

# **SEMI CLOSED CIRCUIT REBREATHER DIVER COURSE**

## **UNIT SPECIFIC – DOLPHIN/RAY**

### **INTRODUCTION**

This is the entry-level certification course for recreational divers wishing to utilize the Nitrox semi-closed circuit rebreather (Dolphin rebreather / Ray rebreather)

### **COURSE OBJECTIVES**

The objective of this course is to train recreational divers in the benefits, hazards and proper procedures for using the Dolphin /Ray rebreather to a maximum depth of 40 msw.

### **QUALIFICATIONS OF GRADUATES**

Upon successful completion of this course, graduates may engage in diving activities utilizing the Dolphin /Ray rebreather to a maximum depth of 40 msw

### **WHO MAY TEACH**

This course may be taught by any active Rebreather Instructor

### **STUDENT / INSTRUCTOR RATIO**

1. CLASSROOM  
Unlimited, so long as adequate facility, supplies and additional time are provided to ensure comprehensive and complete training
2. OPEN-WATER  
A maximum of 6 students per active ITDA Instructor is allowed. The ratio should be reduced as required due to environmental and operational constraints. All dives should be carried out in accordance with HSE ACOPS

### **STUDENT PRE-REQUISITES**

1. Minimum age 15
2. Minimum certification of ITDA Nitrox Diver (may be combined in program) or equivalent, at the discretion of the instructor

### **REQUIRED COURSE MINIMUMS**

1. Classroom/briefing hours – 6
2. Open-water dives – 4 with a minimum of 180 accumulated minutes

### **REQUIRED EQUIPMENT**

The following equipment is required for each student:

1. Mask and fins
2. Exposure suit adequate for the open-water environment
3. Access to oxygen analyser (instructor may supply)
4. Adequate weight
5. Bailout cylinder (minimum 2 litre w.c) and regulator along with low pressure inflation hose

### **REQUIRED SUBJECT AREAS**

The following topics must be covered during this course. The ITDA Rebreather Manual is mandatory for use during this course but instructors may use any additional text or materials that they feel help present these topics.

1. HISTORY AND EVOLUTION OF REBREATHERS
2. COMPARISON OF OPEN CIRCUIT / CLOSED CIRCUIT / SEMI CLOSED CIRCUIT
3. PRACTICAL MECHANICS OF THE SYSTEM
4. ASSEMBLY AND DISASSEMBLY OF THE ATDOLPHIN/RAY
  - a) Layout and design
  - b) Scrubber recharge
  - c) System maintenance
  - d) Breathing loop decontamination procedures
5. GAS PHYSIOLOGY
  - a) Oxygen toxicity
  - b) Nitrogen absorption
  - c) CO<sub>2</sub> toxicity
  - d) Gas consumption
6. FORMULA WORK
  - a) O<sub>2</sub> metabolizing calculations
  - b) Inspired O<sub>2</sub> calculations (rebreather equation)
  - c) Equivalent air depth
7. DIVE TABLES
  - a) Inspired O<sub>2</sub> table
  - b) Equivalent air depth
8. DIVE COMPUTERS
  - a) Mix adjustable
  - b) O<sub>2</sub> integrated
9. DIVE PLANNING
  - a) Operational planning
  - b) Gas requirements
  - c) Oxygen limitations
  - d) Nitrogen limitations

### **REQUIRED OPEN-WATER SKILLS**

The following open-water skills must be completed by students during open-water dives. The dive depth shall not exceed 1.6 BAR PO<sub>2</sub>

1. Properly analyze gas mixture
2. Demonstrate adequate pre-dive planning
  - a) Limits based on system performance
  - b) Limits based upon oxygen exposure at planned depth with mix
  - c) Limits based upon nitrogen absorption at planned depth with mix
3. Properly execute the planned dive within all pre-determined limits
4. Diver will demonstrate actual safety stops at pre-determined depths
5. Properly execute a recovery from a system failure and switch to bail-out

### **GRADUATION REQUIREMENTS**

In order to complete this course, students must:

1. Satisfactorily complete the ITDA Dolphin/Ray Rebreather written examination with a minimum mark of 80%
2. Complete all open-water requirements safely and efficiently
3. Demonstrate mature, sound judgement concerning dive planning and execution

### **SUPPORT MATERIALS**

1. ITDA Student Registration
2. ITDA Dolphin/Ray Rebreather Manual
3. ITDA Dolphhin/Ray Rebreather PowerPoint Presentation