25. Mine Diver Level II

25.1 Introduction

This course is the second stage of training in the TDI Mine Diver development program. This course is not intended to prepare divers for evaluating all facets of mine diving. The objective of this course is to expand and critique previous skills accomplished in the TDI Cavern and Mine Diver Level I programs. Emphasis is placed upon dive planning and skill perfection through actual mine penetration. This course may be combined with TDI Mine Diver Level I at the discretion of the instructor.

This course uses the same principles and techniques as the TDI Full Cave course, including utilizing the same training materials and equipment. However, dual certification is not permitted and graduates wishing to dive in caves must complete the TDI Full Cave course.

25.2 Qualifications of Graduates

Upon successful completion of this course, graduates may engage in mine diving activities without direct supervision provided the graduates adhere to the following limits:

1. Penetration is limited to the 1/3 air rule
2. 40 metres / 130 feet maximum depth
3. No equipment removal in mine
4. Safety and decompression stops appropriate or necessary, within the current qualification of student(s) and instructor(s)
5. Maintain a continuous guideline
6. Proper mine diving equipment is used

25.3 Who May Teach

Any active TDI Mine Diving Instructor specifically authorized by the HQ Training Department. Minimum criteria to be considered for authorization are TDI Full Cave Instructor with a verifiable minimum of 30 mine dives OR complete a Mine Diver Level 2 Instructor course with an active status TDI Mine Diver IT. Prerequisites for the Mine Diver Level 2 instructor course include certification as a TDI Mine Diver Level 1 instructor, proof of 200 logged mine dives, have taught a minimum of 3 TDI Mine Diver Level 1 courses, and have assisted with at least one TDI Mine Diver Level 2 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. N/A

Cave Dives

1. A maximum of 3 students per instructor; it is the instructor's discretion to reduce this number as conditions dictate

25.5 Student Prerequisites

1. Minimum age 18
2. Certified TDI Mine Diver Level I, or equivalent

25.6 Course Structure and Duration

Open Water Execution

1. 8 mine dives are required with a minimum accumulated bottom time of 240 minutes at 3 different sites (different water entry points in the same mine system may be considered a different site for Mine Diver Level II training if they are at least 100 metres / 330 feet apart)
2. At least 1 of these sites should be a location not utilized in training during the student's Mine Diver Level I course
3. If the student is already certified as a TDI Mine Diver Level I or TDI Full Cave Diver, a maximum of 2 dives may be credited towards Mine Diver Level II training at the discretion of the instructor
4. If combined with Mine Diver Level I, a total of 12 dives with a total minimum bottom time of 340 minutes must be conducted over a minimum of 6 days

Course Structure

1. TDI allows instructors 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
2. Course must be taught in no less than 4 days

25.7 Administrative Requirements

The following are the administrative tasks:

1. Collect the course fees from all the students
2. Ensure that the students have the required equipment and certifications
3. Communicate the training schedule to the students
4. Have the students complete the:
    a. *TDI Liability Release and Express Assumption of Risk Form*
    b. *TDI Medical Statement Form*

Upon successful completion of the course the instructor must:

1. Issue the appropriate TDI certification by submitting the *TDI Diver Registration* Form to TDI Headquarters or registering the students online through member's area of the TDI website

25.8 Training Material

Required Material

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)

Optional Material

1. *NACD Art of Safe Cave Diving*
2. *Basic Cave Diving – A Blueprint for Survival*
3. *CDAA - Cavern / Sinkhole* Manual
4. *NSS – CDS Cave Diving* Manual
5. *Cavern Measureless to Man*
6. *The Darkness Beckons – Martyn Farr*

25.9 Required Equipment

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 with burn time suitable for the planned dive time
9. One primary cave-diving reel with length appropriate for intended dive
10. Computer, watch or bottom timer and depth gauge
11. Slate or wet notes with a pencil
12. Submersible dive tables or back up dive computer
13. Three directional line arrows
14. One non- directional line marker
15. Gap reel with 15 metres / 50 feet of guideline
16. It is recommended that the team properly mark decompression cylinders and stage them, in any dive where decompression is planned, at least 1 stop deeper than the planned decompression obligation

Required equipment is the same as TDI Full Cave diver. Instructor must use equipment required for TDI Full Cave diving during all water exercises

25.10 Required Subject Areas

The following topics must be covered during this course:

1. Policy for Mine/Cave Diving
2. Gas Matching Procedures and Management to Include Dissimilar Volumes
3. Psychological Considerations
4. Equipment Considerations
    a. Cylinder options
    b. Regulator options
    c. Buoyancy compensator device (BCD) / harness options
    d. Reel options
    e. Proper weighting
    f. Equipment configurations
5. Communication
    a. Hand signals
    b. Light signals
    c. Touch contact signal
6. Swimming Techniques
    a. Body posture/ trim
    b. Buoyancy control
    c. Line following
    d. Propulsion techniques

7. Physiology
    a. Breathing techniques
    b. Stress management
    c. Decompression theory and its application to mine diving
8. Mine Environment
    a. Types of mines
    b. Geology
        i. Bottom
        ii. Ceiling
    c. Structure
    d. Hazards
    e. Local access requirements
    f. Land owner relations
9. Conservation
10. Problem Solving
    a. Emergency procedures
    b. Equipment failure
    c. Silting conditions
11. Accident Analysis
12. Review of Dive Tables and Decompression Theory
13. Mine/Cave Diving Etiquette

25.11 Required Skill Performance and Graduation Requirements

As much of the following information as possible must be determined/ obtained and utilized in dive planning:

1. What material(s) were extracted from the mine and by what method(s)
2. Were toxic solutions or substances used or created during the extraction process and is there a risk of such substance(s) remaining or of any general pollution. If so, ascertain which location(s)
3. Obtain a detailed map of the mine from the mining company or whoever is responsible for the site
4. Are there any known or potentially collapsible tunnels?
5. All known access and egress points from the mine, their depths and possible emergency traverses to other exits
6. Type(s) of sediment in the mine
7. Type of ceiling supports; ie wooden or metal and how to detect signs of wear, type of debris left in the mine
8. All possible entanglement points

9. Location, size and depth of vertical extraction shafts
10. Points that could damage divers' delicate equipment such as lines, dry suits, etc
11. Line options
12. How to evaluate the stability of a passage
13. Existing collapse points
14. Special equipment requirements
15. Type of entry/exit

Land Drills

1. How to properly deploy a guideline
2. How to properly follow a guideline
3. Use of safety reel in lost diver procedures
4. Use of safety reel in lost line drill

The student 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)

In-water skills

1. Properly deploy a guideline
2. Properly use directional and non directional line markers
3. Properly follow a guideline with eyes open and closed (simulating loss of visibility)
4. Air share with a buddy with eyes open , following the guideline
5. Air share with a buddy with lights off and eyes closed and use touch contact, following the guideline
6. Remove and replace mask while in contact with guideline
7. Demonstrate light / hand -signals and touch contact
8. Conservation and awareness techniques
9. Referencing as back-up navigation
10. Demonstrate adequate anti-silting techniques
11. Simulate a primary light failure, and use back light to exit the cave
12. Demonstrate lost line and lost diver drills
13. Demonstrate to use of reels to perform jumps and gaps required in circuits and traverses to maintain a continuous guideline to open water
14. Identify and avoid potential hazard, entanglement and collapse points

In order to complete this course, students must:

1. Satisfactorily complete the TDI Cave Diver Course written examination (*this requirement may be waived by the instructor if the student is already TDI Full Cave certified*)
2. Perform all land drills and mine dive 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 mine environment
5. Log all dives

25.12 Permission to Dive

Before conducting training in any man-made environment, permission must be obtained from whoever is responsible for the site; for example the mine owner/operator, government department, etc. Additionally, the relevant local emergency services should be informed of the activity prior to commencement.