



DEPT. OF TRANSPORTATION
DOCKETS

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Complete Support & Testing of Underwater Diving Equipment

March 8, 2009

RE: DOCKET NO. USCG-1998-3786

Comments on Commercial Diving Operations

This document was assembled by Dive Lab, Inc., in response to the Coast Guard notice of intent to amend the current commercial diving regulations. These are our recommendations which we believe could help reduce accidents, save lives, and make the commercial diving industry safer and more productive. Because the Coast Guard, Army Corps of Engineers, and OSHA regulations originate from the Code of Federal regulations, these issues and recommendations will pertain to all. In addition, the Association of Diving Contractors International (ADCI) consensus standards will also be affected.

Background: Dive Lab, Inc., overseas and manages all factory training for Kirby Morgan Dive Systems, Inc., the world's largest manufacturer of diving helmets and full face masks used for commercial, military and scientific umbilical supplied diving. In addition, Dive Lab issues over 1000 technician and operator user certifications every year to commercial, military, law enforcement/public safety, and scientific divers worldwide. Dive Lab performs both manned and unmanned testing on man worn diving and life support equipment and maintains a world class testing laboratory capable of testing military, commercial, and recreational man worn equipment, as well as, fire fighting, mine safety, and aviation life support equipment.

The Kirby Morgan Technician and Operator/User courses were developed for users of KMDSI equipment to teach and promote standardized operating, maintenance and repair training for all users. Currently, in the United States, as well as most other countries, there are diving schools and training establishments that teach diving and chamber operations, however, there is very little or no oversight or standardization in what is taught in regards to man worn life support equipment. Many diving schools do not teach man worn equipment (Helmets and Masks) in accordance with the guidelines and recommendations of the manufacturer. Man worn equipment training is lacking, especially in set-up, use and basic maintenance. Many of the schools fail to set a proper example when it comes to equipment maintenance and pre dive/ post dive procedures.

The items listed herein are very important issues that need to be addressed. We will be happy to explain in greater detail on any of the items listed.

1. Require all life support equipment such as helmets, emergency gas systems to have log books and documentation that shows all use, repairs and maintenance.
2. Require a minimum level of factory recognized training for persons performing pre/ post dive maintenance of diver life support equipment. Divers, tenders and life support technicians performing pre and post dive maintenance must be trained on the model of equipment being used IAW the recommendations of the manufacturer of the diving helmet or mask being used.
3. Require a minimum level of training and certification for technicians performing repairs, inspections, and overhauls.
4. Require that all man worn life support equipment be set-up using formalized pre-dive set-up inspection procedures as recommended by the manufacturer.
5. Require that diving umbilicals be flow tested at least annually or anytime fittings are changed. In addition, each surface supply system, i.e. compressor system, control console / panel must also undergo flow testing at least once a year and anytime repairs, alterations or changes are made.
6. Require that divers have a minimum level of knowledge and training for the equipment being dived as stated by the manufacturer of the equipment. This will include all set-up, operational use, operational parameters and emergency procedures.
7. Require all divers have a fully functional emergency gas system interfaced and set-up IAW the recommendations of the helmet or mask manufacturer so that a shift to emergency gas can be done with one operational step (opening the EGS valve). Cylinder pressures will be checked and logged prior to each dive.
8. Require that the diving supervisor or a qualified person designated by the diving supervisor, visually inspect each diver prior to entering the water to ensure proper dress, pre dive function tests, and fully functional EGS system with the cylinder valve open and the high pressure regulator pressurized and isolated at the emergency valve.
9. Require that manufacturers of diving helmets and full face masks have a technical manual that outlines all operational, emergency and normal user procedures as well as all maintenance procedures. The manual must also give detailed technical information on the maximum diving depth, minimum /maximum supply pressure, and volume requirements needed to perform at respiratory work rates (RMV) of 40, 50, 62.5 and 75 RMV, and state the resistive effort at each work rate.
10. Require that all diving helmets and masks have a pressure relief system that will maintain internal face piece/oral pressures below 69 mbr (1 psig) in the event the umbilical pressure is overdriven. The

relief system must be capable of maintaining face piece and oral pressures below 69 mbr (1 psig) while the helmet is breathed at 62.5 RMV and also being supplied with an additional free flow of air of 600LPM (21 scfm).

11. Require manufacturers of diving helmets and masks state the minimum operating temperatures that the equipment may be used , as well as, the minimum and maximum storage temperatures.

12. Require manufacturers of diving helmets and masks provide for the interface of an emergency gas system capable of providing a minimum performance capability of 40 RMV to the deepest depth in which breathing apparatus is to be used.

13. Require manufacturers of helmets and full face masks certify that the re- inspired CO₂ in the helmet or mask does not exceed 1% SEV for breathing rates of 10 RMV, 1.5% at 40 RMV and no more than 2% SEV at work rates of 40 RMV and above.

14. Require Coast Guard investigators have the training and minimum level of knowledge to perform audits to ensure compliance by industry in the proper maintenance of worn diving and support equipment. Training and guidance needs to be standardized and uniform so that all districts operate in the same manner.

15. Require proper reporting and chain of custody for all equipment involved in a fatality. Please see the chain of custody form as listed below.

Best Regards,



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DIVING HELMET/FULL FACE MASK ACCIDENT CHAIN OF CUSTODY CHECK LIST

Mike Ward Dive Lab Inc.

Oct 22, 2006

These guidelines are intended as the first action for persons securing man worn diving helmets or full face masks and associated equipment following a diving fatality or serious incident. These guidelines were assembled by Dive Lab to aid persons involved in the recovery and custody of man worn equipment to avoid loss or distortion of physical evidence which could help identify the cause, factors, and / or influences leading to the accident / incident. Additionally, these guidelines are intended to aid in documenting the circumstances surrounding the accident to help in a safe efficient manner to aid any future detailed forensic examination, equipment testing, and investigation.

Note: All equipment the diver was wearing should be photographed and documented. All man worn articles including wet or dry suits and buoyancy compensators should be included as equipment to be inspected and possibly tested. It is strongly recommended that the manufacturer of the helmet or full face mask UBA or person designated by the manufacturer such as an authorized dealer / agent be present prior to any forensic equipment testing to allow input for proper set-up prior to any performance, stability, or sealing integrity testing. Under no circumstances should the equipment be tested without qualified / trained persons present. Prior to any testing or disassembly of the equipment, a detailed outline and plan should be developed that clearly defines the purpose, intent, and scope of the testing. It is strongly recommended that the manufacturer review the test plan prior to testing. Prior to any performance testing the UBA should be fully inspected and all post-dive / pre-dive checks performed by persons that have been properly trained and qualified on the particular equipment.

During Recovery:

4.

1. Note adjustments do not make any changes. DO NOT alter or disturb the helmet or mask once on the surface other than removing from the body. Video and pictures are also highly recommended during all phases of the recovery if possible.

2. Fill out as appropriate

a. Names of persons performing recovering _____

b. Contact information _____

c. Location _____

d. Type of suit the diver was wearing: Wet suit _____ Dry suit _____ Hot water _____

Remarks: _____

e. Type of Helmet or Mask: _____

f. Helmet or mask model _____ Serial # _____

g. Type of Gas supply system: Compressor _____ HP control Panel _____ Supply pressure at depth _____ PSIG

h. Make and model of gas supply system _____

i. Umbilical make _____

j. Umbilical I.D. _____ length _____ number of fittings _____ k. Type, size of EGS cylinder _____

k. Type of EGS interface whip and QD _____

l. Other items attached to EGS regulator _____

m. Type of harness with / or without jock _____

n. Gloves, Boots, Finns _____

q. Recovery depth _____

r. Water temp _____

s. Maximum dive depth _____

t. Recovery depth _____

u. Dive time _____

v. Open Circuit on _____ off _____ Cylinder Pressure _____

w. Note the EGS valve position _____

x. Note position of steady flow valve _____

y. Note any kind leaks, water in helmet _____

z. Was the helmet or mask on or off the body _____

3. Write up a brief explanation of the dive job general conditions and equipment being used. Record any obvious damage the man worn equipment, leaking gas, or anything odd or of possible interest. Take

5.

digital pictures and / or video if possible. Ensure the equipment is properly secured and unavailable to anyone other than the official custodian.

Remarks _____

Name Print _____

Title _____

Organization _____

Signature _____

Witness name and contact information _____

Witness Signature _____ Date _____

6.