

22. DPV Cave Diver

22.1 Introduction

This course is designed to teach trained cave divers how to utilize Diver Propulsion Vehicles (DPVs) in the cave environment. Divers will learn about safe DPV use, DPV components, and care and maintenance. Students will learn to plan dives that may incorporate extended penetration, longer bottom times, complex dive planning, and proper methods of gas management.

22.2 Qualifications of Graduates

Upon successful completion of this course, graduates may engage in DPV cave diving activities without direct supervision so long as the following limits are adhered to:

1. If each diver utilizes a single DPV, each diver must turn the dive with no less than twice the amount of gas required to exit the cave while swimming.
2. If each diver utilizes multiple DPVs, each diver must turn the dive with no less than twice the amount of gas required to exit the cave while utilizing the DPV.
3. No equipment removal in cave with exception of stage bottles if utilized.
4. 39 Metres /130 Feet maximum depth.
5. Students are encouraged to gain experience before attempting to plan and execute complex DPV cave dives.
6. Safety and decompression stops are completed as appropriate or necessary.

22.3 Who May Teach

An active TDI DPV Cave Instructor.

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

22.5 Student Prerequisites

1. Minimum age 18.
2. Certified as a TDI Full Cave Diver or equivalent.
3. Provide proof of at least 25 non-training full cave dives.

22.6 Course Structure and Duration

Open Water Execution:

1. Students must complete 3 cave DPV dives with a minimum accumulated bottom time of 90 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 4.

22.7 Administrative Requirements

Administrative Tasks:

1. Collect the course fees from all the students.
2. Ensure that the students have the required equipment.
3. Communicate the 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.

22.8 Required Materials

The following material is required:

1. N/A.

22.9 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 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 15 Metres/50 Feet of guideline.
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.

Instructor must use full cave diving equipment during all water exercises.

22.10 Required Subject Areas

The following topics must be covered during this course:

1. Motivations for DPV cave diving.
2. Advantages 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.
 - e. DPV courtesy and etiquette.
7. Dive planning and gas management:
 - a. Turn time, turn distance, and turn pressure.
 - b. Gas mix(es) and NDLs or decompression obligations.

- c. Swim speed, DPV travel speed, SAC rate
- d. Adequate gas reserves to swim out a disabled DPV from maximum penetration

22.11 Required Skill Performance and Graduation Requirements

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).

The student must perform the following in-water skills during cave dives:

1. Share gas while using DPVs, maintaining physical contact between donor and out of air diver and 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 his disabled DPV.

In order to complete this course, students 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.