CDG Training Process Guidance Notes.

23rd April 2017. Version 5

Intended circulation: Mentors, first time mentors, examiners and trainees within the CDG.

Scope and Aim.

These guidance notes are aimed primarily at divers within the CDG who have chosen to take on the role of Mentor but also provide information for Trainees, Examiners and other CDG Qualified Divers. The points listed below lay out both the sequence and content of the training process and the method by which first time mentors learn about the mentoring process.

Sequence and Content.

1. Beginning the mentoring process: Mentors will start the underwater mentoring/training aspects of the CDG training process only when the Trainee has been elected/welcomed into the Section in the normal way. Thus all parties will be covered by the insurance provided through the CDG.

2. First time mentor support: A QD will have been active for two years before starting mentoring. A Trainee proposed by a first time Mentor will be seconded by an experienced Mentor who will guide the first time Mentor through the training process. A Mentor will be considered to be an experienced Mentor once two of his/her trainees have qualified.

3. Content of training: All mentors will refer to the CDG Training Standard to ensure that both the Mentor and the Trainee are covering the areas listed in the Standard. A breakdown of the CDG Training Standard can be found in Appendix 1. of this document. The breakdown is intended to provide guidance on how the CDG anticipates the content of the Training Standard will be covered during a typical mentoring/training period.

4. Before applying to join the CDG: An applicant is expected to have reviewed the following CDG documentation with the support of either the proposer or seconder:

CDG Safety Code.
CDG Cave Diver Education Rules.
CDG Recreational Cave Diving Risk Assessment.
CDG Training Standard.
CDG Assessment Schedule.

And:

Signed the Release and Waiver of Liability Agreement.

5. Theory sources and external training: The CDG expects trainees to pro actively develop their own theoretical knowledge by reading the Manual, other books/sources and if appropriate, doing courses with outside agencies. Mentors should help the Trainee select suitable material to cover the areas of the Training Standard that have not been covered by CDG mentoring/training.

6. Before mentoring starts: A Trainee will have a good grounding in dry caving, demonstrate a basic knowledge of First Aid (covering cardiac arrest, how to perform CPR, maintaining an airway and control bleeding) and hold a basic scuba diving qualification equivalent to a CMAS one star certification or be able to demonstrate equivalent skills to a section examiner before in-water training is started.

7. Structure of training: The training process will be split into open water/cavern diving and overhead diving phases. A Trainee will be mentored through initial equipment configuration before and during basic skill training in an open water or cavern environment. Traditionally the Trainee's sponsors take on the role of Mentor but sections can make other arrangements (with due regard to section 4.) in which case the Trainee must be made aware of who their Mentor is.

The following definitions are provided for clarity:

Open water: A freshwater site offering sufficient space for all the planned activities in an area where the depth is 10 m or less and offers an area shallow enough so that the Trainee can stand up during initial valve drills to gain air should the need arise.

Cavern: An entrance area to a cave or mine which can be dived without entering an overhead environment. The depth should not exceed 10 m and offers an area in which the Trainee can stand up to gain air during initial valve drills should the need arise. Most UK cavern zones will be out of daylight so a light should be rigged to indicate the safe exit point. All CDG training dives in a cavern zone will be carried out with two independent breathing sets and will be carried out in accordance with the rule of thirds.

8. Open water/cavern diving phase: Basic training will be delivered in an open water or cavern environment and will cover the skills listed below. The Trainee's Mentor or a section examiner will assess a Trainee's ability against the standards listed in Appendix 2. of this document. During the training/assessment dives the Trainee will wear UK side mount cave diving kit including a buoyancy compensator.

The list of basic skills that will be assessed by the Mentor or Examiner is:

Theoretical knowledge and out of water activities:

Gas laws needed to calculate cylinder contents in litres, surface consumption rate, Consumption rate at depth and partial pressures.
Calculation of thirds.
Kitting and de-kitting.
Out of water pre dive checks.

In water training and assessment will cover the following areas all of which must be completed to the standard listed in Appendix 2 before overhead diving commences:

In water equipment checks.
Mask clearing/mask removal and replacement.
Swapping demand valves.
Reading gauges (SPGs, compass, depth gauge, dive timer).
Buoyancy control to protect visibility when following a line and ascending.
Line following with junctions and securing the line.
Breathing from a free flowing reg whilst following a line with junctions.
Breathing from a flooding second stage whilst following a line with junctions.
Dealing with and mitigating roll off.
Search drills using hand search and reel search techniques.
Dealing with entanglement.

9. Overhead diving phase: Once a Trainee has completed basic training, cave diving under mentor supervision can commence. The Mentor and Trainee will develop the basic skills through experience building and will cover the additional core skills listed below:

Theory.

Ascent rates.
Dive planning.
Identifying contaminated gas.
Prioritisation and dealing with task loading.
Modified thirds gas calculations.
Stage cylinder applications.
Underwater transportation of equipment.
Multi compartment decompression models.
Non-square profile diving.

Practical above water exercises.

Stowing dive equipment beyond a sump.
Stage cylinder configuration.
Trimming heavy loads for underwater transportation.

Practical underwater skills.

Line cutting and repair.
Removal of equipment underwater.
Stage cylinder use.
Transporting equipment underwater.

The Mentor should start all practical skill training in good visibility conditions before developing the Trainee's skill set in progressively more difficult conditions until the Trainee can execute most of the practical skills with a blacked out mask. The Trainee's Mentor or a section examiner will assess a Trainee's ability against the standards listed in Appendix 3. of this document.

10. Exploration skills: As the Trainee becomes more confident with the core skills the Mentor will cover the exploration skills. Practical skills should be developed in an open-water or cavern environment before the Trainee applies them in an overhead environment.

Theory and above water skills.

Line marking.
Loading a reel.
Belays.
Junctions.
Recovering and removing loose line.
Survey theory.

Practical above water exercises.

Preparing a line.
Loading a reel.
Drawing a survey from data.

Practical underwater skills.

Line laying, including belays and junctions.
Surveying.
Recovering and removing loose line.
Replacement of old line.

The Trainee's Mentor or a section examiner will assess a Trainee's ability against the relevant parts of the standards listed in Appendix 3. of this document.

11. Gaining Experience: Throughout the phases of training the Trainee must gain experience and make progress in other ways than just learning what the Mentor teaches. These include:-

Progressing in cave diving to develop increased experience.

Longer sumps.
Deeper sumps.
Longer times underwater.
Worse visibility.
A Trainee from a diving background should make parallel progress in caving.

Progressing in developing a broad knowledge of cave diving.

Attending CDG Training Camps.
Learning about sumps by diving them.
Acquire background knowledge of sumps (through discussion with other cave divers and reading about them in the CDG Newsletter and Sump Indices and other sources, printed and online).

Progressing in developing a broad experience of cave diving.

Helping with cave diving projects. (It's important that the Trainee is not treated as a sump donkey, diving at the limit of his/her training with inadequate supervision from the Mentor preoccupied with his/her own project.)
Relining much-dived sumps.
Diving in other areas and with divers from other sections.

Progressing from dependence on the Mentor to independence.

Understand the risks associated with UK cave diving.
Identify the specific risks both normal and exceptional during the planning phase of a dive.
Be able to adapt equipment configurations and procedures to mitigate the identified risks.
Understand how failure to identify and/or mitigate risks has contributed to accidents.
Perform the basic survival and the exploration skills.
Solve problems as they occur on a dive.
Be able to recognise when an incident pit situation is starting to develop.
Know when to turn a dive.

12. Recording progress: The Trainee will maintain a trainee diver training log sheet as an addition to a detailed log of all diving and caving activities for submission to the Section when applying for qualification and to record the progress of training in accordance with the CDG Qualified Diver Assessment Standard.

Revision of document: This document is maintained by the Exam and Training Committee. Comments on this document from members of the group should be passed to the Committee via the committee member in each section.

Appendix 1

The CDG Training Standard classification for the mentoring/training process.

The CDG Training Standard is published for use by the wider cave diving community in the UK as well as the internal use of the group. Although all parts of the standard are important the CDG does not consider that a mentor or trainer will be a suitably qualified person to act as sole provider of assistance to a trainee in all areas of the standard. To formally identify the areas of the standard that the CDG mentors and trainers can be reasonably expected to cover with a trainee and those areas which they cannot the standard is divide into two lists below. Members of the group who are suitability qualified to assist trainees with any areas of the training process covered by the second list should not see that list as a restriction on them providing mentoring/training to trainees in those areas.

Areas of the CDG Training Standard directly covered by the mentoring/training process.

The following subject areas, listed in the CDG Training Standard, are considered to make up the elements of the standard that are to be covered during the training/mentoring process within the CDG.

5.2 Out-of-water Training

Equipment configuration

- Suits
- Buoyancy compensation devices and techniques
- Harnesses
- Cylinders
- Regulators
- Lighting
- Ancillary Equipment

Theory of underwater Skills

- Buoyancy control and recovery from failure
- Air contamination identification and responses
- Mask clearing
- Total mask failure
- Sinus and ear clearing failure
- Regulator swapping
- Breathing supply failure procedure: Free flow
- Breathing supply failure procedure: Flooding second stage
- Breathing supply failure procedure: Roll off
- Multiple cylinder diving
- Underwater transportation of equipment
- Finning techniques
- Removing and replacing equipment
- Emergency rescue procedures
- Zero visibility techniques

Above water skills and theory

- Pre-dive planning
- Gear assembly and pre-dive checks
- Kitting-up underground
- Air margin calculations
- Porterage to dive base
- Equipment maintenance
- Cylinder markings and testing
- Risk assessment and mitigation
- Emergency rescue procedures

Psychology

- Motivation for cave diving
- Setting personal limits
- Pre-dive mental preparation
- Solo diving
- Multiple divers – single sump
- Coping with adversity
- The effect of task loading

Line Management:

- A brief overview of the history of line laying and following in the UK
- The risks and benefits of using a dive line in a sump
- Line construction and properties
- Line tagging and junctions
- Line reels
- Common codes of conduct for line usage and maintenance
- Describing and navigating using lines
- Line laying and belaying techniques
- Branch lines and out tags
- Lost line procedures
- Line cutting procedures
- Clearing tangled line
- Line following
- Bridging line gaps
- The affect of your actions on other divers

Surveying

- Surveying to true north
- Recording data underwater
- Drawing up surveys

5.3 Open water practice

The Trainee should conduct at least two open-water dives totalling at least 60 minutes underwater practising the following skills:

- Equipment assembly, check and weight for neutral buoyancy
- The use of a buoyancy control devices and techniques
- Changing between breathing sets
- Controlling a failed regulator due to: A damaged or clogged exhaust port by purging the regulator for each breath
- Controlling a failed regulator due to: A free flowing regulator by turning the cylinder tap on and off for each breath and also to give a controlled slow free flow so as to free both hands
- Roll off prevention and resolution
- Mask clearance and total failure
- Line following and repair
- Using a spool or gap reel
- Line laying
- Lost line drills using hand search and search reel
- Zero visibility techniques
- Line surveying
- Simulated emergency procedures

5.4 Cave diving under supervision

The Trainee should conduct at least two cave dives totalling at least 60 minutes underwater practising the following skills:

- Line laying and following
- Simulated emergency procedures
- Surveying

Areas of the CDG Training Standard not covered by the mentoring/training process.

The following areas of the CDG Training Standard, whilst important in their own right, are subjects which the CDG expects trainees to learn from sources other than the CDG mentoring/training process. These subject areas will either already be known by the Trainee or be learned from background reading, external training or explanation by a suitably qualified person from within the group.

5.2 Out-of-water Training

UK Caves

- The formation of caves
- The physical environment
- Classic sites
- Access
- Sources of information
- Cave conservation
- Legal aspects to cave diving

First Aid

- Cardiac arrest
- Cardio-pulmonary resuscitation
- Maintaining an airway
- Controlling bleeding
- Dealing with shock
- Hypothermia
- Drowning

Diving related

Physiology and Medicine

- Diving on medications (e.g. decongestants)
- Arterial gas embolism
- Pulmonary barotrauma
- Dysbarism

Decompression Diving Techniques

- Gas laws
- Decompression diving physiology
- Decompression sickness
- Oxygen toxicity
- Nitrogen narcosis
- Development of the multiple compartment decompression algorithms
- Use of tables in square profile diving
- Use of dive computers in calculating decompression schedules
- Dangers associated with non-square profile diving
- Micro-bubble theory
- Flying after diving and diving at altitude
- In-water use of Oxygen during decompression
- Decompression incident emergency procedures

Awareness of advanced techniques

- Nitrox
- Mixed gases
- Scooters
- Rebreathers
- Habitats
- Oxygen cleaning
- Compressors and compressing

Appendix 2

Basic skills assessment standard.

A Qualified Diver (probably the trainee's mentor) will assess a trainee to the levels listed in the table below using a dive line of ten or more meters which will include three or more intermediate belays and one line junction. The assessment will be carried out in a non-overhead environment with minimal depth. Skills can be demonstrated over several dives but each separate dive must be carried out in accordance with the rule of thirds.

Skill.	Required basic training level.
In water equipment checks.	Face down in the water perform a reg swap while observing SPG readings. Check that cylinder valves can be reached and turned.
Mask clearing/mask removal and replacement.	Clear mask without losing the line but maintaining buoyancy control and trim. Removing and replacing mask whilst maintaining contact with the line.
Swapping demand valves.	Swap between demand valves whilst maintaining contact with a line, buoyancy control and trim.
Instrument reading.	Correctly read SPGs, compass, depth and time whilst maintaining contact with the line, buoyancy and trim.
Buoyancy control to protect visibility when following a line and ascending.	Swim out and back along a length of line, one arm's length above it, using a variety of finning techniques without disturbing the vis. All ascents must be carried out in a controlled manner using a slow ascent rate.
Line following with a junction.	Follow a line, out and back, one arm's length above it past several belays and a junction without disturbing the vis. “Out tag” the junction on the way past.
Breathing from a free flowing regulator whilst following a line with a junction.	Using a demand valve specially set up to freeflow on one breathing of the two breathing sets. Use both methods of controlling gas flow whilst swimming out and back along the line,one arm's length above the line maintaining buoyancy and trim, swap to the good breathing set if in difficulty.
Breathing from a flooding second stage whilst following a line with a junction.	Using a demand valve specially set up with a disabled or removed exhaust diaphragm on one of the two breathing sets. Use the purge button to control the gas flow whilst swimming out and back along the line, one arms length above the line maintaining buoyancy and trim, swap to the good breathing set if in difficulty.
Dealing with and mitigating roll off.	In water, the trainee turns off and breathes down the in use breathing set. Either turn it back on or swap to the other breathing set whilst maintaining contact with the line. Demonstrate the ability to mitigate roll off by checking cylinder valves at each reg swap whilst swimming along a line.
Search drills using hand search and reel search techniques.	With a blacked out mask and from an unknown position close to the line chosen by the Qualified Diver, carry out a hand search to regain the line. With a blacked out mask and from an unknown position away from the line chosen by the qualified diver, carry out a line reel search to regain the line.
Dealing with entanglement.	Using a half meter length of dive line with no knots or snag points the Qualified Diver will create a loop that can be placed on any likely snag point on the trainee diver's equipment. The loop is then pulled tight to simulate mild entanglement. The trainee must perform the entanglement drill without losing the line.

Appendix 3

Overhead diving and Exploration skills assessment standard.

A Qualified Diver (probably the trainee's mentor) will assess a trainee to the levels listed in the tables below. The assessment will be carried out in a non-overhead environment with not more than 10 m depth. Skills can be demonstrated over several dives but each separate dive must be carried out in accordance with the rule of thirds.

Overhead diving skills.	**Required basic training level.**
Line cutting and repair.	Secure the exit line, deploy the cutting tool, cut the line cleanly, stow the cutting tool. Tie two sections of line together securely without losing contact with the exit line.
Removal of equipment underwater.	Whilst maintaining contact with the line remove and replace helmet and mask. Whilst maintaining contact with the line remove and replace a breathing set
Stage cylinder use.	Whilst maintaining contact with the line carry a stage cylinder, swap onto it from a side mount breathing set and then swap back. Demonstrate the ability to drop off and collect a stage, securing it to the line in between.
Transporting equipment underwater.	Having weighted a load for neutral buoyancy carry it along a 40m length of line with a depth that ranges from surface to 10 m. Maintain contact with the line at all times, control the load and still be able to carry out the normal tasks of a dive:Regulator swaps, flow checks and instrument reading.

Exploration skills.	**Required basic training level.**
Line laying, including belays and junctions.	Lay 40 m of line with a variety of belays and at least one junction. Line must be of good enough quality for an inexperienced diver to follow easily. Junctions must be solid with a belayed close to the join and be tagged with an out marker.
Surveying.	Using a survey slate or wetnotes record survey data along a 40 m line with junctions. Bearing between, depth of and distance between each survey station must be recorded. Trainee must be able to identify all necessary survey stations needed to produce a grade III survey.
Recovering and removing loose line.	Recover a 20 m length of line that has become disconnected from its belays without creating an entanglement hazard. Recovered line to be secured for safe transportation.
Replacement of old line.	Lay line along an existing 40 m line reusing or replacing the existing belays. Recover the old line without creating an entanglement hazard.