2.4.2 Cave Diver Level 2

2.4.2.1 Course Outcomes

GUE's Cave Diver Level 2 course is designed to expand the cave diving skills of experienced Cave 1 trained divers. Among its outcomes are: a focus on environmental awareness, capacity with extended penetration dives, advanced navigation, use of jump spools, enhanced team awareness, advanced problem resolution, stress management, and use of a bottom and decompression stage.

2.4.2.2 Prerequisites

Applicants for a Cave 2 course must:

a. Submit a completed Course Registration Form, Medical History Form, and Liability Release to GUE HQ.
b. Hold insurance that will cover diving emergencies such as hyperbaric treatment, e.g., DAN Master-level insurance or equivalent.
c. Be physically and mentally fit.
d. Be a nonsmoker.
e. Obtain a physician's written authorization for the use of prescription drugs, except for birth control, or for any medical condition that may pose a risk while diving.
f. Be a minimum of 18 years of age. Documented parental or legal guardian consent must be submitted to GUE HQ when the participant is a minor.
g. Be a certified GUE Cave Diver Level 1 diver.
h. Have completed at least 25 non-training Cave 1 dives beyond GUE Cave Diver Level 1 certification.

2.4.2.3 Course Content

The Cave Diver Level 2 course is normally conducted over five days. It requires a minimum of ten cave dives that are conducted in at least three different caves[1] and at least forty hours of instruction, encompassing classroom lectures, land drills, and in-water work.

Divers wishing to use triox as a breathing gas are required to review all Triox Primer academics, including the exam, with their instructor and perform at least two dives using triox 30/30. Successful completion of these objectives results in the addition of triox 30/30 to the allowed post-certification breathing gases and will be noted on the Cave 2 certification card.

2.4.2.4 Cave Diver Level 2 Specific Training Standards

a. Student-to-instructor ratio is not to exceed 6:1 during land drill or surface exercises; it cannot exceed 3:1 during any in-water training.
b. Maximum of 1/3 of the total gas supply can be used for cave penetration
c. Maximum depth of 100 ft/30 m.
d. Minimum 140 ft^3/4000 L of gas is required to begin a Cave 2 dive
e. No DPV diving

[1] In this context, caves are considered to be different if they have geographically distinct entrances.

2.4.2.5 Required Training Materials

GUE training materials and recommended reading as determined by the course study packet received via online download after GUE course registration.

Divers wishing to use triox as a breathing gas must be familiar with all academic materials included in Triox Primer.

2.4.2.6 Academic Topics

a. Introduction: GUE organization and course overview (objectives, limits, expectations)
b. Guideline use, including the use of a jump spool
c. Dive team order and protocols
d. Touch contact
e. Advanced navigation
f. Advanced dive planning
g. Gas management with thirds and while using a stage cylinder
h. Accident analysis
i. Stress management
j. Environmental considerations
k. Communication
l. Cave restrictions
m. Basic survey techniques
n. Decompression
o. Triox Primer academic topics, when relevant

2.4.2.7 Land Drills and Topics

a. Guideline use and procedures, including use of a jump spool
b. Missing diver procedures
c. Unconscious diver recovery
d. Back gas regulator and valve failure modes and management
e. Bottom and decompression stage usage (drops and pickups)
f. Switching to and from a stage and decompression cylinders
g. Bottom and decompression stage failure management
h. Lost guideline procedures
i. Basic and advanced navigation skills, including gaps/jumps, circuits, and traverses
j. Guideline referencing skills

2.4.2.8 Required Dive Skills and Drills

a. Demonstrate proficiency in safe diving techniques, including pre-dive preparation, in-water activity, and post-dive assessment.
b. Demonstrate awareness of team member location and a concern for safety, responding quickly to visual indications and dive partner needs.
c. Demonstrate a safe and responsible demeanor throughout all training.
d. Demonstrate proficiency in underwater communication.
e. Demonstrate basic proficiency in managing the GUE base equipment configuration.
f. Demonstrate safe ascent and descent procedures.

g. Must be able to swim at least 500 yds/450 m in less than 14 minutes without stopping. This test should be conducted in a swimsuit and, where necessary, appropriate thermal protection.
h. Must be able to swim a distance of at least 60 ft/18 m on a breath hold while submerged.
i. Demonstrate proficiency in managing breathing system failures, including proper assessment and valve manipulation (fixable, non-fixable, and erroneous) with regulator switching as appropriate and bottom and decompression stage failure management.
j. Demonstrate proficiency during gas-sharing scenarios, including decompression gas sharing.
k. Demonstrate proficiency in cave navigation, including visual references, guideline use, and limited and simulated zero visibility.
l. Comfortably demonstrate at least three propulsion techniques that would be appropriate in delicate and/or silty environments; one of these kicks must be the backward kick.
m. Demonstrate proficiency in the use of touch contact for limited and simulated zero visibility situations.
n. Demonstrate the efficient deployment of a backup light.
o. Demonstrate the ability to search for a missing diver while performing a simulated missing diver drill.
p. Demonstrate the skills needed to locate a lost line while performing a simulated lost line drill.
q. Demonstrate capacity with advanced cave navigation as outlined in Appendix B.
r. Demonstrate capacity in planning for and dealing with minor and major restrictions.
s. Demonstrate a calm demeanor while sharing gas in simulated zero visibility for a prolonged distance.
t. Demonstrate the ability to use a stage cylinder with appropriate gas switching procedures during extended penetration cave dives.
u. Demonstrate good buoyancy and trim, i.e., approximate reference is a maximum of 20 degrees off horizontal while remaining within 3 ft/1 m of a target depth.
v. Demonstrate diver rescue techniques, including effective management of an unconscious diver.
w. Divers wishing to use triox as a breathing gas must successfully conduct at least two dives while using triox 30/30.

2.4.2.9 Equipment Requirements

GUE base equipment configuration as outlined in Appendix A, plus:

a. GUE double tank configuration
b. One primary and two backup lights
c. One bottom stage with stage regulator
d. One decompression stage with stage regulator
e. One safety spool
f. At least two jump spools
g. One primary reel per team
h. At least twelve line markers; six directional and six non-directional

Excluding:

a. Surface marker buoy with spool

Prior to the commencement of the class, students should consult with a GUE representative to verify equipment requirements and appropriateness of any selected equipment.

Appendix A - GUE Base Equipment Configuration

The GUE base equipment configuration is comprised of:

a. Tanks/cylinders: Students may use a single tank/cylinder with a single- or dual-outlet valve. Students may also use dual tanks/cylinders connected with a dual-outlet isolator manifold, which allows for the use of two first stages. Dual tanks/cylinders connected with a dual-outlet, non-isolator manifold can be used, but only in recreational (no decompression) diving, and are considered an alternative for a single tank/cylinder. Consult course-specific standards and your instructor to verify size requirements.
b. Regulators:
    i. Single tank: The first stage must supply a primary second stage via a 5 to 7 ft/1.5 to 2 m hose. A backup second stage must be necklaced and supplied via a short hose. The first stage must also supply an analog pressure gauge, inflation for the buoyancy compensator (BC), and (when applicable) inflation for a drysuit.
    ii. Double tank: One first stage must supply a primary second stage via a 5 to 7 ft/1.5 to 2 m hose (7 ft/2 m hose is required for all cave classes), and inflation for the buoyancy compensator (BC). The other first stage must supply a necklaced backup second stage via a short hose, an analog pressure gauge, and (when applicable) inflation for a drysuit.
c. Backplate system:
    i. Is held to the diver by one continuous piece of webbing. This webbing is adjustable and uses a buckle to secure the system at the waist.
    ii. A crotch strap is attached and looped through the waistband to prevent the system from riding up a diver's back.
    iii. The continuous webbing must support five D-rings;
        1. The first placed at the left hip
        2. The second placed in line with a diver's right collarbone
        3. The third placed in line with the diver's left collarbone
        4. The fourth and fifth are placed on the front and back of the crotch strap when divers plan to use advanced equipment such as DPVs.
    iv. The harness below the diver's arms has small restrictive bands to allow for the placement of backup lights. The webbing and system retains a minimalist approach.
d. Buoyancy compensation device (BC):
    i. A diver's BC is back-mounted and minimalist in nature.
    ii. It is free of extraneous strings, tabs, or other material.
    iii. There are no restrictive bands or restrictive elastic affixed to the buoyancy cell.
    iv. Wing size and shape is appropriate to the cylinder size(s) employed for training.
e. At least one time/depth measuring device

f. Wrist-mounted compass
g. Mask and fins: Mask is low-volume; fins are rigid, non-split.
h. Backup mask
i. At least one cutting device
j. Wetnotes with pencils
k. Surface marker buoy (SMB) with spool: when required, the SMB should be appropriate for environmental conditions and deployed using a spool with at least 100 ft/30 m of line.
l. Exposure suit appropriate for the duration of exposure

Additional Course-Specific Equipment

a. Where required, back gas and stage cylinders are marked in accordance with the GUE General Training Standards, Policies, and Procedures document and configured in line with GUE protocols.
b. When drysuit inflation systems are applicable, they should be sized appropriately for the environment; small tanks are placed on the left side of the backplate with larger supplies affixed to the diver's left back gas tank.
c. Underwater lights:
    i. When required, backup lights should be powered by alkaline batteries (not rechargeable) and stowed on the D-rings at a diver's chest.
    ii. Backup lights should have a minimal amount of protrusions and a single attachment at the rear.
    iii. The primary light should consist of a rechargeable battery pack and be fitted with a Goodman-style light handle.
    iv. When burn time requirements create the need for an external battery pack, it should reside in a canister mounted on the diver's right hip.
d. Guideline devices, as required during cave diving activities:
    i. A primary reel is required for all cave diving and provides a minimalist form factor with a handle designed to support a Goodman or "hands free" handle operation. The primary reel must contain at least 150 ft/45 m of line.
    ii. A safety spool is required for each diver while cave diving and must contain at least 150 ft/45 m of line.
    iii. A jump or gap spool is required during Cave 2 diving and must contain at least 75 ft/23 m of line.

Appendix B - Advanced Cave Navigation

Advanced cave navigation, as required during GUE Cave Diver Level 2 classes, must consist of at least the following:

a. Jumps that allow time for problems to develop and thus require changing of team position as the jump is removed. These jumps are to include both middle of one line to start of another line, and end of one line to middle of another.
b. Jumps, as described above, that allow for creation of scenarios that require decisions about leaving or pulling the jump, who should pull the jump, etc.
c. Extended penetration on a jump line so that students experience being removed from the perceived comfort of the main line.

d. Penetration in side passages with a technically challenging environment.
e. Jumps that provide students with experience with the skills and communication needed to rearrange a team's order in a small area with limited line of sight and challenging environmental surroundings.
f. Multiple jumps that help students appreciate the potential confusion that can result in the midst of increased task loading during critical navigation.
g. Navigation that lets students attempt, and ideally complete, a circuit and/or traverse of reasonable distance so they can appreciate the complexity and risk associated with errors in marking, gas management, or generally bad decision making.
h. Primary reel installation of at least 120 ft/35 m from open water to the tie-in point on the main line, with at least three tie-offs past the secondary tie-off.