



Association of Diving Contractors International

ADCI STANDARD 10-2006 – Errata 2

On The Job Training Procedures

Scope: *ADCI Standard 10-2006* establishes a procedure whereby commercial diver personnel must complete at least 464 hours of formal training at an accredited commercial or military diving school. Provisions are made for an additional 223 hours of on-the-job training to satisfy the requirements necessary for the individual to obtain formal ADCI commercial diving certification after having completed the required field service and number of dives.

The *ADCI Consensus Standards for Commercial Diving Operations*, Chapter 2., paragraph C.5 sets forth the required curriculum for completion of 223 hours of on-the-job training.

The requirements are:

<u>Subject</u>		<u>Hours</u>
Trainee Participation in Chamber Operations	44	
Seamanship & Rigging Fundamentals	15	
Practical Application of Seamanship and Rigging	40	
Maintenance of Divers Umbilical		12
Underwater Work Using Lightweight Diving Equipment	30	
Underwater Tools		24
Hot Water Systems		2
Introduction to Welding/Burning and Cutting	24	
Marine Engines and Compressors		8
Drawings, Blueprint Reading, Report Writing	8	
Drysuit Diving (Practical and Classroom)	16	

Procedure: ADCI member companies that employ personnel who have completed less than 625 hours of formal academic training in commercial diving subjects as set forth in ANSI/ACDE-01-1998 shall ensure that diver personnel receive the required on-the-job training necessary to meet requirements of referenced ADCI Standards.

It is not the intent of ADCI to define in what manner the on-the-job training is accomplished. It is however, a responsibility of ADCI to enumerate the general content of each curriculum item as extracted from the Commercial Diver Training – Minimum Standard set forth in ANSI/ACDE-01-1998.

Each company will establish the mechanism appropriate to their organizational structure and internal requirements to satisfy and properly record that the requisite training has been accomplished. It is recommended that on-the-job training be recorded in each divers' personnel records and also be recorded in the Divers Log Book section reserved for such entries.

Training: Set forth below is the Objectives and Outline of Instruction for each of the identified subjects. Where an individual can demonstrate proficiency in a subject from other forms of employment or on-the-job training experience outside the accredited commercial or military school courses of instruction, that proficiency may be considered as having satisfied the training hours of that particular subject.

TRAINEE PARTICIPATION IN CHAMBER OPERATIONS [44]

A. Objectives:

- To provide the trainee with practice in the operational procedures of a Hyperbaric chamber and simulating the treatment of diving injuries.
- To develop trainee skills in the proper decompression and recompression operations.

B. Outline of Instruction:

- Review operating procedures for the chamber
- Practice maintaining steady rate of ascent/descent
- Conduct simulated treatments
- Use of man lock, treatment lock, and the purpose of medical locks
- Conduct simulated treatment using oxygen and/or nitrox
- Practice maintaining required pressure while ventilating
- Safety precautions
- Decompression operations
 - Surface decompressions using oxygen and/or nitrox
 - Surface decompression using air
- Lock in/lock out procedures
- Pressure test

SEAMANSHIP & RIGGING FUNDAMENTALS [15]

A. Objectives:

- To provide the trainee with knowledge of the construction, use, and care, of fiber, synthetic, and wire rope.
- To familiarize the trainee with the purpose, and use of splices in fiber and wire rope.
- To instruct the trainee in the purpose and use of terminal fittings on wire rope.
- To introduce the trainee to the applicable sections of the American Petroleum Institute.

B. Outline of Instruction:

- Fiber and Wire Rope
 - a. Types, Sizes (how measured), Care and maintenance
- Synthetic rope
 - a. Nylon, Polyester (Dacron), Polypropolene
- Splices
 - a. Types, application, strength, safety factors
- Wire rope clips
 - a. Use, method of application, strength
- Terminal fittings
 - a. Types, strength, method of application
- Blocks and tackles and mechanical advantage
- Come alongs, chain hoists, shackles, and grip hoist
- Winches and air tuggers
- Hand signals for controlling crane operations
- Calculations of problems for safe working load and breaking strain for fiber and wire rope
- Slings
- Performance of underwater projects for practical application of rigging

PRACTICAL APPLICATION OF SEAMANSHIP AND RIGGING [40]

A. Objectives: To provide the trainee practice in the application of seamanship and rigging

B. Outline of Instruction:

- Splices – eye, short, long
- Splices in wire rope – Flemish, eye (3 strand), back (3 strand), short
- Knots and hitches – square knot; hitches (clove, rolling, timber, telegraph, two half hitches, round turn & two half hitches, girth); fisherman's, single sheet, & double sheet bends; cats-paw; prussic; bowlines (single, running, stopper, French, double, baker) bowlines, double carrick
- Practical application of knot tying and splicing
- Reeving of block and tackles
- Hooks
- Mechanical advantage
- Chain

MAINTENANCE OF DIVERS UMBILICAL [12]

A. Objectives:

- To instruct the trainee in the proper method for making-up, maintaining, and testing dive hose
- To provide practice to the trainee in making-up and testing dive hose

B. Outline of Instruction:

- Lifelines – make-up, maintenance, minimum strength requirement, testing, snap shackle types/sizes
- Airhose – make-up, maintenance, testing, marking
- Air hose connection
- Checking for safety
- Communications cable: care and maintenance
- Practical application

UNDERWATER WORK USING LIGHTWEIGHT DIVING EQUIPMENT [30]

A. Objectives:

- To provide the trainee with practical experience in diving and lightweight equipment
- To provide the trainee experience in some of the more difficult underwater tasks encountered in commercial diving
- To familiarize the trainee with safety issues surrounding using lightweight diving gear, and hazards encountered (i.e. liveboating)

B. Outline of Instruction:

- Safety Precautions
- Emergency procedures for loss of gas - bail out, pneumo hose, standby diver procedures
- Bottom search project (lost object recovery)
- Single flange up
- Blank flange removal
- Multiple bolts and flange projects
- Penetration (outfalls and intakes)
- Overhead patches, sea chests
- Angle descent line
- Hogging line project
- Excavating and dredging – air lifts, hand jetting

C. Liveboating:

- Operational considerations (sunset rule, visibility, sea state, vessel, tending considerations)

- Safety considerations (depth, standby boat, propeller shutdown, propeller guards, standby diver, bailout, bottom time limits)

UNDERWATER TOOLS [24]

A. Objectives:

- To provide the trainee with a knowledge of the care and use of tools and equipment used underwater
- To familiarize the trainee with safety precautions required to safely use tools and equipment underwater

B. Outline of Instruction:

- Nomenclature and use of tools – hand, pneumatic/hydraulic/special, dredges and air-lifts, lift bags
- Underwater use of tools
- Inspections/Maintenance of tools
- Safety precautions
- Practical application

HOT WATER SYSTEMS [2]

A. Objectives:

- To list the terms associated with diver's hot water systems and the problems associated with the effects of cold
- To provide practical experience in the set-up, operation, shut down, and maintenance of divers' hot water systems

B. Outline of Instruction:

- System description
- Operational procedures
- Hot water suits and umbilical
- Maintenance and troubleshooting
- Safety Procedures
- Practical experience in operation and maintenance of diver's hot water system

INTRODUCTION TO TOPSIDE WELDING/BURNING and CUTTING [24]

A. Objectives:

- To provide proper training so the student can understand the applications of topside welding, explain the limitations of topside welding in regard to size of project, position, and condition of metals being welded. Students should be able to describe the techniques for topside welding in the flat, vertical, and overhead positions.

B. Outline of Instruction:

- Application of topside welding
- Limitations of topside welding
- Topside welding techniques

MARINE ENGINES AND COMPRESSORS [8]

A. Objectives:

- To provide the trainee with fundamental knowledge of the operation, maintenance, and field troubleshooting of diesel engines and low pressure compressors.

B. Outline of Instruction:

- Application of diesel engines in diving
- Air compressors
- Generators
- Cranes

- Boats
- Trucks
- Forklifts
- Hydraulic Power Plans
- Etc.
- Systems common to all diesel engines
 - Fuel System
 - Fuel Filter
 - Injectors
 - Lubrication
 - Cooling
 - Intake
 - Exhaust
- Power Take Offs and Clutches
- Diesel operation (practical)
- Maintenance (practical)
- Trouble Shooting (practical)
- Types of compressors used in diving
- Compressor systems
 - Intake
 - Compression stage
 - Intercooler
 - Lubrication – Oil Selection
 - Variable Differential Unloader
 - Hydraulic Unloader
 - Filters
 - Volume Tanks
 - Supply valves/manifold
- Compressor calculations
 - Capacity (CFM/SCFM)
 - Depth limit (over bottom pressure)
- Set up of compressors used in diving/chamber systems
- Compressor operation (practical)
- Compressor maintenance (practical)
- Troubleshooting (practical)
- Air purity testing
- Valves and fittings
- Air system schematic

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