

## **Appendix B**

### **AAUS Standards**

## SECTION 3.00 DIVING EQUIPMENT

### 3.10 General Policy

All equipment shall meet standards as determined by the Diving Safety Officer and the Diving Control Board. All equipment shall be regularly examined by the person using them and serviced according to manufacturer recommendations. Equipment that is subjected to extreme usage under adverse conditions should require more frequent testing and maintenance.

### 3.20 Equipment

#### *Regulators*

- Only those makes and models specifically approved by the Diving Safety Officer and the Diving Control Board shall be used.
- Scuba regulators shall be inspected and tested prior to first use and every 12 months thereafter.
- Regulators will consist of a primary second stage and an alternate air source (such as an octopus second stage or redundant air supply).

#### *Breathing Masks and Helmets*

Breathing masks and helmets shall have:

- A non-return valve at the attachment point between helmet or mask and hose, which shall close readily and positively.
- An exhaust valve.
- A minimum ventilation rate capable of maintaining the diver at the depth to which they are diving.

#### *Scuba Cylinders*

- Scuba cylinders shall be designed, constructed, and maintained in accordance with the applicable provisions of the Unfired Pressure Vessel Safety Orders.
- Scuba cylinders must be hydrostatically tested in accordance with DOT standards.
- Scuba cylinders must have an internal and external inspection at intervals not to exceed 12 months.
- Scuba cylinder valves shall be functionally tested at intervals not to exceed 12 months.

#### *Backpacks*

- Backpacks without integrated flotation devices and weight systems shall have a quick release device designed to permit jettisoning with a single motion from either hand. *Gauges*
- Gauges shall be inspected and tested before first use and every 12 months thereafter.

#### *Flotation Devices*

- Each diver shall have the capability of achieving and maintaining positive buoyancy.
- Personal flotation systems, buoyancy compensators, dry suits, or other variable volume buoyancy compensation devices shall be equipped with an exhaust valve.
- These devices shall be functionally inspected and tested at intervals not to exceed 12 months.

#### *Timing Devices, Depth, and Pressure Gauges*

- Both members of the buddy team must have an underwater timing device, an approved depth indicator, and a submersible pressure gauge.

#### *Determination of Decompression Status: Dive Tables, Dive Computers*

- A set of diving tables, approved by the Diving Control Board, must be available at the dive location.
- Dive computers may be utilized in place of diving tables, and must be approved by the Diving Control Board. AAUS recommendations on dive computers are located in Appendix 8.

## SECTION 5.00 SCIENTIFIC DIVER CERTIFICATION

This section describes the training and performance standards for AAUS Scientific Divers. These standards represent the minimum required level of knowledge and skills presented in a generalized format. Individual diving programs are encouraged to expand upon and augment these requirements, develop or utilize appropriate educational materials, and optimize instructional programs to suit and reflect their specific needs.

### 5.10 Prerequisites

#### *Administrative*

The applicant/candidate must complete all administrative and legal documentation required by the Organizational Member.

#### *Diver Certification*

The applicant/ candidate must, at minimum, show documented proof of entry-level diver certification from an internationally recognized training agency. As an alternative, AAUS OMs who wish to train and certify entry-level divers under AAUS auspices may do so under the guidelines presented in Section 4.0.

#### *Medical Examination*

The applicant/candidate must be medically qualified for diving as described in Section 6.0 of the AAUS Standards for Scientific Diving.

#### *Swimming/Watermanship Evaluation*

The applicant/candidate must demonstrate the following in the presence of the Diving Safety Officer, instructor, or other approved examiner. All tests are to be performed without swim aids, however, where exposure protection is needed, the applicant must be appropriately weighted to provide for neutral buoyancy.

- a) Swim underwater for a distance of 25 yards/meters without surfacing.
- b) Swim 400 yards/meters in less than 12 minutes.
- c) Tread water for 10 minutes, or 2 minutes without the use of hands.
- d) Transport a passive person of equal size a distance of 25 yards/meters in the water.

### 5.20 Training

The diver must complete theoretical aspects and practical training for a minimum cumulative time of 100 hours. Theoretical aspects shall include principles and activities appropriate to the intended area of scientific study.

#### *Theoretical Training/ Knowledge Development Required*

##### Topics:

1. Diving Emergency Care Training
  - Cardiopulmonary Resuscitation (CPR)
  - Standard or Basic First Aid
  - Recognition of DCS and AGE
  - Accident Management
  - Field Neurological Exam
  - Oxygen Administration
2. Dive Rescue
3. Dive Physics
4. Dive Physiology

5. Dive Environments
6. Decompression Theory and its Application
7. AAUS Scientific Diving Regulations and History
  - Scientific Dive Planning
  - Coordination with other Agencies
  - Appropriate Governmental Regulations
8. Scientific Method
9. Data Gathering Techniques (Only Items specific to area of study required)
  - Transect Sampling (Quadrating)
  - Transecting
  - Mapping
  - Coring
  - Photography
  - Tagging
  - Collecting
  - Animal Handling
  - Archaeology
  - Common Biota
  - Organism Identification
  - Behavior
  - Ecology
  - Site Selection, Location, and Re-location
  - Specialized Equipment for data gathering
  - HazMat Training
  - HP Cylinders
  - Chemical Hygiene, Laboratory Safety (Use Of Chemicals)

Suggested Topics:

10. Specific Dive Modes (methods of gas delivery)
  - Open Circuit
  - Hooka
  - Surface Supplied diving
11. Small Boat Operation
12. Rebreathers
  - Closed
  - Semi-closed
13. Specialized Breathing Gas
  - Nitrox
  - Mixed Gas
14. Specialized Environments and Conditions
  - Blue Water Diving,
  - Ice and Polar Diving (Cold Water Diving)
  - Zero Visibility Diving
  - Polluted Water Diving
  - Saturation Diving
  - Decompression Diving

- Overhead Environments
- Aquarium Diving
- Night Diving
- Kelp Diving
- Strong Current Diving (Live-boating)
- Potential Entanglement

#### 15. Specialized Diving Equipment

- Full face mask
- Dry Suit
- Communications

### *Practical Training/ Skill Development*

#### Confined Water Evaluation

At the completion of training, the trainee must satisfy the Diving Safety Officer or the instructor of their ability to perform the following, as a minimum, in a pool or in sheltered water:

- Enter water with full equipment.
- Clear face mask.
- Demonstrate air sharing, including both buddy breathing and the use of alternate air source, as both donor and recipient, with and without a face mask.
- Demonstrate ability to alternate between snorkel and scuba while kicking.
- Demonstrate understanding of underwater signs and signals.
- Demonstrate simulated in-water mouth-to-mouth resuscitation.
- Rescue and transport, as a diver, a passive simulated victim of an accident.
- Demonstrate ability to remove and replace equipment while submerged.
- Demonstrate watermanship ability, which is acceptable to the instructor.

#### Open Water Evaluation

The trainee must satisfy an instructor, approved by the Diving Safety Officer, of their ability to perform at least the following in open water:

- Surface dive to a depth of 10 feet in open water without scuba.
- Demonstrate proficiency in air sharing as both donor and receiver.
- Enter and leave open water or surf, or leave and board a diving vessel, while wearing scuba gear.
- Kick on the surface 400 yards while wearing scuba gear, but not breathing from the scuba unit.
- Demonstrate judgment adequate for safe diving.
- Demonstrate, where appropriate, the ability to maneuver efficiently in the environment, at and below the surface.
- Complete a simulated emergency swimming ascent.
- Demonstrate clearing of mask and regulator while submerged.
- Demonstrate ability to achieve and maintain neutral buoyancy while submerged.
- Demonstrate techniques of self-rescue and buddy rescue.
- Navigate underwater.
- Plan and execute a dive.

### *Checkout Dive/ Additional Experience*

Practical training must include an Open Water checkout dive(s), with evaluation of the skills listed in Open Water Evaluation, with the DSO or qualified delegate followed by at least 11 ocean or open water dives in a variety of dive sites and diving conditions, for a cumulative bottom time of 6 hours. Dives following the checkout dive must be supervised by a certified Scientific Diver with experience in the type of diving planned, with the knowledge and permission of the DSO.

## **5.30 Examinations**

### *Written Exams*

Before completing training, the trainee must pass a written examination that demonstrates knowledge of at least the following:

1. Function, care, use, and maintenance of diving equipment.
2. Physics and physiology of diving.
3. Diving regulations and precautions.
4. Near-shore currents and waves.
5. Dangerous marine animals.
6. Emergency procedures, including buoyant ascent and ascent by air sharing.
7. Currently accepted decompression procedures.
8. Demonstrate the proper use of dive tables.
9. Underwater communications.
10. Aspects of freshwater and altitude diving.
11. Hazards of breath-hold diving and ascents.
12. Planning and supervision of diving operations.
13. Diving hazards.
14. Cause, symptoms, treatment, and prevention of the following: near drowning, air embolism, carbon dioxide excess, squeezes, oxygen poisoning, nitrogen narcosis, exhaustion and panic, respiratory fatigue, motion sickness, decompression sickness, hypothermia, and hypoxia/anoxia.
15. Suggested topics (from Sec. 5.20) at the DSO's discretion.

### *Equipment*

The trainee will be subject to examination/review of:

1. Personal diving equipment
2. Task specific equipment

## **5.40 Diver Permits/ Certifications**

AAUS requires that no person shall engage in scientific diving unless that person is authorized by an organizational member pursuant to the provisions of this standard. Only a person diving under the auspices of the organizational member that subscribes to the practices of AAUS is eligible for a scientific diver certification.

### *Scientific Diver-In-Training Permit*

This is a permit to dive, usable only while it is current and for the purpose intended. This permit signifies that a diver has completed and been certified as at least an entry level diver through an internationally recognized certifying agency or scientific diving program, and has the knowledge skills and experience necessary to continue training as a scientific diver under supervision, as approved by the DSO.

### *Scientific Diver Certification*

This permit signifies a diver has completed all requirements in Section 5.0 and is authorized by the AAUS OM to engage in scientific diving without supervision, as approved by the DSO. Submission of documents and participation in aptitude examinations does not automatically result in certification. The applicant must convince the Diving Safety Officer and members of the DCB that they are sufficiently skilled and proficient to be certified. This skill will be acknowledged by the signature of the Diving Safety Officer. Any applicant who does not possess the necessary judgment, under diving conditions, for the safety of the diver and their partner, may be denied organizational member scientific diving privileges.