open water environment.

3.2 Qualifications of Graduates

Upon successful completion of this course, graduates may:

1. Assist an active TDI Instructor during approved diving courses provided the activities are similar to the graduate's prior training
2. Supervise and conduct dives for certified technical divers provided the activities are similar to the graduate's prior training
3. This program does not cover overhead environment with the exception of advanced wreck

3.3 Who May Teach

1. Any active TDI Instructor may teach this program

3.4 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. A maximum of 4 students per instructor; it is the instructor's discretion to reduce this number as conditions dictate

3.5 Student Prerequisites

1. Minimum age 18
2. Certified as an SDI Divemaster (equivalent ratings from other agencies are not accepted for this TDI Divemaster prerequisite) Must have all current SDI Divemaster materials
3. Provide copies of current CPR and first aid training
4. Have a current medical examination
5. Provide proof of 50 logged dives
6. Certified as a technical diver

3.6 Course Structure and Duration

Open Water Execution

1. Four dives are required with a minimum accumulated bottom time of 100 minutes

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 10

3.7 Administrative Requirements

The following are the administrative tasks:

1. Collect the course fees from all the divemaster candidates
2. Ensure that the divemaster candidates have the required equipment
3. Communicate the training schedule to the divemaster candidates
4. Have the divemaster candidates:
    a. Complete the *TDI Liability Release and Express Assumption of Risk* form
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

Upon successful completion of the course the instructor must:

1. Issue the TDI Divemaster certification by submitting the *TDI Divemaster* application to TDI Headquarters

3.8 Required Equipment

The following are required for this course:

1. TDI course specific user manuals

The minimum equipment requirements for training by an instructor, divemaster and student are as follows:

1. Mask and fins
2. Buoyancy compensator device (BCD) with low-pressure power inflator
3. Regulator with submersible pressure gauge; students wearing air integrated hose-less computers are not required to carry a separate submersible pressure gauge
4. Alternate air source
5. Weight system and/or weights
6. Personal dive computer
7. Exposure suit adequate for the training conditions
8. Compressed gas cylinder
9. Compass
10. Knife and rescue signal
11. A dive flag is required on all open water training dives unless otherwise specified by local laws or regulations
12. Extra equipment associated with the particular technical diving activity they are participating in

3.9 Required Subject Areas

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

1. Knowledge Development
    a. Recreational dive leader
    b. Diving physics
    c. Diving physiology
    d. Diving equipment
    e. Personal dive skills
    f. Professional skills

3.10 Required Skill Performance and Graduation Requirements

Divemaster Performance Requirements:

1. Must give a minimum of 2 briefs/debriefs
2. Show preparation, planning, and control in dive management and technical diving activities
3. Four open water dives. Training dives must not exceed the divemaster candidate's current experience.
4. Upon successful completion of the dives, students must complete their logbooks and the instructor must sign off on the completed dives
5. Students must demonstrate all the skills required in TDI course standards at the highest technical diver level held at divemaster quality in leadership level equipment.

In order to complete this course, students must:

1. Satisfactorily complete the TDI written examination for the highest technical diver rating held
2. Complete all water requirements
3. Demonstrate mature and sound judgment concerning dive planning and execution

4. Non-Diving Specialty Instructor

4.1 Introduction

The TDI Non-Diving Specialty Instructor course is designed to teach members of the scuba diving industry, such as store owners, service technicians, etc the knowledge to safely function as an independent instructor of the non-diving specialties listed below:

1. Visual Inspection Procedures
2. TDI Nitrox Gas Blender
3. TDI Advanced Gas Blender
4. TDI Oxygen (O_2) Equipment Service Technician
5. Other non-diving specialties, ie unique specialties, offered by TDI, subject to TDI Headquarters approval

In order to become an instructor for one of the above courses; a candidate must be certified by a qualified instructor trainer, experience-based upgrades are not available. Instructors who hold equivalent certifications with another recognized agency, for example gas blender instructors, who wish to cross over as a non-diving specialty instructor may do so by applying via current instructor crossover procedures

4.2 Qualifications of Graduates

Upon successful completion of this course, graduates may:

1. Teach the appropriate TDI Non-diving Specialty

Note: The candidate may be certified to teach multiple specialties at once, provided all corresponding pre-requisites and graduation requirements are met and the instructor trainer conducting the courses is qualified at all levels.

4.3 Who May Teach

An active TDI Instructor Trainer who is qualified to teach the instructor level specialty the candidate will be teaching after graduation

4.4 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

4.5 Student Prerequisites

1. Minimum age 21
2. Affiliated with an TDI facility
3. Minimum of 1 year experience at user level for the specialty which will be taught after graduation
4. Meet all prerequisites for the corresponding specialty they will teach after graduation
5. Hold a current CPR and first aid certification (courses may be combined with the program by qualified instructors)

4.6 Course Structure and Duration

Duration

1. A minimum of 20 hours for the entire course; 15 hours must occur under the direct supervision of a current instructor trainer

4.7 Administrative Requirements

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 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

4.8 Training Material

Required Material:

1. *TDI Standards and Procedures* Manual
2. *TDI Instructor Trainer* manual
3. TDI Instructor Manual(s)
4. Any materials required by current standards for the specialty being taught after graduation

4.9 Required Equipment

1. Any equipment required by the current standard(s) appropriate to the specialty being taught by the Candidate, after graduation

4.10 Required Subject Areas

Instructor trainers may use any additional text or materials that they feel help present these topics. The following topics must be covered:

1. TDI Standards and Procedures
2. History of TDI
3. Products and Procedures
    a. How to place an order
    b. Registration procedures
    c. Yearly renewals
    d. Liability and insurance
4. Risk Management
    a. Waivers and releases
    b. Filling out an accident/incident report
5. Methods of Instruction
    a. Teaching theory, methods and oral communications
    b. Lesson preparation
        i. In classroom
    c. Use of training aids
    d. Home study program, use of knowledge quest
6. Successfully Selling Courses
    a. Budgeting courses
    b. Recruiting students
    c. Organizing and scheduling a course
    d. Retail sales
7. Instructor Ethics
8. All Course Content for the Specialty the Candidate will be Teaching After Graduation

4.11 Required Skill Performance and Graduation Requirements

In order to complete this course, the student is required to pass all the following:

1. Present a minimum of 3 academic presentations, minimum time of 15 minutes , on subjects from the TDI Specialty they will be teaching after graduation
2. Present a minimum of 2 practical presentations, minimum time of 15 minutes , on subjects from the TDI Specialty they will be teaching after graduation
3. Satisfactorily complete all skill performance and graduation requirements for the TDI Specialty they will be teaching
4. Demonstrate the ability to correctly remediate exam questions with a student
5. Satisfactorily complete the *TDI Standards and Procedures instructor* exam
6. Demonstrate mature and sound judgment concerning class planning and execution

4.12 Course Credit

Graduates of the TDI Non-Diving Specialty Instructor Course may upgrade to other non-diving specialties without completing the full course again; all prerequisites, skill performance and graduation requirements for any additional specialty must be met and conducted by a qualified instructor trainer

5. Intro to Tech Instructor

5.1 Introduction

The TDI Intro to Tech Instructor course provides the training required to competently and safely introduce students to the world of technical diving. The objective of this course is to train instructors to familiarize students with technical equipment configurations, to enhance open water diving skills (such as buoyancy, trim, and situational awareness), and to introduce advanced gas planning techniques within a no-decompression context. Although taught in conjunction with material from the TDI Advanced Nitrox and Decompression Procedures courses, this course is strictly a no-decompression course; students are permitted to use enriched air nitrox mixes, provided the gas mix is within their current level of certification.

5.2 Qualifications of Graduates

Upon successful completion of the course, graduates may teach diving activities in a technical equipment configuration provided:

1. The diving activities approximate those of training
2. The areas of activities and environmental conditions approximate those of training

Graduates who are also nitrox instructors may enroll in:

1. TDI Advanced Nitrox Instructor course
2. TDI Decompression Procedures Instructor course

5.3 Who May Teach

1. A TDI Instructor Trainer qualified to teach the TDI Intro to Tech Instructor course

5.4 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. A maximum of 4 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

5.5 Student Prerequisites

1. Certified as an SDI Open Water Scuba Diver Instructor, or equivalent
2. Certified as a Advanced Nitrox and Deco Procedures diver, or equivalent

OR

1. Certified as a TDI Advanced Nitrox and Deco Procedures Instructor, or equivalent

5.6 Course Structure and Duration

Open Water Execution

1. Four dives with a minimum accumulated bottom time of 100 minutes

Course Structure

1. TDI allows instructor trainers to structure courses according to the number of candidates participating and their skill level

Duration

1. The minimum number of classroom and briefing hours is 6

This course may be taught in conjunction with the TDI Nitrox Instructor Course

5.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

5.8 Required Material and Equipment

The following are required for this course:

1. *TDI Intro to Tech* Student Manual or eLearning course
2. *TDI Intro to Tech* Instructor Guide
3. *TDI Into to Tech* PowerPoint Presentation
4. *TDI Advanced Nitrox and Decompression Procedures* Student and Instructor materials
5. *TDI Standards and Procedures* Manual

The following minimum equipment is required for each instructor and instructor candidate:

1. Sufficient gas supply for the planned dives
2. Alternate air source attached to a secondary regulator (a sufficient length hose for air sharing attached to a secondary regulator is required)
3. A submersible pressure gauge
4. Depth gauge and bottom timer and / or dive computer
5. A redundant scuba unit (pony cylinder) with regulator and SPG is recommended but not required
6. Buoyancy compensator device with power inflator, appropriate for equipment configuration
7. Ascent reel with lift bag/surface marker buoy
    a. Appropriate for maximum planned depth
    b. Lift bag with at least 11 kg / 25 lbs of lift
8. Exposure protection appropriate for local diving condition
9. Slates/wet notes
10. All equipment properly labeled and cleaned as required for enriched air nitrox (EAN) mixtures
11. Oxygen (O_2) analyzer (if required)

5.9 Required Subject Areas

Instructor trainers must use the current *TDI Standards and Procedures* Manual, *TDI Intro to Tech* and *TDI Advanced Nitrox/Decompression Procedures* Manuals or eLearning 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. Physics
    a. Pressure review
2. Physiology
    a. Hyperthermia
    b. Hypothermia
    c. Psychological aspects
    d. Hypoxia
    e. Oxygen toxicity
        i. Whole body
        ii. CNS
    f. Nitrogen narcosis
    g. Nitrogen absorption and elimination
    h. Carbon dioxide toxicity
    i. Carbon Monoxide toxicity
3. Formula Work
    a. Best mix computations
    b. Maximum operating depth of a mixture computation
4. Equipment considerations
    a. Single/double cylinder(s); valve options
    b. Regulator options
    c. Harness/BC options
    d. Computer, bottom timer, depth gauge options
    e. Ascent and navigation reels/spools options
    f. Lift bag/surface marker bag options
    g. Exposure protection options
    h. Minimum equipment, bring only what you need
    i. Stream lining and stowing equipment
    j. Stage cylinder options
    k. Jon-line or Garvin clips
    l. Proper weighting and buoyancy control during dive phase and decompression

5. Dive Tables
    a. Equivalent air depth (EAD) with any table
    b. Computer generated tables (Pro-Planner, DPA, Dr. X, Abyss, etc)
6. Dive Computers
    a. Mix adjustable
    b. Oxygen (O_2) integrated
7. Dive Planning
    a. Gas requirements
    b. Oxygen limitations
    c. Nitrogen limitations
    d. Tables/computer dive planning and execution
    e. Surface air consumption (SAC) rate calculations
    f. Minimum gas reserve calculations for no-decompression dives
    g. Environmental considerations
8. Procedures
    a. Entry/exit strategies
    b. Emergency strategies in case of gas failure/loss
    c. Ascent/descent strategies
    d. Dive planning
    e. Standard operation
        i. Gas requirements
        ii. Oxygen limitations
        iii. Nitrogen limitations
    f. Emergency planning
        i. Omitted decompression
        ii. Decompression sickness
        iii. Equipment failure
    g. Primary and decompression gas
        i. Normal operations
        ii. Failure, loss or inadequate emergency procedures
        iii. Analysis and logging
        iv. Safeguards on deco supply regulators
        v. Rigging and deployment of decompression equipment
    h. Descent
        i. Methods of entry, down lines or free decent
        ii. Organization of equipment carried on dive
    i. Ascent
        i. Variable rates
        ii. Trim and compensation

   j. Fixed or drifting decompression methods
      i. Up lines fixed to bottom
      ii. Reels and lift bags/surface marker buoys
      iii. Free drifting stages or boat supply
      iv. Self-contained versus surface supply / rendezvous gas cylinders
   k. Support
      i. From shore
      ii. From descent line or fixed platform
      iii. From live aboard boat
9. Decompression Options
   a. Air
   b. Nitrox
   c. Oxygen
10. Administration Procedures
   a. Medical form
   b. Waiver forms
   c. Risk management
   d. Registration forms
   e. Standards and procedures

5.10 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate; maximum training depths shall not exceed 30 metres / 100 feet. The student must complete the following skills:

Land drills:

1. Properly analyze gas mixtures
2. Selection and preparation of equipment
3. Conduct team oriented skills (buddy checks) for lift bag deployment
4. Gas matching among buddy teams
5. Demonstrate familiarity with basic hand signals
6. Demonstrate adequate pre-dive planning with limits based on the team and personal gas consumption

Pre-dive drills:

1. Use S.T.A.R.T. * before every dive
2. Stress analysis and mitigation

***START is S-drill (OOA drill and Bubble Check), Team (buddy equipment checks), Air (gas matching), Route (entry/exit and planned path underwater), Tables (depth, duration, waypoints and schedule).**

In-water drills:

1. Weight check
2. Demonstrate adequate buoyancy control; ability to hover at fixed position in water column without moving hands or feet
3. Demonstrate adequate trim; ability to maintain horizontal during the descent, bottom and ascent portion of the dive
4. Demonstrate no-silting propulsion techniques; frog kick, modified frog kick, modified flutter kick, backwards kick
5. Demonstrate the ability to perform the following exercises while maintaining trim and buoyancy in the water column:
    a. Regulator exchange
    b. Regulator recovery
    c. Mask partial flood and clear with minimal air loss
    d. Mask removal and clear with minimal air loss
6. Demonstrate the ability to perform a safety drill (S-drill) while maintaining trim and buoyancy in the water column
7. Demonstrate the ability to perform a valve drill while maintaining trim and buoyancy in the water column (if double cylinders are being used)
8. Demonstrate the ability to deploy a surface marker buoy or lift bag while maintaining trim and buoyancy in the water column
9. Demonstrate emergency deployment of a backup regulator or bail-out scuba system
10. Demonstrate a simulated emergency gas sharing at a stationary depth
11. Contingency situations and problems solving (as appropriate by instructor trainer)
    a. Omitted decompression
    b. Extended bottom time profile with increased deco and recalculation
    c. Failure to deploy lift bag / surface marker buoy and reel
    d. Missed up-line or missed boat anchor
    e. Loss of deco gas
12. A proper stop of at least 3 minutes shall be conducted on all dives and proper staged decompression stops whenever and wherever required
13. Demonstrate good buoyancy control and situational awareness throughout the dive
14. Show good situational awareness

In order to complete this course candidates must:

1. Complete all open water requirements safely and efficiently
2. Satisfactorily complete the TDI Advanced Nitrox and Decompression Procedures written examinations and be able to adequately explain each answer to a prospective student
3. Demonstrate mature, sound judgment concerning training, dive planning and execution
4. Demonstrate proficiency in teaching the TDI Intro To Tech course
5. Present at least 1 graded academic and at least 1graded open water presentation on an Intro to Tech topic

6. Sidemount Instructor

6.1 Introduction

This course is designed to train instructors to teach certified divers how to safely utilize side- mounted primary cylinders as an alternative to the traditional back-mounted configuration.

6.2 Qualifications of Graduates

Upon successful completion of the course, graduates may teach diving activities in a sidemount equipment configuration provided:

1. The diving activities approximate those of training
2. The areas of activities and environmental conditions approximate those of training

Graduates who are also nitrox instructors may enroll in:

1. TDI Advanced Nitrox Instructor course
2. TDI Decompression Procedures Instructor course

6.3 Who May Teach

This course may be taught by any active TDI Sidemount Diving Instructor Trainer.

6.4 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 Dives

1. A maximum of 4 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

6.5 Student Prerequisites

1. Certified as an SDI Open Water Instructor or equivalent
2. Certified as a TDI Sidemount Diver or equivalent

6.6 Course Structure and Duration

Water Execution

1. Three open water dives are required with a minimum accumulated bottom time of 90 minutes

Course Structure

1. TDI allows instructor trainers to structure courses according to the number of candidates participating and their skill level

Duration

1. The suggested number of classroom and briefing hours is 4

6.7 Administrative Requirements

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 schedule to the instructor candidates
4. Have the instructor candidates:
    a. Complete the *TDI Liability Release and Express Assumption of Risk* Form
    b. Submit the *TDI Medical Statement* Form signed by a licensed physician

Upon successful completion of the course the instructor must:

1. Issue the appropriate TDI certification by submitting the *TDI Instructor Registration* Form to TDI Headquarters

6.8 Required Equipment

The following equipment is required for each instructor and instructor candidate:

1. Dual cylinders, volume appropriate for planned dive, and student gas consumption
2. Two independent first and second stage regulators each with a submersible pressure gauge
3. Buoyancy compensator device (BCD) with power inflator appropriate for sidemount configuration
4. Exposure suit adequate for diving environment
5. Mask and fins

6. Dive computer and a additional depth and timing device; backup computer recommended

Instructor Trainer and candidates must wear full sidemount diving equipment during all water exercises

6.9 Required Subject Areas

Instructor Trainers must use the current *TDI Standards and Procedures* and *TDI Sidemount* student manual or eLearning but may also use any text or materials that they feel help present these topics.

Required Material

1. *SDI/TDI Sidemount* Manual and Knowledge Quest or eLearning
2. *SDI/TDI Sidemount* Instructor Guide

Optional Materials

1. *TDI Sidemount* Cue Cards
2. *TDI Sidemount Evaluation* Slate

The following topics must be covered during this course:

1. Gas matching procedures to include dissimilar volumes
2. Gas management utilizing independent cylinders
3. Psychological considerations
4. Equipment considerations
    a. Cylinder options
    b. Regulator options
    c. Buoyancy compensator / harness options d. Proper weighting
    d. Equipment configurations
5. Communication
    a. Hand signals
    b. Light signals
6. Problem solving
    a. Gas-sharing
    b. Gas hemorrhages
    c. Light failure
    d. Loss of visibility
    e. Entanglement
    f. Self rescue
7. Tight spaces
8. Conservation
9. Difficult water entries
10. S-Drills; specific to sidemount

6.10 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate:

Land drills

1. Land drills may be performed at the instructor's discretion

Pre-dive drills

1. Use START before every dive *START is an acronym for S-drill (Out of Gas drill and Bubble Check), Team (buddy equipment checks), Air (gas matching), Route (entry/exit and planned path underwater, Tables (depth, duration, waypoints and schedule)
2. Stress analysis and mitigation

The instructor candiate must perform the following in-water skills at demonstration quality during dives:

1. Demonstrate various propulsion techniques: frog kick, modified frog kick, modified flutter kick, backwards kick, helicopter turns, and hand pulling if appropriate for the environment
2. Demonstrate adequate buoyancy control; ability to hover at fixed position in water column without moving hands or feet
3. Demonstrate adequate trim; ability to maintain proper position during the descent, bottom and ascent portion of the dive
4. Demonstrate the ability to perform the following exercises while maintaining trim and buoyancy in the water column:
    a. Unclipping and attaching sidemount cylinders
    b. Perform gas switches with and without a mask
5. Demonstrate the ability to safely manage gas in independent cylinders
6. Demonstrate conservation, awareness, and back referencing techniques
7. Deploy lift bag
8. Carry additional cylinder(s); optional

In order to complete this course, candidates must:

1. Comlete all land drills and dive requirements safely and efficiently
2. Satisfactorily complete the *TDI Sidemount* final exam and be able to adequately explain each answer to a prospective student
3. Demonstrate mature, sound judgment concerning dive planning and execution
4. Demonstrate proficiency in teaching the TDI Sidemount course
5. Present at least one graded academic presentation and 1 graded open water presentation on a TDI Sidmount topic and earn a passing score on each

7. Nitrox Instructor

7.1 Introduction

This is the entry level certification course for instructors wishing to teach enriched air nitrox (EAN) as a breathing gas. If open water dives are included, the maximum depth is not to exceed the skill level of the instructor. The objectives of this course are to train instructors in the benefits, hazards, and proper procedures for teaching EAN-22 through EAN-40.

7.2 Qualifications of Graduates

Upon successful completion of this course, graduates may:

1. Engage in teaching activities utilizing EAN-22 through EAN-40

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

1. TDI Advanced Nitrox Instructor course
2. TDI Decompression Procedures Instructor course

7.3 Who May Teach

This course may be taught by any active TDI Nitrox Instructor Trainer

7.4 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. Open water dives are optional, without direct supervision of an instructor trainer

7.5 Student Prerequisites

1. Minimum age 18
2. Minimum certification as an SDI Open Water Scuba Diver Instructor or the equivalent
3. Certified as basic nitrox diver, may be combined with instructor program
4. Provide proof of a minimum of 10 logged nitrox dives

7.6 Course Structure and Duration

Open Water Execution

1. Two dives are recommended but are not 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 suggested number of classroom and briefing hours is 6

7.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

7.8 Required Equipment

The following are required for this course:

1. *TDI Nitrox Instructor* Manual
2. *TDI Standards and Procedures* Manual
3. *TDI EAD* Tables

7.9 Required Subject Areas

The current *TDI Standards and Procedures* Manual and the *TDI Nitrox* Instructor Guide are mandatory for use during this course. Instructor trainers may use any additional text or materials that they feel help present these topics. The following topics must be covered during this course:

1. History of EAN
2. Physiology
    a. Oxygen
    b. Nitrogen
3. Physics
    a. Pressure review
    b. Partial pressures
4. Equipment Requirements
    a. Less than 40 percent
    b. More than 40 percent
5. Dive Tables
    a. Equivalent air depth (EAD)
    b. Enriched air nitrox (EAN)tables
    c. Switching mixes on repetitive dives
6. Dive Computers
    a. Mix adjustable
    b. Air integrated
7. Advantages and Disadvantages of EAN
    a. Use as air for physiological advantage w/air tables or computers
    b. Use to extend no-decompression bottom times or shorten surface intervals
    c. Oxygen (O_2) toxicity hazards and depth limits
    d. Discussion of myths and facts regarding EAN mixtures
8. Procedures
    a. Use and theory of oxygen analyzer
    b. Gas analyzing and logging

7.10 Required Skill Performance and Graduation Requirements

The following skills must be completed by the Instructor candidate:

1. Satisfactorily complete the TDI Nitrox written examination and be able to adequately explain each answer to a prospective student
2. Demonstrate proficiency in analyzing oxygen / nitrogen mixtures
3. Demonstrate proficiency in teaching the TDI Nitrox Diver course
4. Demonstrate proficiency in every skill required in the TDI Nitrox Diver course
5. Present at least 1 graded presentation on a nitrox topic

8. Advanced Nitrox Instructor

8.1 Introduction

This is the instructor level certification course for instructors wishing to teach the use of EAN-21 through 100 percent oxygen (O_2) for optimal mixes to a depth of 40 metres / 130 feet. The object of this course is to train nitrox instructors to teach the benefits, hazards and proper procedures for EAN-21 through 100 percent oxygen (O_2) for dives not requiring staged decompression.

8.2 Qualifications of Graduates

Upon successful completion of this course, instructors may teach diving activities utilizing EAN-21 through 100 percent oxygen provided:

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 Decompression Procedures Instructor course
2. TDI Extended Range Instructor course

8.3 Who May Teach

Any active TDI Advanced Nitrox Instructor Trainer may teach this course

8.4 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. A maximum of 6 students per instructor trainer; it is the instructor's discretion to reduce this number as conditions dictate

8.5 Student Prerequisites

1. Minimum age 18
2. Minimum certification of TDI Advanced Nitrox diver or equivalent
3. Provide proof of 100 logged dives, 25 must be nitrox dives
4. Must have certified 10 students in entry-level nitrox

8.6 Course Structure and Duration

Open Water Execution

1. Four dives with a minimum accumulated bottom time of 100 minutes
2. All dives must be deeper than 23 metres / 75 feet
3. Two dives must be deeper than 30 metres / 100 feet
4. If advanced nitrox is taught in conjunction with decompression procedures a total of 6 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

8.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

8.8 Required Equipment

The following are required for this course:

1. *TDI Advanced Nitrox* Instructor Guide
2. *TDI Standards and Procedures* Manual
3. *TDI Advanced Nitrox* student manual or eLearning
4. *TDI Advanced Nitrox* PowerPoint

The following minimum is required for each instructor:

1. Sufficient gas supply for the planned dives
2. Alternate air source attached to a secondary regulator; a sufficient length hose for air sharing attached to a secondary regulator is required
3. A submersible pressure gauge
4. Depth gauge and bottom timer and / or dive computer
5. A redundant scuba unit (pony cylinder) with regulator and SPG is recommended but not required
6. Buoyancy compensator device (BCD) with power inflator
7. Exposure suit adequate for the open water environment
8. All equipment properly labeled and cleaned as required for enriched air nitrox (EAN) mixtures
9. Oxygen (O_2) analyzer

8.9 Required Subject Areas

Instructor trainers must use the current *TDI Standards and Procedures* Manual and *TDI Advanced Nitrox* 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. Physics
    a. Pressure review
2. 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 (CO_2) toxicity
    f. Carbon monoxide (CO) toxicity
3. Formula Work
    a. Best mix computations
    b. Maximum operating depth of a mixture computation
4. Equipment Requirements
    a. Less than 40 percent
    b. More than 40 percent
5. Dive Tables
    a. Equivalent air depth (EAD) with any table
    b. Computer generated tables (Pro-Planner, DPA, Dr. X, Abyss, etc)

6. Dive Computers
    a. Mix adjustable
    b. Oxygen (O_2) integrated
7. Dive Planning
    a. Operational Planning
        i. Gas requirements
        ii. Oxygen limitations
        iii. Nitrogen limitations
    b. Common mixing procedures (demonstrate one method) partial pressure mixing
    c. Continuous blending
8. Decompression
    a. Enriched air nitrox (EAN) usage as deco gas i.e. 50/50 80/20 etc
    b. Oxygen for decompression
    c. Advantages / disadvantages of multiple gas switches

8.10 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate. Maximum training depths shall not exceed 40 metres / 130 feet. The student must complete the following skills:

1. Properly analyze gas mixtures
2. Demonstrate adequate pre-dive planning limits based on:
    a. Personal gas consumption
    b. Oxygen exposures at planned depth with actual mix
    c. Nitrogen absorption at planned depth with actual mix
3. Properly execute the planned dive within all pre-determined limits

In order to complete this course, students must:

1. Satisfactorily complete the TDI Advanced Nitrox 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 TDI Advanced Nitrox diver course
4. Demonstrate proficiency in teaching advanced nitrox
5. Present at least 1 graded presentation on advanced nitrox topic

9. Decompression Procedures Instructor

9.1 Introduction

This course examines the theory, methods and procedures of planned stage decompression diving. This program is designed as a stand-alone course or it may be taught in conjunction with such TDI courses as TDI Advanced Nitrox Instructor, TDI Advanced Wreck Instructor, or TDI Extended Range Instructor. The objective of this course is to train instructors how to plan and conduct a standard decompression procedures course not to exceed a maximum depth of 45 metres / 150 feet. The most common equipment requirements, equipment set-ups, decompression techniques and decompression mixtures are covered.

9.2 Qualifications of Graduates

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

1. TDI Extended Range Instructor course
2. TDI Advanced Wreck Instructor course
3. TDI Trimix Instructor course

9.3 Who May Teach

Any active TDI Decompression Procedures Instructor Trainer may teach this course

9.4 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. A maximum of 4 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

9.5 Student Prerequisites

1. Minimum age 18
2. Minimum certification of TDI Advanced Nitrox Instructor or equivalent (unless Advanced Nitrox Instructor course is taught in conjunction with Deco Procedures Instructor)
3. Minimum certification of TDI Decompression Procedures diver or equivalent
4. Provide proof of 150 logged dives
5. Have certified 10 students in SDI Deep Diver or TDI Advanced Nitrox diver or equivalent or 10 SDI Advanced Adventure Diver or equivalent

9.6 Course Structure and Duration

Open Water Execution

1. Four decompression dives with a minimum accumulated bottom time of 100 minutes
2. If TDI Advanced Nitrox is taught in conjunction with decompression procedures a total of 6 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

9.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

9.8 Required Equipment

The following are required for this course:

1. *TDI Decompression Procedures* Instructor Guide
2. *TDI Standard and Procedures* Manual
3. *TDI Decompression Procedures* student manual or eLearning
4. *TDI Decompression Procedures* PowerPoint

The following equipment is required for each candidate:

1. Primary cylinder(s)
2. Cylinder volume appropriate for planned dive and student gas consumption
3. Decompression mix cylinder(s)
    a. Cylinder volume appropriate for the planned dive and student gas consumption with submersible pressure gauge
    b. Labeled in accordance with TDI Standards
4. Regulator(s)
    a. Primary and alternate 2nd stage required on all primary cylinders
    b. Submersible pressure gauges are required on all primary cylinders
5. Buoyancy compensator device(s) (BCD) adequate for equipment configuration
6. Jon-line and other rigging lines as dictated by site conditions
7. Ascent reel with lift bag / surface marker buoy
    a. Adequate for maximum planned depth
    b. Minimum of 23 kg / 50 lb lift bag
8. Depth gauge and automatic bottom timer and / or dive computer
9. Exposure suit adequate for the open water environment
10. Oxygen (O_2) analyzer
11. Underwater slate
12. Submersible dive tables, if desired

9.9 Required Subject Areas

Instructor trainers must use the *TDI Decompression Procedures* 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.

1. Overview of Safety Stops Compared to Required Decompression Stops
2. Physics
    a. Pressure review
3. Physiology
    a. Mechanisms of bubble formation
    b. Advantage of hyperoxic mixes for decompression
    c. Nitrogen absorption and elimination
    d. Carbon dioxide (CO_2) toxicity
    e. Ascent / descent rates
    f. Hyperthermia
    g. Hypothermia
    h. Psychological aspects: task loading, stress, panic, time management
4. Decompression Options
    a. Air
    b. Nitrox
    c. Oxygen (O_2)
5. Equipment Considerations
    a. Twin cylinders or single cylinder options, valve options
    b. Stage cylinder options
    c. Harness / BCD option
    d. Computer, depth gauge, bottom timer options
    e. Ascent and navigation reels
    f. Lift bags/surface marker buoys for drifting or free decompression
    g. Jon-line or Garvin clips
    h. Proper weighting and buoyancy control during dive phase and deco
6. Dive Tables
    a. Introduction and review of different models (DCIEM, U.S. Navy, etc)
7. Dive Computers
    a. Mix adjustable
    b. Oxygen (O_2) integrated

8. Dive Planning
    a. Standard operation
        i. Gas requirements
        ii. Oxygen (O_2) limitations
        iii. Nitrogen limitations
    b. Emergency planning
        i. Omitted decompression
        ii. Decompression sickness
        iii. Equipment failure
9. Procedures
    a. Primary and decompression gas
        i. Normal operations
        ii. Failure, loss or inadequate emergency procedures
        iii. Analysis and logging
        iv. Safeguards on deco supply regulators
        v. Rigging and deployment of decompression equipment
    b. Descent
        i. Methods of entry, down lines or free decent
        ii. Organization of equipment carried on diver
    c. Ascent
        i. Variable rates
        ii. Trim and compensation
    d. Fixed or Drifting Deco methods
        i. Up lines fixed to bottom
        ii. Reels and lift bags/surface marker buoys
        iii. Free drifting stages or boat supply
        iv. Self-contained versus surface supply / rendezvous gas cylinders
    e. Support
        i. From shore
        ii. From descent line or fixed platform
        iii. From live aboard boat
10. Administration Procedures
    a. Medical form
    b. Waiver forms
    c. Risk management
    d. Registration forms
    e. Standards and procedures

9.10 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate:

1. Prior to the dive, analyze the gas mixture in each cylinder, fill out the contents tag and facility nitrox log
2. Perform an advanced pre-dive plan and dive analysis (including risk assessment)
    a. Predetermine the appropriate depth and time limits for the dive based upon personal ability, environmental conditions, and gas consumptions (personal and team)
    b. Predetermine the limits associated with nitrogen, including no decompression limits (NDLs) and equivalent air depth (EAD)
    c. Assembly of diver carried equipment
3. Properly execute the planned dive within all predetermined limits
    a. Proper descent and ascent rates
    b. Proper staged decompression stop procedures
    c. Monitoring the status of staged decompression equipment, (tables, computers, cylinders, regulators, etc)
4. Contingency situations and problems solving (as appropriate by instructor trainer)
    a. Omitted decompression
    b. Extended bottom time profile with increased decompression and recalculation
    c. Failure to deploy lift bag / surface marker buoy and reel
    d. Missed up-line or missed boat anchor
    e. Loss of decompression gas
5. A proper stop of at least 3 minutes shall be conducted on all dives and proper staged decompression stops wherever required
6. Demonstrate the correct deployment of a lift a bag / surface marker buoy using a dive reel and / or up-line
7. Demonstrate a simulated emergency gas sharing at a stationary depth not to exceed 30 metres / 100 feet
8. Demonstrate emergency deployment of a backup regulator or bail-out scuba system containing bottom mix at a depth not exceeding 30 metres / 100 feet
9. Demonstrate the proper deployment, management and use of the bottom mix, deco-mix and travel mix (if used), including but not limited to:
    a. Conservative gas management
    b. Depth control to avoid descending too deep for mix
    c. Demonstrate buoyancy control and awareness throughout the dive

In order to complete this course, students must:

1. Satisfactorily complete the TDI Decompression Procedures 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 TDI Decompression Procedures course
4. Demonstrate proficiency in teaching staged decompression
5. Present at least 1 graded presentation on TDI Decompression Procedures topic

10. Extended Range Instructor

10.1 Introduction

This course provides the training and experience required to be certified to competently teach air dives to 55 metres / 180 feet that require staged decompression, utilizing nitrox mixtures or oxygen (O_2) 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 55 metres / 180 feet and utilizing nitrox mixtures or oxygen for staged decompression.

10.2 Qualifications of Graduates

Upon successful completion of this course, graduates may teach technical diving activities utilizing custom nitrox mixtures provided:

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 Trimix Instructor course

10.3 Who May Teach

Any active TDI Extended Range Instructor Trainer may teach the course

10.4 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. A maximum of 4 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

10.5 Student Prerequisites

1. Minimum age 21
2. Provide proof of 250 logged dives, 25 must be extended range dives
3. Certification as a TDI Extended Range Diver or equivalent
4. Certification as a TDI Advanced Nitrox and Decompression Procedures Instructor or equivalent
5. Must have certified 10 students in advanced nitrox diver or decompression procedures diver, a minimum of 5 must be decompression procedures divers

10.6 Course Structure and Duration

Open Water Execution

1. Four dives with a minimum accumulated bottom time of 100 minutes.
2. All dives must be deeper than 30 metres / 100 feet with 2 dives deeper than 40 metres / 130 feet

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 8

10.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

10.8 Required Equipment

The following are required for this course:

1. *TDI Standards and Procedures* Manual
2. *TDI Extended Range / Trimix* Student Manual or eLearning
3. *TDI Extended Range / Trimix* IG
4. *TDI Extended Range / Trimix* PowerPoint Presentation
5. 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 device(s) (BCD) 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 23 kg / 50 lb lift bag
10. Exposure suit adequate for the open water environment
11. Two line cutting devices
12. Underwater slate

10.9 Required Subject Areas

Instructor trainers must use the current *TDI Standards and Procedures* 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, maximum operating depth (MOD), best mix, etc
3. Physiology
    a. Hypoxia
    b. Oxygen (O_2) toxicity
        i. Whole body
        ii. Central nervous system (CNS)
    c. Nitrogen narcosis
    d. Nitrogen absorption and elimination
    e. Carbon dioxide (CO_2) toxicity
    f. Carbon monoxide (CO) toxicity
    g. Hyperthermia
    h. Hypothermia
4. Decompression Option
    a. Air
    b. Nitrox
    c. Oxygen (O_2)
5. Equipment Requirements
    a. Twin cylinder or single cylinder options
    b. Stage cylinder options
    c. Regulator options
    d. Harness / BCD 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. Oxygen (O_2) 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 (O_2) 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

10.10 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate. The maximum depth of 55 metres / 180 feet should not be exceeded.

1. Properly analyze all gas mixtures to be used
2. Demonstrate adequate pre-dive planning limits based on:
    a. Personal and team gas consumption
    b. Oxygen exposures at planned depths for actual mixes
    c. 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 1 dive, 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 TDI Extended Range Diver course
4. Demonstrate proficiency in teaching the TDI Extended Range Diver program
5. Present at least 1 graded presentation on an extended range topic

11. Helitrox Instructor

11.1 Introduction

The Helitrox Instructor course provides the training required to competently teach the methods and procedures for planned stage decompression diving utilizing Helium in the breathing mixture. The objective of this course is to train instructors how to teach standard staged decompression diving not exceeding a maximum depth of 45 metres / 150 feet. Enriched air nitrox (EAN) and Helium mixes with no greater than 35% He content, and up to 100% oxygen for decompression diving are permitted. Breathing gas mixtures containing more than 35% Helium (+/- 5%) or less than 21% oxygen are not permitted (+/- 1%).

11.2 Qualifications of Graduates

Upon completion of this course, graduates may teach Helitrox divers provided:

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

11.3 Who May Teach

Any active TDI Helitrox Instructor Trainer may teach this course

11.4 Student to Instructor Ratio

Academic

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

Open Water

1. A maximum of 4 instructor candidates per active TDI Instructor Trainer are allowed; it is the instructor trainer's discretion to reduce this number as conditions dictate

11.5 Student Prerequisites

1. Minimum age 2l
2. Certified as a TDI Trimix Diver or equivalent
3. Minimum certification of TDI Advanced Nitrox Instructor or equivalent (unless Advanced Nitrox Instructor course is taught in conjunction with Helitrox Instructor course)
4. Proof of 10 certified Advanced Nitrox or Deep or Advanced Adventure divers or equivalent
5. Provide proof of 250 logged dives with a minimum of 20 logged Helitrox or Trimix decompression dives outside of training, 10 of these dives must be in the last 12 months

11.6 Course Structure and Duration

Open Water Execution

1. Four decompression dives with a minimum accumulated bottom time of 100 minutes
2. All dives must be deeper than 30 metres /100 feet; two dives must be at least 40 metres/130 feet

Note: All dives must contain Helium mixtures with contents consistent with course parameters.

Course Structure

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

Duration

1. The recommended number of classroom and briefing hours is 8

11.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

11.8 Training Material

Required material

1. *TDI Decompression Procedures* Student Manual or eLearning and Instructor Guide
2. *TDI Extended Range/Trimix* Student Manual or eLearning and Instructor Guide

Optional Material

1. Corresponding TDI PowerPoint® presentations
2. *TDI Advanced Trimix* Manual

11.9 Required Equipment

The following equipment is required for each student:

1. Primary cylinder(s); cylinder volume appropriate for planned dive and student gas consumption
2. Decompression mix cylinder(s) Cylinder volume appropriate for the planned dive and student gas consumption with submersible pressure gauge.
3. Labeled in accordance with TDI Standards.
4. Depth gauge and automatic bottom timer and I or dive computer programmable with appropriate breathing mixture(s)
5. Regulator(s)
6. Primary and alternate 2nd stage required on all primary cylinders
7. Submersible pressure gauges are required on all primary cylinders
8. Buoyancy compensator device(s) (BCD(appropriate for equipment configuration
9. Line cutting device
10. Jon-line and other rigging lines as dictated by site conditions
11. Ascent reel with lift bag /surface marker buoy appropriate for maximum planned depth, minimum of 12kg / 25lb lift bag
12. Oxygen analyzer and helium analyzer; may be supplied by the instructor
13. Exposure suit adequate for the open water environment
14. Underwater Slate

11.10 Required Subject Areas

The *TDI Decompression Procedures* and *Extended Range/Trimix* Manuals or eLearning are mandatory for use during this course but instructor trainers may use any additional text or materials that they feel help present these topics. The following topics must be covered during this course:

1. Overview of decompression "safety stops" compared to required stops
2. Physics
    a. Pressure review
3. Physiology
    a. Mechanics of bubble formation
    b. Advantages of hyperoxic mixes for decompression
    c. Advantages of helium mixes for bottom gas
    d. Hypoxia
    e. Oxygen toxicity
        i. Whole Body (OTUs)
        ii. Central Nervous System (CNS)
    f. Nitrogen Narcosis
    g. Nitrogen and Helium Absorption and Elimination
    h. Carbon Dioxide Toxicity
    i. Carbon Monoxide Toxicity
    j. Helium
        i. HPNS
        ii. Effects on respiration
        iii. Effects as an insulator
    k. Counter Diffusion
    l. Hyperthermia
    m. Hypothermia
    n. Ascent / Descent rates
    o. Psychological aspects
        i. Task loading
        ii. Stress
        iii. Panic
        iv. Time Management
        v. Equipment
4. Decompression Options
    a. Air
    b. Nitrox
    c. Oxygen

5. Equipment Considerations
    a. Twin cylinder or single cylinder option, valve options
    b. Stage cylinder options
    c. Regulator Options
    d. Harness / BCD options
    e. Computer, depth gauge, bottom timer options
    f. Ascent and navigation reels
    g. Lift bags/surface marker buoys for drifting or free decompression
    h. Jon-line or Garvin clips
    i. Proper weighting and buoyancy control during dive phase and decompression
6. Dive Tables vs. Computers
    a. Introduction and review of different models (Bühlmann, DCIEM, US Navy, etc)
    b. Proper use of electronic multi-level dive computers for dive planning and decompression
        i. Mix adjustable
        ii. O_2 integrated
7. Dive Planning
    a. Standard Operation
        i. Gas requirements
        ii. Oxygen limitations
        iii. Nitrogen limitations
        iv. Helium limitations
    b. Emergency planning
        i. Omitted decompression
        ii. Decompression sickness
        iii. Equipment failure
8. Procedures
    a. Primary and Decompression Gas
        i. Normal operations
        ii. Failure, loss or inadequate emergency procedures
        iii. Analysis and logging
        iv. Safeguards on decompression supply regulators
        v. Rigging and deployment of decompression equipment
    b. Descent
        i. Methods of entry, down lines or free decent
        ii. Organization of equipment carried on diver

c. Ascent
    i. Variable rates
    ii. Trim and compensation
d. Fixed or Drifting Decompression Methods
    i. Up-lines fixed to bottom
    ii. Reels and lift bags/surface marker buoys
    iii. Free drifting stages or boat supplied
    iv. Self-contained versus surface supply / rendezvous gas cylinders
e. Support
    i. From shore
    ii. From descent line or fixed platform
    iii. From live-aboard boat

11.11 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate to demonstration quality:

1. Proper analysis of all gas mixtures to be used

Land Drills

1. Selection and preparation of equipment suitable for soft overhead environment
2. Conduct team oriented drills (buddy checks) for lift bag deployment
3. Conduct team oriented drills (buddy checks) for gas switching procedures
4. Gas matching among buddy team
5. Demonstrate familiarity with basic hand signals
6. Demonstrate adequate pre-dive planning
    a. Limits based on personal and team gas consumption.
    b. Exact dive and decompression profile.

Pre-dive Drills

1. Use START* before every dive
2. Stress analysis and mitigation

In-water Drills

1. Demonstrate buoyancy control (ability to hover at fixed position in water column without moving hands or feet)
2. Show good awareness of buddy and other team members through communications, proximity and team oriented dive practices
3. Demonstrate comfort swimming on surface and at depth carrying single decompression stage bottle
4. Demonstrate ability to drop and retrieve single decompression cylinder while maintaining position in the water column
5. Demonstrate ability to deploy a lift bag solo and as member of team
6. Demonstrate controlled / staged ascent on lift bag / emergency ascent line (lost ascent line)
7. Remove and replace mask (deploy backup mask)
8. Demonstrate appropriate reaction to gas hemorrhage from manifold or first stage, SPG and primary regulator
9. React to BCD inflator malfunction (disconnect LP hose, dump gas and orally inflate BCD/Wing to neutral buoyancy)
10. Demonstrate ability to confirm gas switch(es) at depth with buddy/team members
11. Buddy breathing deco gas for at least one minute
12. Switch to back-up mask (remove and replace mask)
13. Demonstrate appropriate reaction to simulated free-flowing deco regulator
14. Demonstrate appropriate modifications to deco schedule in decompression emergency (over time, over depth) (to be simulated)
15. Demonstrate tired diver tow at depth and on surface (30 meters / 90 feet lateral each)
16. Complete a horizontal breath hold swim at depth for 15 meters / 45 feet
17. Properly execute the planned dive within all pre-determined limits
    a. Assembly of diver carried equipment
    b. Proper descent / ascent rates
    c. Proper staged stop procedures
    d. Monitoring of decompression status equipment (tables, computers, equipment)
18. Contingency Situations and Problem Solving (as appropriate by instructor)
    a. Omitted decompression
    b. Extended bottom time profiles with increased decompression and re-calculated schedules
    c. Failure to deploy lift bag and reel
    d. Missed up-line or missed boat anchor
    e. Loss of decompression gas

19. A safety stop of at least 3 minutes shall be conducted on all no-decompression dives and proper staged decompression stops whenever and wherever mandated.
20. Demonstrate (simulated) emergency gas sharing at a stationary depth not to exceed 30 metres / 100 feet
21. Demonstrate emergency deployment of a backup regulator or bail-out scuba system containing bottom mix at a depth not to exceed 30 metres/100 feet
22. Demonstrate the proper deployment, management and use of the bottom mix, decompression mix and travel mix (if used), including but not limited to:
    a. Conservative gas management
    b. Depth control to avoid descending too deep for mix
    c. Show appropriate and timely responses to instruction / signals from the instructor and demonstrate buoyancy control and awareness throughout the dive

In order to complete this course, candidates must:

1. Satisfactorily complete the TDI Decompression Procedures Course written examination
2. Satisfactorily complete the TDI Trimix course written examination and be able to adequately explain each answer to a prospective student
3. Complete all open water requirements safely and efficiently
4. Demonstrate mature, sound judgment concerning dive planning and execution
5. Demonstrate proficiency in teaching the TDI Helitrox Diver course
6. Present at least 1 graded presentation on a Helitrox topic

12. Advanced Wreck Instructor

12.1 Introduction

Through advanced techniques, this course will instill a level of comfort and discipline allowing the instructor to conduct wreck courses with a greater margin of safety, productivity and enjoyment. This program includes penetration skills and techniques. Depths shall not exceed the level in which the instructor is trained and competent, but in no case shall the maximum depth in this program exceed 55 metres / 180 feet. The objective of this course is to train instructors in the proper techniques, equipment requirements and hazards of teaching wreck diving.

12.2 Qualifications of Graduates

Upon successful completion of this course, instructors may engage in wreck diving instruction provided:

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

12.3 Who May Teach

Any active TDI Advanced Wreck Diving Instructor Trainer may teach this course

12.4 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. A maximum of 4 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

12.5 Student Prerequisites

1. Minimum age 21
2. Certified as a TDI Decompression Procedures and TDI Advanced Wreck Diver or equivalent
3. Certified as a TDI Advanced Nitrox Instructor or equivalent
4. Provide proof of 200 logged dives, at least 50 must be wreck dives, 25 must be wreck penetration dives
5. Have certified 10 students in SDI Wreck Diver or equivalent

12.6 Course Structure and Duration

Open Water Execution

1. Six dives with a minimum accumulated bottom time of 100 minutes.

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 8

12.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

12.8 Required Equipment

The following are required for this course:

1. *TDI Standards and Procedures* Manual
2. *TDI Advanced Wreck* Student Manual
3. *TDI Advanced Wreck* Instructor Guide
4. *TDI Advanced Wreck* PowerPoint Presentation

The following equipment is required for each student:

1. Primary cylinder(s)
    a. Cylinder volume appropriate for the planned dive and candidate gas consumption rate
    b. Dual outlet valve or manifold required
    c. Labeled in accordance with TDI Standards
2. Travel or decompression cylinders as required by dive sites
3. Regulators
    a. Primary and primary redundant required on all primary breathing cylinders
    b. Submersible pressure gauges are required on primary cylinder(s) and travel/decompression cylinder(s)
    c. A sufficient length hose for air sharing leading from a primary or from a primary redundant is required
4. Buoyancy compensator device(s) (BCD) as appropriate for the open water environment
5. Depth gauge and automatic bottom timer and / or dive computer
6. Back-up depth and timing devices; air or multi-gas decompression computers are allowed for use as depth and timing devices
7. Primary light and Back-up light system adequate for the overhead environment
8. Ascent reel with lift bag / surface marker buoy or up line
    a. Adequate for the planned maximum depth
    b. Minimum of 12 kg / 25 lb lift bag
9. Exposure suit adequate for the open water environment
10. Two line cutting devices
11. Underwater slate
12. Reels
    a. Primary penetration reel
    b. Safety reel

Options that the instructor trainer may require

1. Submersible dive tables
2. Bail-out cylinder with regulator
3. Jon-line
4. Compass, surface signaling device (flare, strobe, etc)

12.9 Required Subject Areas

Instructor trainers must use the current *TDI Standards and Procedures* Manual. In addition, the instructor trainer may use any text or materials they feel best presents these topics. The following topics must be covered during this course:

Equipment Requirements

   a. Redundant scuba
   b. Lights
   c. Reels
   d. Tools

5. Procedures
   a. Pre-dive
   b. Pre-penetration
   c. Exiting the confined space
6. Hazards of Wreck Diving
   a. Disorientation
   b. Reduced visibility
   c. Entrapment
   d. Entanglement
   e. Environmental
   f. Loss of gas supply
   g. Line traps
   h. Separated buddy teams
7. Penetration Lines
   a. Types
   b. Proper use
8. Research and Locating
   a. Local regulations
   b. Sources of information
   c. Tools
   d. Surveying
9. Contingency Planning
   a. Chamber locations and evacuation
   b. Communications
   c. Emergency gases

12.10 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate; all dives should be conducted with a maximum depth no deeper than the skill level of the instructor candidate.

1. Properly analyze all gas mixtures to be used
2. Demonstrate adequate pre-dive planning limits based on:
    a. Personal and team gas consumption
    b. Oxygen exposures at planned depths with actual mixes
    c. Nitrogen absorption at planned depth with actual mixes
3. Properly execute the planned dive within all pre-determined limits
4. Demonstrate the proper navigational techniques for the specific dive
5. Demonstrate air sharing with a sufficient length hose through a restriction
6. Demonstrate the proper procedures for switching and isolating a malfunctioning regulator
7. Demonstrate the proper techniques for locating a lost penetration line
8. Deployment of a lift bag/surface marker buoy or an up-line for decompression
9. Silt-out procedures

In order to complete this course, students must:

1. Demonstrate mature, sound judgment concerning training, dive planning and execution
2. Demonstrate proficiency in every skill required in the TDI Advanced Wreck Diver course
3. Demonstrate proficiency in teaching the TDI Advanced Wreck Diver course
4. Present at least 1 graded presentation on an advanced wreck topic

13. Trimix Instructor

13.1 Introduction

The TDI Trimix Instructor course provides the training required to competently and safely teach breathing gases containing helium with no less than 18 percent oxygen (O_2) for dives that require staged decompression to a maximum depth of 60 metres / 200 feet.

13.2 Qualifications of Graduates

Upon completion of this course, graduates may engage in teaching activities that utilize custom Trimix mixtures provided:

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

13.3 Who May Teach

1. Any active TDI Advanced Trimix Instructor Trainer may teach this course

13.4 Student to Instructor Ratio

Academic

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

Open Water

1. A maximum of 4 instructor candidates per active TDI Instructor Trainer are allowed; it is the instructor trainer's discretion to reduce this number as conditions dictate

13.5 Student Prerequisites

1. Minimum age 2l
2. Minimum certification as a TDI Trimix Diver and a TDI Advanced Nitrox and Decompression Procedures Instructor, or equivalent
3. Proof of 15 certified advanced nitrox or decompression procedures divers; minimum of 10 must be decompression procedures divers
4. Provide proof of 250 logged dives with a minimum of 20 logged Trimix dives outside of training, 10 of these dives must be in the last 12 months

13.6 Course Structure and Duration

Open Water Execution

1. Four dives with a minimum accumulated bottom time of 100 minutes
2. Two dives must be deeper than 45 metres / 150 feet

Course Structure

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

Duration

1. The recommended number of classroom and briefing hours is 8

13.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

13.8 Required Materials

1. *TDI Extended Range and Trimix* Manual or eLearning
2. *TDI Advanced Trimix Diver* Manual or eLearning
3. *TDI Trimix Instructor* Manual
4. *TDI Standards and Procedures* Manual

13.9 Required Equipment

The following are required for this course: 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. Cylinder(s) labeled in accordance with TDI Standards
2. Decompression mix cylinder(s)
    a. Cylinder volume appropriate for planned dive and candidate gas consumption
    b. Cylinder(s) labeled in accordance with TDI standards
3. Suit inflation cylinder; required for dry-suit divers only
4. Regulators
    a. Primary and secondary first stages required on all back cylinder(s)
    b. Submersible pressure gauges are required on all primary/bottom mix cylinders
    c. One primary regulator must have a sufficient length hose for air sharing
    d. All 4 regulators must be interchangeable; possible separate primary and decompression regulators to match
5. Buoyancy compensator device(s) (BCD) as appropriate for equipment configuration
6. Redundant depth and timing devices such as:
    a. Air decompression computers allowed for use as depth and timing devices if in gauge mode
    b. Trimix computers
    c. Electronic bottom timer
7. Redundant light system (if required by site)
8. Ascent reel with lift bag
    a. Appropriate for planned maximum depth
    b. Minimum 23 kg / 50 lb delayed surface marker buoy or lift bag (a dump valve highly recommended)
9. Exposure suit appropriate for the open water environment
10. Line cutting device(s)
11. Underwater slate and writing device

13.10 Required Subject Areas

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

1. Physics
2. Pressure review
3. Physiology
    a. Hypoxia
    b. Oxygen Toxicity
        i. Whole Body
        ii. Central nervous system (CNS)
    c. Nitrogen narcosis
    d. Nitrogen and helium absorption and elimination
    e. Carbon monoxide (CO) toxicity
    f. Carbon dioxide (CO_2) toxicity
    g. Helium
        i. HPNS
        ii. Effects on respiration
        iii. Effects as an insulator
    h. Counter diffusion
    i. Hyperthermia
    j. Hypothermia
4. Decompression Options
    a. Air
    b. Nitrox
    c. Helium
5. Equipment Options
    a. Twin cylinder options
    b. Stage cylinder options
    c. Suit inflation options
    d. Regulator options
    e. Harness / BCD options
    f. Computer / depth gauge / bottom timer options
    g. Ascent and navigation reels
    h. Lift bags
    i. Lights
    j. Redundant mask and knife
    k. Jon-line

6. Dive Tables
    a. Computer generated tables
    b. *DCIEM Helitrox* Tables and / or other published tables
7. Dive Planning
    a. Operation planning
        i. Support
        ii. Teams
    b. Individual and team planning
        i. Gas requirements
        ii. Oxygen (O_2) limitations
        iii. Inert gas limitations
8. Proper gas switches
    a. Emergency planning
        i. Omitted decompression
        ii. Oxygen (O_2) toxicity
        iii. Decompression sickness
        iv. General
9. Procedures
    a. Bottom, travel and decompression gas
    b. Normal operations
    c. Establish appropriate emergency procedures
    d. Analyzing and logging

13.11 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate to demonstration quality; it is recommended that a minimum of 4 dives be conducted between 40 metres / 130 feet and 60 metres / 200 feet

1. Properly demonstrate analysis of all gas mixtures to be used
2. Demonstrate appropriate 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 inert gas absorption at planned depth with actual mixes
3. Properly execute the planned dive within all pre-determined limits
4. Demonstrate the proper navigational techniques for the specific dive
5. During 2 dives, demonstrate an ascent with reel and bag, while performing staged decompression
6. Demonstrate the proper procedures for switching and isolating malfunctioning manifold or primary regulators

Land Drills

1. Demonstrate familiarity with basic and intermediate hand signals
2. Select and prepare equipment suitable for soft overhead environment with long decompression obligations
3. Conduct team oriented drills for lift bag deployment and gas switching procedure
4. Drills for buddy rescue

Pre-dive Drills

1. Use START* before every dive
2. Stress analysis and mitigation

***START is S-drill (OOA drill and Bubble Check), Team (buddy equipment checks), Air (gas matching), Route (entry/exit and planned path underwater), Tables (depth, duration, waypoints and schedule).**

In-water Drills

1. Demonstrate buoyancy control
2. Show good awareness of buddy and other team members through communications, proximity and team oriented dive practices
3. Demonstrate competence managing two stage cylinders including drop and recovery while maintaining position in the water column
4. Demonstrate ability to confirm gas switches at depth with buddy/team members
5. Demonstrate lift bag deployment from depth and use of bag as back-up buoyancy device
6. Demonstrate air-sharing ascent from depth, no greater than 30 metres / 100 feet, while one member of buddy team is without mask or blacked out mask.
7. Create contingency decompression schedule after simulated loss of decompression gas
8. Demonstrate controlled ascent with simulated toxed diver, including surface tow at least 30 metres / 100 feet, with simulated equipment removal on surface (in water too deep to stand in) from victim

In order to complete this course, students must:

1. Satisfactorily complete the TDI Trimix 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 TDI Trimix Diver course
4. Demonstrate proficiency in teaching the TDI Trimix Diver course
5. Present at least 1 graded presentation on a Trimix topic

14. Advanced Trimix Instructor

14.1 Introduction

The TDI Advanced Trimix Instructor course provides the training required to competently and safely teach breathing gases containing helium for dives that require staged decompression to a maximum depth of 100 metres / 330 feet. The objective of this course is to train instructors to teach the benefits, hazards and proper procedures of utilizing custom oxygen, helium, and nitrogen mixtures as breathing gases.

14.2 Qualifications of Graduates

Graduates may engage in teaching activities utilizing custom Trimix mixtures provided:

1. The diving activities approximate those of training
2. The areas of activities approximate those of training
3. Environmental conditions approximate those of training
4. May teach TDI Entry level Trimix or TDI Advanced Trimix

14.3 Who May Teach

Any active TDI Advanced Trimix Instructor Trainer may teach this course

14.4 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. A maximum of 4 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

14.5 Student Prerequisites

1. Minimum age 21
2. Certification as a TDI Advanced Trimix Diver or equivalent
3. Certification as a TDI Extended Range Instructor or TDI Trimix Instructor or equivalent
4. Provide proof of 250 logged dives, of which 30 must be Trimix dives
5. Provide proof of 20 dives deeper than 55 metres / 180 feet

And meet one of the following experience requirements:

1. Certify at least 10 extended range divers or Trimix divers to depths of at least 45 metres / 150 feet
2. Assist with at least 2 complete TDI Advanced Trimix classes taught by an active TDI Advanced Trimix Instructor and provide a letter of recommendation from the assisted instructor(s)

14.6 Course Structure and Duration

Open Water Execution

1. Four dives with a minimum accumulated bottom time of 100 minutes
2. Two dives must be deeper than 70 metres / 230 feet

Course Structure

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

Duration

1. The recommend number of classroom and briefing hours is 8

14.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

Upon successful completion of the course the Instructor must:

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

14.8 Required Materials

1. *TDI Standards and Procedures* Instructor Manual
2. *TDI Extended Range / Trimix* Student Manual
3. *TDI Extended Range / Trimix* Instructor Guide
4. *TDI Extended Range / Trimix* PowerPoint Presentation

14.9 Required Equipment

The following equipment is required for each student:

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(s)
    a. Cylinder volume appropriate for planned dive and candidate consumption
    b. Labeled in accordance with TDI Standards
3. Decompression mix cylinder(s)
    a. Cylinder volume appropriate for planned dive and candidate gas consumption
    b. Labeled in accordance with TDI Standards
4. Suit inflation cylinder; required for dry-suit divers only
5. Regulators
    a. Primary and primary redundant required on all bottom mix cylinder(s)
    b. Submersible pressure gauges are required on all primary/bottom mix cylinders
    c. One primary regulator must have a sufficient length hose for air sharing
    d. It is strongly recommended that all 4 required regulators be DIN or all 4 regulators be yoke
6. Buoyancy compensator device(s) (BCD) as appropriate for equipment configuration
7. Redundant depth and timing devices; air decompression computers allowed for use as depth and timing devices
8. Redundant light system (if required by site)
9. Ascent reel with lift bag
10. Adequate for planned maximum depth.
11. Minimum 23 kg / 50 lb lift bag / surface marker buoy, dump valve highly recommended
12. Exposure suit adequate for the open water environment
13. Line cutting device
14. Underwater slate

14.10 Required Subject Areas

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

1. Physics
    a. Pressure review
2. Physiology
    a. Hypoxia
    b. Oxygen (O_2) Toxicity
        i. Whole Body
        ii. Central nervous system (CNS)
    c. Nitrogen narcosis
    d. Nitrogen and helium absorption and elimination
    e. Carbon monoxide (CO) toxicity
    f. Carbon dioxide (CO_2) toxicity
    g. Helium
        i. HPNS
        ii. Effects on respiration
        iii. Effects as an insulator
    h. Counter diffusion
        i. Hyperthermia
        ii. Hypothermia
3. Decompression Options
    a. Air
    b. Nitrox
    c. Helium
4. Equipment Options
    a. Twin cylinder options
    b. Stage cylinder option
    c. Suit inflation options
    d. Regulator options
    e. Harness / BCD options
    f. Computer / depth gauge / bottom timer options
    g. Ascent and navigation reels
    h. Lift bags
    i. Lights
    j. Redundant mask and knife
    k. Jon-line

5. Dive Tables
    a. Computer generated tables
    b. *DCIEM Helitrox* Tables and / or other published tables
6. Dive Planning
    a. Operation planning
        i. Support
        ii. Teams
    b. Team planning
        i. Gas requirements
        ii. Oxygen (O_2) limitations
        iii. Inert gas limitations
    c. Emergency planning
        i. Omitted decompression
        ii. Oxygen (O_2) toxicity
        iii. Decompression sickness
7. General Procedures
    a. Bottom, travel and decompression gas
        i. Normal operations
        ii. Failure, loss or inadequate emergency procedures
        iii. Analyzing and logging

14.11 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate. It is recommended that all dives be conducted between 55 metres / 180 feet and 100 metres / 330 feet.

1. Properly demonstrate analysis of all gas mixtures to be used
2. Demonstrate adequate pre-dive planning limits based on:
    a. Personal and team gas consumption
    b. Oxygen exposures at planned depths for actual mixes
    c. Inert gas absorption at planned depth with actual mixes
3. Properly execute the planned dive within all predetermined limits
4. Demonstrate the proper navigational techniques for the specific dive
5. During 2 dives, demonstrate an ascent with ascent reel and bag; perform staged decompression
6. Demonstrate the proper procedures for switching and isolating a malfunctioning primary regulator

In order to complete this course, students must:

1. Satisfactorily complete the TDI Advanced Trimix 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 TDI Advanced Trimix Diver course
4. Demonstrate proficiency in teaching the TDI Advanced Trimix Diver Program
5. Present at least 1 graded presentation on a advanced Trimix topic

15. Gas Blender Instructor

15.1 Introduction

This is the instructor level certification course for instructors wishing to teach the TDI Nitrox Gas Blender program. The objective of this course is to train instructors to teach the proper techniques involved in blending nitrox gasses for use in scuba.

15.2 Qualifications of Graduates

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

15.3 Who May Teach

Any active TDI Gas Blender Instructor Trainer may teach this course

15.4 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

15.5 Student Prerequisites

1. Minimum age 21
2. Certified TDI Nitrox Gas Blender or equivalent.

15.6 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

15.7 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

15.8 Required Equipment

The following are required equipment for this course:

1. *TDI Nitrox Gas Blending* Manual
2. *TDI Nitrox Gas Blending* Instructor Guide
3. *TDI Standards and Procedures* Manual
4. *TDI Nitrox Blender* PowerPoint Presentation

15.9 Required Subject Areas

Instructor trainers must use the *TDI 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
    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 compatible systems components
4. Gas Production Equipment
    a. Compressors
    b. Cylinders
    c. Filtration systems
    d. Analog gauges
    e. 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 (O_2) Analyzing
    a. Procedures
    b. Oxygen (O_2) analyzers
7. Cylinder Handling and Sign Out

15.10 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate:

1. Satisfactorily complete the TDI Nitrox 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 nitrox mixtures
4. Demonstrate proficiency in teaching the TDI Nitrox Gas Blender program
5. Present at least 1 graded presentation on a nitrox blending topic

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

17. Oxygen (O_2) Equipment Service Technician Instructor

17.1 Introduction

This is the instructor level certification course for instructors wishing to teach the TDI Oxygen (O_2) Service Technician course. This course involves the preparation of scuba equipment for use with diving gasses. The objective of this course is to train instructors to teach the proper preparation of scuba equipment for the use with diving gases. This course may be combined with the TDI Visual Inspection Procedures Instructor course at the discretion of the instructor trainer.

17.2 Qualifications of Graduates

Upon successful completion of this course, graduates may teach the TDI Oxygen (O_2) Service Technician course

17.3 Who May Teach

Any active TDI Equipment Service Technician Instructor Trainer may teach this course

17.4 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

17.5 Student Prerequisites

1. Minimum age 21
2. Certified as a TDI Service Technician
3. Provide proof of VIP certification or equivalency through a recognized agency
4. Provide proof of a repair certification or equivalency through a recognized agency

17.6 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; Visual inspection procedures (VIP) instructor may be combined with this course by oxygen service technician ITs who also hold the VIP IT rating

Duration

1. The minimum number of classroom and briefing hours is 6; 9 hours if combined with a VIP course

17.7 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

17.8 Required Equipment

The following are required for this course:

1. *TDI Equipment Service Technician* Manual
2. *TDI Equipment Service Technician* Instructor Guide
3. *TDI Standards and Procedures* Manual
4. *TDI Equipment Service Technician* PowerPoint presentation

17.9 Required Subject Areas

Instructor trainers must use the *TDI Equipment Service Technician* 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 Service Technician
2. Gases 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. Equipment Servicing
    a. Materials for use in oxygen (O_2) cleaned systems
        i. Lubricants
        ii. O-rings
        iii. Cleaning chemicals
    b. Procedures for oxygen cleaning
        i. Cylinders
        ii. Valves
        iii. Regulators
        iv. System components
5. Gas Production
    a. Equipment
        i. Compressors
        ii. Cylinders
        iii. Filtration systems
        iv. Analog Gauges
        v. Digital Gauges

6. 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
7. Oxygen (O_2) Analyzing
    a. Procedures
    b. Oxygen (O_2) analyzers
8. Cylinder Handling and Sign Out

17.10 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate:

1. Satisfactorily complete the TDI Equipment Service Technician 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 the preparation of scuba equipment for the use with diving gases
4. Demonstrate proficiency in teaching the TDI Equipment Service Technician program
5. Present at least 1 graded presentation on an equipment service topic

18. Cavern Diving Instructor

18.1 Introduction

The purpose of this program is to evaluate a candidate instructor with respect to the following criteria:

1. Level of knowledge, professionalism and proficiency in presenting a comprehensive TDI Cavern Diver program
2. Proficiency in demonstrating the required land and water skills
3. Overall attitude toward safety, both for the instructor and their student
4. Reducing the long-term environmental impact of our sport by the developing skilled, efficient and well educated divers
5. Possessing a thorough knowledge of the standards and procedures of TDI

18.2 Qualifications of Graduates

Upon successful completion of this program, graduates will be authorized by TDI to teach and certify students in the TDI Overhead Environment/ Cavern Diver course

18.3 Who May Teach

This program may be conducted by the TDI Headquarters Training Staff and/or a senior instructor who has been approved by TDI Headquarters to evaluate instructor candidates

18.4 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

Overhead Environment Training

1. The maximum candidate to instructor trainer ratio is 3:1

18.5 Student Prerequisites

1. Minimum age 21
2. Certified as an open water instructor in active teaching status with an internationally recognized scuba training agency for at least 1 year
3. Have a minimum certification of TDI Nitrox Instructor or equivalent and TDI Full Cave certification or equivalent
4. Provide proof of at least 100 full cave dives
5. Provide proof of teaching a minimum of 4 SDI/TDI/ERDI courses and assisting with a minimum of 1 complete TDI Cavern Diver course with 1 active TDI Cavern Instructor.
6. Provide recommendation from a TDI Cavern Instructor with which the candidate has assisted in cavern training classes and stating that the candidate is prepared for the instructor evaluation program

18.6 Course Structure and Duration

Water Execution

1. TDI allows the instructor trainers to structure programs accordingly; adequate time to ensure comprehension and ability to perform skills required

Program Structure

1. Candidates must participate in a minimum of 2 supervised cavern dives

Duration

1. Minimum time of 15 hours

Limits of Training

1. Minimum cylinder size: 22.2 litres /160 cubic feet
2. Maximum penetration: 1/3 of a single cylinder.
3. 61 linear metres / 200 linear feet from the surface
4. Minimum starting pressure: 6 litres / 52 cubic ft of volume
5. Maximum depth: 40 metres / 130 feet
6. Daylight zone: within sight of the surface entrance
7. No restrictions (areas too small for two divers to pass side-by-side)
8. No decompression diving, safety stops as appropriate or necessary

18.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

18.8 Required Equipment

Required Reading:

1. *TDI Cavern Diver* Manual or eLearning course
2. *TDI Cavern Diver* Instructor Guide
3. *TDI Cavern Diver* Digital Instructor Resource

Suggested Reading:

1. *NACD Art of Safe Cave Diving*
2. *Basic Cave Diving – A Blueprint for Survival*
3. *Caverns Measureless to Man* – Sheck Exley

Equipment Requirements

1. Primary cylinders, minimum volume size is 22.2 litres / 160 cubic feet, a manifold system recommended
2. Mask, low volume recommended
3. Fin straps taped or reversed if applicable
4. Appropriate cylinder harness and buoyancy compensator device (BCD) with automatic low pressure inflator
5. Two completely independent first and second stage regulators; one regulator having a long hose, one first stage regulator having a submersible pressure gauge and low pressure hose for buoyancy compensator device

6. Three battery powered lights consisting of:
    a. A primary light with illumination sufficient for the environment and an expected burn time appropriate for the planned dive
    b. Two back up lights, each having an expected burn time suitable for the planned dive
7. Exposure suit, adequate for the diving environment
8. Watch or bottom timer and a depth gauge; a dive computer may be used in place of one or both)
9. Computer and/or submersible dive tables, both are recommended
10. Slate or wet notes and pencil
11. Small knife or other suitable line cutting device
12. Safety reel with a minimum of 37 metres / 125 feet of guideline
13. One primary cave diving reel with approximately 107 metres / 350 feet per team
14. Three directional line arrows
15. One non-directional marker

Note: The instructor candidate must be in full cave equipment configuration for all water activities.

18.9 Required Subject Areas

1. Policy of Cavern Diving
2. Gas Matching Procedures/Management
3. Accident Analysis
4. Psychological Considerations
5. Equipment Considerations
    a. Body posture and buoyancy control
    b. Communication
    c. Hand signals
    d. Light signals
6. Touch Contact
7. Swimming Techniques
8. Review of Problem Solving
    a. Accident analysis
    b. Equipment failure scenarios
    c. Emergency procedures
    d. Body posture/trim
    e. Buoyancy control
    f. Line following
    g. Propulsion techniques

9. Review of Dive Tables/Computers
10. Physiology
    a. Breathing techniques
    b. Stress management
11. Cave Environment/Conservation
12. Land Owner Relations
13. Local Access Requirements

18.10 Required Skill Performance and Graduation Requirements

The instructor candidates are required to demonstrate the cave diver land/safety drills as described in the *TDI Diving in Overhead Environments* materials. Candidates will teach and encourage cave manners and proper etiquette at all times.

1. Proper use of reels; primary, safety
2. Simulated situations/emergencies including:
    a. Air sharing
    b. Line entanglement
    c. Broken or cut guideline
    d. Primary light failure
    e. Valve-regulator failure
    f. Fin and mask failures
3. Communication
    a. Light
    b. Hand and touch
4. Candidates are required to present a minimum of 2 lectures, 1 prepared and 1 impromptu, from the TDI Diving in Overhead Environments Diver materials

Candidate must be proficient with the following in-water skills during cavern dives, and must demonstrate and conduct the student through a selection of the following:

1. Dive planning to include conservative decompression procedures and proper diver etiquette on all dives
2. Pre-dive briefing, air supply and equipment matching, bubble check, air-sharing, and post-dive critique
3. Buoyancy control, body posture, and propulsion techniques
4. Communication with use of light/hand signals

5. Air-sharing drill in
    a. Full visibility situation
    b. A lights out, eyes closed situation using a single-file swimming method and touch contact
6. Line following, eyes closed, touch contact drill
7. Use of reels; primary and safety
8. Demonstrate proper stress identification and countermeasures

Note: All situation/emergency drills are to be conducted during the exit of all dives.

Note: A continuous guideline to open water must be maintained on all cavern dives.

In addition to the above, the candidate must:

1. Complete the TDI Diving in Overhead Environments examination with a minimum score of 80 percent and 100 percent remediation
2. Complete all land drills and course requirements safely and efficiently
3. Demonstrate mature, sound judgment concerning dive planning and execution
4. Maintain an appropriate level of awareness and respect for the cave environment
5. Receive the recommendation for certification by the TDI Training Director

Note: An irresponsible or cavalier attitude is sufficient grounds to deny certification.

18.11 Renewal Requirements

1. Have certified at least 4 TDI Cavern Divers
2. Taught a minimum of 2 complete courses
3. Logged a minimum of 15 non-training cave dives

19. Intro to Cave Diving Instructor

19.1 Introduction

The purpose of this program is to evaluate a candidate instructor with respect to the following criteria:

1. Level of knowledge, professionalism and proficiency in presenting a comprehensive TDI Intro to Cave Diver program
2. Proficiency in demonstrating the required land and water skills
3. Overall attitude toward safety, both for the instructor and student
4. Reduce the long-term environmental impact of scuba by the developing skilled, efficient and well educated divers
5. Possess a thorough knowledge of the *TDI Standards and Procedures*

19.2 Qualifications of Graduates

Upon successful completion of this program, graduates will be authorized by TDI to teach and certify students in the following areas:

1. TDI Overhead Environment/ Cavern Diver course
2. TDI Intro to Cave Diver course

19.3 Who May Teach

This program may be conducted by the TDI Headquarters Training Staff and/or a senior instructor who has been approved by TDI Headquarters to evaluate instructor candidates

19.4 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

Overhead Environment Training

1. The maximum candidate to instructor trainer ratio is 3:1

19.5 Student Prerequisites

1. Minimum age 21
2. Certified as an open water instructor in active teaching status with an internationally recognized scuba training agency for a minimum of 1 year
3. Have a minimum certification of TDI Cavern Instructor or equivalent with active teaching status
4. Provide proof of at least 150 full-cave dives
5. Provide proof of teaching a minimum of 3 cavern diver courses and assisting with a minimum of 1 complete TDI Introductory Cave Diver course with 1 active TDI Intro to Cave Instructor.
6. Provide recommendation from a TDI Intro to Cave Instructor with which the candidate has assisted in introductory cave training classes and stating that the candidate is prepared for the instructor evaluation program

19.6 Course Structure and Duration

Water Execution

1. TDI allows the instructor trainers to structure programs accordingly; adequate time to ensure comprehension and ability to perform skills required

Program Structure

1. Candidates must participate in a minimum of 2 TDI supervised introductory cave dives

Duration

1. Minimum time of 15 hours

Limits of Training

1. Minimum cylinder size: 22.2 litres / 160 cubic feet
2. Maximum penetration: 1/3 of the double cylinder volume
3. Minimum starting pressure 6 litres / 52 cubic ft. of volume
4. Maximum depth: 40 metres / 130 feet
5. Decompression allowed when required

19.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

Upon successful completion of the course the Instructor must:

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

19.8 Required Equipment

Required Reading:

1. *TDI Diving in Overhead Environments* Manual or eLearning course
2. *TDI Diving in Overhead Environments* Instructor Guide
3. *TDI Diving in Overhead Environments* Instructor Resource CD, optional

Suggested reading:

1. *NACD Art of Safe Cave Diving*
2. *Basic Cave Diving – A Blueprint for Survival*
3. *Caverns Measureless to Man* – Sheck Exley

Equipment Requirements

1. Primary cylinders, minimum volume size is 22.2 litres / 160 cubic feet, a manifold system recommended
2. Mask, low volume recommended
3. Fin straps taped or reversed if applicable
4. Appropriate cylinder harness and buoyancy compensator device (BCD) with automatic low pressure inflator
5. Two completely independent first and second stage regulators; one regulator having a long hose, one first stage regulator having a submersible pressure gauge and low pressure hose for buoyancy compensator device

6. Three battery powered lights consisting of:
    a. A primary light with illumination sufficient for the environment and an expected burn time appropriate for the planned dive
    b. Two back up lights, each having an expected burn time suitable for the planned dive
7. Exposure suit, adequate for the diving environment
8. Watch or bottom timer and a depth gauge; a dive computer may be used in place of one or both
9. Computer and/or submersible dive tables, both are recommended
10. Slate or wet notes and pencil
11. Small knife or other suitable line cutting device
12. Safety reel with a minimum of 37 metres / 125 feet of guideline
13. One primary cave diving reel with approximately 107 metres / 350 feet per team
14. Three directional line arrows
15. One non-directional marker

Note: The instructor candidate must be in full cave equipment configuration for all water activities.

19.9 Required Subject Areas

1. Decompression Theory and its Application to the Special Needs of Cave Diving
2. Gas Matching Procedures/Management
3. Accident Analysis
4. Psychological Considerations
5. Equipment Considerations
    a. Cylinder options
    b. Regulator options
    c. Buoyancy compensator device/harness options
    d. Reel options
    e. Equipment configurations
6. Body Posture and Buoyancy Control
7. Communication
    a. Hand signals
    b. Light signals
    c. Touch contact
8. Swimming Techniques

9. Review of Problem Solving
    a. Accident analysis
    b. Equipment failure scenarios
    c. Buoyancy control
    d. Line following
    e. Propulsion techniques
10. Review of Dive Tables/Computers
11. Physiology
    a. Breathing techniques
    b. Stress management
12. Cave Environment/Conservation
13. Land Owner Relations
14. Local Access Requirements

19.10 Required Skill Performance and Graduation Requirements

The candidates are required to demonstrate the cave diver land/safety drills as described in the *TDI Diving in Overhead Environments* Diver materials. Candidates will teach and encourage cave manners and proper etiquette at all times.

1. Proper use of reels; primary, safety
2. Simulated situations/emergencies including:
    a. Air sharing
    b. Lost guideline
    c. Lost diver
    d. Line entanglement
    e. Broken or cut guideline
    f. Primary light failure
    g. Valve-regulator failure
    h. Fin and mask failures
3. Communication:
    a. Light
    b. Hand and touch
    c. Use of line arrows and non-directional markers
4. Candidates are required to present a minimum of 2 lectures, 1 prepared and 1 impromptu, from the TDI Diving in Overhead Environments Diver materials

Candidate must be proficient with the following in-water skills during introductory cave dives. Candidates must proficiently demonstrate and conduct the student through a selection of the following:

1. Dive planning to include conservative decompression procedures and proper diver etiquette on all dives
2. Adequate pre-dive briefing, air supply and equipment matching, bubble check, air-sharing, and post-dive critique
3. Buoyancy control, body posture, and propulsion techniques
4. Communication with use of lights/hand signals
5. Air-sharing drill in:
    a. Full visibility situation
    b. A lights out, line following, touch contact drill, through a restriction using a single-file swimming method
6. Lost diver and lost line drills
7. Use of reels and guideline; circuits, traverses, jumps and gaps and emergency drills
8. Proper use and reading of line arrows and non-directional markers
9. Demonstrate proper stress identification and counter measures
10. Primary light failure drill, exit on back-up light

Note: All situation/emergency drills are to be conducted during the exit of all dives.

Note: A continuous guideline to open water must be maintained on all cave dives.

In addition to the above, the candidate must:

1. Complete the TDI Diving in Overhead Environments examination with a minimum score of 80 percent with 100 percent remediation
2. Complete all land drills and cave diving requirements safely and efficiently
3. Demonstrate mature, sound judgment concerning dive planning and execution
4. Maintain an appropriate level of awareness and respect for the cave environment
5. Receive the recommendation for certification by the training director

Note: An irresponsible or cavalier attitude is sufficient grounds to deny certification.

19.11 Renewal Requirements

1. Have certified at least 4 cavern or TDI Intro to Cave Divers
2. Taught a minimum of 2 complete courses
3. Logged a minimum of 15 non-training cave dives

20. Full Cave Diving Instructor

20.1 Introduction

The purpose of this program is to evaluate a candidate instructor with respect to the following criteria:

1. Level of knowledge, professionalism and proficiency in presenting a comprehensive TDI Cave Diving course
2. Proficiency in demonstrating the required land and water skills
3. Overall attitude toward safety, both for the instructor and their student
4. Reducing the long-term environmental impact of our sport by the developing skilled, efficient and well educated divers
5. Possessing a thorough knowledge of the *TDI Standards and Procedures*

20.2 Qualifications of Graduates

Upon successful completion of this program, graduates will be authorized by TDI to teach and certify students in the following areas:

1. TDI Overhead Environment/ Cavern Diver course
2. TDI Introductory Cave Diver course
3. TDI Cave Diver course

20.3 Who May Teach

This program may be conducted by the TDI Headquarters Training Staff and/or a senior instructor who has been approved by TDI Headquarters to evaluate instructor candidates.

20.4 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

Overhead Environment Training

1. The maximum candidate to instructor ratio is 3:1

20.5 Student Prerequisites

1. Minimum age 21
2. Be a certified as an open water instructor in active teaching status with an internationally recognized scuba training agency for at least 2 years
3. Have a minimum certification of TDI Intro to Cave Instructor or equivalent , with active teaching status
4. Provide proof of at least 200 full-cave dives
5. Provide proof of teaching a minimum of 3 TDI Intro to Cave Diver courses
6. Provide proof of assisting with a minimum of 1 complete TDI Full Cave Diver course with an active TDI Full Cave Diver Instructor
7. Provide recommendation from a minimum of 1 TDI Full Cave Diver Instructor with whom the candidate has assisted in cave training, stating the candidate is prepared for the TDI Full Cave Diver Instructor Evaluation Program.

The TDI Full Cave Diver Instructor candidate must work with a minimum of 1 TDI Full Cave Diver Instructor and 1 TDI Full Cave Evaluator. The final TDI Full Cave Evaluator cannot give the candidate's recommendation to enter in the TDI Full Cave Diver Instructor course.

20.6 Course Structure and Duration

Water Execution

1. TDI allows the instructor trainers to structure programs accordingly; adequate time to ensure comprehension and ability to perform skills required

Program Structure

1. Candidates must participate in a minimum of 2 TDI supervised cave dives

Duration

1. Minimum time of 15 hours

Limits of Training

1. Minimum cylinder size: 22.2 litres / 160 cubic feet
2. Maximum penetration: 1/3 of the double cylinder volume
3. Minimum starting pressure: 6 litres / 52 cubic ft. of volume
4. Maximum depth: 40 metres / 130 feet
5. Decompression allowed when required

20.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

20.8 Required Equipment

Required reading:

1. *TDI Diving in Overhead Environments* Manual
2. *TDI Diving in Overhead Environments* Instructor Guide
3. *TDI Diving in Overhead Environments* Instructor Resource CD (Optional)

Suggested reading:

1. *NACD Art of Safe Cave Diving*
2. *Basic Cave Diving – A Blueprint for Survival*
3. *Caverns Measureless to Man* – Sheck Exley

Equipment Requirements

1. Primary cylinders, minimum volume size is 22.2 litres / 160 cubic feet, a manifold system recommended
2. Mask, low volume recommended
3. Fin straps taped or reversed if applicable
4. Appropriate cylinder harness and buoyancy compensator device (BCD) with automatic low pressure inflator
5. Two completely independent first and second stage regulators; one regulator having a long hose, one first stage regulator having a submersible pressure gauge and low pressure hose for buoyancy compensator device

6. Three battery powered lights consisting of:
    a. A primary light with illumination sufficient for the environment and an expected minimum burn time appropriate for the dive
    b. Two backup lights, each having an expected burn time suitable for the planned dive time
7. Exposure suit, adequate for the diving environment
8. Watch or bottom timer and a depth gauge; a dive computer may be used in place of one or both
9. Computer and/or submersible dive tables, both are recommended
10. Slate or wet notes and pencil
11. Small knife or other suitable line cutting device
12. Safety reel with a minimum of 37 metres / 125 feet of guideline
13. One primary cave-diving reel with approximately 107 metres / 350 feet per team
14. Jump/Gap reel with approximately 15 metres / 50 feet of guideline
15. Three directional line arrows
16. One non-directional marker
17. It is recommended that the team pre-position decompression cylinders approximately 1 stop deeper than their planned decompression depth in any dive where decompression is planned. Cylinders should be clearly marked, easily identifiable (even in no visibility conditions) and incorporate a regulator and submersible pressure gauge.

Note: All the instructor candidates must be in full cave equipment configuration for all water activities.

20.9 Required Subject Areas

1. Decompression Theory and its Application to the Special Needs of Cave Diving
2. Gas Matching Procedures/Management
3. Accident Analysis
4. Psychological Considerations
5. Equipment Considerations
    a. Cylinder options
    b. Regulator options
    c. Buoyancy compensator device (BCD)/harness options
    d. Reel options
    e. Equipment configurations
6. Body Posture and Buoyancy Control

7. Communication
    a. Hand signals
    b. Light signals
    c. Touch contact
8. Swimming Techniques
9. Review of Problem Solving
    a. Accident analysis
    b. Equipment failure scenarios
    c. Buoyancy control
    d. Line following
    e. Propulsion techniques
10. Review of Dive Tables/Computers
11. Physiology
    a. Breathing techniques
    b. Stress management
12. Cave Environment/Conservation
13. Land Owner Relations
14. Local Access Requirements

20.10 Required Skill Performance and Graduation Requirements

The candidates are required to demonstrate the cave diver land/safety drills as described in the *TDI Diving in Overhead Environments* Diver materials. Candidates will teach and encourage cave manners and proper etiquette at all times.

1. Proper use of reels; primary, safety, jump and gap
2. Circuits, traverses, T's, jumps and gaps
3. Simulated situations/emergencies including:
    a. Air sharing
    b. Lost guideline
    c. Lost diver
    d. Line entanglement
    e. Broken or cut guideline
    f. Primary light failure
    g. Valve/regulator failure
    h. Fin and mask failures
4. Communication:
    a. Light
    b. Hand and touch
5. Candidates are required to present a minimum of 2 lectures, 1 prepared and 1 impromptu, from the *TDI Diving in Overhead Environments* Diver materials

Candidate must be proficient with the following in-water skills during introductory cave dives. Candidates must proficiently demonstrate and conduct the student through a selection of the following:

1. Dive planning to include conservative decompression procedures and proper diver etiquette on all dives
2. Demonstrate adequate pre-dive briefing, air supply and equipment matching, bubble check, air-sharing, and post-dive critique
3. Buoyancy control, body posture, and propulsion techniques
    a. Air-sharing drill in:
    b. Full visibility
4. A lights out situation, touch contact, exiting cave through a restriction using a single file swimming method
5. Lost diver and lost line drills
6. Proper use of reels and guideline; circuits, traverses, jumps and gaps and emergency drills
7. Proper use and reading of line arrows and non-directional markers
8. Proper stress identification and countermeasures
9. Primary light failure drill, exit on back-up
10. Lost line and lost diver drills
11. Propulsion techniques for heavy outflow

Note: All situation/emergency drills are to be conducted during the exit of all dives.

Note: A continuous guideline to open water must be maintained on all cave dives.

In addition to the above, the candidate must:

1. Complete the TDI Diving in Overhead Environments examination with a minimum score of 80 percent with 100 percent remediation
2. Complete all land drills and cave diving requirements safely and efficiently
3. Demonstrate mature, sound judgment concerning dive planning and execution
4. Maintain an appropriate level of awareness and respect for the cave environment
5. Receive the recommendation for certification by the training director

Note: An irresponsible or cavalier attitude is sufficient grounds to deny certification.

20.11 Renewal Requirements

1. Have certified at least 4 cavern or TDI Intro to Cave Divers and at least 2 cave divers
2. Taught a minimum of 3 complete courses
3. Logged a minimum of 15 non-training cave dives

21. DPV Cave Diver Instructor

21.1 Introduction

The purpose of this program is to train a DPV Cave Instructor candidate with respect to the following criteria:

1. Level of knowledge, professionalism and proficiency in presenting a comprehensive TDI DPV Cave DIver course
2. Proficiency in demonstrating the required land and water skills
3. Overall attitude toward safety, both for the instructor and their student
4. Reducing the long-term environmental impact of DPV use on cave systems by developing well-trained divers
5. Possessing a thorough knowledge of the *TDI Standard and Procedures*

21.2 Qualifications of Graduates

Upon successful completion of this program, graduates will be authorized by TDI to teach and certify students in the following area:

1. TDI DPV Cave Diver

21.3 Who May Teach

This program may be conducted by the TDI Headquarters Training Staff and/or a senior instructor who has been approved by TDI Headquarters to evaluate DPV Cave Instructor candidates.

21.4 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. NA

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

1. A maximum of 2 students per instructor; it is the instructor's discretion to reduce this number as conditions dictate.

21.5 Student Prerequisites

1. A TDI Full Cave Dive Instructor for at least 1 year
2. Taught at least 5 complete TDI Full Cave Diver courses
3. Provide proof of at least 50 logged non-training DPV Dives
4. Co-Teach at least 1 TDI Full Cave DPV Course with an active TDI DPV Cave Diver Instructor

21.6 Course Structure and Duration

Water Execution

1. TDI allows the instructor trainers to structure programs accordingly; adequate time to ensure comprehension and ability to perform skills required

Program Structure

1. DPV Cave Instructor candidates must participate of a minimum of 3 supervised DPV cave dives

Duration

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

Limits of Training

1. Penetration limited to 1/3 or less of twin cylinders and 1/3 or less of a stage cylinder
2. Maximum depth 130 on to level of training of student
3. No equipment removal in cave except for decompression cylinders, stage cylinders,or DPV

21.7 Administrative Requirements

The following are the administrative tasks;

1. Collect the course fees from all Instructor candidates
2. Ensure that the instructor candidate have the required equipment
3. Communicate the training schedule to the instructor candidates
4. Have the instructor candidates complete the following:
    a. *TDI Liability Release and Express Assumption of Risk* Form
    b. *TDI Medical Statement* Form signed by a licensed physician

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

21.8 Required Equipment

The following materials is required:

1. N/A

The following equipment is required for each student:

1. Dual cylinders, volume appropriate for planned dive, student gas consumption
2. Two independent first and second stage regulators; one regulator equipped with a long hose
3. Submersible pressure gauge
4. Buoyancy compensator device (BCD) with power inflator
5. Exposure suit adequate for diving environment
6. Mask and fins, NO Snorkel
7. Two line cutting devices
8. Three battery powered lights; 1 primary and 2 back-ups, each with a burn time suitable for the planned dive time
9. One primary cave-diving reel with length appropriate for intended dive
10. Safety reel with a minimum of 37 metres / 125 feet of guideline
11. Appropriate number of gap and jump reels with adequate capacity for planned dive
12. Computer, watch or bottom timer and depth gauge
13. Slate or wet notes with a pencil
14. Submersible dive tables or back up dive computer
15. Three directional line arrows
16. One non-directional line marker
17. DPV adequately configured for the cave environment

21.9 Required Subject Areas

The following topics must be covered during this course:

1. Motivations for DPV cave diving
2. Advantage of DPV use
3. Equipment considerations
    a. DPV Options
    b. DPV components
    c. Rated burn time
    d. Care and Maintenance
    e. DPV rigging
    f. Helmets

4. Problem solving procedures
    a. DPV malfunction or failure
    b. Towing
    c. Gas sharing with DPVs
    d. Light failure
    e. Entanglement
    f. Collision avoidance
    g. Team separation
5. Environmental considerations
    a. Appropriate vs. inappropriate passages
    b. Suitable cave conditions
    c. Low impact DPV use
6. DPV diving techniques
    a. Buoyancy and trim with DPV
    b. Dropping, securing, and retrieving a DPV
    c. Installing guidelines with a DPV
    d. Instigating directional and depth changes
7. Dive planning and gas management
    a. Turn time, turn distance and turn pressure
    b. Gas mix(es) and NDLs or decompression obligations
    c. Gas management, including stage as a safety bottle for DPV extended range

21.10 Required Skill Performance and Graduation Requirements

The DPV Instructor candidates are required to demonstrate the DPV cave diver land drills as described in the *TDI DPV Cave Diver Standards*

The DPV Instructor candidate must perform the following s-drill and skills during all dives:

1. Demonstrate adequate pre-dive planning
2. Equipment check and equipment matching
3. Bubble check
4. Demonstrate specialized propulsion techniques in varying types of flow
5. Demonstrate proper buoyancy control
6. Demonstrate proper body posture
7. Demonstrate proper stress analysis (detection and management)
8. Demonstrate proper use and rigging of a DPV
9. Tow harness and simulating towing technique and rescue techniques

The DPV Instructor candidate must perform the following in-water skills during cave dives:

1. Share gas with DPVs while maintaining visual contact with the guideline.
2. Simulate primary light failure and exit utilizing the DPV and the smallest backup light
3. Simulate exiting the cave with disabled DPV
4. Exit while towing a team member and their disabled DPV
5. Candidate is required to present a minimum of 2 lectures, 1 prepared and 1 impromptu from the TDI DPV Diver Required subject areas

In order to complete this course, the DPV Instructor candidate must:

1. Perform all dive requirements safely and efficiently
2. Demonstrate mature, sound judgment concerning dive planning and execution
3. Maintain an appropriate level of awareness and respect for the cavern environment
4. Log all dives

22. Semi-Closed Circuit Rebreather Instructor, Unit Specific- DOLPHIN, RAY, Atlantis, SUBMATIX ST100 & AZIMUTH

22.1 Introduction

This is the entry-level certification course for instructors wishing to teach one of the following semi-closed circuit rebreathers; Dolphin, Ray, Submatix ST100 or Azimuth. The objective of this course is to train instructors in the benefits, hazards and proper procedures while teaching SCR rebreather courses.

22.2 Qualifications of Graduates

Upon successful completion of this course, graduates may teach no decompression diving activities utilizing the Dolphin, Ray, Submatix ST100 or Azimuth to a maximum depth of 40 metres / 130 feet, to divers; utilizing nitrox mixes not exceeding their level of certification.

22.3 Who May Teach

Any active TDI Rebreather Instructor Trainer may teach this course. Specific TDI Instructor Trainer certification required for each specific rebreather.

22.4 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. A maximum of 6 students per instructor trainer for the Draeger units, for the Azimuth and Submatix units a maximum of 4 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

22.5 Student Prerequisites

1. Minimum age 18
2. Certified as a TDI Rebreather diver; specific certification required for each specific rebreather
3. Certified as a TDI Nitrox Instructor, or equivalent
4. Provide proof of 10 semi-closed rebreather logged dives, dives conducted during this course cannot be included

22.6 Course Structure and Duration

Open Water Execution

1. A minimum of 6 dives with a minimum of 150 accumulated minutes for the Azimuth
2. A minimum of 4 dives with a minimum of 100 accumulated minutes for the Drager units
3. A minimum of 5 dives with a minimum of 125 accumulated minutes for the Submatix ST100

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

22.7 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 candidate:
    a. Complete the *TDI Liability Release and Express Assumption of Risk form*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

22.8 Training Material

Required material

1. *TDI Diving Rebreathers Diver* Manual
2. Specific manufacturer manual for the rebreather being dived
3. *TDI Standards and Procedures* Manual
4. *TDI Diving Rebreathers* Instructor Guide
5. *TDI Diving Rebreathers* PowerPoint (optional)
6. *TDI Diving Rebreathers* Instructor Resource CD

Optional Material

1. TDI plastic EAD and PO_2 tables
2. Nitrox and rebreather equations software

22.9 Required Equipment

The following equipment is required for each student:

1. Rebreather specific to the training being conducted
2. Integrated PO_2 monitoring device for inhaled PO_2 for each rebreather
3. Mask and fins
4. Exposure suit appropriate for the open water environment
5. Access to oxygen analyzer, instructor may supply
6. Appropriate weight
7. Bailout cylinder, minimum size 1.9 litres / 13 cubic feet
8. Flow meter, instructor may supply

22.10 Required Subject Areas

The *TDI Diving Rebreathers* Manual and the manufacturer's manual are mandatory for use during this course; instructor trainers may use any additional text or materials that they feel help present these topics. The following topics must be covered during this course:

1. History and Evolution of Rebreathers
2. Comparison of Open Circuit, Closed Circuit, and Semi-closed Circuit
3. Practical Mechanics of the System
    a. Assembly and disassembly of the rebreather
    b. Layout and design
    c. Scrubber recharge
    d. System maintenance
    e. Breathing loop decontamination procedures

4. Review of Nitrox
    a. Dalton's Law (triangle)
    b. Optimum nitrox mix
    c. Oxygen (O_2) tracking
    d. Gas preparation
    e. Dive planning examples
5. Gas Physiology
    a. Oxygen (O_2) toxicity
    b. Hyperoxia
    c. Hypoxia
    d. Asphyxia
    e. Hypercapnia
    f. Nitrogen absorption
    g. Carbon dioxide (CO_2) toxicity
    h. Gas consumption
        i. Cylinder sizes
        ii. Depth and workload
6. Formula Work / Metabolic Consumption
    a. Oxygen (O_2) metabolizing calculations
    b. Inspired (O_2)calculations, rebreather equation
    c. Equivalent air depth (EAD)
7. Dive Tables
    a. Inspired oxygen (O_2) table
    b. Equivalent air depth
8. Dive Computers
    a. Mix adjustable
    b. Oxygen (O_2) integrated
    c. Percentage oxygen (PO_2) monitoring devices
9. Problem Solving
    a. Canister flooding
    b. Mouthpiece loss
    c. Scrubber exhaustion
    d. Battery or sensor loss
    e. Breathing Bag rupture
    f. Open circuit bailout system
        i. On board gas
        ii. Off board gas
    g. Hyperoxia scenario

   h. Hypoxia scenario
   i. Hypercapnia scenario
   j. Post problem maintenance of equipment
10. Dive Planning
   a. Operational planning
      i. Gas requirements
      ii. Oxygen limitations
      iii. Nitrogen limitations

22.11 Required Skill Performance and Graduation Requirements

The dive depth shall not exceed 1.6 ATM PO_2. The following skills must be completed by the student during open water dives:

1. Properly analyze gas mixture
2. Perform all pre dive checks, positive, negative, flow rate, by-pass regulator operation, relief valve pressure, a minimum of 6 times
3. Demonstrate a leak check and repair scenario
4. Demonstration of integrity of exhale counterlung for Submatix ST100
5. Properly packing a scrubber canister a minimum of 2 times; if using the ExtendAir cartridge one packing must be with granular material
6. Properly execute set-up and breakdown a minimum of 6 times for Azimuth or 4 times for Draeger and Submatix ST100 rebreathers
7. Demonstrate adequate pre-dive planning limits based on:
   a. System performance
   b. Oxygen exposures at planned depth with mix
   c. Nitrogen absorption at planned depth with mix
8. Properly execute the planned dives within all pre-determined limits
9. Properly execute a recovery from a system failure and switch to bail-out stationary a minimum of 2 times
10. Properly execute a recovery from a system failure and switch to bail-out hovering a minimum of 2 times, one of the bail-out scenarios the diver must switch to open circuit and complete dive and safety stop on open circuit; direct ascent must begin when diver switches to open circuit, this scenario should be conducted no deeper than 20 metres / 60 feet
11. Properly demonstrate hose clearing technique after each bail-out scenario

12. Perform block switch a minimum of 2 times, Azimuth only
13. Proper PO_2 monitoring on all dives, if unit is equipped with PO_2 monitoring device
14. Properly execute a mask clearing exercise with emphasis on minimal gas loss
15. Safely and properly execute a buddy out of air scenario, it is preferable the buddy is on a SCR unit also
16. Diver will demonstrate actual safety stops at predetermined depths
17. Properly execute cleaning and maintenance of the rebreather, including breathing loop decontamination

In order to complete this course, students must:

1. Satisfactorily complete the TDI Diving Rebreathers course written examination
2. Complete all open water requirements safely and efficiently
3. Demonstrate mature, sound judgment concerning dive planning and execution

23. KISS GEM Level 1 Instructor

23.1 Introduction

This is the instructor level certification course for instructors wishing to teach the TDI KISS GEM Level 1 rebreather course. The objective of this course is to train instructors to teach recreational rebreather diving, and to develop basic rebreather diving teaching skills appropriate to diving within the normal recreational depth limits for no decompression diving to 30 metres / 100 feet using between 32-40% Nitrox Gas.

23.2 Qualifications of Graduates

Upon successful completion of this course, graduates may teach the TDI KISS GEM Level 1 Rebreather course not to exceed the depth maximum of 30 metres / 100 feet with Nitrox Gases between 32-40%.

23.3 Who May Teach

Any active TDI KISS GEM Level 1 Instructor Trainer may teach this course.

23.4 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. A maximum of 4 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

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

1. A maximum of 4 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

23.5 Student Prerequisites

1. Minimum age 18
2. Provide proof of:
    a. Certified TDI KISS GEM Level 1 Diver
    b. Certified TDI Nitrox Instructor, or equivalent
    c. 200 verified logged dives, 50 using nitrox

3. Assist with at least one complete TDI KISS GEM user course to the satisfaction of the instructor trainer
4. Provide proof of 50 logged rebreather dives on approved rebreathers, with a minimum of 50 accumulated hours; 25 dives and 25 hours must be on a KISS GEM diving system.

Or

1. If the candidate is already a certified TDI SCR or CCR instructor, in place of #4 above, provide proof of 25 verified logged GEM rebreather dives with a minimum of 25 accumulated hours

23.6 Course Structure and Duration

Confined Water Execution

1. A minimum of 1 confined water session with a minimum of 60 accumulated minutes

Open Water Execution

1. A minimum of 5 dives with a minimum of 200 accumulated minutes

Course Structure

1. TDI allows the instructor trainers to structure programs accordingly; adequate time to ensure comprehension and ability to perform skills required

Duration

1. The minimum number of classroom and briefing hours is 6. The minimum course duration is 2 days. The minimum number of equipment overview hours is 2

23.7 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*
    b. Submit the *TDI Medical Statement* Form signed by a licensed physician

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

23.8 Training Material

Required Material

1. KISS GEM owner's manual
2. TDI KISS GEM PowerPoint Slides
3. *TDI Standards and Procedures* Manual

Optional Material

1. Richard Pyle - *A Learners Guide to Closed Circuit Rebreather Operations*
2. Kenneth Donald - *Oxygen & The Diver*
3. John Lamb – *Oxygen Measurement for Divers*
4. Barsky, Thurlow & Ward - *The Simple Guide to Rebreather Diving*
5. Bob Cole – *Rebreather Diving*
6. Jeffrey Bozanic – *Mastering Rebreathers*

23.9 Required Equipment

The following equipment is required for each student:

1. A complete GEM rebreather, the instructor candidate must own or have access to their own, GEM unit in order to take the course, and to teach it in the future
2. Printed checklists from the GEM owner's manual
3. GEM rebreather owner's manual
4. A minimum of 1 integrated PO_2 monitoring for each GEM
5. Access to oxygen analyzer (instructor may supply)
6. Appropriate CO_2 absorbent (ExtendAir™ cartridge or equivalent) for the dives to be conducted
7. Underwater slate
8. Depth gauge and automatic bottom timer AND/OR Nitrox dive computer
9. Mask and fins
10. Exposure suit, appropriate for the open water environment
11. Appropriate weight
12. Toolkit with appropriate spares (instructor may supply)
13. Disinfectant (instructor may supply)
14. One line cutting device

23.10 Required Subject Areas

Instructor trainers must use the *TDI Diving Rebreathers* Student Manual, instructor guide, manufacturer's manual 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. History and Evolution of Rebreathers
2. Comparison of Open Circuit, Closed Circuit, and Semi-closed Circuit Units
3. Practical Mechanics of the GEM Rebreather System
    a. Assembly and disassembly of the GEM rebreather
    b. Layout and design
    c. Scrubber replacement
    d. Pre-dive safety check sequence
    e. System maintenance and storage
    f. Breathing loop decontamination procedures
4. Review of Nitrox
    a. Dalton's Law (triangle)
    b. Optimum nitrox mix
    c. Oxygen tracking
    d. Gas preparation and analysis
5. Gas Physiology
    a. Oxygen toxicity
    b. Hyperoxia
    c. Hypoxia
    d. Asphyxia
    e. Hypercapnia
    f. Nitrogen absorption
    g. CO_2 toxicity
    h. Gas consumption
        i. Cylinder sizes
        ii. Depth and workload
6. Formula Work
    a. Cylinder size/duration equation
    b. Equivalent air depth
7. Dive Tables
    a. Equivalent air depth
    b. CNS toxicity tables
    c. NDL tables

8. Dive Computers
    a. Mix adjustable
    b. Oxygen integrated
    c. PO_2 monitoring devices
9. Dive Planning
    a. Operational planning
    b. Gas requirements including bailout scenarios
    c. Oxygen limitations
    d. Nitrogen limitations
    e. PSCR and FO_2 drop
10. Problem Solving
    a. Canister flooding
    b. Mouthpiece loss
    c. Scrubber exhaustion
    d. Battery or sensor failure
    e. Breathing bag rupture
    f. Open circuit bailout
    g. Hyperoxia scenario
    h. Hypoxia scenario
    i. Hypercapnia scenario
    j. Post problem maintenance of equipment

23.11 Required Skill Performance and Graduation Requirements

The dive depth shall not exceed 1.4 ATM PO_2. The following skills must be demonstrated to instructor quality by all instructor candidates.

Equipment Skills

1. Mouthpiece servicing skills

Confined Water Skills

1. Complete GEM pre-dive checklist
2. Pre-dive checks
    a. Scrubber packing
    b. Unit assembly
    c. One-way valve check
    d. Positive and negative pressure tests
3. Properly analyze supply cylinder
4. Proper fitting and adjustment of counter-lung system

5. Correct starting orientation of mouth piece
6. Perform in water bubble check
7. Open-loop breathing
8. Perform 1 bail-out ascent from a depth not shallower than 1.5 metres / 5 feet
9. Perform a complete unit disassembly and cleaning

Note: All pool dives must be conducted with a minimum of 40% (+/- 1%) oxygen in the source cylinder.

Open Water Skills

1. Properly analyze gas mixture
2. Perform pre-dive check sequence with use of manufacturer's checklist
3. Demonstrate a leak check and repair scenario
4. Properly pack scrubber canister
5. Properly execute set-up and breakdown of the GEM
6. Demonstrate adequate pre-dive planning
    a. Limits based on system performance
    b. Limits based upon oxygen exposures at planned depth with mix
    c. Limits based upon nitrogen absorption at planned depth with mix
7. Properly execute the planned dives within all pre-determined limits
8. Demonstrate the proper adjustment of the counter-lung system underwater
    a. Adjustment of V-Straps (or lower strap assembly), including removal and replace
    b. Adjustment of the counter-lung bungees
9. Properly execute a recovery from a system failure and switch to bail-out stationary
10. Properly execute a recovery from a system failure and switch to bail-out hovering a minimum of 2 times, one of the bail-out scenarios the diver must switch to open circuit and complete dive and safety stop on open circuit; direct ascent must begin when diver switches to open circuit, this scenario should be conducted no deeper than 18 metres / 60 feet
11. Properly demonstrate hose clearing technique after each bail-out scenario
12. Proper PO_2 monitoring on all dives
13. Properly execute a mask clearing exercise with emphasis on minimal gas loss
14. Open-loop or OC from 6 metres / 20 feet to surface
15. Demonstrate comfort setting up and diving the unit
16. Demonstrate good buoyancy control during the dive

17. Safely and properly execute a buddy out of air scenario, it is preferable the buddy be on a SCR unit also
18. Diver will demonstrate actual safety stops at pre-determined depths
19. Properly execute cleaning and maintenance of the GEM rebreather, including breathing loop decontamination

In order to complete this course, students must:

Complete all open water requirements safely and efficiently

1. Demonstrate mature, sound judgment concerning dive planning and execution
2. Pass the diver exam with 80% answered correctly and 100% remediation

In order to complete this course, instructors must:

1. Satisfactorily complete the TDI KISS GEM course written examination with a minimum score of 100 percent, without reference and be able to adequately explain each answer to a prospective student
2. Demonstrate mature, sound judgment concerning training, dive planning and execution
3. Complete all open water requirements safely and efficiently
4. Demonstrate proficiency in teaching the TDI KISS GEM Diver Program
5. Present a minimum of 1 graded presentation on a KISS GEM topic

24. KISS GEM Sidekick Instructor

24.1 Introduction

This is the instructor level certification course for instructors wishing to teach the TDI KISS GEM Sidekick rebreather course. The objective of this course is to train instructors to teach recreational rebreather diving, and to develop basic rebreather diving teaching skills for no decompression diving to 30 metres / 100 feet using between 32-40% Nitrox Gas.

24.2 Qualifications of Graduates

Upon successful completion of this course, graduates may teach the TDI KISS GEM Sidekick Rebreather course not to exceed the maximum depth of 30 metres / 100 feet with Nitrox Gases between 32-40%.

24.3 Who May Teach

1. Any active TDI KISS GEM Sidekick Instructor Trainer may teach this course.

24.4 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. A maximum of 4 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

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

1. A maximum of 4 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

24.5 Student Prerequisites

1. Minimum age 21
2. Provide proof of
    a. Certified TDI KISS GEM Level 1 Diver
    b. Certified TDI Nitrox Instructor, or equivalent
    c. 200 verified logged dives, 50 using nitrox

3. Assist with at least one complete TDI KISS GEM Sidekick user course to the satisfaction of the instructor trainer
4. Provide proof of 50 logged rebreather dives on approved rebreathers, with a minimum of 50 accumulated hours; 25 dives and 25 hours must be on a KISS GEM or KISS GEM Sidekick diving system.
    a. If the above GEM time is on the standard GEM then 10 dives and 10 hours must be on the GEM Sidekick

Or

5. If the candidate is already a certified TDI SCR or CCR instructor, in place of #4 above, provide proof of 25 verified logged KISS GEM rebreather dives with a minimum of 25 accumulated hours. Of this, 10 dives and 10 hours on the GEM Sidekick

Or

6. If the candidate is already a certified KISS GEM instructor; provide proof of 10 KISS GEM Sidekick dives with a minimum of 10 accumulated hours

24.6 Course Structure and Duration

Confined Water Execution

1. A minimum of 1 confined water session with a minimum of 60 accumulated minutes

Open Water Execution

1. A minimum of 5 dives with a minimum of 200 accumulated minutes; two dives must be deeper than 15 metres / 50 feet

Course Structure

1. TDI allows the instructor trainers to structure programs accordingly; adequate time to ensure comprehension and ability to perform skills required

Duration

1. The minimum number of classroom and briefing hours is 6. The minimum course duration is 2 days. The minimum number of equipment overview hours is 2

24.7 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
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

24.8 Training Material

Required Material

1. *KISS GEM Sidekick* owner's manual
2. *TDI KISS GEM* PowerPoint Slides
3. *TDI KISS GEM Sidekick* PowerPoint Slides
4. *TDI Standards and Procedures* Manual

Optional Material

1. Richard Pyle -*A Learners Guide to Closed Circuit Rebreather Operations*
2. Kenneth Donald -*Oxygen & The Diver*
3. John Lamb – *Oxygen Measurement for Divers*
4. Barsky, Thurlow & Ward - *The Simple Guide to Rebreather Diving*
5. Bob Cole – *Rebreather Diving*
6. Jeffrey Bozanic – *Mastering Rebreathers*

24.9 Required Equipment

The following equipment is required for each student

1. A complete KISS GEM Sidekick rebreather, the instructor candidate must own or have access to a KISS GEM Sidekick unit in order to take the course, and to teach it in the future
2. Printed checklists from the KISS GEM Sidekick owner's manual
3. GEM Sidekick rebreather owner's manual
4. A minimum of 1 integrated PO_2 monitoring for each GEM Sidekick

5. Access to oxygen analyzer (instructor may supply)
6. Appropriate CO_2 absorbent (ExtendAir™ cartridge or equivalent) for the dives to be conducted
7. Underwater slate
8. Depth gauge and automatic bottom timer AND/OR Nitrox dive computer
9. Mask and fins
10. Exposure suit, appropriate for the open water environment
11. Appropriate weight
12. Tool-kit with appropriate spares (instructor may supply)
13. Disinfectant (instructor may supply)
14. One line cutting device

24.10 Required Subject Areas

Instructor trainers must use the *TDI Diving Rebreathers* Student Manual or eLearning, instructor guide, manufacturer's manual 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. History and Evolution of Rebreathers
2. Comparison of Open Circuit, Closed Circuit, and Semi-closed Circuit Units
3. Practical Mechanics of the GEM Sidekick Rebreather System
    a. Assembly and disassembly of the GEM Sidekick rebreather
    b. Layout and design
    c. Scrubber replacement
    d. Lung volume control system: Divers must understand how the lung volume control system works. By the end of the course, the diver should be familiar with the adjustment techniques of the lung volume control system.
    e. Pre-dive safety check sequence
    f. System maintenance and storage
    g. Breathing loop decontamination procedures
4. Review of Nitrox
    a. Dalton's Law (triangle)
    b. Optimum nitrox mix
    c. Oxygen tracking
    d. Gas preparation and analysis

5. Gas Physiology
    a. Oxygen toxicity
    b. Hyperoxia
    c. Hypoxia
    d. Asphyxia
    e. Hypercapnia
    f. Nitrogen absorption
    g. CO_2 toxicity
    h. Gas consumption
        i. Cylinder sizes
        ii. Depth and workload
6. Formula Work
    a. Cylinder size/duration equation
    b. Equivalent air depth
7. Dive Tables
    a. Equivalent air depth
    b. CNS toxicity tables
    c. NDL tables
8. Dive Computers
    a. Mix adjustable
    b. Oxygen integrated
    c. PO_2 monitoring devices
9. Dive Planning
    a. Operational planning
    b. Gas requirements including bailout scenarios
    c. Oxygen limitations
    d. Nitrogen limitations
    e. PSCR and FO_2 drop
10. Problem Solving
    a. Canister flooding
    b. Mouthpiece loss
    c. Scrubber exhaustion
    d. Battery or sensor failure
    e. Breathing bag rupture
    f. Open circuit bailout
    g. Hyperoxia scenario
    h. Hypoxia scenario
    i. Hypercapnia scenario
    j. Post problem maintenance of equipment

24.11 Required Skill Performance and Graduation Requirements

The dive depth shall not exceed 1.4 ATM PO_2. The following skills must be demonstrated to Instructor quality by all instructor candidates.

Equipment Skills

1. Mouthpiece servicing skills

Confined Water Skills

1. Complete GEM SIDEKICK pre-dive checklist
2. Pre-dive checks
    a. Scrubber packing
    b. Unit assembly
    c. One-way valve check
    d. Positive and negative pressure tests
3. Properly analyze supply cylinder
4. Properly calibrate and verify oxygen sensors
5. Proper fitting and adjustment of counter-lung system
6. Lung volume control system adjustment
7. Correct starting orientation of mouthpiece, readjust underwater
8. Perform in water bubble check
9. Open-loop breathing
10. Demonstrate proper PO_2 monitoring
11. Perform 1 bail-out ascent from a depth not shallower than 1.5 metres / 5 feet
12. Disconnect and re-connect the gas supply underwater.
13. Practice breathing in different positions and note the change in the work of breathing in each position.
14. Demonstrate the proper adjustment and rigging of the counter-lung system, prior to diving and underwater.
    a. Proper placement of attachment clips to the GEM Sidekick and proper securing of the diving system to the diver while underwater.
    b. Remove and replace diving system; ensure that proper placement can be achieved while underwater.
15. Flood recovery
16. Perform a complete unit disassembly and cleaning

Note: All pool dives must be conducted with a minimum of 40% (+/- 1%) oxygen in the source cylinder.

Open Water Skills

1. Properly analyze gas mixture
2. Properly calibrate and verify oxygen sensors
3. Perform pre-dive check sequence with use of manufacturer's checklist before every dive
4. Demonstrate a leak check and repair scenario
5. Properly pack scrubber canister (minimum of 2 times)
6. Properly execute set-up and breakdown of the GEM Sidekick a minimum of 5 times
7. Demonstrate adequate pre-dive planning
    a. Limits based on system performance
    b. Limits based upon oxygen exposures at planned depth with mix
    c. Limits based upon nitrogen absorption at planned depth with mix
8. Perform in water bubble check
9. Properly execute the planned dives within all pre-determined limits
10. Demonstrate the proper procedures for:
    a. Hypoxia
    b. Hyperoxia
    c. Hypercapnia
    d. Gas loss
    e. Sensor failure
    f. Dive computer failure
    g. PO_2 display failure
    h. Water in the loop
11. Demonstrate the proper adjustment and rigging of the counter-lung system, prior to diving and underwater.
    a. Proper placement of attachment clips to the GEM Sidekick and proper securing of the diving system to the diver while underwater.
    b. Remove and replace diving system; ensure that proper placement can be achieved while underwater.
12. Lung volume control system adjustment on the surface and underwater
13. Properly execute a recovery from a system failure and switch to bail-out stationary
14. Properly execute a recovery from a system failure and switch to bail-out hovering a minimum of 2 times, one of the bail-out scenarios the diver must switch to open circuit and complete dive and safety stop on open circuit; direct ascent must begin when diver switches to open circuit, this scenario should be conducted no deeper than 18 metres / 60 feet

15. Properly demonstrate hose clearing technique after each bail-out scenario
16. Demonstrate proper PO_2 monitoring
17. Properly execute a mask clearing exercise with emphasis on minimal gas loss
18. Open-loop or OC from 6 metres / 20 feet to surface
19. Demonstrate comfort setting up and diving the unit
20. Demonstrate good buoyancy control during the dive
21. Safely and properly execute a buddy out of air scenario; it is preferable the buddy be on a SCR unit also
22. Diver will demonstrate actual safety stops at pre-determined depths
23. Properly execute cleaning and maintenance of the GEM Sidekick rebreather, including breathing loop decontamination

In order to complete this course, students must: Complete all open water requirements safely and efficiently

1. Demonstrate mature, sound judgment concerning dive planning and execution
2. Pass the diver exam with 80% answered correctly and 100% remediation

In order to complete this course, instructors must:

1. Satisfactorily complete the TDI KISS GEM Sidekick course written examination with a minimum score of 100 percent, without reference and be able to adequately explain each answer to a prospective student
2. Demonstrate mature, sound judgment concerning training, dive planning and execution
3. Complete all open water requirements safely and efficiently
4. Demonstrate proficiency in teaching the TDI KISS GEM Sidekick Diver Program
5. Present a minimum of 1 graded presentation on a KISS GEM Sidekick topic

25. Air Diluent Closed Circuit Rebreather Instructor - Unit Specific

25.1 Introduction

This is the instructor level certification course for instructors wishing to teach the unit specific closed circuit rebreather course. The objective of this course is to train instructors to teach recreational rebreather diving, and to develop basic rebreather diving skills appropriate to diving within the normal recreational depth limits for no decompression diving to 30 metres / 100 feet using oxygen (O_2) and an air diluent.

25.2 Qualifications of Graduates

Upon successful completion of this course, graduates may teach the TDI Closed Circuit Rebreather course not to exceed the manufacturers designed depth maximum of 30 metres / 100 feet with air diluent. This course is manufacturer specific.

25.3 Who May Teach

Any active TDI CCR Rebreather Instructor Trainer with a unit specific qualification may teach this course

25.4 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. A maximum of 2 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

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

1. A maximum of 2 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

25.5 Student Prerequisites

1. Minimum age 21
2. Certified TDI unit specific Rebreather Diver, or equivalent
3. Certified TDI Advanced Nitrox Instructor, or equivalent
4. Provide proof of 250 verified logged dives with 100 being on nitrox
5. Provide proof of a minimum of 100 logged dives and a minimum of 100 hours on the specific unit
6. Be a certified rebreather diver (not unit specific) for a minimum of 12 months.
7. Assist on at least one complete unit specific user course to the satisfaction of the instructor trainer
8. If the rebreather is a TDI approved sidemount rebreather, the student must hold the TDI Sidemount Instructor certification or equivalent.

25.6 Course Structure and Duration

Open Water Execution

1. Four dives

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

25.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

25.8 Training Material

Required material

1. *TDI Diving Rebreathers* Student Manual or eLearning course
2. *TDI Diving Rebreathers* Instructor Guide
3. *TDI Standards and Procedures* Manual

Optional Material

1. *TDI Diving Rebreather* PowerPoint Presentation
2. TDI Rebreather Work Slate
3. TDI Scenario Slates (14)
4. Richard Pyle - *A Learners Guide to Closed Circuit Rebreather Operations*
5. Kenneth Donald - *Oxygen & The Diver*
6. John Lamb – *Oxygen Measurement for Divers*
7. Barsky, Thurlow & Ward - The Simple Guide to Rebreather Diving
8. Bob Cole – *Rebreather Diving*
9. Jeffrey Bozanic – *Mastering Rebreathers*

25.9 Required Equipment

The following equipment is required for each student:

1. Closed circuit rebreather; the student must own or have access to their own CCR unit specific
2. Depth gauge and automatic bottom timer and / or dive computer
3. Mask, fins
4. Exposure suit suitable for the diving environment
5. Knife
6. Slate and pencil
7. Bailout cylinder with a minimum capacity of 3 litres / 18 cubic feet
8. Ascent reel with lift bag / surface marker buoy, appropriate for maximum planned depth, minimum of 12 kg 25 lbs

25.10 Required Subject Areas

Instructor trainers must use the *TDI Diving Rebreathers* Student Manual, instructor guide, manufacturer's manual 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. History and Evolution of Rebreathers
2. Comparison of Open Circuit, Closed Circuit and Semi Closed Circuit Rebreather Systems and the Benefits/Problems with Each
3. Practical Mechanics of the System
    a. Assembly and disassembly of the unit specific CCR
    b. Layout and design of the unit
    c. Absorbent canister design and maintenance
    d. Breathing loop decontamination procedures
    e. Manufacturer supported additional fittings, automatic diluent valve (ADV)
    f. Keying valve to individuals metabolic rate, if unit is equipped with this valve
    g. Valve maintenance
    h. DSV (mouthpiece) use, design and limitations
4. Gas Physiology
    a. Oxygen (O_2) toxicity
    b. Nitrogen absorption
    c. Carbon dioxide (CO_2) toxicity
    d. Gas consumption
5. Electronic Systems Design and Maintenance
    a. Oxygen (O_2) metabolizing calculations
    b. Equivalent air depth (EAD) theory revision
    c. Fuel cells
    d. System electronics functionality and calibration procedures
    e. Battery condition / testing
6. Dive Tables
    a. Equivalent air depth operation
    b. Constant partial pressure of oxygen (PPO_2) theory
    c. Central nervous system (CNS) and awareness of oxygen tracking units (OTU)
7. Dive Computers
    a. Mix adjustable
    b. Constant percentage of oxygen (PO_2)
    c. Oxygen (O_2) integrated

8. Dive Planning
    a. Operational planning
    b. Gas requirements including open circuit bailout scenarios / limitations
    c. Oxygen limitations
    d. Nitrogen limitations
    e. Off board open circuit bailout
9. Emergency Procedures.
    a. Use of B.A.D.D.A.S.S
    b. Three H's problems
    c. Flooded loop
    d. Cell warnings
    e. Battery warnings / failure

25.11 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate. The maximum training depth shall not exceed the manufacturers design limit

1. Demonstrate proper analysis of all gas mixtures to be used
2. Demonstrate a complete systems check and rebreather configuration
3. Demonstrate appropriate pre-dive planning limits based on:
    a. Personal gas consumption
    b. Oxygen consumption and exposures at planned depth
    c. Nitrogen absorption at planned depth
4. Properly execute the planned dive within all pre-determined limits
5. Demonstrate the proper procedures for:
    a. Buoyancy control
    b. ADV use
    c. Bail-out
    d. Mouthpiece removal
    e. Ascent techniques
    f. Safety stops
    g. Buddy checks
    h. Simulated emergency
6. Properly execute the break down and maintenance of rebreather

7. Post dive clean of unit
    a. Mouth piece and hoses
    b. Clean and disinfect unit
    c. Inspect components of unit
8. Diver maintenance of unit
    a. Cell remove and replace
    b. Mouthpiece strip and rebuild
    c. Replacing batteries

In order to complete this course, students must:

1. Satisfactorily complete the TDI Diving Rebreathers course written examination with a minimum score of 80 percent, without reference and be able to adequately explain each answer to a prospective student
2. Demonstrate mature, sound judgment concerning training, dive planning and execution
3. Complete all open water requirements safely and efficiently
4. Demonstrate proficiency in teaching the TDI Diving Rebreathers Diver Program
5. Present a minimum of 1 graded presentation on a closed circuit rebreather topic

26. Air Diluent CCR Decompression Procedures Instructor - Unit Specific

26.1 Introduction

This is the instructor level certification course for instructors wishing to teach the unit specific closed circuit rebreather decompression procedures course. The objective of this course is to train instructors to teach recreational rebreather diving, and to develop basic rebreather diving skills appropriate to diving within the normal recreational depth limits for decompression diving to 40 metres / 130 feet using oxygen (O_2) and an air diluent.

26.2 Qualifications of Graduates

Upon successful completion of this course, graduates may teach the TDI Closed Circuit Rebreather Decompression Procedures course not to exceed the manufacturers designed depth maximum of 40 metres / 130 feet with air diluent. This course is manufacturer specific.

26.3 Who May Teach

Any active TDI CCR Rebreather Instructor Trainer with a unit specific qualification may teach this course

26.4 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. A maximum of 2 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

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

1. A maximum of 2 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

26.5 Student Prerequisites

1. Minimum age 21
2. Certified TDI Unit Specific Rebreather Diver, or equivalent
3. Certified TDI Advanced Nitrox Instructor, or equivalent
4. Certified TDI Decompression Procedures Instructor, or equivalent
5. Provide proof of 250 verified logged dives, 100 being on nitrox
6. Provide proof of a minimum of 100 logged dives and a minimum of 100 hours on the specific unit
7. Be a certified rebreather diver (not unit specific) for a minimum of 12 months
8. If the rebreather is a TDI approved sidemount rebreather, the student must hold the TDI Sidemount Instructor certification or equivalent.

OR

1. Be a current TDI Air Diluent CCR (unit specific) and TDI Open Circuit Decompression Procedures Instructor (or equivalent)

26.6 Course Structure and Duration

Open Water Execution

1. Four dives

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

26.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

26.8 Training Material

Required material

1. *TDI Diving Rebreathers* Student Manual
2. *TDI Diving Rebreathers* Instructor Guide
3. *TDI Standards and Procedures* Manual
4. *TDI CCR Preflight Checklist*
5. *TDI Decompression Procedures* Student Manual or eLearning
6. *Rebreather Course Evaluation* Form (see appendix)
7. Manufacturer's minimum training standards

Optional Material

1. *TDI Diving Rebreathers* PowerPoint Presentation
2. TDI Rebreather Cue Cards
3. TDI Scenario Slates (14)

26.9 Required Equipment

The following equipment is required for each student:

1. Closed circuit rebreather; the student must own or have access to their own CCR unit specific
2. Depth gauge and automatic bottom timer and / or dive computer
3. Mask, fins
4. Exposure suit suitable for the diving environment
5. Knife
6. Slate and pencil
7. Bailout cylinder with a minimum capacity of 5 litres / 40 cubic feet
8. Ascent reel with lift bag / surface marker buoy appropriate for maximum planned depth minimum of 12 kg / 25 lbs

26.10 Required Subject Areas

Instructor trainers must use the *TDI Diving Rebreathers* Student Manual, instructor guide, manufacturer's manual 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. History and Evolution of Rebreathers
2. Comparison of Open Circuit, Closed Circuit and Semi Closed Circuit Rebreather Systems and the Benefits/Problems with each
3. Practical Mechanics of the System
    a. Assembly and disassembly of the unit specific CCR
    b. Layout and design of the unit
    c. Absorbent canister design and maintenance
    d. Breathing loop de-contamination procedures
    e. Manufacturer supported additional fittings, automatic diluent valve or (ADV)
    f. Keying valve to individuals metabolic rate (if unit is equipped with this valve)
    g. Valve maintenance
    h. DSV (mouthpiece) use, design and limitations
4. Gas Physiology
    a. Oxygen (O_2) toxicity
    b. Nitrogen absorption
    c. Carbon dioxide (CO_2) toxicity
    d. Gas consumption
5. Electronic Systems Design and Maintenance
    a. Oxygen (O_2) metabolizing calculations
    b. Equivalent air depth (EAD) theory revision
    c. Fuel cells
    d. System electronics functionality and calibration procedures
    e. Battery condition / testing
6. Dive Tables
    a. Equivalent air depth (EAD) operation
    b. Constant partial pressure of oxygen (PPO_2) theory
    c. Central nervous system (CNS) and awareness of oxygen tracking (OTU)
7. Dive Computers
    a. Mix adjustable
    b. Constant percentage of oxygen (PO_2)
    c. Oxygen (O_2) integrated

8. Dive Planning
    a. Operational planning
    b. Gas requirements including open circuit bailout scenarios / limitations
    c. Oxygen limitations
    d. Nitrogen limitations
    e. Off board open circuit bailout
9. Emergency Procedures
    a. Use of B.A.D.D.A.S.S
    b. Three H's problems
    c. Flooded loop
    d. Cell warnings
    e. Battery warnings / failure

26.11 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate. The maximum training depth shall not exceed the manufacturers design limit.

1. Demonstrate proper analysis of all gas mixtures to be used
2. Demonstrate a complete systems check and rebreather configuration
3. Demonstrate appropriate pre-dive planning limits based on:
    a. Personal gas consumption
    b. Oxygen consumption and exposures at planned depth
    c. Nitrogen absorption at planned depth
4. Properly execute the planned dive within all pre-determined limits
5. Demonstrate the proper procedures for:
    a. Buoyancy control
    b. ADV use
    c. Bail-out
    d. Mouthpiece removal
    e. Ascent techniques
    f. Safety stops
    g. Buddy checks
    h. Simulated emergency
6. Properly execute the break down and maintenance of rebreather
7. Post dive clean of unit
    a. Mouth piece and hoses
    b. Clean and disinfect unit
    c. Inspect components of unit

8. Diver maintenance of unit
    a. Cell removal and replacement
    b. Mouthpiece strip and rebuild
    c. Replacing batteries
9. Demonstrate comfort swimming on surface and at depth carrying one bailout/decompression cylinder
10. Demonstrate ability to drop and retrieve one bailout/decompression cylinder while maintaining position in the water column
11. Demonstrate ability to deploy SMB / lift-bag solo and as a member of a team
12. Demonstrate appropriate reaction to gas hemorrhage from manifold or first stage, SPG and primary regulator
13. Demonstrate appropriate reaction to simulated free-flowing deco regulator
14. Buddy breathing deco gas for at least 1 minute
15. Oxygen rebreather mode at less than 6 metre / 20 foot stops
16. Complete one bailout scenario at depth to include decompression obligation on open circuit

In order to complete this course, students must:

1. Satisfactorily complete the TDI Diving Rebreathers course written examination with a minimum score of 80 percent, without reference and be able to adequately explain each answer to a prospective student
2. Demonstrate mature, sound judgment concerning training, dive planning and execution
3. Complete all open water requirements safely and efficiently
4. Demonstrate proficiency in teaching the TDI Closed Circuit Rebreather Diver Program
5. Present a minimum of 1 graded presentation on a closed circuit rebreather topic

27. Helitrox Diluent CCR Decompression Procedures Instructor - Unit Specific

27.1 Introduction

This is the instructor level certification course for instructors wishing to teach the unit specific closed circuit rebreather helitrox diluent decompression procedures course. The objective of this course is to train instructors to teach recreational rebreather diving, and to develop basic rebreather diving skills appropriate to diving within the normal recreational depth limits for decompression diving to 45 metres / 150 feet using oxygen (O2) and helitrox (minimum 20% oxygen, maximum 35% helium) as diluent.

27.2 Qualifications of Graduates

Upon successful completion of this course, graduates may teach the TDI Closed Circuit Rebreather Helitrox Diluent Decompression Procedures course not to exceed the manufacturers designed depth maximum of 45 metres / 150 feet with helitrox diluent. This course is manufacturer specific.

27.3 Who May Teach

Any active TDI Helitrox CCR Rebreather Instructor Trainer with a unit specific qualification may teach this course

27.4 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. A maximum of 2 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

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

1. A maximum of 2 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

27.5 Student Prerequisites

1. Minimum age 21
2. Certified TDI Unit Specific Rebreather Diver, or equivalent
3. Certified TDI Advanced Nitrox Instructor, or equivalent
4. Certified TDI Decompression Procedures Instructor or Helitrox Deco Procedures Instructor, or equivalent
5. Provide proof of 250 verified logged dives, 100 being on nitrox
6. Provide proof of a minimum of 100 logged dives and a minimum of 100 hours on the specific unit
7. Be a certified rebreather diver (not unit specific) for a minimum of 12 months
8. If the rebreather is a TDI approved sidemount rebreather, the student must hold the TDI Sidemount Instructor certification or equivalent.

OR

9. Be a current TDI Air Diluent CCR Instructor (unit specific) and TDI Open Circuit Helitrox Decompression Procedures Instructor (or equivalent)

27.6 Course Structure and Duration

Open Water Execution

1. Four dives

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

27.7 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
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

27.8 Training Material

Required material

1. *TDI Diving Rebreathers* Student Manual or eLearning
2. *TDI Diving Rebreathers* Instructor Guide
3. Manufacturer's manual and updates
4. Manufacturer's Build Checklist
5. *TDI CCR Preflight Checklist*
6. *TDI Decompression Procedures* Student Manual or eLearning
7. *TDI Extended Range and Trimix Diver* Student manual or eLearning
8. *TDI Extended Range and Trimix Diver* Instructor Guide
9. *Rebreather Course Evaluation* Form (see appendix)
10. Manufacturer's minimum training standards
11. *TDI Standards and Procedures* Manual

Optional Material

1. *TDI Diving Rebreathers* PowerPoint Presentation
2. T*DI Extended Range and Trimix* PowerPoint presentation
3. *TDI Rebreather* Cue Cards
4. *TDI Scenario* Slates (14)

27.9 Required Equipment

The following equipment is required for each student:

1. Closed circuit rebreather; the student must own or have access to their own CCR unit specific. Any modifications must be approved by the manufacturer.
2. Depth gauge and automatic bottom timer and / or dive computer
3. Mask, fins
4. Exposure suit suitable for the diving environment
5. Knife
6. Slate and pencil
7. Bailout cylinder with appropriate capacity for planned dive
8. Ascent reel with lift bag / surface marker buoy with adequate lift and size for the dive environment and a backup.

27.10 Required Subject Areas

Instructor trainers must use the *TDI Diving Rebreathers* and *TDI Extended Range and Trimix* Student Manual or eLearning, instructor guides, manufacturer's manual and the current *TDI Standards and Procedures*, 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. History and Evolution of Rebreathers
2. Comparison of Open Circuit, Closed Circuit and Semi Closed Circuit Rebreather Systems and the Benefits/Problems with each
3. Practical Mechanics of the System
    a. Assembly and disassembly of the unit specific CCR
    b. Layout and design of the unit
    c. Absorbent canister design and maintenance
    d. Breathing loop de-contamination procedures
    e. Manufacturer supported additional fittings, automatic diluent valve or (ADV)
    f. Keying valve to individual's metabolic rate (if unit is equipped with this valve)
    g. Valve maintenance
    h. DSV (mouthpiece) use, design and limitations
4. Gas Physiology
    a. Oxygen (O2) toxicity
    b. Nitrogen absorption
    c. Carbon dioxide (CO2) toxicity
    d. Gas consumption
5. Electronic Systems Design and Maintenance
    a. Oxygen (O2) metabolizing calculations
    b. Equivalent air depth (EAD) theory revision
    c. Fuel cells
    d. System electronics functionality and calibration procedures
    e. Battery condition / testing
6. Dive Tables
    a. Equivalent air depth (EAD) operation
    b. Constant partial pressure of oxygen (PPO2) theory
    c. Central nervous system (CNS) and awareness of oxygen tracking (OTU)

7. Dive Computers
    a. Mix adjustable
    b. Constant percentage of oxygen (PO2)
    c. Oxygen (O2) integrated
8. Dive Planning
    a. Operational planning
    b. Gas requirements including open circuit bailout scenarios / limitations
    c. Oxygen limitations
    d. Nitrogen limitations
    e. Off board open circuit bailout
9. Emergency Procedures
    a. Use of B.A.D.D.A.S. - Bail out, Anxiety breaths, Decide – Diluent flush, Always know your PO2, Skills to overcome problem
    b. Three H's problems
    c. Flooded loop
    d. Cell warnings
    e. Battery warnings / failure
10. Helium Considerations
    a. Helium absorption and elimination
    b. Advantages of hyperoxic mixes for decompression
    c. Advantages of helium for bottom gas
    d. Hypoxia
    e. HPNS
    f. Effects on respiration
    g. Effects as an insulator
    h. Helium limitations

27.11 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate. The maximum training depth shall not exceed the manufacturers design limit.

1. Demonstrate proper analysis of all gas mixtures to be used
2. Demonstrate a complete systems check and rebreather configuration
3. Demonstrate appropriate pre-dive planning limits based on:
    a. Personal gas consumption
    b. Oxygen consumption and exposures at planned depth
    c. Nitrogen absorption at planned depth
    d. Thermal constraints

4. Properly execute the planned dive within all pre-determined limits
5. Demonstrate the proper procedures for:
    a. Mouthpiece familiarity drills
    b. Bailout drills
    c. Gas shutdowns and loss of gas
    d. Broken hoses
    e. Flooded absorbent canister
    f. CO_2 breakthrough
    g. Semi-closed mode
    h. Low oxygen drills
    i. High oxygen drills
    j. Flooding Loop
    k. Electronics and battery failure
    l. Properly execute the ascent procedures for an incapacitated CCR diver and tow the diver a minimum of 50 metres at the surface with both rescuer and victim wearing complete CCR diving system and bailout system
6. Properly execute the break down and maintenance of rebreather
7. Demonstrate comfort swimming on surface and at depth carrying one bailout/decompression cylinder
8. Demonstrate ability to drop and retrieve one bailout/decompression cylinder while maintaining position in the water column
9. Demonstrate ability to deploy SMB / lift-bag solo and as a member of a team
10. Demonstrate appropriate reaction to simulated free-flowing deco regulator
11. Buddy breathing deco gas for at least 1 minute
12. Oxygen rebreather mode at less than 6 metre / 20 foot stops
13. Complete one bailout scenario at depth to include simulated or actual decompression obligation on open circuit

In order to complete this course, students must:

1. Satisfactorily complete the TDI Diving Rebreathers and TDI Extended Range and Trimix course written examinations with a minimum score of 80 percent on each, without reference and be able to adequately explain each answer to a prospective student
2. Demonstrate mature, sound judgment concerning training, dive planning and execution
3. Complete all open water requirements safely and efficiently
4. Demonstrate proficiency in teaching the TDI Helitrox CCR Diver Program
5. Present a minimum of 1 graded presentation on a Helitrox CCR topic

28. Mixed Gas Closed Circuit Rebreather Instructor - Unit Specific

28.1 Introduction

This is the instructor level certification course for instructors wishing to teach the mixed gas closed circuit rebreather course. The objective of this course is to train instructors to teach mixed gas rebreather diving, and to develop technical rebreather diving skills appropriate to diving to a maximum depth 60 metres / 200 feet or the maximum depth set by the manufacture of the specific unit, using Trimix with 16 percent oxygen (O_2) or greater.

Instructors can be qualified to teach on any unit that TDI has diver standards for.

28.2 Qualifications of Graduates

Upon successful completion of this course, graduates may teach the TDI Mixed Gas Closed Circuit Rebreather course not to exceed the manufacturers designed depth maximum or 60 metres / 200 feet with mixed gas diluent. This course is unit specific.

28.3 Who May Teach

An active TDI Instructor Trainer with a unit specific mixed gas instructor trainer rating

28.4 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. A maximum of 2 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

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

1. A maximum of 2 students per instructor trainer; it is the instructor trainer's discretion to reduce this number as conditions dictate

28.5 Student Prerequisites

1. Minimum age 21
2. TDI CCR Air Diluent Decompression Procedures (unit specific) Instructor (or equivalent) with 15 students taught and 1 year teaching experience on the unit specific CCR

And

3. TDI Advanced Trimix Instructor or equivalent, with 15 students taught and 1 further year teaching experience of Trimix open circuit

Or

4. Properly verified proof of 30 logged mixed gas dives on a rebreather with 15 logged dives beyond 65 metres / 215 feet

28.6 Course Structure and Duration

Open Water Execution

1. Four dives

Course Structure

1. TDI allows instructors 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

28.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

28.8 Training Material

Required material:

1. *TDI Diving Rebreathers* Student Manual
2. *TDI Diving Rebreathers* Instructor Guide
3. *TDI Standards and Procedures* Manual

Optional Material:

1. *TDI Diving Rebreathers* PowerPoint Presentation
2. *TDI Rebreather* Work Slate
3. *TDI Scenario* Slates (14)
4. Richard Pyle - *A Learners Guide to Closed Circuit Rebreather Operations*
5. Kenneth Donald - *Oxygen & The Diver*
6. John Lamb – *Oxygen Measurement for Divers*
7. Barsky, Thurlow & Ward - The Simple Guide to Rebreather Diving
8. Bob Cole – *Rebreather Diving*
9. Jeffrey Bozanic – *Mastering Rebreathers*

28.9 Required Equipment

The following equipment is required for each student:

1. Closed circuit rebreather; the student must own or have access to their own CCR (if Discovery MK VI / SE7EN is used, the unit must be equipped with full 60M upgrade including 60M e-module and counterlungs with manual addition valves.
2. Depth gauge and automatic bottom timer and / or dive computer
3. Mask, fins
4. Exposure suit suitable for the diving environment
5. Knife
6. Slate and pencil
7. Bailout cylinder with a minimum capacity of 3 litres / 18 cubic feet

28.10 Required Subject Areas

Instructor trainers must use the *TDI Diving Rebreathers* Student Manual, instructor guide, manufacturer's manual 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. History and Evolution of Rebreathers
2. Comparison of Open Circuit, Closed Circuit and Semi Closed Circuit Rebreather Systems and the Benefits/Problems with Each
3. Practical Mechanics of the System
    a. Assembly and disassembly of unit specific CCR
    b. Layout and design of the unit
    c. Absorbent canister design and maintenance
    d. Breathing loop de-contamination procedures
    e. Manufacturer supported additional fittings, automatic diluent valve (ADV)
4. Gas Physiology
    a. Oxygen (O_2) toxicity
    b. Nitrogen absorption
    c. Carbon dioxide (CO_2) toxicity
    d. Gas consumption
5. Electronic Systems Design and Maintenance
    a. Oxygen (O_2) metabolizing calculations
    b. Equivalent air depth (EAD) theory revision
    c. Fuel Cells
    d. System electronics functionality and calibration procedures
6. Dive Tables
    a. Equivalent air depth (EAD) operation
    b. Constant partial pressure of oxygen (PPO_2) theory
    c. Central nervous system (CNS) and awareness of oxygen tracking units (OTU)
7. Dive Computers
    a. Mix adjustable
    b. Constant percentage of oxygen (PO_2)
    c. Oxygen (O_2) integrated
8. Dive Planning
    a. Operational planning
    b. Gas requirements including bailout scenarios
    c. Oxygen limitations
    d. Nitrogen limitations

9. Emergency Procedures
    a. Use of B.A.D.D.A.S.S
    b. Three H's problems
    c. Flooded loop
    d. Cell warnings
    e. Battery warnings

28.11 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate. The maximum training depth shall not exceed the manufacturer's design limit.

1. Demonstrate proper analysis of all gas mixtures to be used
2. Demonstrate a complete systems check and rebreather configuration
3. Demonstrate adequate pre-dive planning limits based on:
    a. Personal gas consumption
    b. Oxygen (O_2) consumption and exposures at planned depth
    c. Nitrogen absorption at planned depth
4. Properly execute the planned dive within all pre-determined limits
5. Demonstrate the proper procedures for:
    a. Buoyancy control
    b. ADV use
    c. Bail-out
    d. Mouthpiece removal
    e. Ascent techniques
    f. Safety stops
    g. Buddy checks
    h. Simulated emergency
6. Properly execute the break down and maintenance of rebreather

In order to complete this course, students must:

1. Satisfactorily complete the TDI Closed Circuit Rebreather Course written examination with a minimum score of 80 percent without reference, and be able to adequately explain each answer to a prospective student.
2. Demonstrate mature, sound judgment concerning training, dive planning and execution
3. Complete all open water requirements safely and efficiently
4. Demonstrate proficiency in teaching all skills in the unit specific diver standards
5. Present 1 graded presentation on a closed circuit rebreather topic
6. Present and evaluate all subjects covered in the unit specific diver standards

29. Advanced Mixed Gas Closed Circuit Rebreather Instructor - Unit Specific

29.1 Introduction

This is the instructor level certification course for instructors wishing to teach the mixed gas closed circuit rebreather course. The objective of this course is to train instructors to teach mixed gas rebreather diving, and to develop technical rebreather diving skills appropriate to diving to a maximum depth 100 metres / 330 feet or the maximum depth set by the manufacturer of the specific unit, using custom Trimix as a breathing gas.

Instructors can be qualified to teach on any units that TDI has diver standards for.

29.2 Qualifications of Graduates

Upon successful completion of this course, graduates may teach the TDI Advanced Mixed Gas Closed Circuit Rebreather course not to exceed the manufacturers designed depth maximum or 100 metres / 330 feet with custom mixed gas as a diluent. This course is unit specific.

29.3 Who May Teach

An active TDI Instructor Trainer with a unit specific advanced mixed gas instructor trainer rating

29.4 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. A maximum of 2 students per instructor trainer; it is the instructor's discretion to reduce this number as conditions dictate

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

1. A maximum of 2 students per instructor trainer; it is the instructor's discretion to reduce this number as conditions dictate

29.5 Student Prerequisites

1. Minimum age 21
2. TDI CCR Mixed Gas (unit specific) Instructor (or equivalent) with 10 mixed gas students taught and 1 year teaching experience on the unit specific CCR
3. Properly verified and logged proof of 30 mixed gas dives on the unit specific rebreather with 15 logged beyond 65 metres / 215 feet

29.6 Course Structure and Duration

Open Water Execution

1. Four dives

Course Structure

1. TDI allows instructors 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

29.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

29.8 Training Material

Required material:

1. *TDI Diving Rebreathers* Student Manual
2. *TDI Diving Rebreathers* Instructor Guide
3. *TDI Standards and Procedures* Manual

Optional Material:

1. *TDI Diving Rebreathers* PowerPoint Presentation
2. *TDI Rebreather* Work Slate
3. *TDI Scenario* Slates (14)
4. Richard Pyle - *A Learners Guide to Closed Circuit Rebreather Operations*
5. Kenneth Donald - *Oxygen & The Diver*
6. John Lamb – *Oxygen Measurement for Divers*
7. Barsky, Thurlow & Ward - The Simple Guide to Rebreather Diving
8. Bob Cole – *Rebreather Diving*
9. Jeffrey Bozanic – *Mastering Rebreathers*

29.9 Required Equipment

The following equipment is required for each student:

1. Closed circuit rebreather; the student must own or have access to their own CCR
2. Depth gauge and automatic bottom timer and / or dive computer
3. Mask, fins
4. Exposure suit suitable for the diving environment
5. Knife
6. Slate and pencil
7. Two bailout cylinders with a minimum capacity of 11.1 liters / 80 cubic feet with mix appropriate for planed depth

29.10 Required Subject Areas

Instructor trainers must use the *TDI Diving Rebreathers* Student Manual, instructor guide, manufacturer's manual 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. History and Evolution of Rebreathers
2. Comparison of Open Circuit, Closed Circuit and Semi Closed Circuit Rebreather Systems and the Benefits/Problems with Each
3. Practical Mechanics of the System
    a. Assembly and disassembly of unit specific CCR
    b. Layout and design of the unit
    c. Absorbent canister design and maintenance
    d. Breathing loop de-contamination procedures
    e. Manufacturer supported additional fittings, automatic diluent valve (ADV)

4. Gas Physiology
    a. Oxygen (O_2) toxicity
    b. Nitrogen absorption
    c. Carbon monoxide (CO_2) toxicity
    d. Gas consumption
    e. Equivalent air depth (EAD) theory revision narcotic depth related to helium
5. Electronic Systems Design and Maintenance
    a. Oxygen (O_2) metabolizing calculations
    b. Fuel cells
    c. System electronics functionality and calibration procedures
6. Dive Tables
    a. Equivalent air depth (EAD) operation
    b. Constant partial pressure of oxygen (PPO_2) theory
    c. Central nervous system (CNS) and awareness of oxygen tracking units (OTU)
    d. Software generated dive profiles
7. Dive Computers
    a. Mix adjustable
    b. Constant percentage of oxygen (PO_2)
    c. Oxygen (O_2) integrated
8. Dive Planning.
    a. Operational planning
    b. Gas requirements including bailout scenarios
    c. Oxygen limitations
    d. Nitrogen limitations
9. Emergency Procedures
    a. Use of B.A.D.D.A.S.S
    b. Three H's problems
    c. Flooded loop
    d. Cell warnings
    e. Battery warnings

29.11 Required Skill Performance and Graduation Requirements

The following skills must be completed by the instructor candidate. The maximum training depth shall not exceed the manufacturers design limit or 100 metres / 330 feet.

1. Demonstrate proper analysis of all gas mixtures to be used
2. Demonstrate a complete systems check and rebreather configuration
3. Demonstrate adequate pre-dive planning limits based on:
    a. Personal gas consumption
    b. Oxygen consumption and exposures at planned depth
    c. Nitrogen absorption at planned depth
4. Properly execute the planned dive within all pre-determined limits
5. Demonstrate the proper procedures for:
    a. Buoyancy control
    b. ADV use
    c. Bail-out
    d. Mouthpiece removal
    e. Ascent techniques
    f. Safety stops
    g. Buddy checks
    h. Simulated emergency
6. Properly execute the break down and maintenance of rebreather

In order to complete this course, students must:

1. Satisfactorily pass the TDI Closed Circuit Rebreather Course written examination with a minimum score of 80 percent without reference, and be able to adequately explain each answer to a prospective student
2. Demonstrate mature, sound judgment concerning training, dive planning and execution
3. Complete all open water requirements safely and efficiently
4. Demonstrate proficiency in teaching all skills in the unit specific advanced mixed gas diver standards
5. Present a minimum of 1 graded presentation on an advance mixed gas closed circuit rebreather topic
6. Present and evaluate all subjects covered in the unit specific diver standards

30. Rebreather Full Cave Diver Instructor

30.1 Introduction

The purpose of this program is to evaluate a candidate instructor with respect to the following criteria:

1. Level of knowledge, professionalism and proficiency in presenting a comprehensive TDI Rebreather Cavern Diver, Rebreather Intro to Cave Diver, and Rebreather Full Cave Diver courses.
2. Proficiency in demonstrating the required land and water skills
3. Proficiency in presenting information from academic sessions associated with TDI Rebreather Cave Diving courses
4. Overall attitude toward safety, both for the instructor and their student
5. Reducing the long-term environmental impact of our sport by developing skilled, efficient and well educated divers
6. Possessing a thorough knowledge of the *TDI Standards and Procedures*

30.2 Qualifications of Graduates

Upon successful completion of this program, graduates will be authorized by TDI to teach and certify students in the following areas:

1. TDI Rebreather Cavern Diver course
2. TDI Rebreather Intro to Cave Diver course
3. TDI Rebreather Full Cave Diver course

30.3 Who May Teach

This program may be conducted by the TDI Headquarters Training Staff and/or a senior Instructor Trainer who has been approved by TDI Headquarters to evaluate instructor candidates. The Instructor Trainer must be qualified as an instructor on the TDI approved rebreather they are diving, and as an Air Diluent Decompression Diver (or equivalent) on the TDI approved rebreather the student is diving.

30.4 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

Overhead Environment Training

1. The maximum candidate to instructor ratio is 3:1

30.5 Student Prerequisites

1. Minimum age 21
2. Be a certified as an open water instructor in active teaching status with an internationally recognized scuba training agency for at least 2 years
3. Be certified as a TDI Rebreather Full Cave Diver or equivalent
4. Provide proof of at least 200 full-cave dives, a minimum of 100 of these dives must be rebreather cave dives.
5. Have a minimum of TDI CCR Air Diluent Decompression Procedures Instructor certification or equivalent
6. Have a minimum of 1 year rebreather teaching experience
7. Have certified a minimum of 25 rebreather divers at any level
8. Provide proof of assisting with at least 2 courses in each of the 3 levels of TDI Rebreather Cave training
9. Provide recommendation from a TDI Rebreather Cave Instructor with whom the candidate has assisted a minimum of 1 course with. This must be an instructor other than the Instructor Trainer conducting the Instructor Evaluation.

Note: An active TDI Full Cave instructor may administratively upgrade to this rating provided the following requirements are met:

1. Certification as an open circuit TDI Full Cave instructor
2. Certified as minimum of TDI Air Diluent CCR – Unit Specific instructor (must be certified TDI Air Diluent Deco CCR instructor if decompression cave dives are conducted)
3. Have issued 5 rebreather certs at any level
4. Provide proof of 20 logged rebreather cave dives
5. Have co-taught two complete Rebreather Full Cave courses with an active TDI Rebreather Full Cave instructor and provide a letter verifying co-teaching activity listing dates and students

30.6 Course Structure and Duration

Water Execution

1. TDI allows the instructor trainers to structure programs accordingly; adequate time to ensure comprehension and ability to perform skills required

Program Structure

1. Candidates must participate in a minimum of 2 TDI supervised rebreather cavern dives
2. Candidates must participate in a minimum of 2 TDI supervised rebreather introductory cave dives
3. Candidates must participate in a minimum of 2 TDI supervised rebreather full cave dives

Duration

1. Minimum time of 45 hours

Limits of Training Dives

1. Cavern Dives:
    a. Diver carries adequate bailout to safely exit from the furthest point of penetration using a minimum SAC rate of 30 litres per minute/1 cubic foot per minute OR the student's calculated elevated SAC rate to account for a CO_2 event, whichever is greater
    b. 60 linear metres / 200 linear feet from the surface
    c. 30 metres / 100 feet maximum depth
    d. No decompression diving
    e. No restrictions; no areas too small for 2 divers to pass side-by-side
    f. Safety stops as appropriate or necessary
    g. Maintain a continuous guideline
    h. Proper cavern diving equipment is used in conjunction with a TDI approved rebreather
    i. No removal of life support equipment shall be permitted within the overhead environment
    j. Visibility must be adequate to identify the exit from inside the cavern

2. Introductory Cave Dives:
    a. Diver carries adequate bailout to safely exit from the furthest point of penetration using a minimum SAC rate of 30 litres per minute/1 cubic foot per minute OR the student's calculated elevated SAC rate to account for a CO_2 event, whichever is greater
    b. 40 metres / 130 feet maximum depth
    c. No decompression diving
    d. Maintain a continuous guideline (no jumps, no gaps)
    e. Proper cave diving equipment is used in conjunction with a TDI approved rebreather
3. Full Cave Dives:
    a. Diver carries adequate bailout to safely exit from the furthest point of penetration and complete any decompression stops using a minimum SAC rate of 30 litres per minute/1 cubic foot per minute OR the student's calculated elevated SAC rate to account for a CO_2 event, whichever is greater
    b. 45 metres / 150 feet maximum depth
    c. No equipment removal in cave
    d. Complete safety and decompression stops as appropriate or necessary
    e. Maintain a continuous guideline
    f. Proper cave diving equipment is used in conjunction with a TDI approved rebreather

30.7 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*
    b. Submit the *TDI Medical Statement* form signed by a licensed physician

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

30.8 Required Equipment

Required reading:

1. *TDI Diving in Overhead Environments* Manual
2. *TDI Diving in Overhead Environments* Instructor Guide
3. *TDI Diving in Overhead Environments* Instructor Resource CD (Optional)
4. *TDI Diving Rebreathers* Student Manual
5. *TDI Diving Rebreathers* PowerPoint Presentation (optional)
6. CCR Manufacturer's manual and updates

Suggested reading:

1. *NACD Art of Safe Cave Diving*
2. *Basic Cave Diving – A Blueprint for Survival*
3. *Caverns Measureless to Man* – Sheck Exley

Equipment Requirements

1. A complete TDI approved rebreather
2. Minimum of 1 rebreather enabled computer or PO_2 monitoring device
3. Off board bailout cylinder(s) – volume appropriate for planned dive
4. Bailout regulator(s) equipped with pressure gauge and low pressure off board (quick connect) gas supply hose.
5. Buoyancy compensator device (BCD) with power inflator
6. Exposure suit adequate for diving environment
7. Access to an oxygen analyzer (instructor may supply)
8. Mask and fins
9. Minimum of 2 cutting devices
10. Slate and pencil
11. Three battery powered lights; 1 primary and 2 back-ups, each with a with burn time suitable for the planned dive time
12. Safety reel with a minimum of 37 metres / 125 feet of guideline
13. Gap reel with 15 metres / 50 feet of guideline
14. One primary cave-diving reel with length appropriate for intended dive
15. Computer, watch or bottom timer and depth gauge
16. Slate or wet notes with a pencil
17. Submersible dive tables or backup dive computer
18. Three directional line arrows
19. Three non-directional marker
20. Any staged decompression cylinders must be properly labeled

Note: All the instructor candidates must be in full cave equipment configuration for all water activities.

30.9 Required Subject Areas

1. Policy for Cave Diving
2. Psychological Considerations
3. Equipment Considerations
    a. Bailout cylinder options
        i. Single bailout cylinder vs redundant bailout
        ii. Long hose vs short hose on bailout
    b. Rebreather configuration options
    c. Scrubber options
    d. Buoyancy compensator device (BCD) / harness options
    e. Reel options
    f. Proper weighting
    g. Equipment configurations
4. Communication
    a. Hand signals
    b. Light signals
    c. Touch contact signals
5. Swimming Techniques
    a. Body posture/ trim
    b. Buoyancy control and rebreather weighting
    c. Line following
    d. Propulsion techniques
6. Physiology
    a. Breathing techniques
    b. Stress management
    c. Decompression theory and its application to cave diving
7. Cave Environment
    a. Geology
        i. Bottom
        ii. Ceiling
    b. Local access requirements
    c. Land owner relations
8. Conservation
9. Problem Solving
    a. Emergency procedures
    b. Equipment failure
    c. Silting conditions
10. Accident Analysis
11. Review of Dive Tables and Decompression Theory

12. Cave Diving with Open Circuit Divers
    a. Bailout configuration requirements
    b. Out of air emergencies
13. Cave Diving Etiquette

30.10 Required Skill Performance and Graduation Requirements

At NO point is the student to be unable to monitor their PO_2 while on the loop. Zero visibility drills must be performed in a way that the student may monitor the status of the breathing loop; i.e. no mask but able to monitor HUD, lights out but able to use display back light to view PO_2, etc. Or, the drill must be done on bailout.

The candidates are required to demonstrate the cave diver land/safety drills as described in the *TDI Diving in Overhead Environments* Diver materials. Candidates will teach and encourage cave manners and proper etiquette at all times.

1. How to properly deploy a guideline
2. How to properly follow a guideline
3. Proper use of reels; primary, safety, jump and gap
4. Circuits, traverses, T's, jumps and gaps
5. Use of safety reel in lost diver procedures
6. Use of safety reel in lost line drill
7. Properly conduct bail out exit including bottle swapping while following a guideline
8. Properly conduct bail out exit including bottle swapping simulating zero visibility and using touch contact while following a guideline
9. Simulated situations/emergencies including:
10. Line entanglement
11. Broken or cut guideline
12. Primary light failure
13. Valve/regulator failure
14. Fin and mask failures
15. Communication
16. Light
17. Hand and touch
18. Candidates are required to present a minimum of 6 lectures,3 prepared and 3 impromptu, from the *TDI Diving in Overhead Environments* Diver materials

Candidate must be proficient with the following in-water skills during introductory cave dives. Candidates must proficiently demonstrate and conduct the student through a selection of the following:

1. Properly deploy a guideline
2. Properly use directional and non directional line markers
3. Properly follow a guideline
4. Properly follow a guideline simulating loss of visibility
5. Perform bailout exit practicing bottle swapping with teammates, following the guideline
6. Perform bailout exit practicing bottle swapping with teammates simulating zero visibility and using touch contact, following the guideline
7. Remove and replace mask while in contact with guideline
8. Demonstrate light / hand signals and touch contact
9. Conservation and awareness techniques
10. Referencing as back-up navigation
11. Demonstrate adequate anti-silting techniques
12. Simulate a primary light failure, and use back light to exit the cave
13. Demonstrate lost line drills using instrumentation lighting only
14. Demonstrate lost diver drills
15. Demonstrate to use of reels to perform jumps and gaps required in circuits and traverses to maintain a continuous guideline to open water
16. Exit the cave flying the rebreather in SCR mode
17. Exit the cave simulating solenoid failure (if applicable)
18. Demonstrate advanced navigation techniques including a minimum of:
    a. 4 jumps
    b. 2 circuits
19. Demonstrate rebreather unit specific skills in compliance with current level of rebreather certification as outlined in the TDI course curriculum

Note: All situation/emergency drills are to be conducted during the exit of all dives.

Note: A continuous guideline to open water must be maintained on all cave dives.

In addition to the above, the candidate must:

1. Complete the TDI Diving in Overhead Environments Instructor written examination with a minimum score of 80 percent with 100 percent remediation
2. Complete all land drills and cave diving requirements safely and efficiently
3. Demonstrate mature, sound judgment concerning dive planning and execution
4. Maintain an appropriate level of awareness and respect for the cave environment
5. Receive the recommendation for certification by the training director

Note: An irresponsible or cavalier attitude is sufficient grounds to deny certification.

30.11 Renewal Requirements

1. Have certified at least 4 TDI Rebreather Cavern Divers or TDI Rebreather Intro to Cave Divers and at least 2 TDI Rebreather Full Cave Divers
2. Taught a minimum of 3 complete courses
3. Logged a minimum of 15 non-training cave dives

31. TDI Instructor Trainer

31.1 Introduction

The Instructor Trainer Workshop (ITW) trains candidates as full evaluators to conduct the Instructor Evaluation Course (IEC) independently. A corresponding, current instructor level rating must be held for all IT levels, along with minimum student certifications as detailed in this outline. TDI instructors must successfully complete the ITW to qualify for an upgrade to TDI IT status. ITW course requirements are found in the SDI Instructor Trainer standards.

31.2 Policies for All Instructor Trainers

1. Instructor Trainers must be registered with International Training World Headquarters and the respective International Training Regional Office in their country of residence
2. Upon completion of the Instructor Trainer Workshop, instructor trainers may upgrade to other IT levels without attending another Instructor Trainer Workshop provided they have remained actively teaching instructor courses
3. Within TDI, all of the courses require a minimum number of certifications and some require a minimum number of dives before TDI Instructors may obtain the instructor trainer level for that course
4. Instructor trainers are required to teach a course at their highest certified level every 2 years

IT upgrade requirements are as follows:

TDI Level	Students Required	Dives Required
Nitrox	10	25
Advanced Nitrox	10	50
Decompression	10	25
Extended Range	25	100
Helitrox	15	50
Advanced Trimix *	30 Trimix or Advanced Trimix; must be Advanced Trimix instructor	100
Semi-Closed Rebreather	15	50
Nitrox Blender	10	n/a
Advanced Gas Blender	10	n/a
O_2 Service Technician	10	n/a
CCR Air Diluent	25 at any level	200 hours
CCR Mixed Gas	10 (+Air Diluent IT)	300 Hours
CCR Advanced Mixed Gas	10 (+Air Diluent IT and Mixed Gas IT)	350 Hours

**Advanced Trimix IT rating covers both Trimix and Advanced Trimix levels; there is no Trimix IT rating*

Note: Unless otherwise specified, a minimum of 10 students must be certified at that level, before an individual may request an upgrade to the TDI IT level

32. International Training Crossover Course

32.1 Introduction

The course is designed to give professionals crossing over to any International Training professional certification – SDI, TDI, ERDI, PFI, First Response Training International - the necessary skills and knowledge to work with International Training. This program covers the minimum requirements for an administratively conducted professional crossover program. Certain courses, agencies or regions may require practical evaluations of performance as part of the crossover program. To see if a candidate requires any practical assessment please contact the training department.

32.2 Qualifications of Graduates

Upon successful completion of this course, graduates may:

1. Conduct training courses and issue certifications for approved ratings and programs.

32.3 Who May Teach

1. An active Instructor Trainer or Course Director
2. International Training-approved agency representative
3. World HQ Training Department

32.4 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, if applicable

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

Open Water, if applicable

1. Unlimited, so long as proper evaluation can be provided where open water evaluations are required

32.5 Student Prerequisites

1. Have professional qualifications from an agency recognized by International Training. Contact the Training department for a list of approved agencies and courses.
2. Have no active quality assurance investigations or past quality assurance issues that prohibited teaching status or terminated membership. Quality assurance matters can be submitted to HQ Training Department for review and consideration.

32.6 Course Structure and Duration

In-water execution; where required this course must be conducted either in confined water, open water, or both, at the instructor's discretion and in accordance with the required skill performance

1. Crossovers requiring in-water evaluations must follow that course's evaluation requirements. Evaluations may only be conducted by active Instructor Trainers holding IT status for the level being evaluated.

Course Structure

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

Duration

1. The number of hours required depends on number of candidates and levels crossing over

32.7 Administrative Requirements

Administrative Tasks:

1. Collect the crossover fees from all candidates
2. Ensure that the students have the required materials
3. Ensure the candidates have been issued and completed the online familiarization course (if available in their language)
4. Communicate the schedule to the students
5. Have the students complete the:
    a. *Applicable Crossover Application*
    b. *Waiver and Releases for any course requiring in-water evaluations*
    c. *Medical Release for any course requiring in-water evaluations*

Upon successful completion of the course the instructor must submit:

1. Crossover Application
2. Crossover Checklist
3. Copies of professional certification cards or printout of credentials from agency website
4. Verification of professional Liability Insurance where applicable
5. Printout of completed online familiarization course
6. For levels requiring IT evaluation, an instructor registration form signed by the evaluating IT

32.8 Required Equipment

Equipment appropriate for level crossing over to when in-water evaluations are required. The following material is required:

1. Code for online professional familiarization course (if available in language/region)
2. Appropriate Divemaster, Assistant Instructor, or Instructor materials
3. Crossover Checklist
4. Appropriate Crossover Application

The following material is available and recommended:

1. Crossover/Familiarization PowerPoint

32.9 Required Subject Areas

The following topics must be covered during this course:

1. Administrative requirements and crossover packages
2. History of International Training
    a. TDI
    b. SDI
    c. ERDI
    d. First Response Training International
    e. PFI
3. Global representation
    a. Regional Offices
    b. Local Sales Managers
4. Technical Diving International
    a. Standards and procedures
5. Scuba Diving International
    a. Standards and procedures

6. Emergency Response Diving International
    a. Standards and procedures
7. First Response Training International
    a. Standards and procedures
8. Performance Freediving International
    a. Standards and procedures
9. Risk management
    a. Waivers and Releases
    b. Medical requirements
    c. Insurance requirements
10. Marketing with International Training
    a. Marketing resources
    b. Content development
11. International Trainings services and benefits
    a. Website tools
        i. Accessing standards
        ii. Registering Professional-level qualifications and Upgrades
        iii. Registering divers
        iv. Renewing membership
        v. Instructor resources
    b. Purchasing student materials
    c. Teaching aids
12. International Training's Pledge to you

32.10 Required Skill Performance and Graduation Requirements

For certain certifications crossing over, candidates are required to successfully complete certain in-water skills and other performance requirements. These can be found in the instructor course standards in the Skill Performance and Graduation Requirements section.

In order to complete the crossover, candidates must:

1. Demonstrate mature and sound judgment and a thorough understanding of working with International Training.
2. The crossover is not complete until World HQ Training Department has reviewed all documents and the candidate has received their member number and proof of qualifications.